

# 3Dimensions™



**Service Manual**  
MAN-06384 Revision 001

**HOLOGIC®**







# 3Dimensions™

Digital Mammography System

Digital Tomosynthesis System

## Service Manual

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# Chapter 1 Introduction

## 1.1 System Capabilities

The system provides the user interfaces for the performance of screening and diagnostic mammograms:

- Conventional mammography with a digital image receptor equivalent in size to large mammography film.
- Tomosynthesis scan with a digital image receptor equivalent in size to large mammography film (Tomosynthesis option).
- Conventional digital mammogram and tomosynthesis scan during one compression (Tomosynthesis option).

## 1.2 Skills Needed for System Use

You must know how to do the following:

- Perform the trackball operations, like click, drag, and/or select
- Perform the touchscreen operations
- Select from menus
- Type information in text fields
- Select the options in the screens
- Select the entries from drop-down lists
- Use scroll bars

## 1.3 Training Requirements

Hologic does not accept the responsibility for injury or damage caused by incorrect system operation. See the *User Guide* for directions on how to use the system.

The Service Engineers must complete Hologic training programs before they operate or service a system.

## 1.4 Quality Control Requirements

Facilities in the United States must use the Quality Control Manual to create a Quality Assurance and Quality Control program. The facility must create the program to meet the requirements of the Mammography Quality Standards Act or to be accredited by ACR or another accreditation body.

Facilities outside the United States can use the Quality Control Manual as a guide to create a program to meet the local standards and regulations.



### 1.5 Product Complaints

Report any complaints or problems in the quality, reliability, safety, or performance of this product to Hologic. If the device has caused or added to patient injury, immediately report the incident to Hologic. (See the copyright page for contact information.)










### 1.6 Hologic Cybersecurity Statement

Hologic continuously tests the current state of computer and network security to examine possible security problems. When necessary, Hologic provides the updates to the product.








For Cybersecurity Best Practices documents for Hologic products, refer to the Hologic Internet site at [www.Hologic.com](http://www.Hologic.com).

### 1.7 Symbols

This section describes the Symbols on this system.

Symbol	Description
	Type B Applied Part
	Potential Equalization terminal
	Protective Earth terminal
	"OFF" (power)
	"ON" (power)
	Discard electrical and electronic equipment separately from standard waste. Send decommissioned material to Hologic or contact your service representative.
	Warning Electricity
	Manufacturer
	Date of Manufacture



Symbol	Description
	This system transmits radio frequency (RF) energy (non-ionizing radiation)
	Caution—Radiation
	Follow instructions for use
	Caution
	Catalog number
	Serial number
	Part number

## 1.8 Descriptions of Warnings, Cautions, and Notes

Descriptions of Warnings, Cautions, and Notes used in this manual:



### **WARNING!**

**The procedures that you must follow accurately to prevent possible dangerous or fatal injury.**



### **Warning:**

**The procedures that you must follow accurately to prevent injury.**



### **Caution:**

**The procedures that you must follow accurately to prevent damage to equipment, loss of data, or damage to files in software applications.**



### **Note**

Notes show additional information.



## 1.9 Document Conventions

When prompted to add text, enter the text printed in `monospaced font` exactly as shown.



## Chapter 2 General Information



### Note

Hologic configures some systems to meet specific requirements. Your system configuration may not have all the options and accessories included in this manual.

## 2.1 System Overview

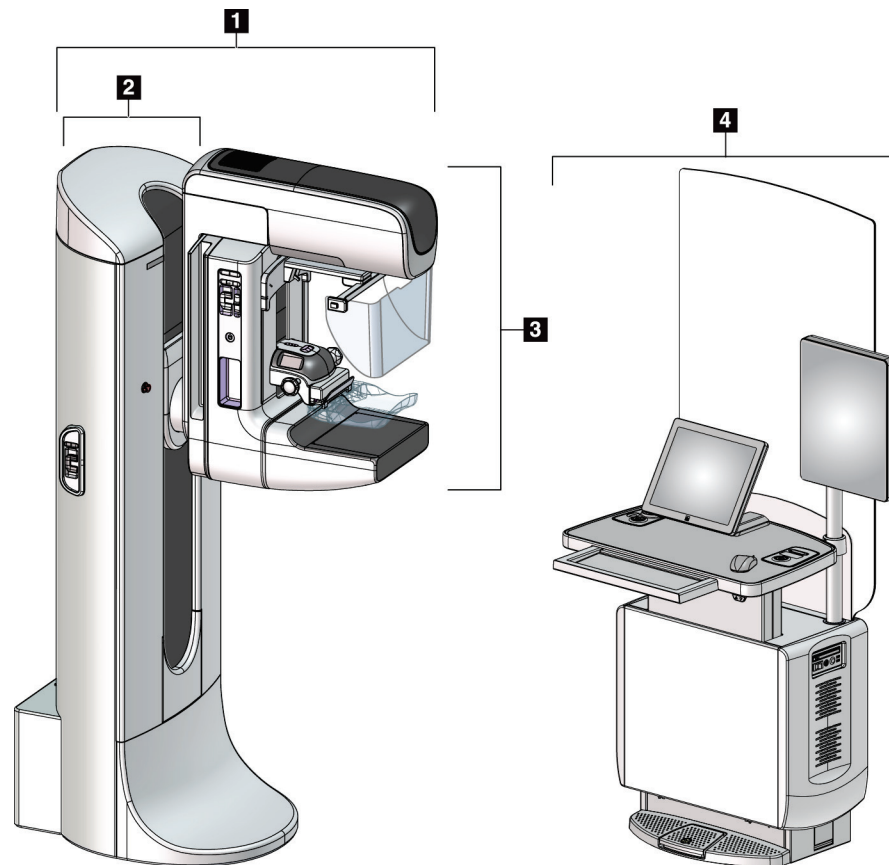


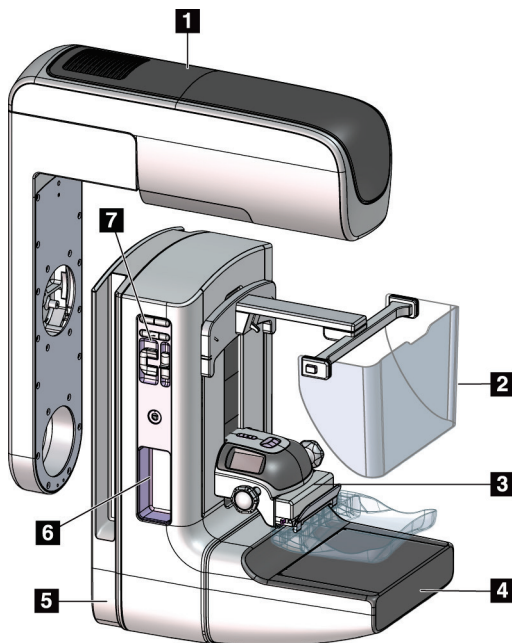
Figure 1: 3Dimensions™ System

### Figure Legend

1. Tubestand (Gantry and C-arm)
2. Gantry
3. C-arm (Tube Arm and Compression Arm)
4. Universal Acquisition Workstation



#### 2.1.1 C-Arm Overview



**Figure Legend**

1. Tube Arm
2. Patient Face Shield
3. Compression Device
4. Image Receptor
5. Compression Arm
6. Patient Handle
7. C-arm Control Panel

*Figure 2: C-arm Overview*

#### 2.2 Safety Information

Read and understand this manual before you use the system.

The system has protective devices, but the Service Engineer must understand how to safely use the system. The Service Engineer must remember the health hazards of x rays.

#### 2.3 Warnings and Precautions



This system is classified as CLASS I, TYPE B APPLIED PART, IPX0, permanently connected equipment, continuous operation with short term loading per IEC 60601-1. There are no special provisions to protect the system from flammable anesthetics or ingress of liquids.



---

##### **WARNING!**

**Risk of electric shock. Only connect this equipment to supply mains with Protective Earth.**

---



**WARNING!**

For North American electrical safety requirements, use a Hospital Grade receptacle to supply a correct Ground.

---

**WARNING!**

Electrical equipment used near flammable anesthetics can cause an explosion.

---

**WARNING!**

To correctly isolate the system, attach only approved accessories or options to the system. Only approved personnel can change the connections.

---

**WARNING!**

Keep a 1.5 meter safe distance between the patient and any non-patient devices.

Do not install non-patient system components (like the Workflow Manager, a diagnostic review workstation, or a hard copy printer) in the Patient Area.

---

**WARNING!**

This system contains lethal voltages.

---

**Warning:**

This device contains dangerous material. Send decommissioned material to Hologic or contact your service representative.

---

**Warning:**

C-arm movement is motorized.

---

**Warning:**

You increase the patient dose to high levels when you increase the AEC exposure adjustment. You increase the image noise or decrease image quality when you decrease the AEC exposure adjustment.

---





**Warning:**

Control the access to the equipment according to local regulations for radiation protection.

---



**Warning:**

The disk drives installed in this system are a Class I Laser Product. Prevent direct exposure to the beam. Hidden laser radiation exists if the case to a disk drive is open.

---



**Warning:**

The bar code scanner installed in this system is a Class II Laser Product. Prevent direct exposure to the beam. Hidden laser radiation exists if the cover is opened.

---



**Warning:**

Keep your full body behind the radiation shield during the exposure.

---



**Warning:**

Do not move the C-arm while the system retrieves the image.

---



**Warning:**

The user or a Service Engineer must correct problems before the system is used.

---



**Warning:**

Always follow the safety precautions for x-ray exposures.

---



**Caution:**

The system is a medical device and not a normal computer. Only make approved changes to the hardware or software. Install this device behind a firewall for network security. The computer virus protection or network security for this medical device is not supplied (for example, a computer firewall). The network security and anti-virus provisions are the responsibility of the user.

---



**Caution:**

Do not turn off the Acquisition Workstation circuit breaker except in emergency. The circuit breaker can turn off the Uninterruptible Power Supply (UPS) and risk data loss.

---





**Caution:**

Risk of data loss. Do not put any magnetic media near or on devices that create any magnetic fields.



**Caution:**

Do not use any heat source (like a heating pad) on the image receptor.



**Caution:**

To prevent possible damage from thermal shock to the Digital Image Receptor, follow the recommended procedure to turn off the equipment.



**Caution:**

The display is calibrated for compliance to DICOM standards. Do not make any brightness or contrast adjustments to the display.



**Caution:**

Use the least possible amount of cleaning fluids. The fluids must not flow or run.



**Caution:**

To prevent damage to the electronic components, do not use disinfectant sprays on the system.

## 2.4 Emergency Off Switches

The Emergency Off switches remove the power from the Gantry and the Acquisition Workstation Lift Mechanism (on the workstations that include that option). Do not routinely use the Emergency Off switches to turn off the system.

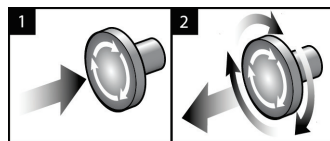


Figure 3: Emergency Off Switch Functionality

There are three Emergency Off switches, one on each side of the Gantry and one on the Acquisition Workstation.

1. To turn Off the Gantry and disable the Acquisition Workstation Lift Mechanism, press any of the Emergency Off switches.
2. To reset the Emergency Off switch, turn clockwise approximately one-quarter turn until the switch pops back out.



## 2.5 Interlocks

The system has safety interlocks:

- C-arm vertical movement and rotation are disabled when compression force is applied. A Service Engineer can configure the lockout force from 22 Newtons (5 pounds) to 45 Newtons (10 pounds).
- If the x-ray button and/or x-ray footswitch\* is released before the end of the exposure, the exposure stops and an alarm message is displayed.  
\* (The x-ray footswitch option is available only on the Universal Acquisition Workstation console.)
- When in Tomo mode, the system does not allow an exposure if the Grid is in the x-ray field (Tomosynthesis option).
- Mirror and Filter position flags also prevent x rays when the Light Field Mirror or the Filter Assembly is not correctly positioned.

## 2.6 Compliance

This section describes the mammography system compliance requirements and the responsibilities of the manufacturer.

### 2.6.1 Compliance Requirements

The manufacturer has the responsibility for the safety, reliability, and performance of this equipment with the following provisions:

- The electrical installation of the room meets all requirements.
- The equipment is used according to the *User Guide*.
- The assembly operations, extensions, adjustments, changes, or repairs are performed only by authorized persons.
- The network and communication equipment is installed to meet IEC Standards. The complete system (network and communications equipment and the mammography system) must be in compliance with IEC 60601-1.



**Caution:**

**Medical Electrical Equipment needs special precautions about EMC and must be installed, put into service and used according to the EMC information provided.**

---



**Caution:**

**Portable and mobile RF communications can affect medical electrical equipment.**

---





**Caution:**

The use of unauthorized accessories and cables can result in increased emissions or decreased immunity. To keep the isolation quality for the system, attach only approved Hologic accessories or options to the system.

---



**Caution:**

The Medical Electrical (ME) Equipment or ME System should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, make sure that the ME Equipment or ME System operates correctly in this configuration.

---



**Caution:**

This system is intended for use by healthcare professionals only. This system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as re-orienting or relocating the equipment or shielding the location.

---



**Caution:**

Changes or modifications not expressly approved by Hologic could void your authority to operate the equipment.

---



**Caution:**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

---



**Caution:**

Based on ENCLOSURE PORT IMMUNITY to RF WIRELESS COMMUNICATIONS EQUIPMENT test level per IEC 60601-1-2 ed. 4, this device shows susceptibility to GMRS 460, FRS 460 transmission frequency. Provide a minimum separation of 30 cm between GMRS and FRS radios and the system.

---



#### 2.6.2 Compliance Statements

The manufacturer states this device is made to meet the following requirements:



Medical – Applied electromagnetic radiation equipment as to electrical shock, fire and mechanical hazards only in accordance with ANSI/AAMI ES 60601-1 (2005) + A1: 2012, C1: 2009 / (R)2012, A2: 2010 / (R)2012 and CAN/CSA-C22.2 No. 60601-1 (2014)

- CAN/CSA - ISO 13485-03 Medical Devices – Quality Management Systems – Requirements for Regulatory Purposes (Adopted ISO 13485:2003 second edition, 2003-07-15)
- CAN/CSA C22.2 NO. 60601-1:2014 Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance
- EN 60601-1: 2006 / A1: 2013 Medical Electrical Equipment. General Requirements for Basic Safety and Essential Performance
- ETSI EN 300 330-1: V1.3.1, and ETSI EN 300 330-2: V1.5.1: 2006—Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz
- ETSI EN 301 489-1: V1.6.1, and ETSI EN 301 489-3: V1.8.1: 2008—Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services
- FCC, 47 CFR Part 15, Subpart C, Section 15.225: 2009
- FDA, 21 CFR [Parts 900 and 1020]
- IEC 60601-1: 2005 / A1: 2012 ed 3.1 Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance
- IEC 60601-1-2 Ed. 4th: 2014 Medical Electrical Equipment – Part 1-2: General Requirements for Basic Safety and Essential Performance - Collateral Standard: Electromagnetic Compatibility – Requirements and Tests
- IEC 60601-1-3 Ed. 2.0: 2008 / A1: 2013 Medical Electrical Equipment – Part 1-3: Particular Requirements for the Safety of X-Ray source assemblies and X-Ray tube assemblies for medical diagnosis
- IEC 60601-2-28: 2017 Medical Electrical Equipment - Part 2-28: Particular Requirements for the Basic Safety and Essential Performance of X-ray Tube Assemblies for Medical Devices
- IEC 60601-2-45: 2011 / AMD1: 2015 Medical Electrical Equipment – Part 2-45: Particular Requirements for the Basic Safety and Essential Performance of Mammographic X-Ray Equipment and Mammographic Stereotactic Devices
- RSS-210: Issue 7, 2007 Radio Standards Specification Low-power License-exempt Radiocommunication Devices: Category I Equipment
- ANSI/AAMI ES 60601-1: +A1: 2012, C1: 2009 / (R)2012 and A2: 2010 / (R)2012 Medical Electrical Equipment, Part 1: General Requirements for Basic Safety and Essential Performance, includes amendment (2010)



2.7 Label Locations

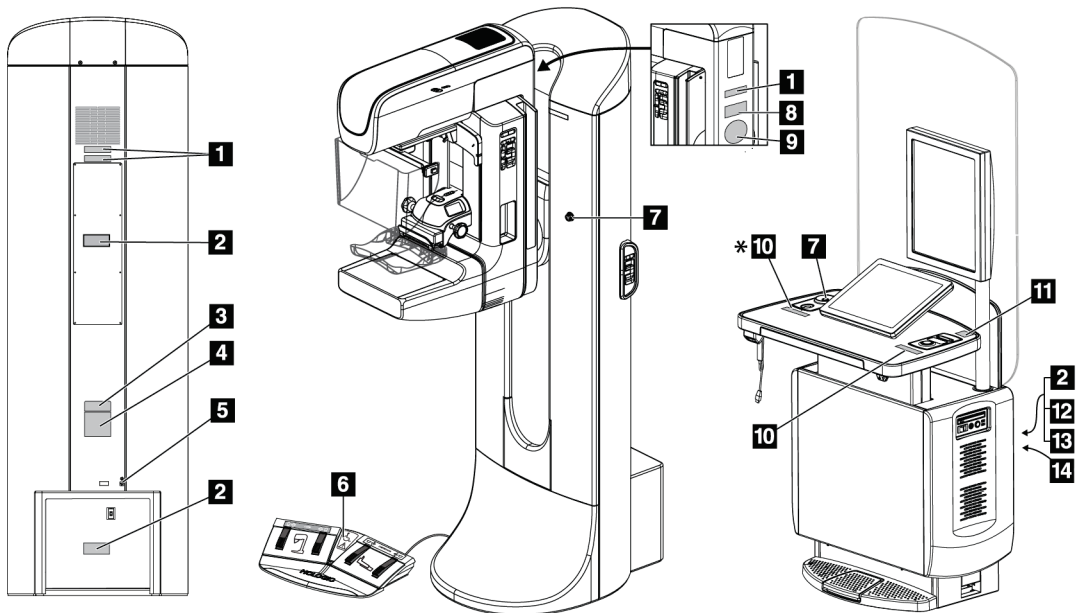


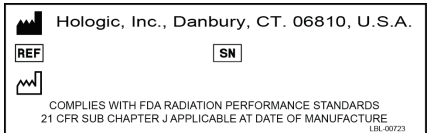
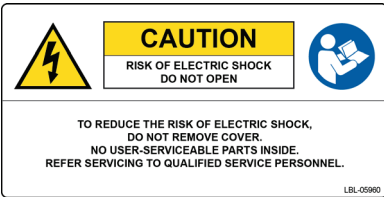

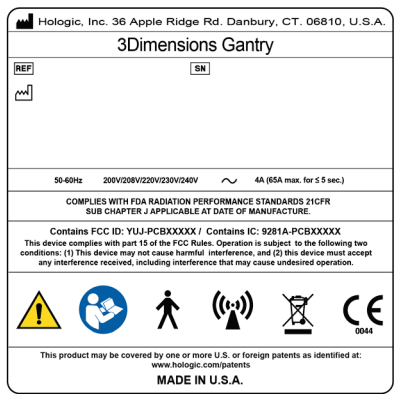



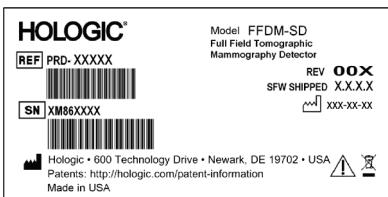
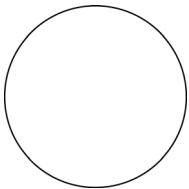
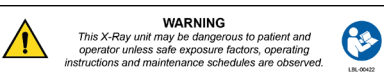

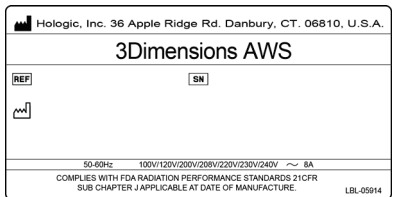
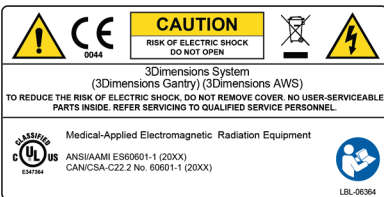
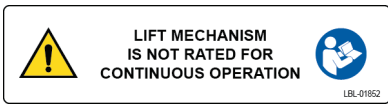
Figure 4: Label Locations



# 3Dimensions System Service Manual

## Chapter 2: General Information

Table 1: System Labels

<p>1</p>  <p><i>Serialized Device</i></p>	<p>2</p>  <p><i>Electrical Shock Warning</i></p>	<p>3</p>  <p><i>System Model</i></p>
<p>4</p>  <p><i>Gantry Nameplate</i></p>	<p>5</p>  <p><i>Potential Equalization Terminal</i></p> <p>6</p>  <p><i>Wheelchair Warning for Footswitch</i></p> <p>7</p>  <p><i>Emergency Stop Switch</i></p>	<p>8</p>  <p><i>Detector</i></p>
<p>9</p>  <p><i>Vendor-supplied X-ray Tube Serial Number</i></p>	<p>10</p>  <p><i>X-ray Device Warning</i></p>	<p>11</p>  <p><i>Technical Support Contact</i></p>
<p>12</p>  <p><i>Acquisition Workstation Nameplate</i></p>	<p>13</p>  <p><i>Compliance</i></p>	<p>14</p>  <p><i>Acquisition Workstation Lift Limit</i></p>



## Chapter 3 Installation and Connections

### 3.1 Receive Shipment and Unpack

Required Tools:

- Box cutter
- Electric screw gun with #2 Phillips screw head driver
- Small crowbar or claw hammer
- Set of 3/8" socket wrenches
- Hand truck with drop-down wheels

#### 3.1.1 Receiving Instructions

The system is shipped in containers that hold the:

- Gantry
- Acquisition Workstation
- Radiation Shield (not included with the Mobile configuration)
- Image Receptor (IR)—The IR usually does not arrive until the second day.
- Accessories and additional or optional equipment



---

**Note**

A Hologic representative must be present at the time of delivery and is responsible for unpacking the product.

---



---

**Note**

If there is a discrepancy between the contents and the packing list or sales order, contact Hologic immediately. If it is necessary to repack any items for future installation, use the original packaging materials.

---



---

**Note**

If shipping damage is concealed, contact the carrier immediately after discovery.

---

At the time of receipt, perform the following steps before opening the containers:

1. Inspect each container for damage.
2. Note any damage on the shipping manifest.
3. Notify Hologic of any external shipping damage that has occurred.



#### 3.1.2 Unpacking the Gantry

The system Gantry is crated and shipped in a prone position. The C-arm is rotated 180°, and a foam block is wedged between the C-arm and the Gantry.



---

**Warning:**

**Be sure to have the necessary machinery and personnel available to move heavy medical equipment safely.**

---



---

**Warning:**

**To prevent injury to personnel and/or damage to equipment, care must be taken when uncrating the equipment.**

---

To unpack the Gantry from the shipping container:

1. While still in the loading area, cut the retaining straps that secure the cardboard carton to the wooden crate.
2. Remove the nails holding the carton to the wooden crate along the bottom edge of the cardboard.
3. Remove the side screws and washers that hold the carton to the internal wooden support piece.
4. Lift the carton off the wooden crate.
5. Carefully remove all shipping materials (foam padding, tie-downs, straps, shipping wrap, and so on) from around the Gantry and wooden crate. Remove any accessory boxes. Do NOT remove the foam block wedged between the C-arm and Gantry.
6. Open all boxes removed from the Gantry shipping container, and check their contents against the packing list and sales order.
7. Inspect each item for damage, then safely store them near the exam site.
8. Carefully move the Gantry and wooden crate into an upright position.



---

**Warning:**

**The unit is top-heavy when in the upright position.**

---



---

**Caution:**

**Do not attempt to lift or move the Gantry by the C-arm or damage may occur.**

---

9. Remove the top support bolts from the top of the Gantry. (See the following figure.)



---

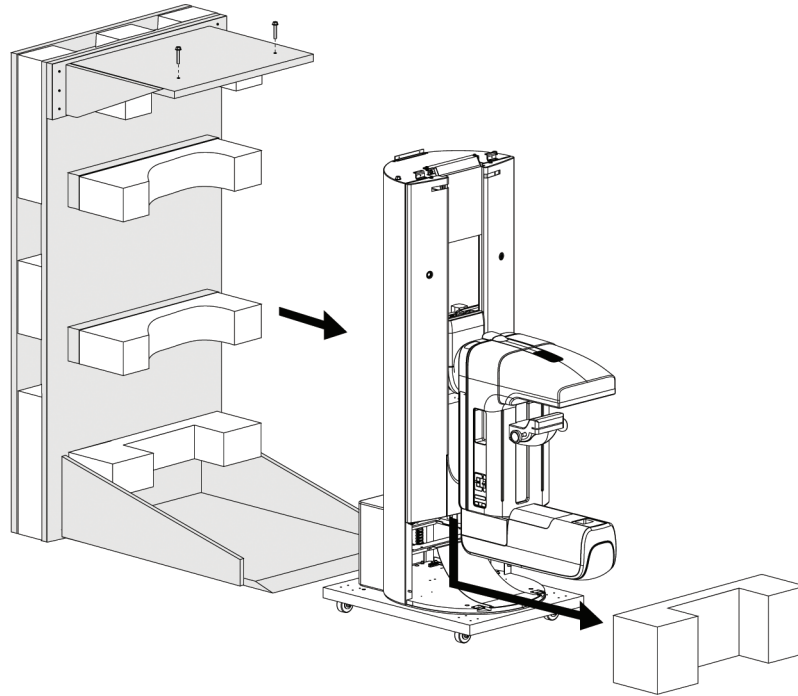
**Caution:**

**Do not insert eyebolts and do not lift the Gantry from the top or damage can occur.**

---



10. Carefully slide the Gantry from the crate. (See the following figure.)



*Figure 5: Unpacking the Gantry*

11. Transport the Gantry from the loading area to the exam area for installation.
12. Remove the four bolts securing the Gantry to the dolly.
13. Use a rigging service to maneuver the Gantry off the dolly and to position the Gantry in the area of installation. Do not attempt to move the Gantry alone.
14. Remove the foam block securing the C-arm. (See the previous figure.)
15. The Service Engineer returns the dolly to Hologic. Refer to the return shipment Bill of Lading (attached to either the dolly or the Gantry). If this documentation is unavailable, contact Hologic Technical Support to acquire a Return Authorization number. Be prepared to identify the site/customer and the system Gantry serial number. Coordinate with the Installation Coordinator as needed.

### **3.1.3 Unpacking the Universal Acquisition Workstation**

The Universal Acquisition Workstation is crated and shipped upright. Most options and accessories are not preinstalled on the workstation. Items such as the monitors, display monitor swing arm, x-ray shield, fingerprint scanner, and bar code reader are packed separately. These packages may be included in the workstation shipping container.



---

**Warning:**

**Be sure to have the necessary machinery and personnel available to move heavy medical equipment safely.**

---





**Warning:**

**The Radiation Shield is tempered glass and may shatter if dropped or overstressed.**

---



**Warning:**

**The Universal Acquisition Workstation is front-heavy. Until the unit is bolted down, be careful when you move or work on the unit. Make sure that the front edge is supported.**

---

To unpack the Universal Acquisition Workstation from the shipping container:

1. While still in the loading area, cut the retaining straps that secure the cardboard carton to the wooden pallet.
2. Lift the carton off the wooden pallet.
3. Carefully remove all shipping materials (foam padding, tie-downs, straps, shipping wrap, and so on) from around the workstation and wooden pallet. Remove any accessory boxes.
4. Open all boxes removed from the workstation shipping container, and check their contents against the packing list and sales order.
5. Inspect each item for damage, then safely store them near the exam site.
6. Carefully maneuver the Universal Acquisition Workstation off the wooden pallet, and transport it from the loading area to the exam area.

#### 3.1.4 Unpacking the Image Receptor



**Caution:**

**Move the Detector to a controlled area prior to unpacking.**

---



**Caution:**

**Extreme care should be taken during unpacking and handling to prevent damage.**

---



**Caution**

**Leave the plastic shipping cover on the detector until actual installation. This plastic cover protects the mylar surface (the shiny silver section) from damage.**

---



**Note**

The detector shipping container is specially designed to minimize shipping damage and to facilitate storage. A temperature monitoring device is included in the shipping container.

---





### Note

If shipping damage is concealed, contact the carrier immediately after discovery.

Upon receipt of the detector, move it to a controlled area which meets these environmental requirements:

<i>Temperature Range</i>	<i>10 °C (50 °F) to 30 °C (86°F) indefinitely</i>
	<i>10 °C (50 °F) to 35°C (95 °F) for a maximum of 12 hours</i>
<i>Maximum rate of temperature change</i>	<i>Less than 10 °C (50 °F) per hour</i>
<i>Relative Humidity Range</i>	<i>10% to 80% without condensing moisture</i>

*(Put in a package for storage in a building.)*

1. Carefully open the multi-layer shipping container and check the contents for damage. Report all issues/discrepancies immediately.
2. Locate and check the temperature logger:
  - If it has a blinking/steady green LED (depends on logger model), that signifies the package stayed within the proper temperature range during shipment. Continue with step 3.
  - If it has a blinking/steady bold red LED (depends on logger model), that signifies the package strayed outside the proper temperature range during shipment. Call Hologic Tech Support for the proper follow-up action.
3. Remove the detector from its container and set aside. Leave the black plastic shipping covering on the detector until actual installation.
4. Locate and set aside the plastic bag containing the detector labels and the detector installation hardware.

## 3.2 Overview of the Installation Process

This section details setting up, positioning, and installing the system in the exam room.



### Caution:

**Do not power up the system until you remove the Grid Assembly shipping bracket or grid damage may occur.**



### Caution:

**Make sure that there is an installed circuit breaker at the Mains that meets the following requirements:**

**40A Breaker, UL 489, or UL HACR listed**





#### Caution

To avoid image artifacts from occurring:

- If the system is installed in a mobile coach, care should be exercised not to locate or park the mobile coach near sources of high power (such as power transmission lines and outdoor transformers).
- Make sure that any mobile power generator, uninterruptable power system (UPS), or voltage stabilizer is at least 3 meters (10 feet) from the closest point of the image detector travel.



#### Note

The network and communication equipment must be installed to meet IEC Standards. The complete system (network and communications equipment and the Mammography System) must be installed to meet IEC 60601-1 and IEC 60601-1-1.



#### Note

Thoroughly read all procedures before starting the installation.

### 3.3 Required Tools and Equipment

- Standard Tool Kit
- System Tool Kit—ASY-02442
- Power hammer drill
- Drill bits and masonry bits
- Anchors (Red Head or equivalent)
- Bolts, washers, shim stock for leveling
- Hacksaw
- Claw hammer
- Center punch
- 3/8 inch or larger ratchet set
- Heavy duty shop vacuum cleaner
- Installation Checklist—refer to [Installation and Preventive Maintenance Checklist](#) on page 439.



### 3.4 Exam Room Layout

Follow the exam room layout shown below for proper clearance zones.

**Note**

The dimensions referenced in the following figure are the minimum for general purposes. We recommend that the customer ensure all installations meet local regulations.

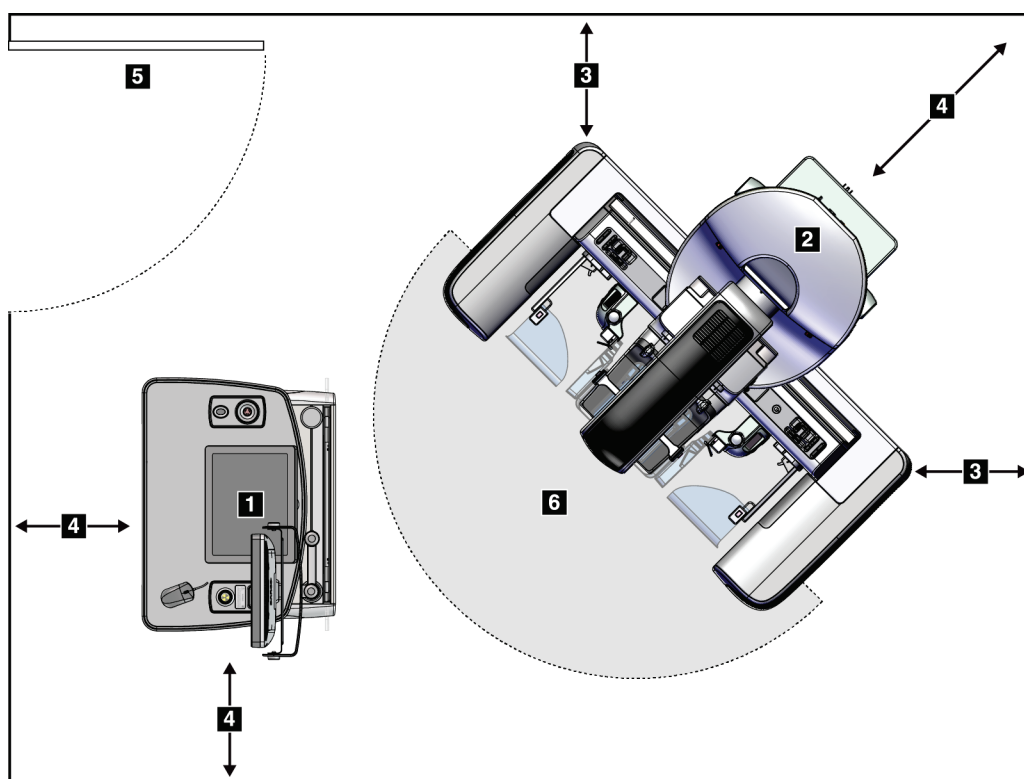


Figure 6: Exam room clearances

**Figure Legend**

1. Acquisition Workstation
2. Tubestand/Gantry
3. Minimum clearance of 50 cm (20 in.)
4. Consult local regulations for minimum clearance
5. Minimum doorway opening of 92 cm (36 in.)
6. Patient Area



## 3.5 Gantry Installation

### 3.5.1 Fasten the Gantry



#### Note

If seismic events are a consideration, see the figure [Center of Gravity Reference](#) on page 434.



#### Caution:

**Do not attempt to lift or move the Gantry by the C-arm or damage may occur.**

1. Position the Gantry in the exam room in a location satisfactory to the technicians and the doctors. Ensure that the circuit breaker and rear panels are accessible.
2. Remove the Gantry top cover, side covers, and the front and rear Gantry covers to access the bolt holes. See the adjacent figure and the figure [Fasten the Gantry](#) on page 23.
  - a. Remove the two screws that fasten the Gantry top cover.
  - b. Remove the bolts located at the top of each Gantry side cover.
  - c. Slide the covers up, and use the inside hooks on the covers, and outer slots on the frame to support the covers while performing the next step.
  - d. Remove the screws that fasten the front cover, and remove the front cover by sliding it down from the retaining pins and forward.
  - e. Remove the four screws from the lower rear cover.
  - f. Remove the rear cover.

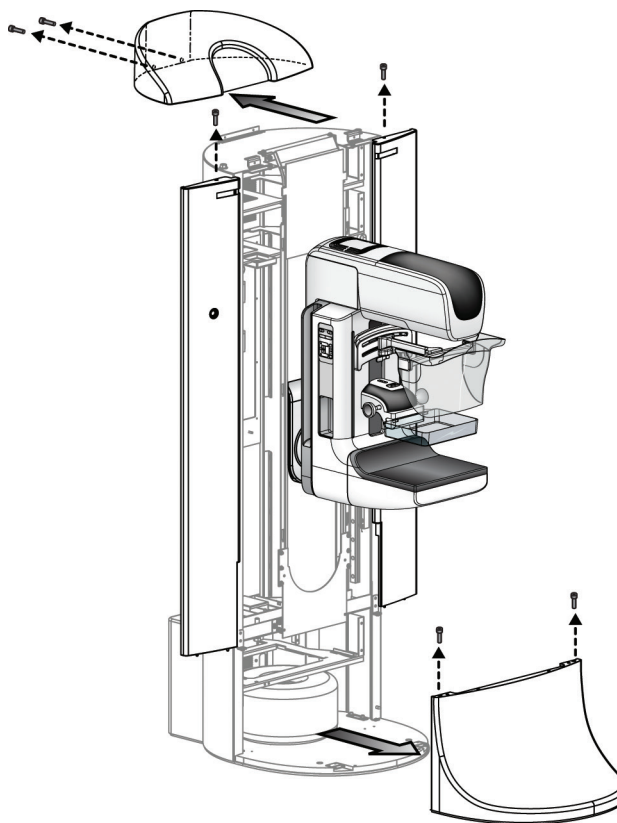


Figure 7: Removing the Front Cover



3. On the exam room floor, mark the four holes for the Gantry bolts.
4. Move the Gantry to allow access to the marks for hole drilling.
5. Drill the anchor holes and set the inserts.
6. Position the Gantry over the inserts and bolt it in place with 5/8 inch hardware in accordance with site specification drawings and/or local building codes.

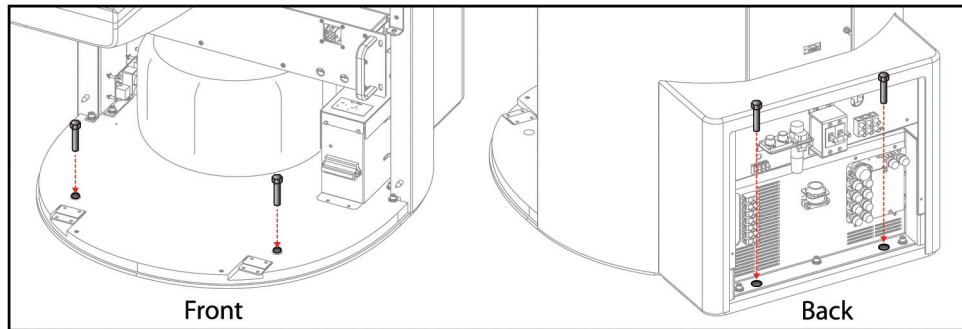


Figure 8: Fasten the Gantry

**Note**

You install the rear Gantry covers further in this chapter.

---

### 3.5.2 Remove the Grid Assembly Shipping Bracket

**Caution**

Manually raise the compression assembly to avoid hitting (and possibly damaging) the carbon fiber cover when the compression assembly is removed.

---

1. Remove the two screws—item 1.
2. Remove the bracket.

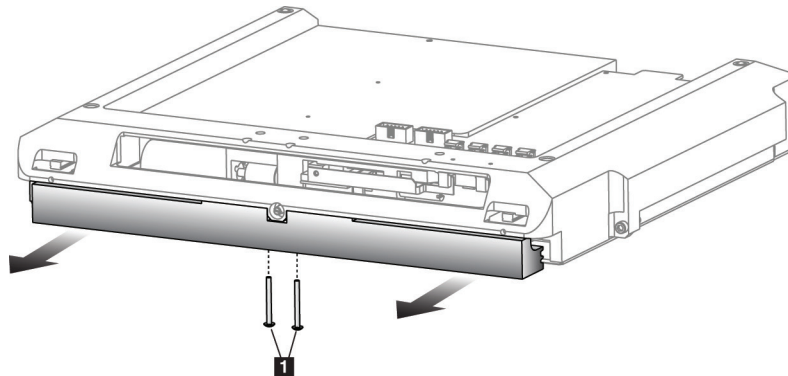


Figure 9: Remove the Grid Assembly Shipping Bracket

**Note**

Store the grid assembly shipping bracket and hardware onsite in the event the unit ever has to be relocated.

---



#### 3.5.3 Configure the Isolation Transformer



##### Caution

The system ships configured for 240 VAC. You must configure the isolation transformer in the Gantry to match the power source at the site.

---

1. Before connecting the Gantry to a mains disconnect, verify the source voltage as follows:
  - a. Measure voltage at the source in the room where the equipment is to be installed.
  - b. Ask about voltage fluctuations or voltage-related problems that have occurred in other equipment at the site.
2. Ensure that the circuit breaker is Off.
3. Remove the lower rear Gantry cover if not already removed. See the following figure.

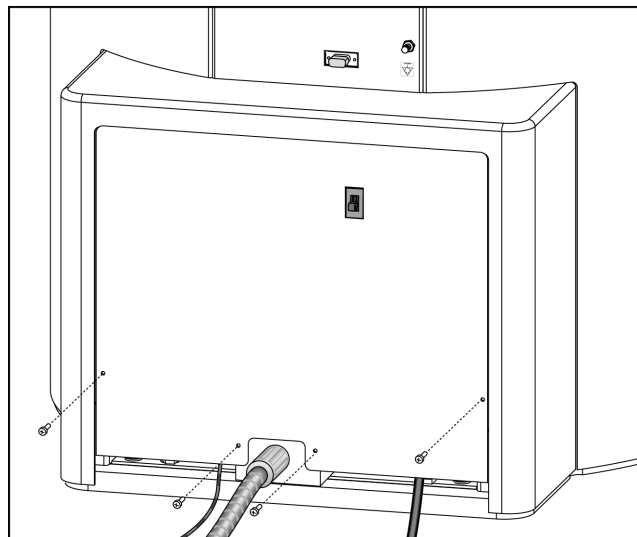


Figure 10: Remove Lower Rear Cover

4. Remove the hole plug from the input power cable bracket, and fasten the input power conduit to the bracket.
5. After determining the input voltage range, verify that the isolation transformer is correctly set. See figure [Isolation Transformer Taps](#) on page 25.
  - a. Set the circuit breaker at the rear of the Gantry to Off.
  - b. Remove the Gantry's lower rear panel to access the input power terminal block.



- c. Verify that the isolation transformer taps are wired to match the source voltage; if they don't match, configure the isolation transformer input wiring and taps.

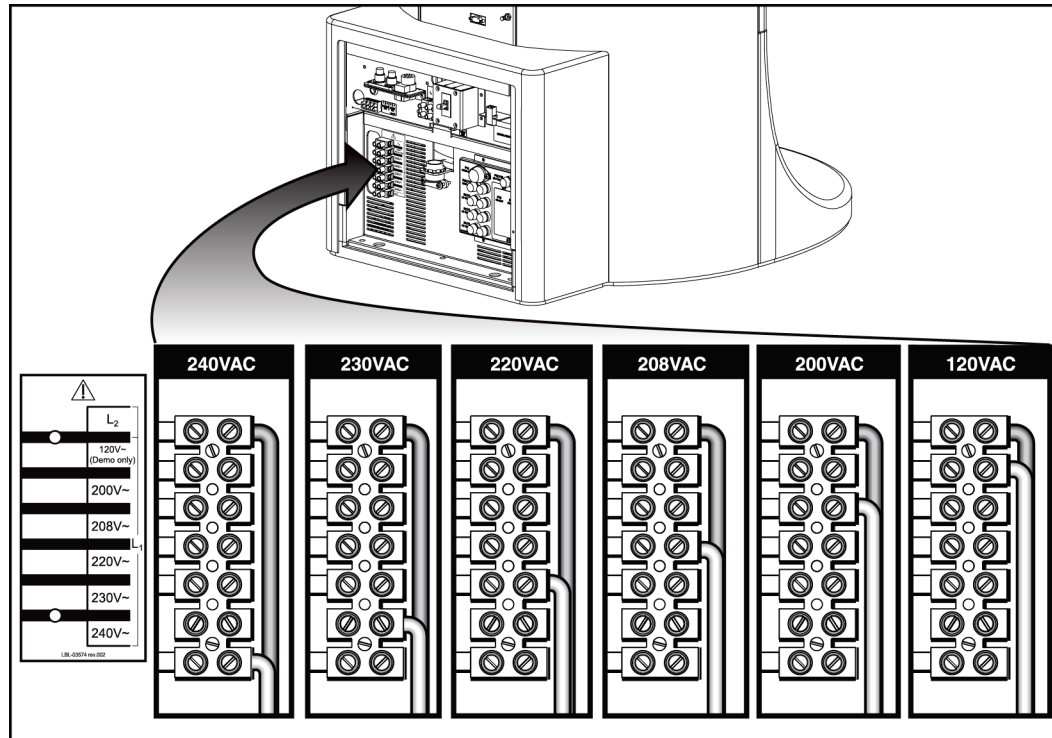


Figure 11: Isolation Transformer Taps



**Caution:**  
120V Demo only is not for clinical use.

### 3.5.4 Input Power Configuration

#### Gantry to Acquisition Workstation Cable Connection

The Acquisition Workstation interconnect (item 4) and fiber optic cables (item 7) are connected to the Gantry connectors as shown in the figure [Gantry Connections](#) on page 26.



#### Gantry Power Cable Connection

1. Route the conduit wires through the nylon cable clamp, and connect to the input power terminal block, as shown in the following figure.
2. Tighten the nylon clamp cap to secure the wires.
3. Have a certified electrician hard wire the opposite end of the input power conduit into the power source via a disconnect panel.

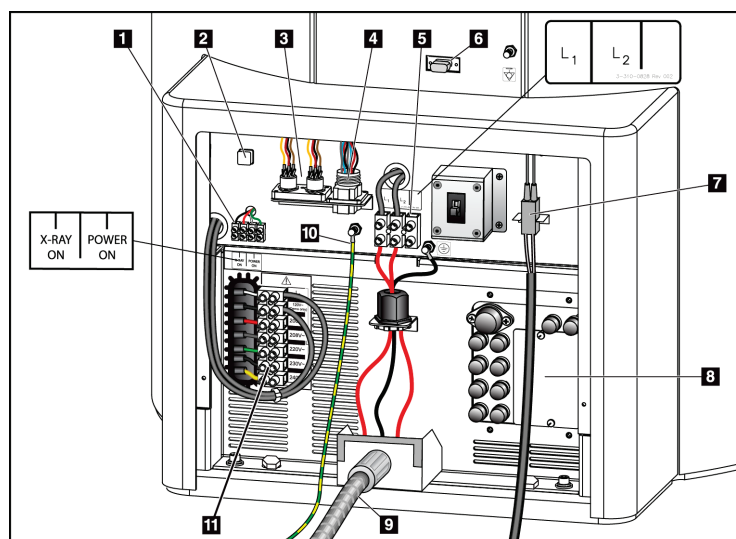


Figure 12: Gantry Connections

#### Figure Legend

1. Power On/X-ray On Terminal Block
2. On/Off Button (service use only)
3. Footswitch Connectors
4. Acquisition Workstation Interconnect
5. Input Power Terminal Block
6. Gantry Service Port (service use only)
7. Fiber Optic Connection
8. Fuse Panel
9. Input Power Conduit
10. Ground connector for separate AWS to Gantry ground cable (as well as the ground lead from AWS to Gantry interconnect cable for some models)
11. Isolation Transformer Taps



### 3.5.5 Install the Gantry Footswitch

The system permits attachment of two dual-function footswitches that plug into receptacles on the Gantry connector panel. See figure [Fasten the Gantry](#) on page 23, item 3.

1. Connect the footswitch to one of the footswitch receptacles by aligning the key to the keyhole and pushing the connector straight in.



#### Note

Either footswitch can be connected to either footswitch receptacle.

2. Position the footswitch in the desired location on the floor below the C-arm.
3. Repeat Steps 1 and 2 for the second footswitch.



#### Warning:

Position the footswitches to prevent accidental operation by a patient or wheelchair.

### 3.5.6 Install the Image Receptor and Breast Platform

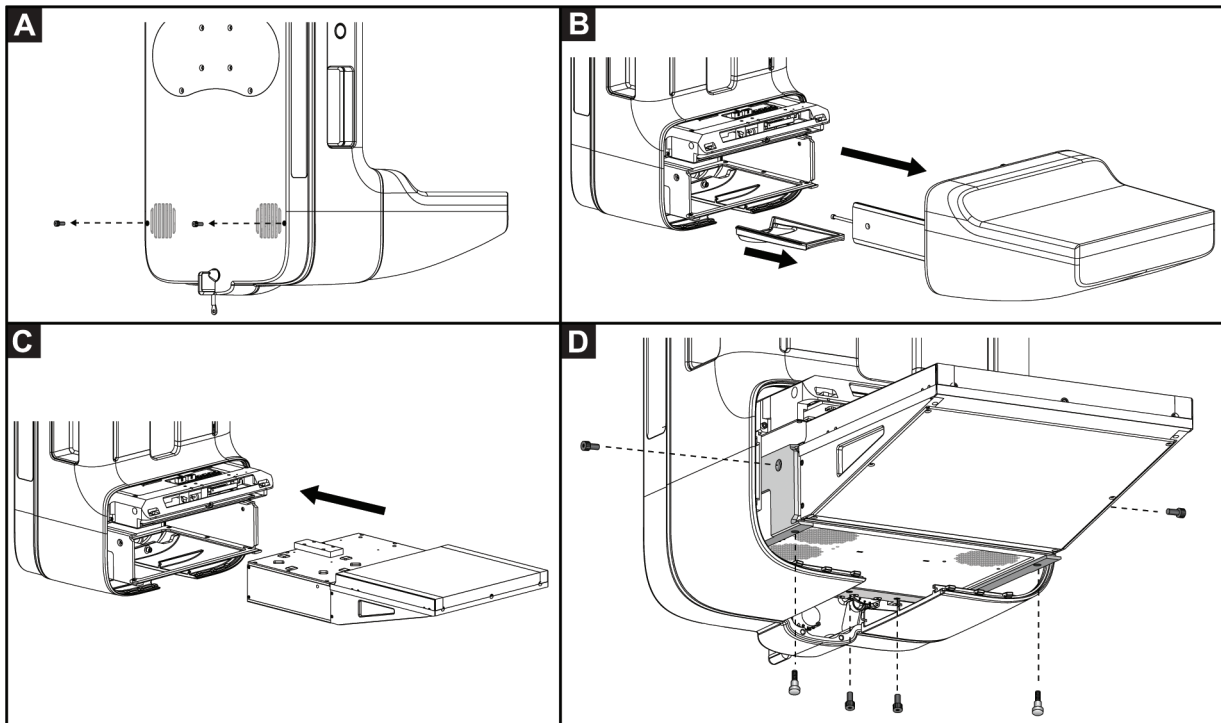


Figure 13: Install the Image Receptor



*A and B—Remove the Breast Platform from the C-arm:*

1. Remove the two hex-head screws located at the rear of the C-arm that fasten the Breast Platform. Save the hardware.
2. Slide the Breast Platform forward.
3. Slide the bottom detail insert located at the rear of the C-arm forward.

*C—Install the Image Receptor:*

1. Carefully remove the Image Receptor from its shipping carton.
2. Remove the protective cover from the mylar surface.
3. Remove the rubber cap at the rear.
4. Slide the Image Receptor into the Platform Mount Brackets until it is seated at the rear (do not force).

*D—Fasten the Image Receptor (use the hardware shipped with the Image Receptor):*

1. Use two hex-head screws in each side of the Platform Mount Brackets.
2. Use two hex-head screws at the bottom rear of the Image Receptor.
3. Use two shoulder-bolts at the bottom front of the Image Receptor.
4. Install the detail insert.
5. Slide the Breast Platform into the C-arm.
6. Fasten the Breast Platform with the previously removed hex-head screws (A).

#### **3.5.7 Affix the Detector Label on Gantry**

Affix the label (shipped with the detector) on the back of the C-arm on the Gantry (refer to item 8, Tomographic Mammography Detector label in [Label Locations](#) on page 13).



### 3.5.8 Install and Adjust the Mag Stand

The magnification (mag) stand must be adjusted for minimum lateral movement before final installation and use by the facility:

1. Make sure the face shield and the compression paddle have not been installed and the compression device is completely to the top.
2. Hold the mag stand on each side just below the black buttons (see the following figure, item 4). Do not press the black buttons.

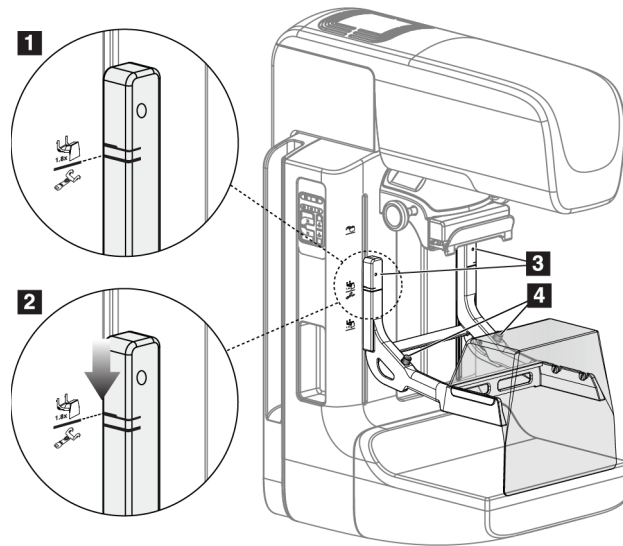


Figure 14: Installation of the magnification (mag) stand



#### Note

There are two sets of mounting slots for the mag stand—one set is for 1.8x, and the other set is for 1.5x.

3. Align the thick black lines on the mag stand with the thick black lines on the C-arm. When these lines meet, the hooks of the mag stand align to the mounting slots on the C-arm (see item 1 in the previous figure).
4. Put the hooks of the mag stand into the C-arm slots. Slide the mag stand down, until the thin black lines on the mag stand and the black line of the C-arm meet (see item 2 in the previous figure).

The locking pins slide into holes and lock the device. You hear an audible click.



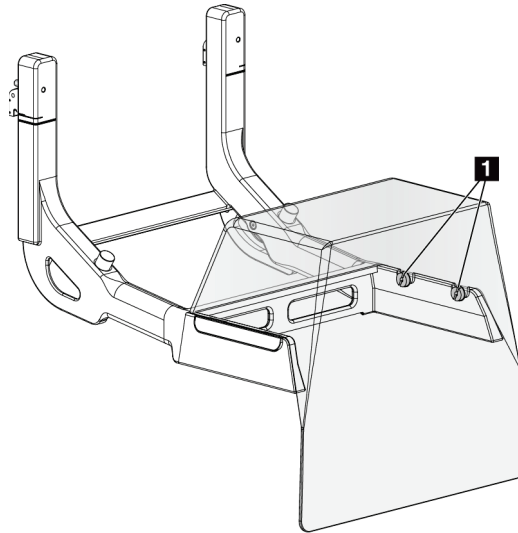
#### Note

If the mag stand is not installed correctly, there is an indicator with a red shaft which protrudes (see item 3 in the previous figure). When the stand is installed correctly, the indicator is retracted.

5. Once properly positioned, check for lateral play in the mag stand.



6. Remove the mag stand:
  - a. Hold the handles of the mag stand and press the black buttons.
  - b. Lift and remove the device from the C-arm.
7. If there is lateral play, do the following:
  - a. While the mag stand is off the machine, adjust the mag stand right-side hex screws (see following figure) 1/4 to 1/8 turn at a time.



*Figure 15: Adjusting lateral play in mag stand*

- b. Reinstall the mag stand and check for lateral play.
  - c. Repeat steps a and b until there is a minimum lateral movement in the mounted mag stand.
  - d. Remove the mag stand.



### 3.5.9 Remote X-ray On/Power On Lamp Connection

The system gives the user the ability to operate remote lights which indicate when the system is On and when x rays are being taken. These lights are normally installed outside the exam room, above the door. Installation should be done by a certified electrician. The relay contacts are rated:

- 10 A 250 VAC (normally open)
  - 10 A 30 VDC (normally open)
1. The connection points are available through the access panel at the rear of the Gantry, as shown in figure [Fasten the Gantry](#) on page 23 , item 1. Connections are made on the Power On/X-ray On terminal block.
  2. Install the remote Power On/X-ray On lights following local guidelines.
  3. Route the remote cables from the lights to the Gantry and connect each cable to the appropriate location on the Power On/X-ray On terminal block.
  4. After the workstation installation is complete and powered on, enable this feature in CalTool. (Refer to [Configure the Remote X-Ray On Light](#) on page 197.)

## 3.6 Acquisition Workstation Installation

### 3.6.1 Mount the Workstation in Position

This section details setting up, positioning, and installing the Universal Acquisition Workstation in the exam room.



---

**Warning:**

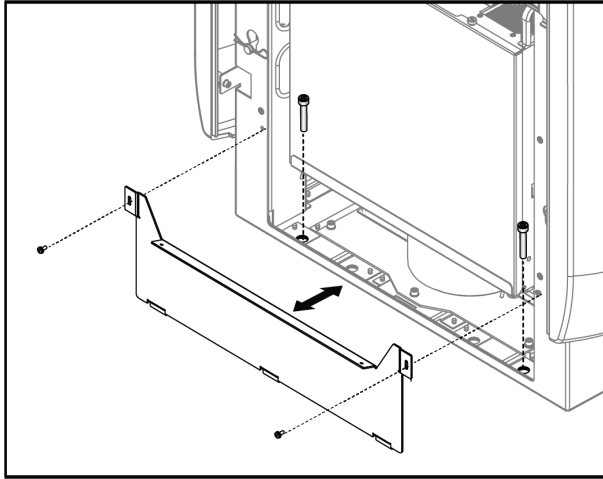
**The Universal Acquisition Workstation is front-heavy. Until the unit is bolted down, be careful when you move or work on the unit. Make sure that the front edge is supported.**

---

1. Position the workstation in the exam room in the specified location.
2. Remove the front, back, and side covers. Remove the top cover (refer to [Remove the Covers and Panels](#) on page 286).



3. Remove the lower rear panel (kick plate) from its location behind the (removed) back cover. This provides access to the anchor bolt locations behind the kick plate. (See following figure.) We recommend that you use the two outer holes for the anchor bolts, if possible.



*Figure 16: Removing the kick plate and accessing the anchor bolt locations*

4. Mark the four anchor holes for the workstation, then move the workstation to access the marks.
5. Drill the anchor holes and set the inserts.
6. Position the workstation over the inserts and bolt it in place in accordance with site specification drawings and/or local building codes.



---

**Note**

You install the workstation covers further in this chapter.

---



### 3.6.2 Input Power Configuration

The isolation transformer within the workstation must be configured to 100, 120, 200, 208, 220, 230, or 240 VAC. After determining the correct VAC for the site, verify that the isolation transformer of the workstation is correctly set. Reconfigure the taps to match site power requirements as required.

1. Verify that the isolation transformer taps are wired to the site voltage requirements. If they are not, configure the isolation transformer input wiring and taps whose location is shown in the following figure (item 1).

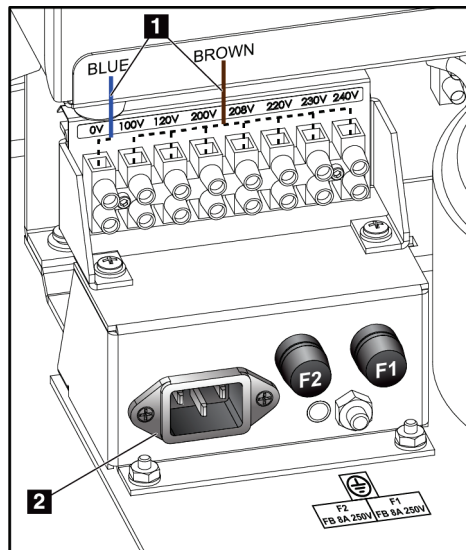


Figure 17: AC Input Power Configuration (example only)

2. Verify that the circuit breaker CB1 rating is as follows: CB1 = 8.0 A 120/240V
3. Verify fuse F1 and F2 ratings: F1 = 8.0 A 250V, F2 = 8.0 A 250V
4. Connect the appropriate workstation power cord to the AC input (see previous figure, item 2).

### 3.6.3 Connect Power

The system ships with two Acquisition Station power cords:

- 1-056-0046 (POWER CORD, INTL 3.0 METERS 10AMP 250V C13)
- 1-056-0047 (POWER CORD, 10FT LG HOSPITAL GRADE 125V 10 AMP SJT GRAY)

Use the power cord to match the application at the site, and then discard the unused cord.

Connect one end of the power cable to the Acquisition Workstation Power Distribution Assembly outlet, see figure Input Power Configuration—Acquisition Workstation, and the other end to the power source from the facility.



#### 3.6.4 Install the Acquisition Workstation Cables

A straight-through cable is used for the Universal Acquisition Workstation interconnect. Either end is connected to the workstation or the Gantry.

To install the Universal Acquisition Workstation cables:

1. Make sure that the power is OFF and the system is unplugged. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. If not done already, remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Route the cables from the Gantry to the workstation through either the right or left bottom slots found on the sides of the workstation frame.
4. Loosen the screws of the covers in their slots.
5. Lift the covers and route the cables through the related slot.
6. Put the covers on the wires and tighten the screws.
7. Route the cables to the front of the workstation.
8. Connect the cables to the Gantry cable interface on the power distribution assembly on bottom of the chassis. (See the following figure.)

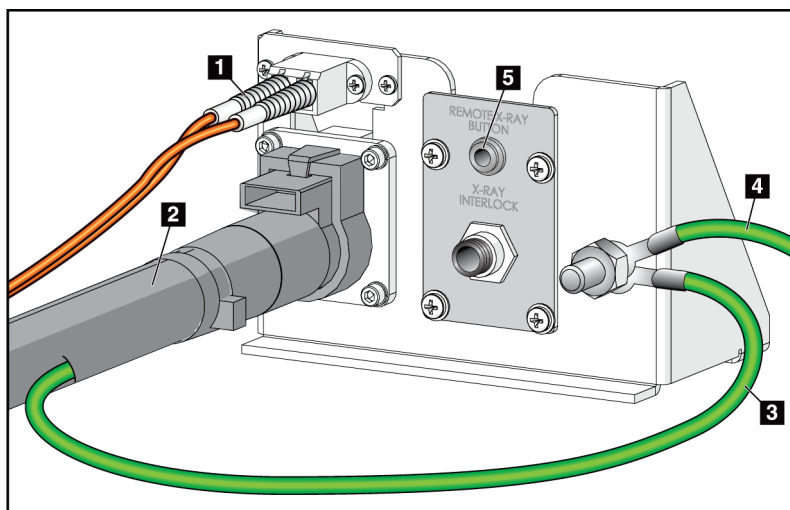


Figure 18: Gantry Cable Interface on Acquisition Workstation

#### Legend

1. Fiber optic cable pair from/to Gantry
2. Interconnect cable from/to Gantry
3. Ground wire from interconnect cable (on some models)
4. Separate ground wire from/to Gantry
5. Connection for optional remote x-ray hand button



The X-ray Interlock connector at the rear of the Gantry provides a normally closed (NC) contact (5V 10mA) for the Acquisition Workstation. When an external interlock is used (for example a door or shield switch), a contact opens and an exposure cannot take place. A switch closure on the contact must occur for an exposure to occur.

**Note**

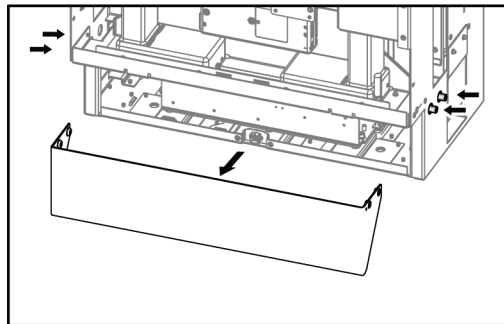
If the X-ray Interlock is utilized, the state of the interlock contacts should be displayed by visual means to the operator per IEC 60601-2-45:2011 (3rd Edition), Clause 203.6.2.1.101.

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### 3.6.5 Install X-ray Activation Footswitch Assembly

To install the X-Ray Activation Footswitch Assembly for the Universal Acquisition Workstation:

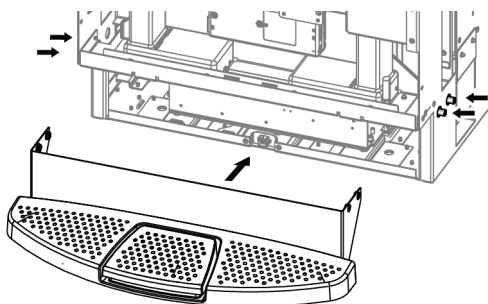
1. If not done already, make sure that the power is OFF and the system is unplugged. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. If not done already, remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Unfasten the four screws (two at each end) of the lower front panel (kick plate) and remove the panel. Retain the screws. (See the following figure.)



*Figure 19: Removing original factory-installed Lower Front Panel (kick plate)*



4. Install the x-ray activation footswitch assembly:
  - a. Attach the new lower front panel kick plate (which is part of the x-ray activation footswitch assembly) by sliding it into place. (See the following figure.)
  - b. With the assembly now attached to the base of the workstation, secure it by tightening the same screws loosened in the previous step.



*Figure 20: Installing x-ray footswitch assembly  
(which includes new lower front panel kick plate)*



#### Note

The wiring connection is made via bulkhead connectors between the footswitch and the workstation with no separate cabling/harnesses used.

See the previous figure. The center arrow points to where the footswitch connector connects with the workstation mating connector.



#### Tip

If there is not enough space to slide the x-ray footswitch assembly into place, loosen the Universal Acquisition Workstation mounting bolts from the floor. If necessary, tilt the front of the workstation up slightly to slide the x-ray footswitch assembly into place.

5. Verify that the footswitch is installed and connected properly:
  - a. On the I/O Interface Board, locate JP5. (See the following figure.)



- b. Using a digital multimeter (DMM), measure resistance between JP5 Pin-2 and JP5 Pin-4 on the I/O Interface Board.
- c. If the footswitch is installed and connected properly:
  - When the footswitch is depressed, your resistance measurement indicates a closed connection.
  - When the footswitch is NOT depressed, your resistance measurement indicates an open connection.
6. Set the jumpers for the proper footswitch operation (parallel or series) that the customer requires. (Refer to the following figure and legend.)

### Figure Legend

**A - For parallel operation** (the operator uses *either* the footswitch or the x-ray button on the tabletop to activate an x-ray image):

- Put jumpers on pins 1-2 and 3-4. (See the adjacent figure, item A.)

**B - For series operation** (the operator uses *both* the footswitch and the x-ray button on the tabletop to activate an x-ray image):

- Verify (or put) jumpers on pins 5-6 and 2-3. (See the adjacent figure, item B.)

### NOTE:

- Parallel operation is the default setting for all shipped UAWS systems.
- Series operation is the default setting for AWS.

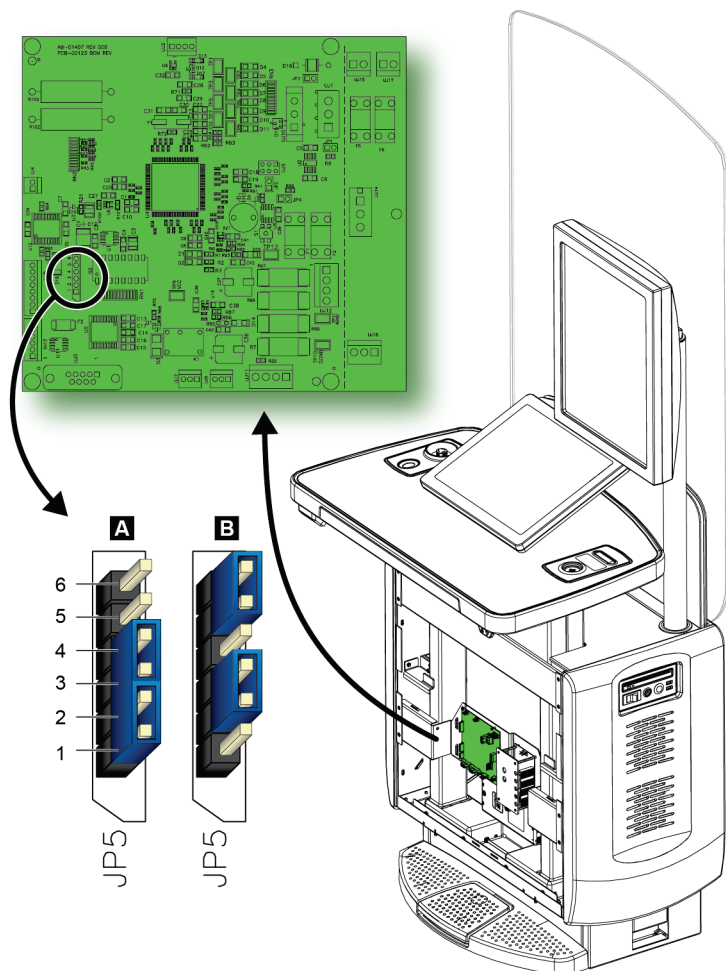


Figure 21: Setting the jumpers on the UAWS I/O Board

7. After the workstation installation is complete and powered on, verify proper operation of the x-ray activation footswitch and the x-ray activation button on the tabletop.



#### 3.6.6 Install the Image Display Monitor

Because of the flexibility in image display monitor mounting positions on the Universal Acquisition Workstation (UAWS), there are various monitor install kits that can be shipped with a system. The install kits are based on the type of UAWS (series I or series II) and the type of monitor support arm requested. Refer to the following two tables to get acquainted with the mounting scenarios for each type of UAWS.



---

##### Caution

Arms and posts all have different part numbers and are meant to be used only with their respective type of UAWS. For example, an articulated arm for a series I UAWS should only be installed on a series I UAWS system. If you installed that same arm on a series II UAWS, interference issues may result and could cause damage to the control monitor and radiation shield.

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Table 2: Image Display Mounting on Series I UAWS



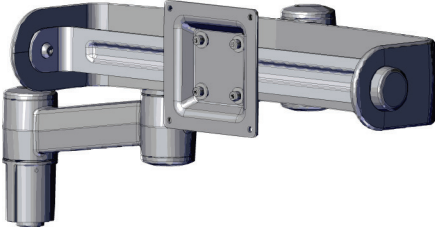

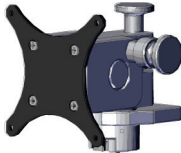

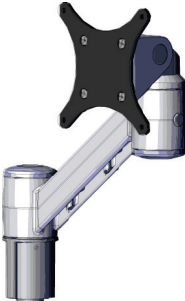
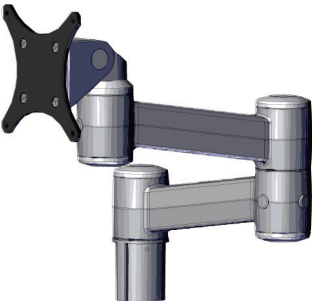
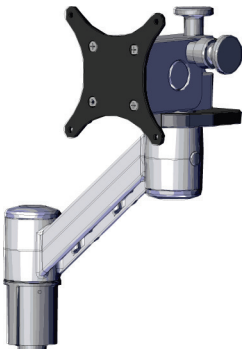
Figure	Item	Description	Notes/Reference
	Monitor Post	A post that is inserted into the workstation and supports any of the series I UAWS arms listed in this table	This post is not pre-installed and must be installed at the customer site. It can be positioned on either the left or right side of the workstation tabletop. Refer to <a href="#">Install the Monitor Post</a> on page 41.
	Standard Arm	The default arm supplied with the series I UAWS mounting and supports the monitor in a straight-ahead manner	Refer to <a href="#">Install Monitor Using the Standard Arm</a> on page 48.
	Articulating Arm	An optional arm that allows the monitor to be turned about 180° horizontally	This arm can be installed/positioned for either the left or right side of the monitor post. The arm is shipped for the right side configuration as the default. Some manual steps are required to configure it for the left side. Refer to <a href="#">Install Monitor Using the Articulating Arm</a> on page 52.
Shallow arm for 3MP LED monitor and 2MP color monitor			
			
Deeper arm for 2MP grayscale monitor			
	Mobile Arm	An optional arm used for mobile installations and supports the monitor in a straight-ahead manner	Refer to <a href="#">Install Monitor Using the Mobile Arm</a> on page 60.



Table 3: Image Display Mounting on Series II UAWS

Figure	Item	Description	Notes/Reference
	Monitor Post	A post that is inserted into the workstation and supports any of the series II UAWS arms listed in this table	This post is pre-installed on the right side of the workstation from manufacturing. It can be repositioned to the left side of the workstation tabletop when necessary at the customer site. Refer to <a href="#">Install the Monitor Post</a> on page 41.
	Standard Arm	The default arm supplied with the series II UAWS mounting and supports the monitor in a straight-ahead manner	This arm can be installed/positioned for either the left or right side of the monitor post. The arm is shipped for the right side configuration as the default. Some manual steps are required to configure it for the left side. Refer to <a href="#">Install Monitor Using the Standard Arm</a> on page 48.
	Articulating Arm	An optional arm that allows the monitor to be turned about 180° horizontally	This arm can be installed/positioned for either the left or right side of the monitor post. The arm is shipped for the right side configuration as the default. Some manual steps are required to configure it for the left side. Refer to <a href="#">Install Monitor Using the Articulating Arm</a> on page 52.
	Mobile Arm	An optional arm used for mobile installations and supports the monitor in a straight-ahead manner	This arm can be installed/positioned for either the left or right side of the monitor post. The arm is shipped for the right side configuration as the default. Some manual steps are required to configure it for the left side. Refer to <a href="#">Install Monitor Using the Mobile Arm</a> on page 60.



#### Install the Monitor Post

The image display monitor can be installed on either the left or right side of the Universal Acquisition Workstation (UAWS). The default side is on the right if the customer has not specified a particular side.



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#### Note

For the series II UAWS, the monitor post comes pre-installed on the right side of the workstation tabletop. Skip this section if this side is acceptable to the customer; otherwise, follow the appropriate steps to reposition the post to the left side.

For the series I UAWS, the monitor post must always be installed (to one side or the other).

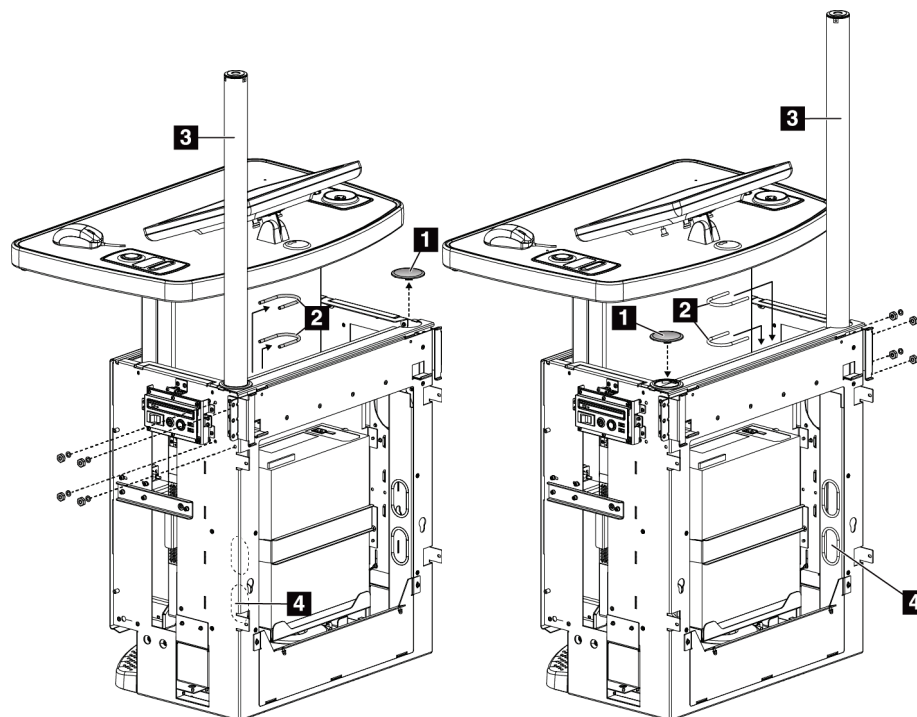
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1. If not done already, make sure that the power is OFF and the system is unplugged. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. If not done already, remove the front, back, side, and top covers. (Refer to [Remove the Covers and Panels](#) on page 286.)



3. Install the monitor post to the appropriate side (left or right) of the workstation, based on the type of UAWS:

#### **Series I Universal Acquisition Workstation**

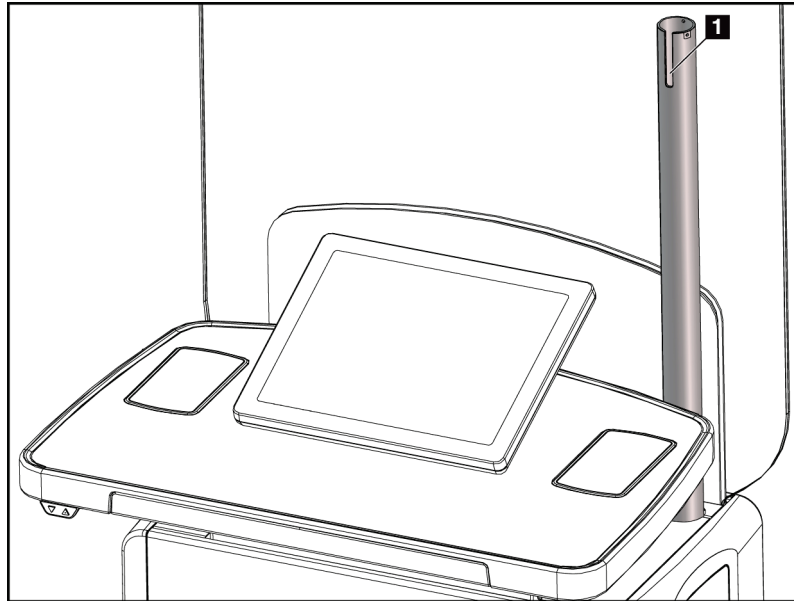


*Figure 22: Installing image display monitor post on either side of workstation (series I UAWS)*

- a. Remove cap (item 1) from top cover on the side you are installing the monitor post.
- b. Loosen the two U-bolts (item 2, using four screws) located near the top of the monitor post shaft.
- c. Slide the monitor post (item 3) down to the bottom of the shaft until it can go no further.



- d. Rotate the monitor post so the notch on top (see following figure, item 1) is facing the operator side of the workstation.
- e. Tighten the two U-bolts to secure the monitor post.



*Figure 23: Notch on monitor post facing operator (right side post mounting)*



#### Series II Universal Acquisition Workstation

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##### Note

For the series II UAWS, the monitor post comes pre-installed on the right side of the workstation tabletop. If this side is acceptable to the customer, skip this section; otherwise, follow these steps to reposition the post to the left side.

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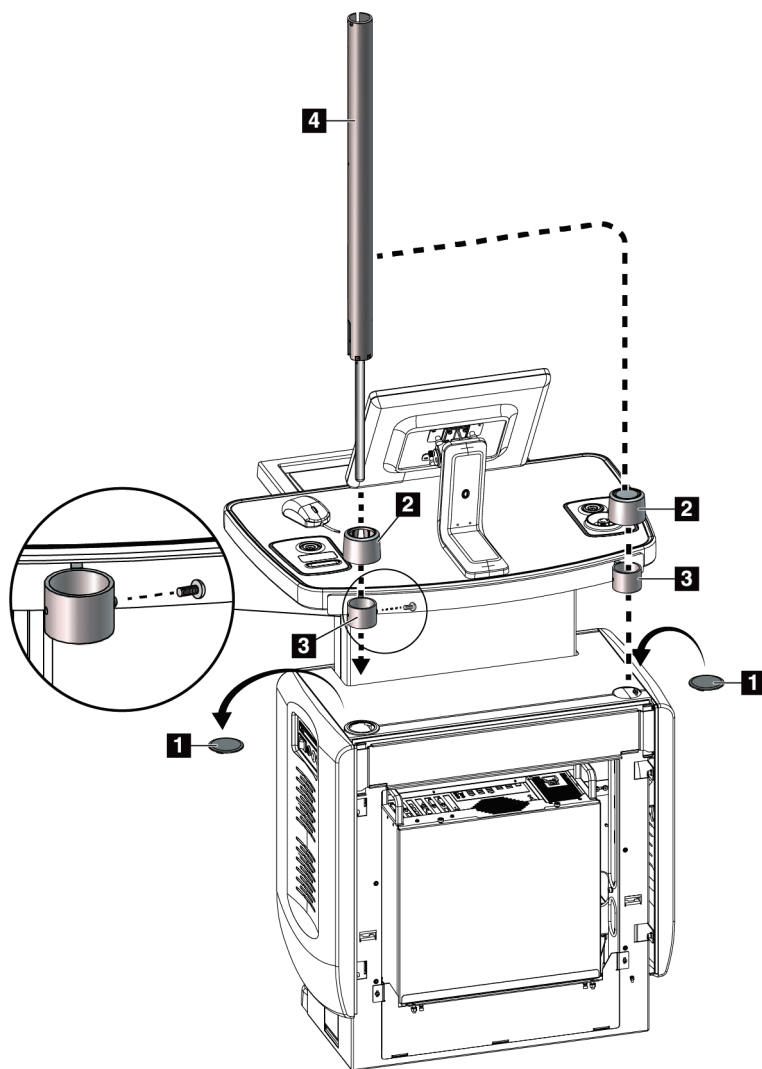
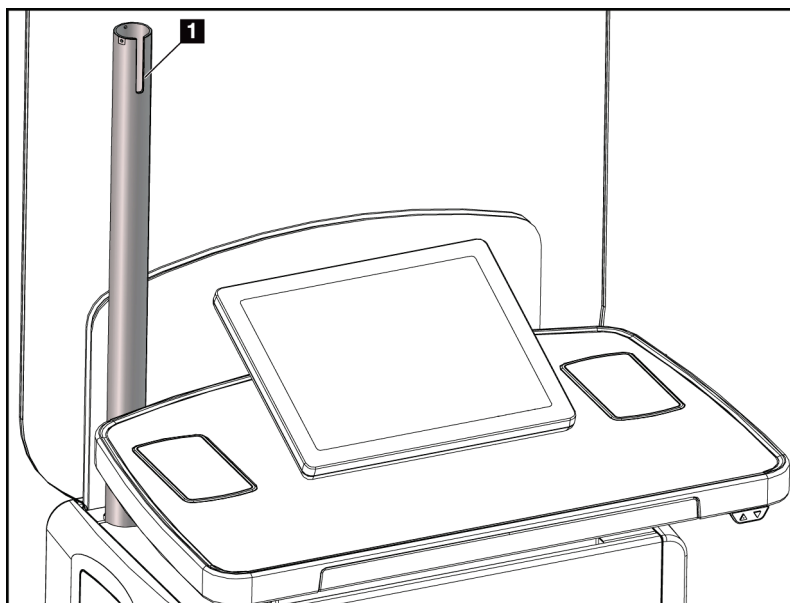


Figure 24: Switching monitor post from right to left side of workstation (series II UAWS)

- Remove the cap (item 1 in previous figure) from the top cover on the side you are installing.
- Remove the top collar (item 2 in previous figure); it is held on only by force.
- Slide the monitor post (item 4 in previous figure) out and insert it into the other side of the workstation.



- d. Rotate the monitor post so the notch on top (item 1 in following figure) is facing the operator side of the workstation.
- e. Tighten the setscrew in the inner collar (item 3 in previous figure) to hold the post in position.
- f. Replace the top collar (item 2 in previous figure).
- g. Place the cap (item 1 in previous figure) on the top cover on the side you moved the post from.



*Figure 25: Notch on monitor post facing operator (left side post mounting)*

#### **Route the Monitor Cables**

1. (2MP Color Monitor only) Connect the extension cable/adaptor (CBL-01673) from the kit to the monitor end of the monitor power cable that is supplied from the manufacturer.



2. Route the cables down the inside of the monitor post and out the access openings of the monitor post and workstation chassis. (See the following figure, item 1.).

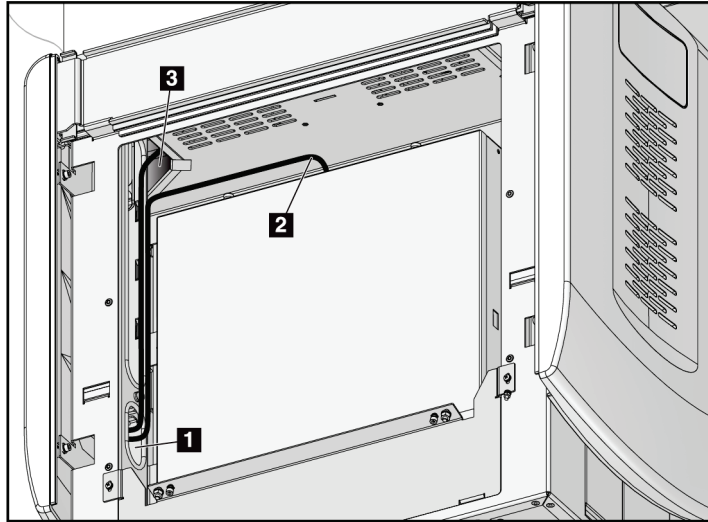


Figure 26: Routing DVI and power cables down monitor post (in right side of workstation)

3. (2MP Color monitor only) Connect the extension cable/adaptor (CBL-01674) to the power supply end of the power cable that is supplied from the monitor manufacturer.
4. Route the DVI cable up through the workstation and over the rear panel of the computer. (See the previous figure, item 2.) Connect the cable to the proper video output on computer rear panel. Use wire ties as necessary for proper cable management.
5. Route the monitor power cable up through the workstation and through the access opening to the platform above the computer. (See the previous figure, item 3.) Use wire ties as necessary for proper cable management.
6. Mount the power supply to the platform above the computer on its bracket and use the strap (supplied in the kit) to hold down the power supply.
7. Attach the power supply to the platform above the computer, based on the type of monitor you are installing:
  - 3MP LED Display - Mount the power supply on the existing bracket and use the strap (FAB-13242) supplied in the kit to secure the power supply.
  - 2MP Color Monitor - Mount the power supply on the existing bracket using power supply spacer (FAB-13362) and strap (FAB-13242) supplied in the kit to secure the power supply. Connect extension cable into monitor power supply.
  - 2MP Grayscale Monitor - Mount the power supply on the existing bracket and use the strap (FAB-13242) supplied in the kit to secure the power supply.
8. Route the AC cable coming from the power supply through the access hole in the platform above the computer to the UPS underneath. Connect the AC cord to the appropriate outlet on the UPS. Use wire ties as necessary for proper cable management.

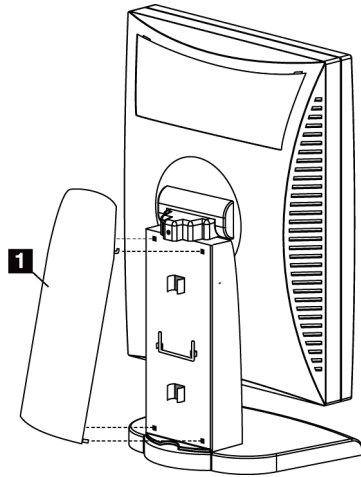


**Remove Pedestal from Monitor (CMP-01531)****Note**

If installing the Barco monitor (Hologic part number CMP-01531), the pedestal of the monitor must be removed before you begin installing the monitor on the Universal Acquisition Workstation.

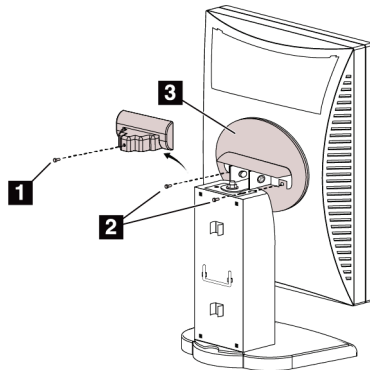
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1. Remove the new image display monitor from its shipping box and packing material.
2. Remove the pedestal cover (item 1 in following figure) by pressing the two bottom latches and lifting the cover up and off.



*Figure 27: Removing pedestal cover*

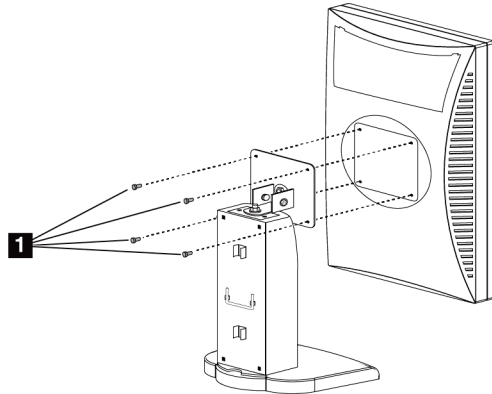
3. Remove the cover to the top of the pedestal (one screw, item 1 in following figure).
4. Locate and unfasten the two screws (item 2) holding the mount cover (item 3) and move the mount cover slightly to the side for better access to the rear of the monitor.



*Figure 28: Removing pedestal hardware*



5. Locate and unfasten the four screws (item 1) for the monitor mount and remove the monitor.



*Figure 29: Removing monitor from monitor mount  
(shown with mount cover removed for better clarity)*

6. Continue with the monitor installation for your type of arm.

### **Install the Monitor to the Arm**

#### **Install Monitor Using the Standard Arm**

##### **Preparing Arm (for Series II UAWS Only)**

1. Determine the side of the post that the monitor is to be mounted.
  - If the monitor is to be mounted on the right side of the post, no changes to the arm are required and you can skip to step 2.
  - If the monitor is to be mounted on the left side of the post, follow these substeps to change the arm configuration to the left side.
    - a. Pry off the two plastic caps from the ends of the arm (items 1 and 2 in the following figure).



- b. Use a metric hex wrench to loosen the hex setscrews (items 1 and 2 in the following figure) under each plastic cap.

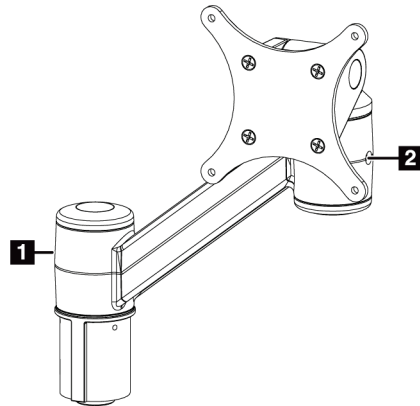


Figure 30: Plastic caps/hex setscrews on standard arm (series II UAWS)

- c. While holding the metal post end, rotate the arm 180 degrees to the left around the metal post end. The arm should now be on the left side if the metal protrusion on the post end is facing you (see the following figure).

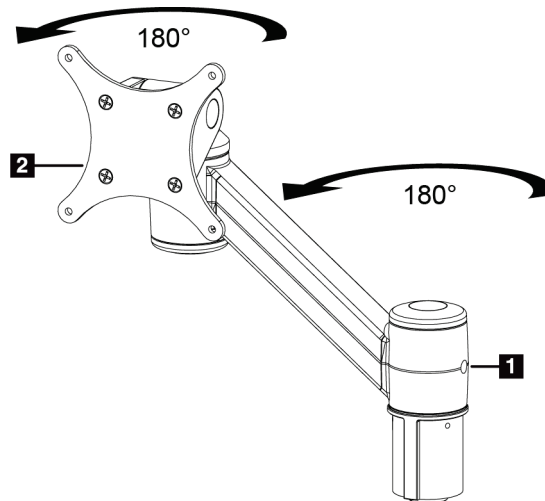
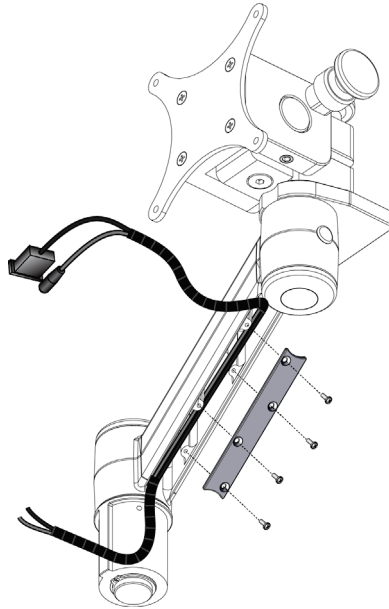


Figure 31: Rotating standard arm 180 degrees to the left (series II UAWS)

- d. While holding the midsection of the arm, rotate the monitor mount 180 degrees to the left around the arm. The monitor mount should now be facing you on the left side if the metal protrusion side of the post end is also facing you (see previous figure).
- e. Tighten the setscrew by the post end of the arm (item 1 in previous figure) to secure the arm in place and replace the plastic cap.
- f. Tighten the setscrew by the monitor mount end of the arm, then back off a 1/4 turn to allow some lateral movement of the monitor mount. Replace the plastic cap.



2. Thread the monitor cables through the arm (see the following figure):
  - a. Route the DVI and power cables through the notch on top of the monitor post. Make sure that you leave enough slack (about 45–60 cm or 18–24 inches) of power cable and DVI cable outside the post so that there is enough to be routed through the articulating arm and attached to the monitor in the following steps.
  - b. Route the cables through the arm.
  - c. Install the cable retainers supplied with the arm install kit to the underside of the arm section (four screws, see the following figures).



*Figure 32: Installing cable retainer after routing monitor cables (series II UAWS)*



**Attaching/Connecting the Monitor**

1. Attach the standard arm to the monitor post (see the following two figures):
  - a. If not done already, route the DVI and power cables (item 3) through the notch on top of the monitor post.
  - b. Align the protrusion of the arm to the groove in the monitor post and insert the arm into the post.
  - c. Secure the arm to the post using the three cap screws (item 4) supplied with the monitor install kit.
2. Attach the image display monitor to the monitor mount (item 2) using four screws supplied with the monitor install kit.
3. Remove the access panel at the rear of the image display monitor (item 1 in the following two figures) and connect the DVI and power cables (item 3). Reattach rear access panel.

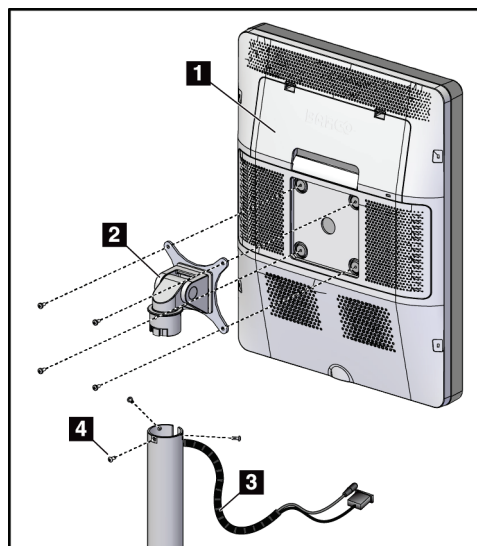


Figure 33: Attaching monitor to standard arm (series I UAWS)

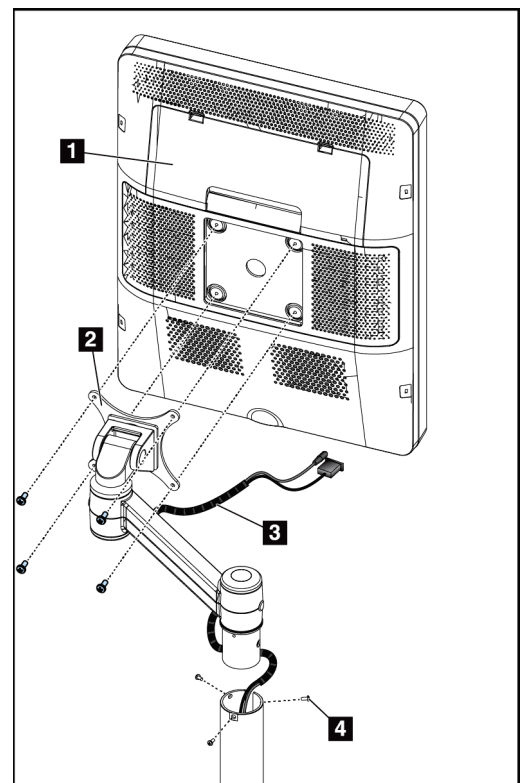


Figure 34: Attaching monitor to standard arm (series II UAWS)

4. After the workstation installation is complete and powered on, configure the image monitor using the on-screen menu of the monitor. (Refer to [Verify Settings of Barco Image Display Monitor](#) on page 299.)



#### Install Monitor Using the Articulating Arm

---



##### Note

For the series I UAWS, the articulating arm is available in two mounting configurations (see the following two figures), shallow and deeper:

- The shallow monitor mounting bracket is used with the 2MP Grayscale Monitor and with the 3MP LED Display monitor.
- The deeper monitor mounting bracket is used with the 2MP Color Monitor.

Make sure you have the correct version for your monitor.

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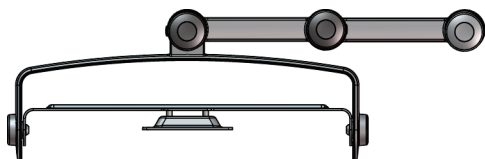


Figure 35: Articulating arm(top view), shallow mount

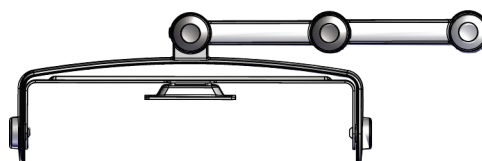
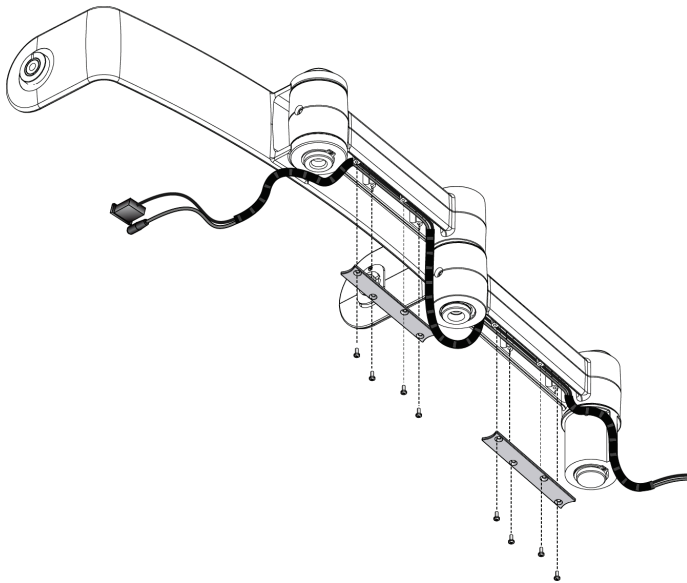


Figure 36: Articulating arm (top view), deeper mount

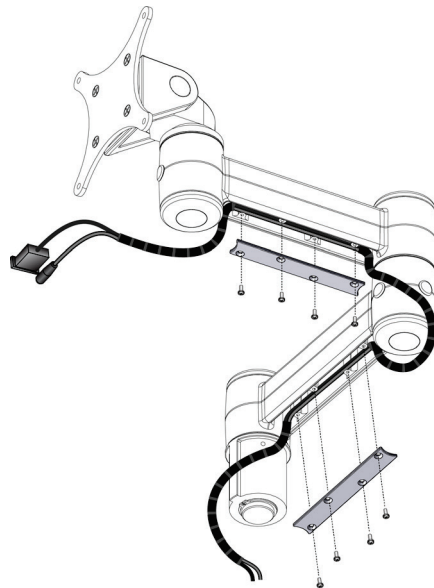
1. Determine the side of the post that the monitor is to be mounted.
  - If the monitor is to be mounted on the right side of the post, no changes to the arm are required and you can skip to step 2.
  - If the monitor is to be mounted on the left side of the post, change the orientation of the arm. Refer to [Change the Orientation of the Articulating Arm](#) on page 55, then continue with step 2 here.



2. Thread the monitor cables through the articulating arm:
  - a. Route the DVI and power cables through the notch on top of the monitor post. Make sure that you leave enough slack (about 45–60 cm or 18–24 inches) of power cable and DVI cable outside the post so that there is enough to be routed through the articulating arm and attached to the monitor in the following steps.
  - b. While holding the double articulating arm near the monitor post, thread the power and DVI cables through the arm along the underside track of the assembly. Ensure that the spiral tubing (if supplied) is wrapped around the portions of cable that are exposed between sections of the articulating arm. (See the following two figures.)
  - c. Install the cable retainers supplied with the arm install kit to the underside of the arm sections (see the following two figures).



*Figure 37: Installing cable retainers after routing monitor cables (series I UAWS)*



*Figure 38: Installing cable retainers after routing monitor cables (series II UAWS)*



3. Place the articulating arm with threaded cables onto the monitor post. Align the protrusion of the arm to the groove in the monitor post and insert arm into the post. Secure the arm to the post using the three cap screws (see the following two figures, item 5) supplied with the monitor install kit.
4. Attach the image display monitor to the monitor mount (item 2) using four screws supplied with the monitor install kit.
5. Remove the access panel at the rear of the image display monitor (item 1 in the following two figures) and connect the DVI and power cables (item 4 in the following two figures). Reattach the rear access panel.

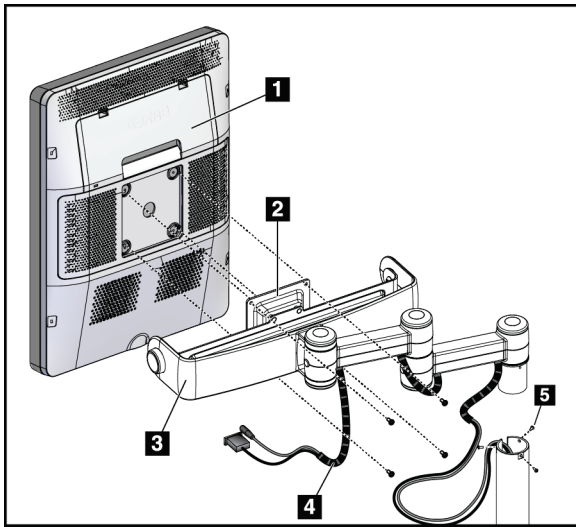


Figure 39: Attaching monitor with cables on articulating arm (series I UAWS)

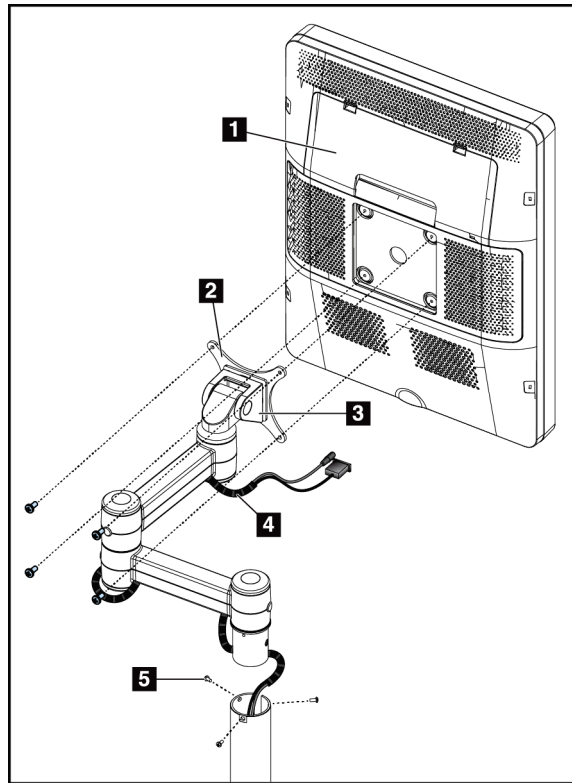


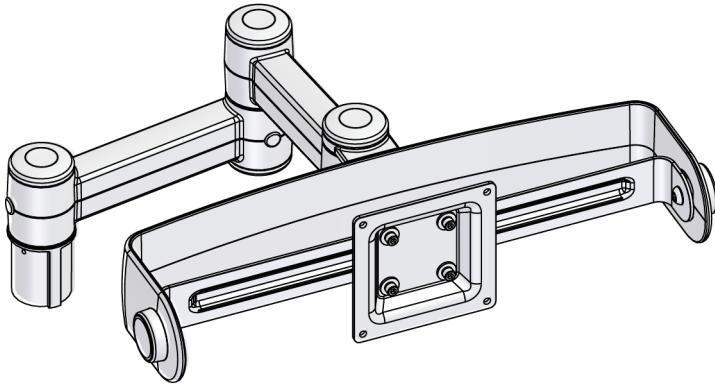
Figure 40: Attaching monitor with cables on articulating arm (series II UAWS)

6. After the workstation installation is complete and powered on, configure the image monitor using the on-screen menu of the monitor. (Refer to [Verify Settings of Barco Image Display Monitor](#) on page 299.)

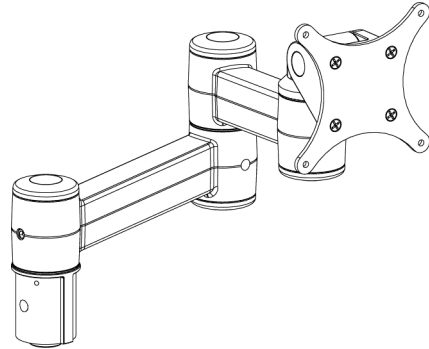


**Change the Orientation of the Articulating Arm**

The articulating arm (see the following figures) allows the image display monitor to be turned about 180° horizontally. This arm can be installed/positioned for either the left or right side of the monitor post (it is shipped in the default position for the right side). Some manual steps are required to configure the arm for the left side.



*Figure 41: Series I UAWS articulating arm in right (default) orientation*



*Figure 42: Series II UAWS articulating arm in right (default) orientation*

**Note**

If you are installing the monitor on the right side of the monitor post, no changes are necessary (skip this section).

If you are installing the monitor on the left side of the monitor post, follow the procedure appropriate for your version of the arm (series I UAWS or series II UAWS) in this section.

**Caution**

Arms are meant to be used only with their respective type of UAWS. For example, an articulated arm for a series I UAWS should only be installed on a series I UAWS system. If you installed that same arm on a series II UAWS, interference issues may result and could cause damage to the control monitor and radiation shield.



#### Series I UAWS

1. Adjust the pivot joint at the monitor post end of the arm (see the following figure):
  - a. Locate and remove the plastic cap and hex screw (5 mm) from the pivot joint ("A" in figure).
  - b. Insert your hex wrench into the screw hole and use the wrench as a lever to loosen and rotate the plug 180° ("B" in figure).

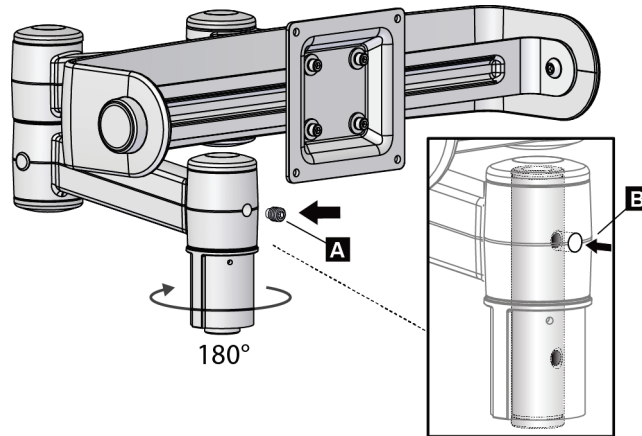


Figure 43: First rotation of articulating arm showing setscrew (series I UAWS)

- c. Apply Loctite 242 to the hex screw and reinstall the screw and cap, keeping in mind these concerns:
    - Take care to align the pivot joint and monitor post plug so that the screw hole allows the full insertion of the screw (see "B" in previous figure.)
    - When reinserting the screw, make sure that the screw is fully recessed inside the screw hole. If it is not, the screw chambers are not aligned properly. If this situation occurs, remove the screw, realign the pivot joint, and monitor post plug, then try reinstalling the screw until properly aligned.
2. View the articulating arm from behind and locate the plastic cap/hex screw in the center pivot section (see the arrow in the following figure).

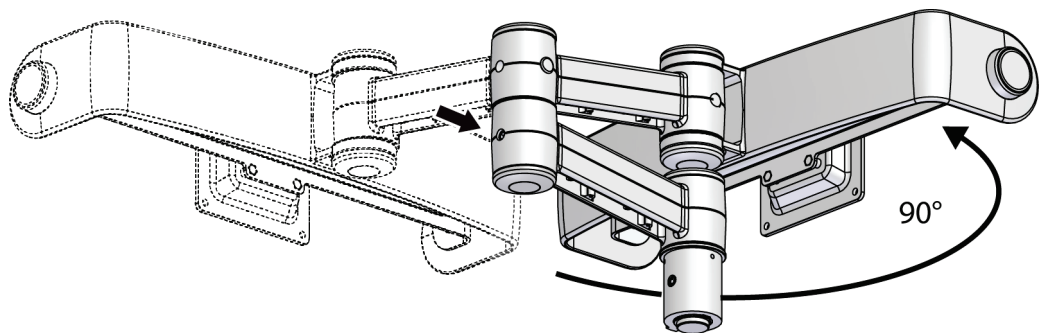
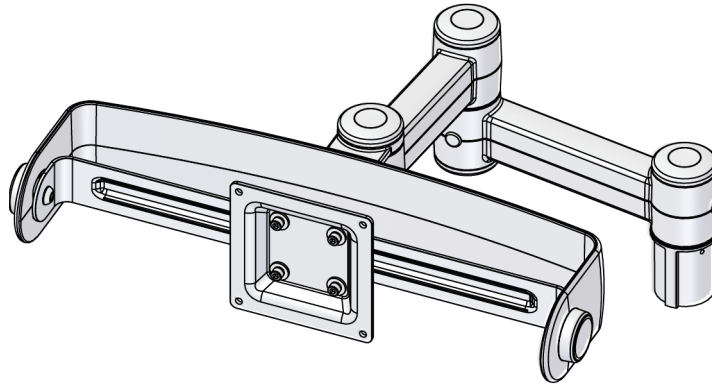


Figure 44: Second rotation of articulating arm showing setscrew, shown from behind (series I UAWS)



3. Remove the plastic cap and loosen the hex screw (5 mm) until the top of it is at least flush with or protruding slightly outside the screw hole.
4. Rotate the arm to the right 90° as seen from behind (see the previous figure), then tighten the hex screw and replace the cap.

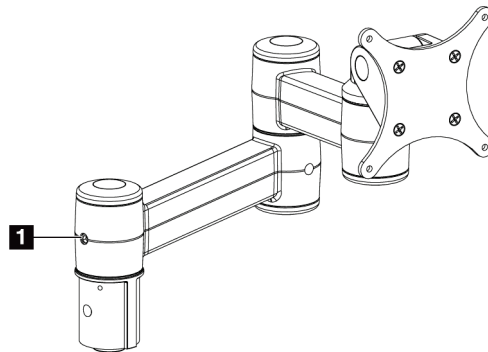
The monitor mount and arm should now be facing you on the left side if the metal protrusion on the post end is also facing you (see the following figure).



*Figure 45: Articulating arm in final left configuration, shown from the front (series I UAWS)*

#### **Series II UAWS**

1. Remove the plastic cap on the post end of the arm (item 1 in the following figure).
2. Use a metric hex wrench (5 mm) to loosen (but not remove) the hex setscrew (item 2 in the following figure) under the plastic cap.



*Figure 46: Plastic cap/hex screw on articulating arm, shown in default right orientation (series II UAWS)*



3. While holding the metal post end, rotate the arm 180 degrees to the left around the metal post end. The arm should now be on the left side if the metal protrusion on the post end is facing you (see the following figure).

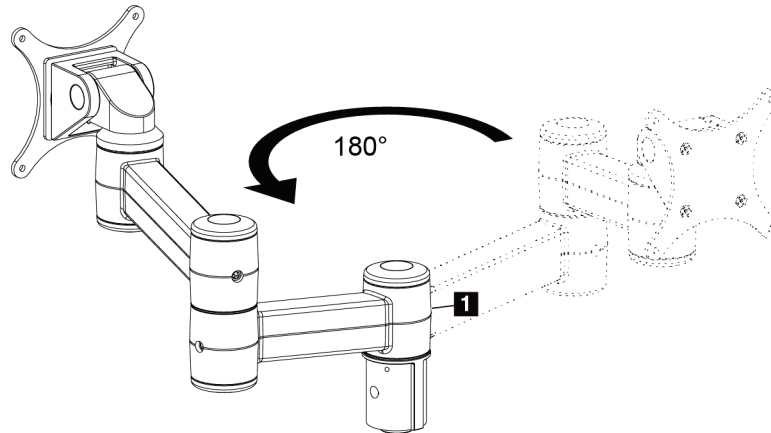


Figure 47: First rotation of articulating arm (series II UAWS)

4. Tighten the hex screw and replace the plastic cap (item 1 in previous figure).
5. Turn the arm around (do not rotate it, just view it from the opposite side). Locate the plastic cap covering the specific hex screw on the center pivot section of the arm as shown the following figure. Remove the plastic cap and hex screw.

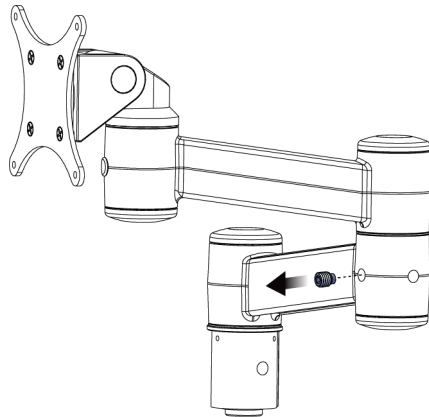
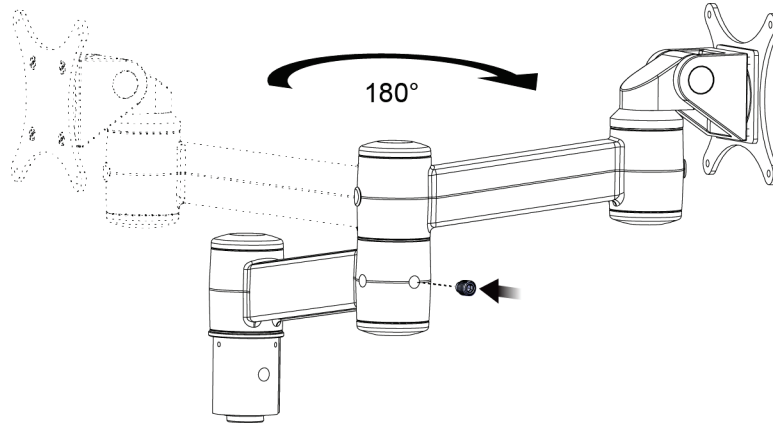


Figure 48: Removing plastic cap/hex screw in center pivot section (series II UAWS)

6. While holding the first section (in the same view as shown in the previous figure), rotate the second section of the arm 180 degrees to the right around the center section (see the following figure).

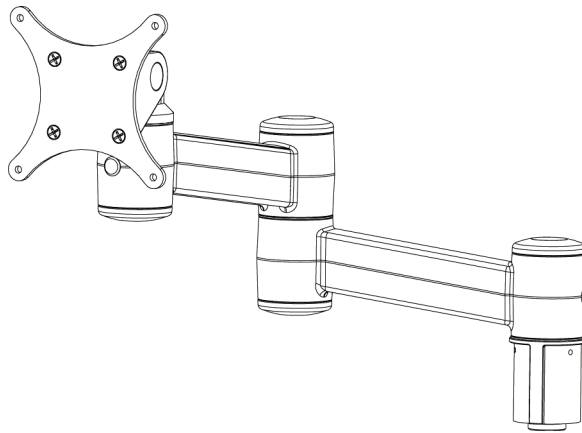


7. Apply Loctite 242 to the hex screw and reinstall the screw in the *second* screw hole in the center section (see the following figure). Replace the plastic cap.



*Figure 49: Second rotation of articulating arm assembly and inserting hex screw, shown from behind (series II UAWS)*

The monitor mount and arm should now be facing you on the left side if the metal protrusion on the post end is also facing you (see the following figure).



*Figure 50: Articulating arm in final left configuration, shown from the front (series II UAWS)*



#### Install Monitor Using the Mobile Arm

##### Preparing Arm (for Series II UAWS Mounting Only)

1. Determine the side of the post that the monitor is to be mounted.
  - If the monitor is to be mounted on the right side of the post, no changes to the arm are required and you can skip to step 2.
  - If the monitor is to be mounted on the left side of the post, follow these substeps to change the arm configuration to the left side.
    - a. Pry off the two plastic caps from the ends of the arm (items 1 and 2 in the following figure).
    - b. Use a metric hex wrench to loosen the hex setscrews (items 1 and 2 in the following figure) under each plastic cap.

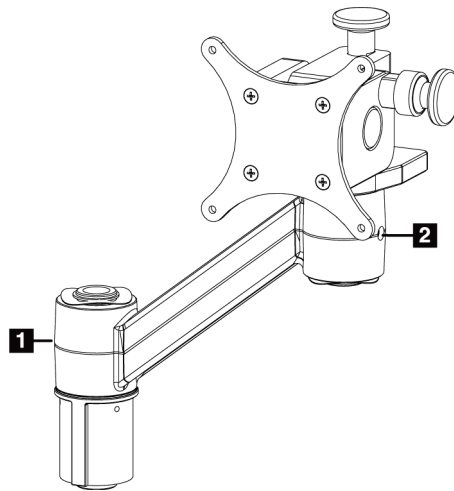
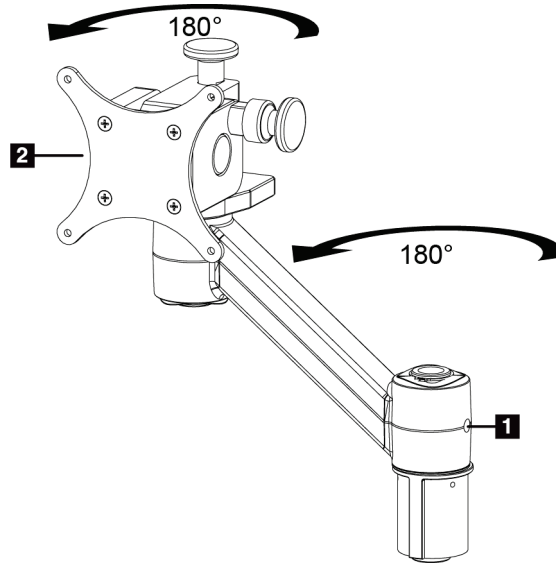


Figure 51: Plastic caps/hex setscrews on mobile arm (series II UAWS)



- c. While holding the metal post end, rotate the arm 180 degrees to the left around the metal post end. The arm should now be on the left side if the metal protrusion on the post end is facing you (see the following figure).

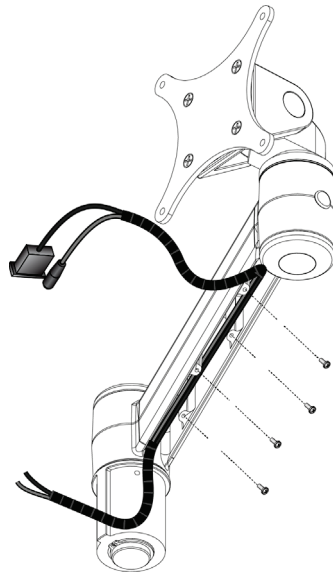


*Figure 52: Rotating mobile arm 180 degrees to the left (series II UAWS)*

- d. While holding the midsection of the arm, rotate the monitor mount 180 degrees to the left around the arm. The monitor mount should now be facing you on the left side if the metal protrusion on the post end is also facing you (see previous figure)
- e. Tighten the setscrew by the post end of the arm (item 1 in previous figure) and add a drop of Loctite 242 on the screw. Replace the plastic cap.
- f. Tighten the setscrew by the monitor mount end of the arm, then back off a 1/4 turn to allow some lateral movement of the monitor mount. Add a drop of loctite on the screw and replace the plastic cap.



2. Thread the monitor cables through the arm (see the following figure):
  - a. Route the DVI and power cables through the notch on top of the monitor post. Make sure that you leave enough slack (about 45–60 cm or 18–24 inches) of power cable and DVI cable outside the post so that there is enough to be routed through the articulating arm and attached to the monitor in the following steps.
  - b. Route the cables through the arm.
  - c. Install the cable retainers supplied with the arm install kit to the underside of the arm section (four screws, see the following figure).



*Figure 53: Installing cable retainer after routing monitor cables under mobile arm (series II UAWS)*



**Attaching/Connecting the Monitor**

1. Attach the mobile arm to the monitor post (see the following two figures):
  - a. If not done already, route the DVI and power cables (item 4) through the notch on top of the monitor post.
  - b. Align the protrusion of the arm to the groove in the monitor post and insert the arm into the post.
  - c. Secure the arm to the post using the three cap screws (item 5) supplied with the monitor install kit.
2. Attach the image display monitor to the monitor mount (item 2) using four screws (item 3) supplied with the monitor install kit.
3. Remove the access panel at the rear of the image display monitor (item 1) and connect the DVI and power cables (item 4). Reattach the rear access panel.

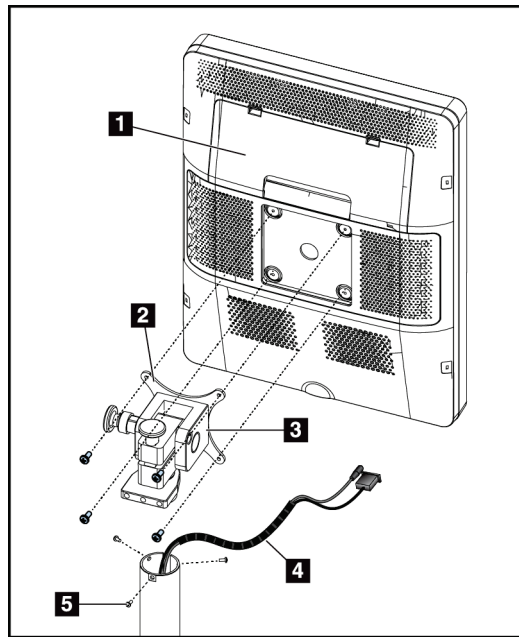


Figure 54: Attaching monitor to mobile arm  
(series I UAWS)

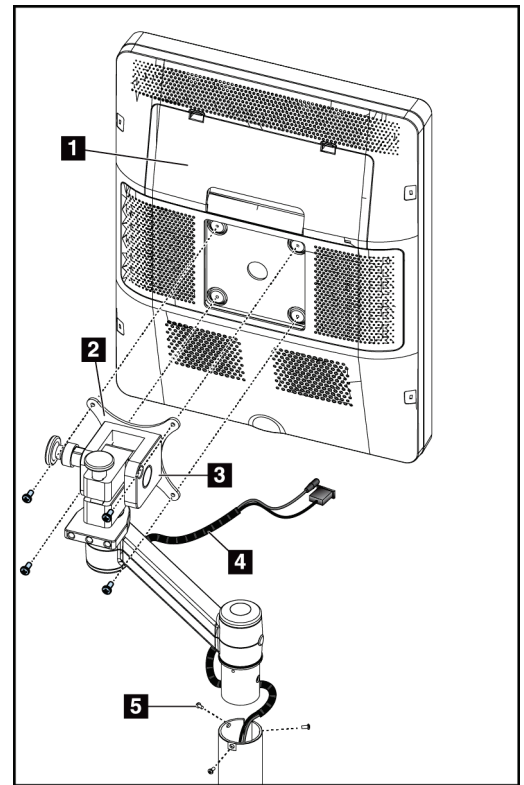


Figure 55: Attaching monitor to mobile arm  
(series II UAWS)

4. After the workstation installation is complete and powered on, configure the image monitor using the on-screen menu of the monitor. (Refer to [Verify Settings of Barco Image Display Monitor](#) on page 299.)



#### 3.6.7 Install Control Monitor

The shipping box for the control/operator monitor is included inside the Universal Acquisition Workstation shipping container.

##### Preparation

1. If not done already, make sure that the power is OFF and the system is unplugged. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. If not done already, remove the front, back, side, and top covers. (Refer to [Remove the Covers and Panels](#) on page 286.)

##### Attach Monitor to Workstation Tabletop

##### Monitor Mounting (Series I UAWS)

1. Install the monitor pivot mount (see the following figure) to the workstation tabletop for a series I UAWS.
  - a. Using a screwdriver, carefully remove the two plastic side covers to the pivot mount.
  - b. Fasten the pivot mount to the workstation tabletop from the top with four screws, two on each side.
  - c. Reattach the two plastic covers.

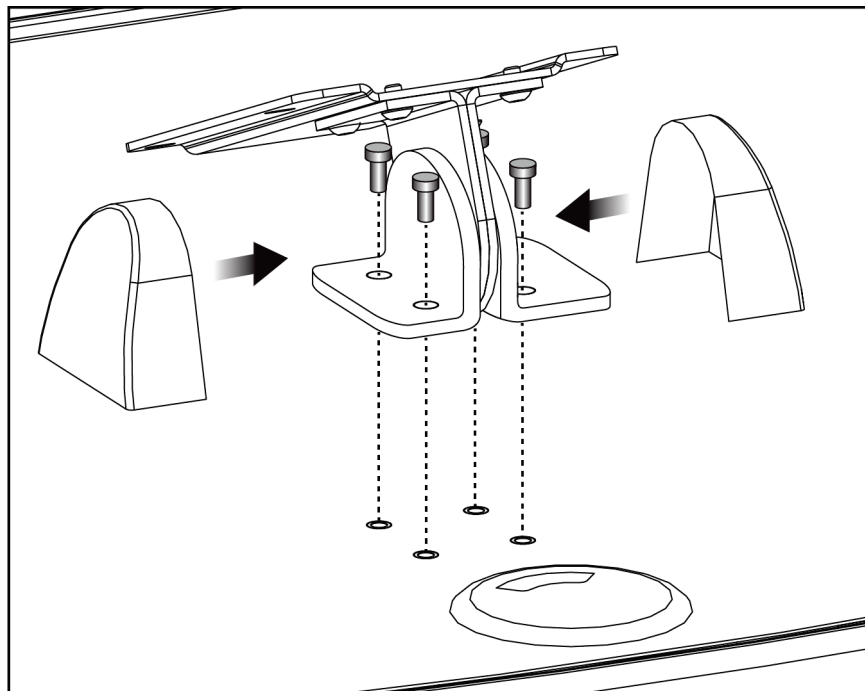
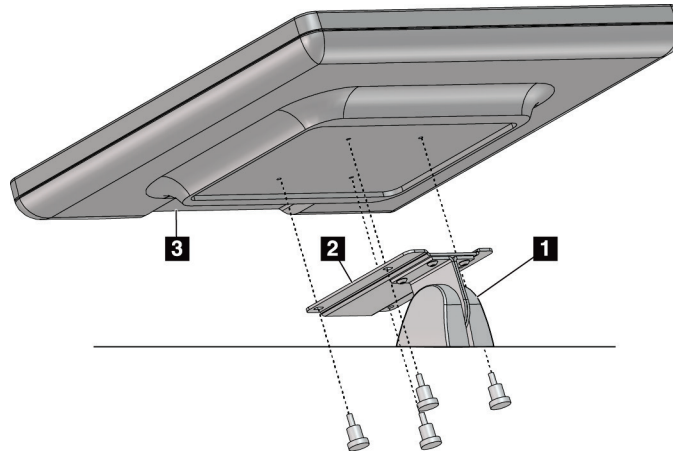


Figure 56: Attaching pivot mount for monitor mount (series I UAWS)



2. If installing a touch screen control monitor, remove the pre-installed mounting plate (item 2 in the following figure, four screws) and replace with the plate that comes with the monitor install kit.



*Figure 57: Attaching monitor to monitor mount (series I UAWS)*

3. Attach the control monitor (item 3 in the previous figure) to the mounting plate (item 2 in previous figure) using the four hand-tightened thumbnail screws.

**Note**

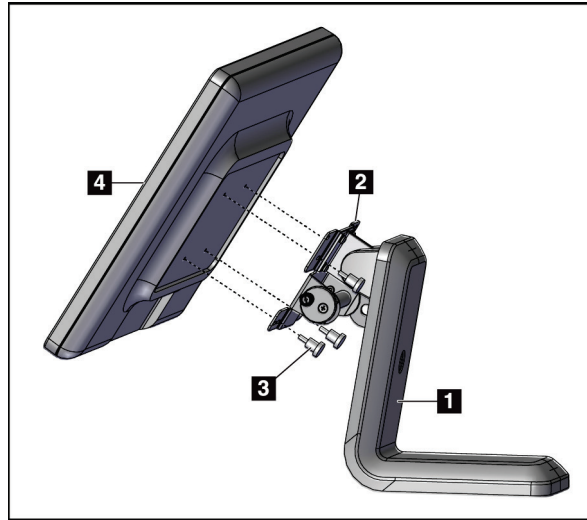
For easier access to the mounting plate or cable panel, tilt the monitor mount plate all the way back until it is resting at about a 45° angle, top-down, bottom-up. When finished, restore the mounted monitor to its proper position, top-up, bottom-down. You may have to loosen the nut on the side of the monitor pivot mount to tilt the monitor. If so, remember to retighten the nut after you restore the monitor to its proper position.

---



#### Monitor Mounting (Series II UAWS)

The monitor mount (item 1) is pre-installed on the workstation tabletop for a series II UAWS. Simply attach the control monitor (item 4 in the following figure) to the monitor mounting plate (item 2) using the four hand-tightened thumbnail screws (item 3).



*Figure 58: Attaching monitor to monitor mount (series II UAWS)*



#### Connect Cables to Monitor

1. Connect the VGA cable to the monitor.
2. Connect the power cable to the monitor:

*Non-Touch screen model* - Simply connect the power cable directly to the monitor.

*Touch screen model* - Connect the power cable (see the following figure) to the adapter cable (CBL-02750) supplied from the install kit and connect the adapter cable to the monitor.

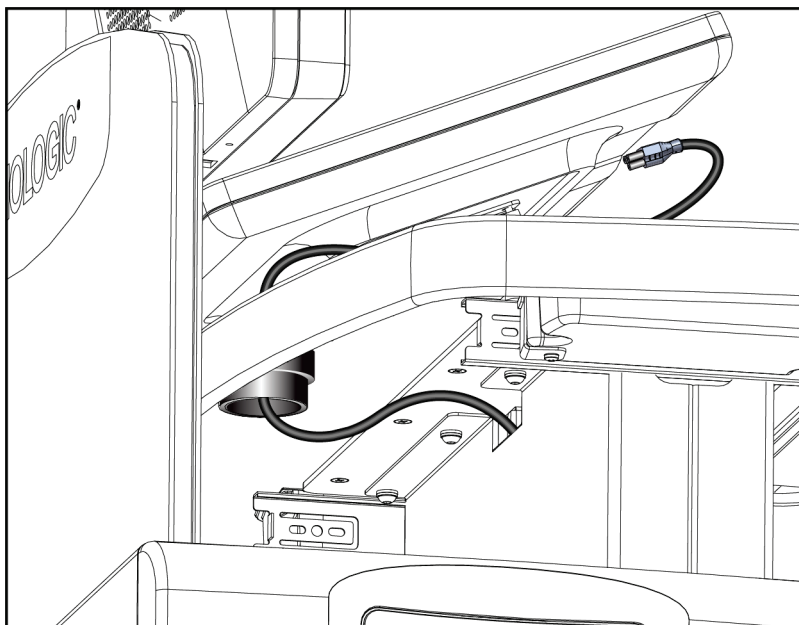


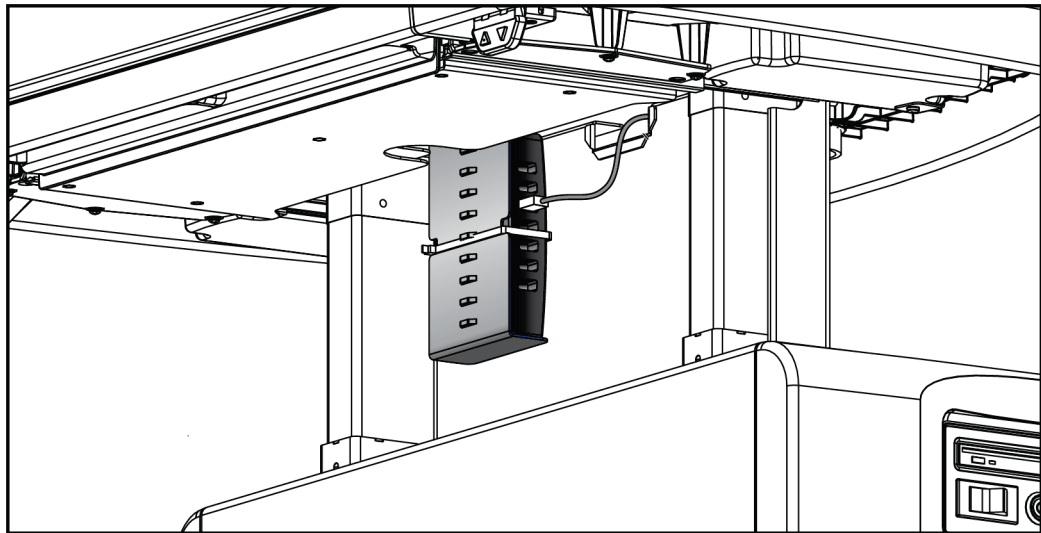
Figure 59: Connecting power adapter cable to control monitor



3. If installing a touch screen model of monitor, follow these steps to connect the USB cable:

**Series I UAWS Monitor Mount**

- a. Plug in the USB cable to the monitor.
- b. Route the USB cable down through the tabletop wireways.
- c. Route the USB cable laterally underneath the tabletop through the rear shroud-to-front shroud wireways. (See the following figure.)
- d. Connect the USB cable to an available port on the USB hub. (See the following figure.)

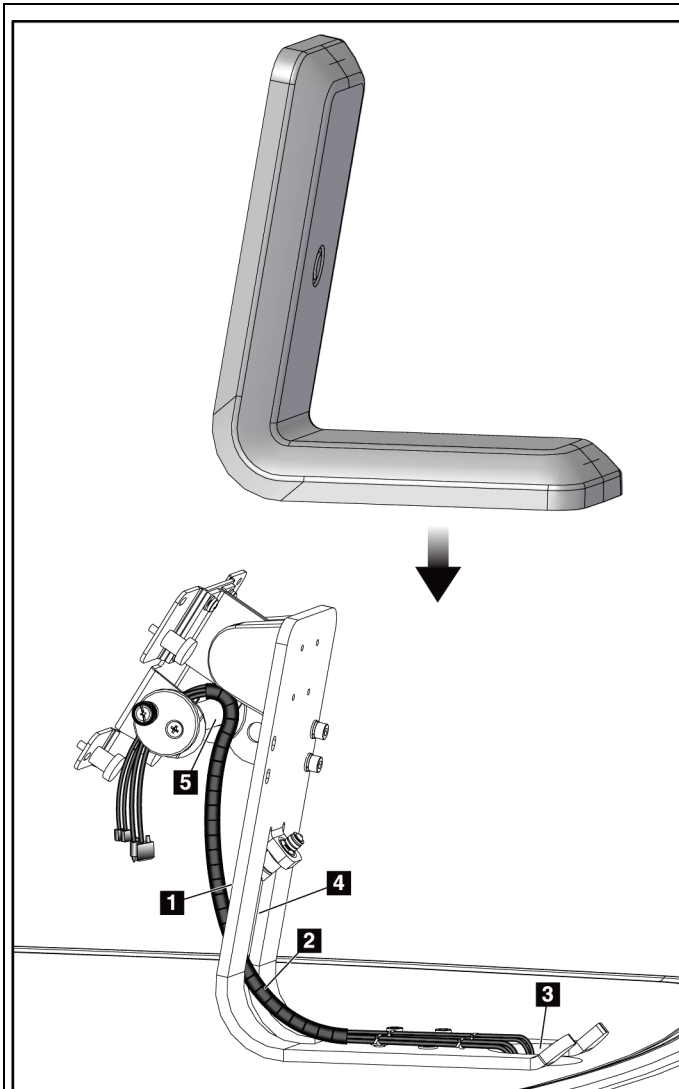


*Figure 60: Connecting USB cable of control monitor to USB hub of workstation*



#### Series II UAWS Monitor Mount

- a. Plug in the USB cable to the monitor.
- b. Route the USB cable through the monitor bracket (refer to the following figure and substeps).



b1. Loosen the setscrew (item 1) in front of the mount and remove the mounting cover.

b2. Remove the plastic tubing (item 2) from the existing cable bundle.

b3. Thread the USB cable around the cable guide on top (item 5), through the hole in the center (item 4), and finally through the bottom of the monitor mounting (item 3).

b4. Replace the plastic tubing (item 2) around the new cable bundle.

b5. Replace the mounting cover and tighten with setscrew to hold the cover in place.

Figure 61: Removing cover to access cables for monitor mount (series II UAWS)



- c. Route the USB cable laterally underneath the tabletop through the rear shroud-to-front shroud wireways. (See the following figure.)
- d. Connect the USB cable to an available port on the USB hub. (See the following figure.)

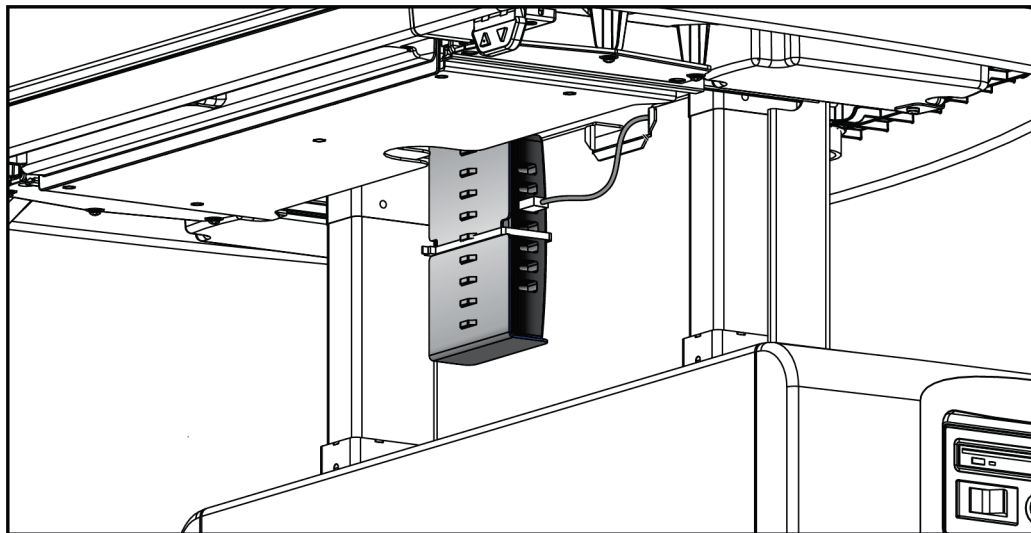


Figure 62: Connecting USB cable of control monitor to USB hub of workstation

#### Calibration (Touch Screen Model Only)

If the control monitor has the touchscreen feature, calibrate the monitor after the workstation installation is complete and powered on. (Refer to [Calibrate Touch Screen Control Monitor](#) on page 312.)

### 3.6.8 Install the Radiation Shield



---

**Warning:**

Use gloves and eye protection when handling the X-ray Shield.

---



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**Warning:**

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.

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**Caution:**

The X-Ray Shield is made of tempered glass and is fragile. Use extreme care when handling and installing the shield. When installing, the shield must be precisely positioned and must not be flexed in any direction.

---





**Caution:**

Inspect the X-ray Shield before and after installation. Small imperfections embedded in the glass are acceptable. Do not install the shield if cracks or chips are visible.



**Caution:**

Use care when cleaning the X-ray Shield to avoid excessive force and movement of the shield.

#### Taller Radiation Shield

1. On the back of the workstation, remove the workstation shield bracket (item F in the following figure, three screws on each side).
2. Insert the back spacer (item A) and the back reinforcement plate (item B).
3. Insert the shield (item C). Two people are required for this action.
4. Insert the front reinforcement plate (item D). Push at the bottom of the front reinforcement plate (item D) to ensure the plate is vertical and there is an equal gap on either side, then insert the front spacer (item E).

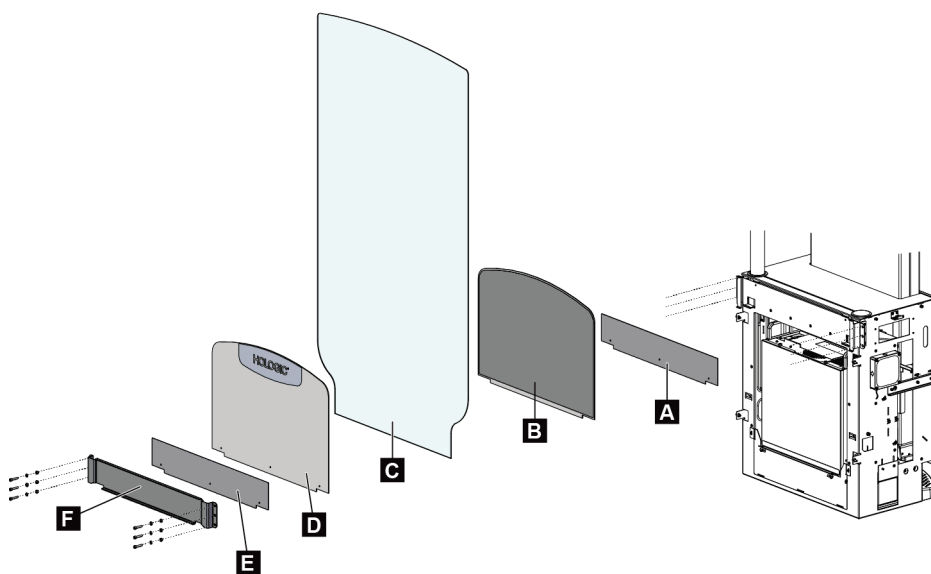


Figure 63: Radiation Shield Installation (taller shield)



5. Install the shield bracket (item F in previous figure), hand tightening the screws in the order shown in the following figure (A through F). After hand tightening screws, tighten 1/4 turn or enough to flatten the lock washer.

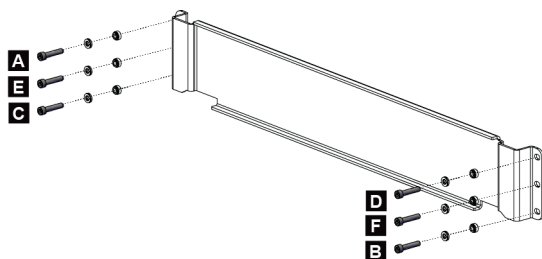


Figure 64: Shield bracket screw fastening

#### Original Radiation Shield

Refer to the following figure to install the original radiation shield:

1. Lift the radiation shield (item A) carefully and place it on the shield supports behind the right and left slots (item B) of the metal bracket.
2. Place the shield reinforcement plates (item C) on either side of the radiation shield (item A) and tighten screws (item D) on both sides of metal bracket.

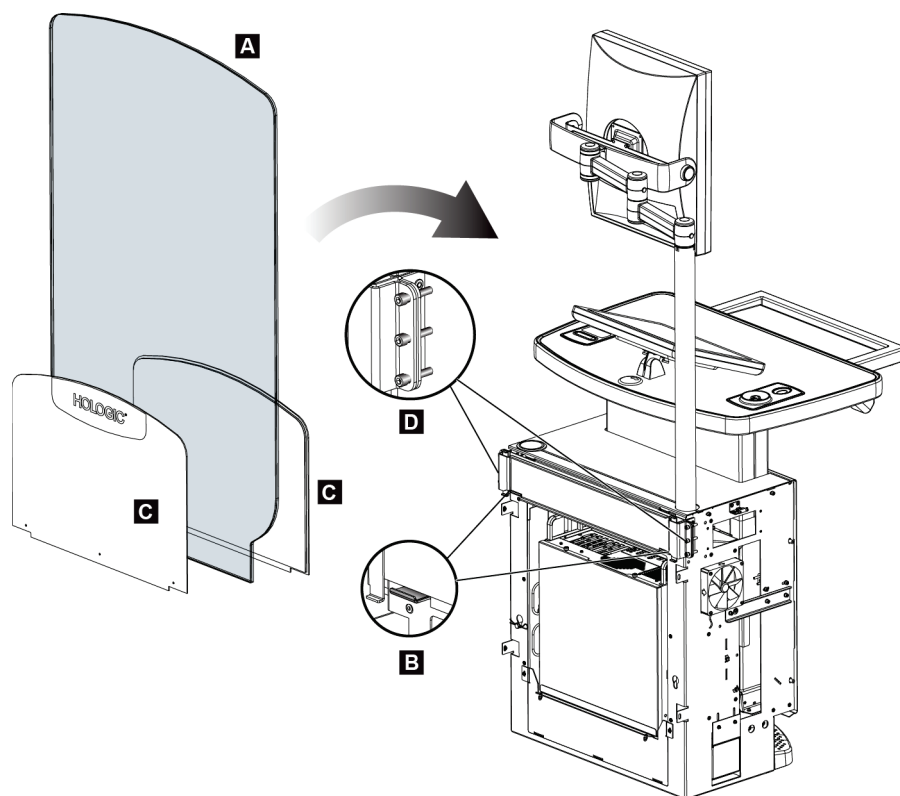


Figure 65: Radiation Shield Installation (original shield)



### **3.7 Install the Covers**

Install the Acquisition Workstation covers. Refer to [Remove the Covers and Panels](#) on page 286.

Install the Gantry covers. Refer to [Gantry Covers Removal](#) on page 216.

### **3.8 Return the Shipping Container to Hologic**

Return the image detector shipping container and the temperature monitoring device to Hologic as per the instructions in the container.







## Chapter 4 System Controls and Indicators

### 4.1 System Power Controls

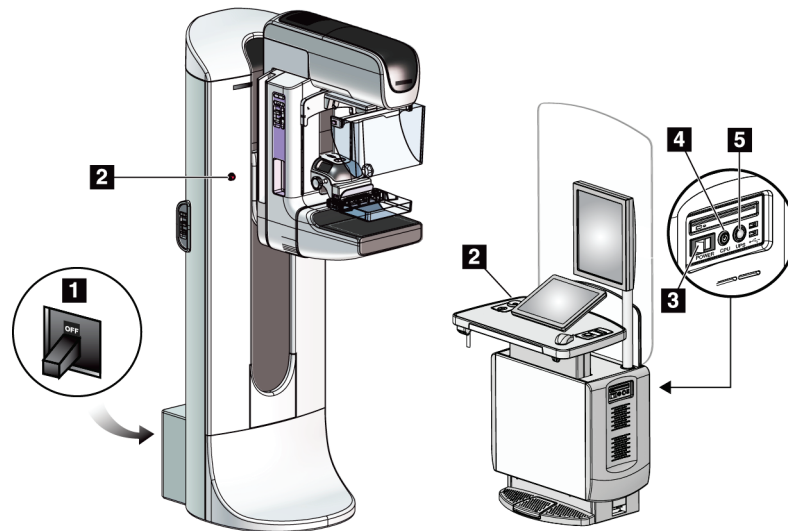


Figure 66: System Power Controls

#### Figure Legend

1. Gantry Power Circuit Breaker
2. Emergency Off Switch (two on the Gantry, one on the Acquisition Workstation)
3. Acquisition Workstation Power Switch
4. Computer Power On/Reset Button
5. Uninterruptible Power Supply (UPS) Power Button

### 4.2 Universal Acquisition Workstation Controls and Displays



#### Note

Hologic configures some systems to meet specific requirements. Your system configuration may not have all the options and accessories included in this manual.



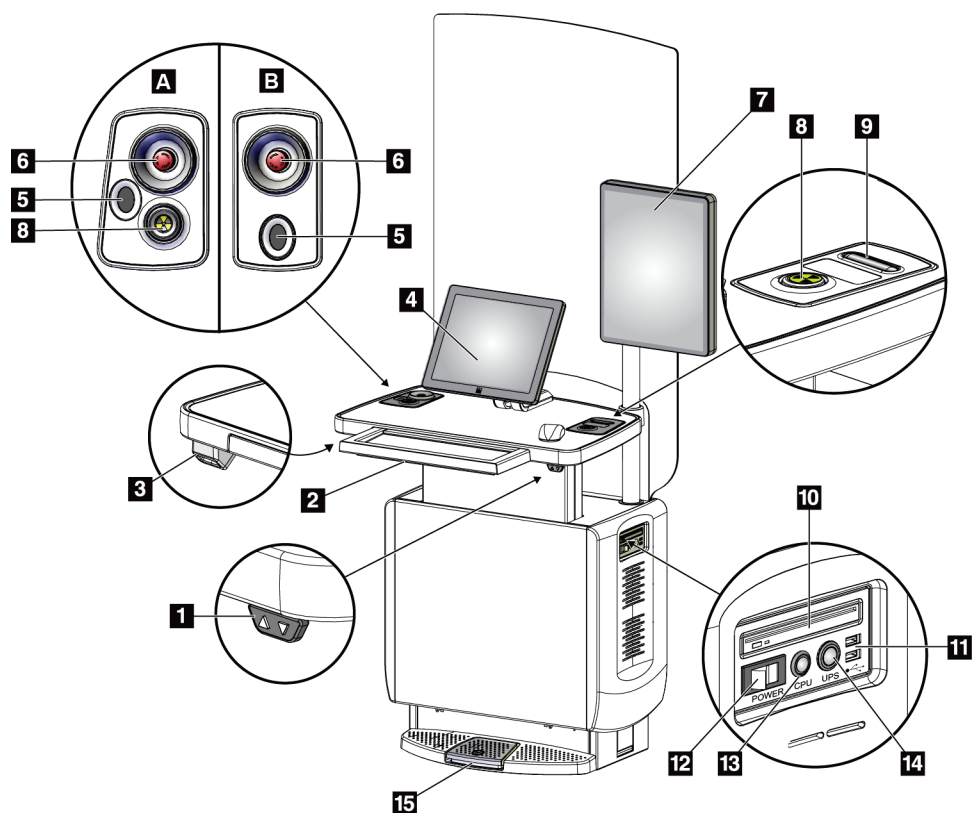


Figure 67: Universal Acquisition Workstation Controls and Displays

### Figure Legend

- |                               |  |
|-------------------------------|--|
| 1. Height Adjustment Switch   | 10. CD/DVD Drive                                       |
| 2. Keyboard (in drawer)       | 11. USB Ports  |
| 3. Bar Code Scanner           | 12. Acquisition Workstation Power Switch               |
| 4. Control Monitor            | 13. Computer Power On/Reset Button                     |
| 5. Fingerprint Scanner*       | 14. Uninterruptible Power Supply (UPS)<br>Power Button |
| 6. Emergency Off Switch*      | 15. X-ray Footswitch                                   |
| 7. Image Display Monitor      |  |
| 8. X-ray Activation Button*   |  |
| 9. Compression Release Button |  |

\*A = series II Universal Acquisition Workstation layout;  
B = series I Universal Acquisition Workstation layout



### Note

The controls for the Universal Acquisition Workstation installed in a mobile environment are the same as the controls for the Universal Acquisition Workstation.



### 4.3 Tubestand Controls and Indicators

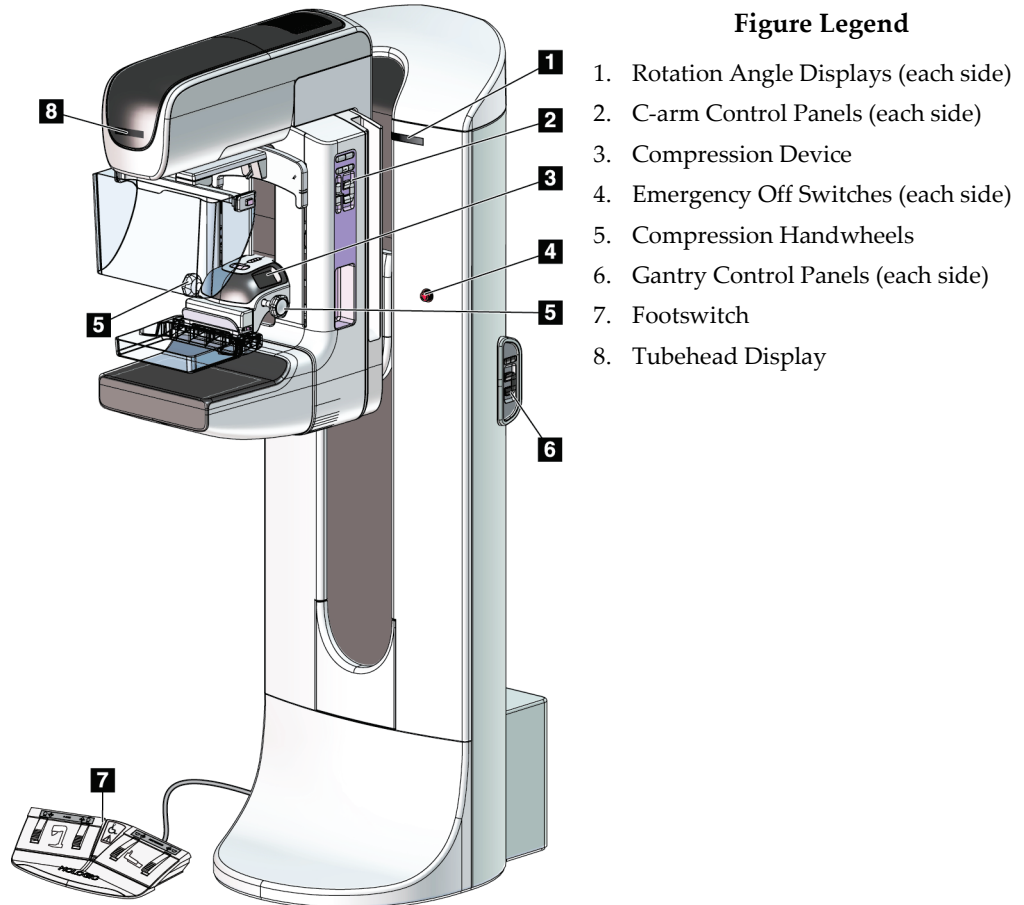


Figure 68: Tubestand Controls and Indicators



#### 4.3.1 Tubehead Display

The Tubehead Display shows:

- SID
- Filter Type
- Collimator Setting
- Paddle Position



Figure 69: Tubehead Display

#### 4.3.2 Compression Device Controls and Display

##### Figure Legend

1. Manual Compression Handwheels
2. Paddle Shift Buttons
3. AEC Sensor Buttons
4. Compression Device Display
5. FAST Compression Mode Slide
6. Paddle Clamp

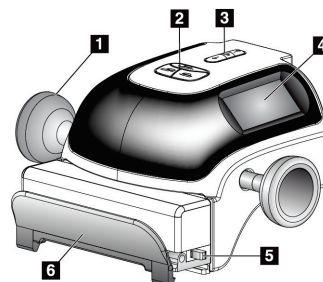


Figure 70: Compression Device

The Compression Device Display shows:

- AEC Sensor Position
- Compression Force (displays 0.0 when force is less than 4 pounds)
- Compression Thickness
- Angle of the C-arm after rotation (for 5 seconds)

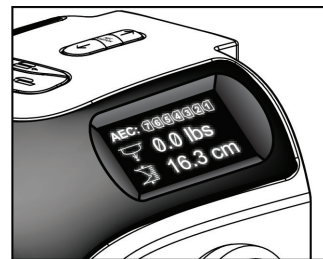


Figure 71: Compression Device Display



### 4.3.3 C-Arm Control Panels

There is a C-arm control panel on both the left side and right side of the C-arm. These buttons provide the Collimator and C-arm functions.



Figure 72: C-arm Control Panel

#### Figure Legend

1. MLO Rotation
2. C-arm Zero
3. Light Field Lamp
4. Motor Enable
5. Collimator Override
6. Clockwise C-arm Rotation
7. C-arm Up and Down
8. Counterclockwise C-arm Rotation
9. Compression Up
10. Compression Down

### 4.3.4 Gantry Control Panels

Control panels on the Gantry provide additional access to C-arm functions. There is a C-arm control panel on both the left side and right side of the Gantry.

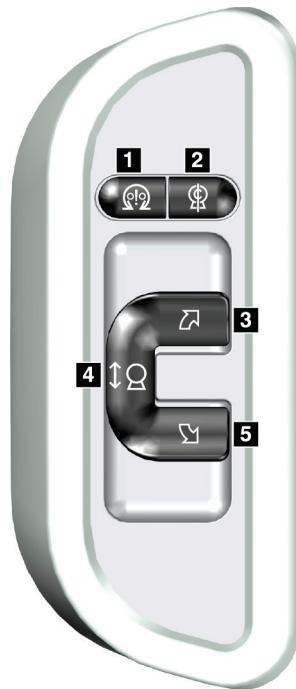


Figure 73: Gantry Control Panel

#### Figure Legend

1. Motor Enable
2. C-arm Zero
3. Clockwise C-arm Rotation
4. C-arm Up and Down
5. Counterclockwise C-arm Rotation



#### 4.3.5 Dual Function Footswitch

**Warning:**

Place each footswitch in a position where, when used, they remain in reach of the Emergency Off Switches.

**Warning:**

Position the footswitches to prevent accidental operation by a patient or wheelchair.

To use the footswitch:

- Press the footswitch to actuate.
- Release the footswitch to stop the movement.

**Figure Legend**

1. C-arm Down
2. C-arm Up
3. Compression Down
4. Compression Up

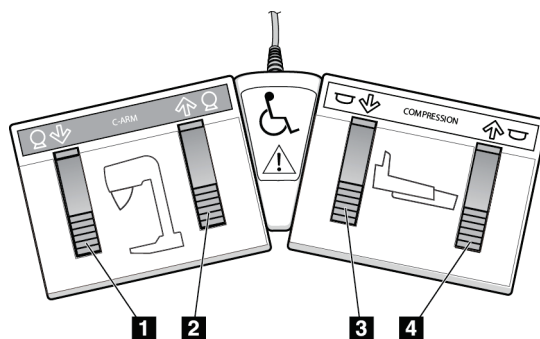


Figure 74: Dual Function Footswitch

#### 4.4 How to Start the System

**Note**

If the system remains on overnight, reboot the system daily to guarantee best performance.

##### 4.4.1 Preparation

1. Make sure that there are no obstructions to C-arm movement or to the view of the Operator.
2. Make sure that all three Emergency Off switches are in the reset position (unpushed).

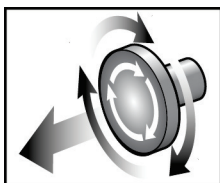


Figure 75: Turn to Reset the Emergency Off Switches

3. Make sure that the Gantry circuit breaker is in the On position.



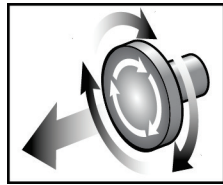
### 4.4.2 System Startup

**Note**

If the system remains on overnight, reboot the system daily to guarantee best performance.

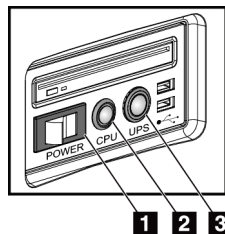
---

1. Make sure that there are no obstructions to C-arm movement or to the view of the Operator.
2. Make sure that all three Emergency Off switches are in the reset position (unpushed).



*Figure 76: Turn to Reset the Emergency Off Switches*

3. Make sure that the Gantry circuit breaker is in the ON position.
4. If the UPS was turned OFF, press the UPS power button to apply power to the UPS (see the following figure).



*Figure 77: Universal Acquisition Workstation Power Buttons*

**Figure Legend**

1. Acquisition Workstation Power Switch
2. Computer Power On/Reset Button
3. UPS Power Button

5. Turn ON the Acquisition Workstation power switch (see the previous figure).
6. Press the computer power button (see the previous figure). The computer powers on and boots up the system.



7. The Windows 10 login screen opens on the Acquisition Workstation control monitor. Log in as **Hologic Service**.

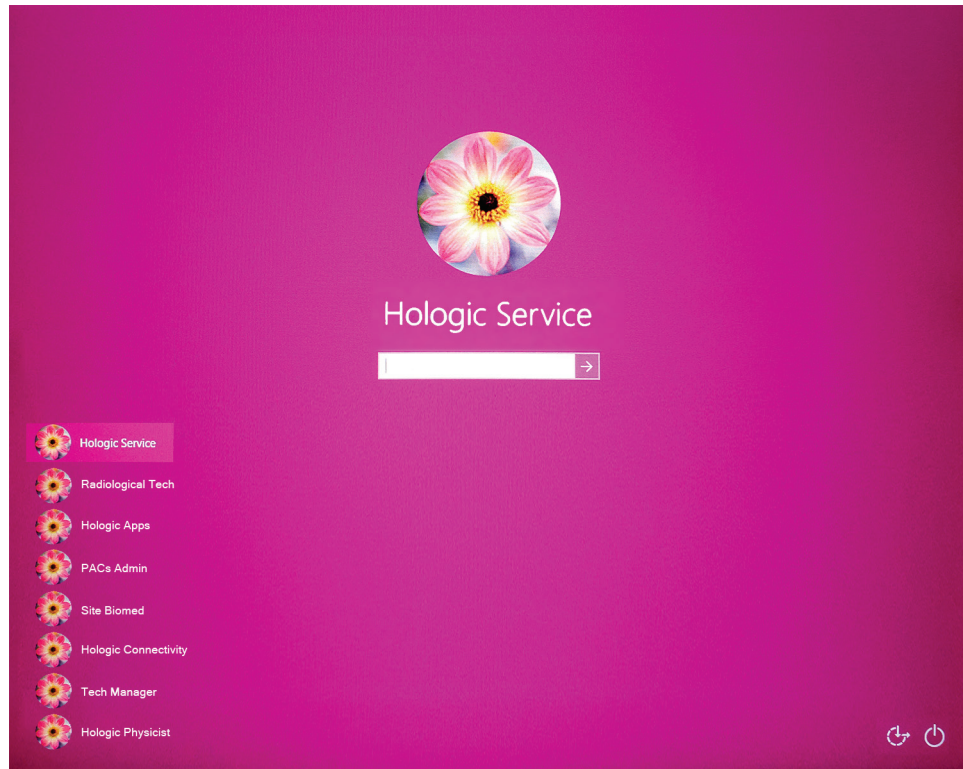


Figure 78: Windows 10 login screen (Hologic Service user selected)

8. The Windows desktop appears. Select and launch the **Capture App** shortcut icon



#### Note

If you log in to Windows as a user other than Service, the Capture application launches immediately.

---



9. The Capture application *Startup* screen opens and the Gantry automatically powers on.

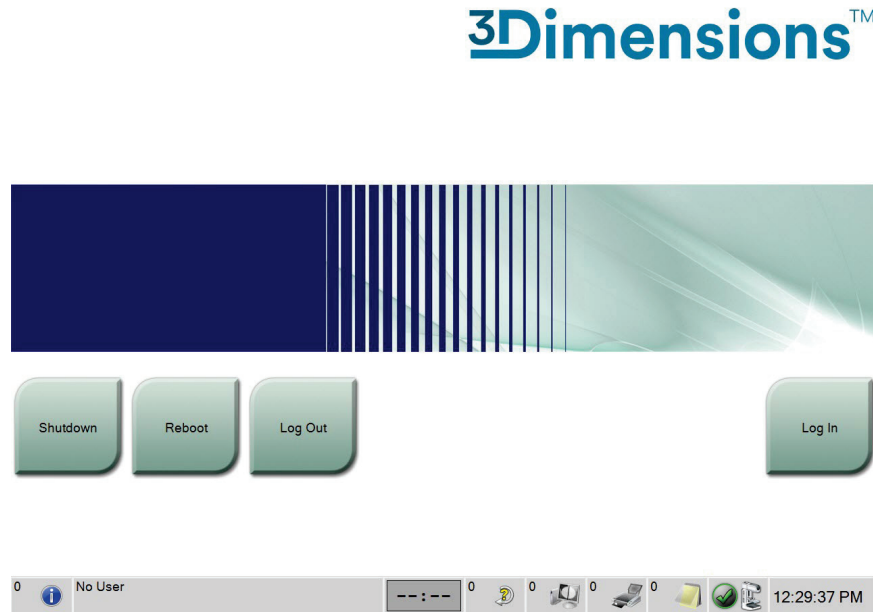


Figure 79: Capture application Startup Screen



### Note

The Capture application *Startup* screen includes a:

- **Shutdown** button that turns off the system
- **Reboot** button that restarts the system.
- **Log In** button that allows you to log in to the Capture application
- **Log Out** button that allows you to log out of the Capture application and opens up the Windows 10 login screen



### Note

The system can require between five minutes and fifteen minutes to prepare for image acquisition. The wait time depends on the detector power configuration. A timer in the Taskbar displays the wait time before the system is ready. Do not acquire clinical or QC images unless the System Status Icon indicates that the system is Ready.



#### 4.4.3 Log In

1. At the Capture application *Startup* screen (see figure [Start Up screen](#) on page 83), select **Log In**.
2. The *Select an Operator* (Log In) screen opens and shows a list of Manager and Technologist user names. Select the **Show All** button to list the Service, Applications, and Physicist user names (see the following figure).



#### Note

If the Auto Login feature is enabled in System (Service) Tools (which it is by default, refer to [Configure User Interface Security \(Auto Login Feature\) \(Optional\)](#) on page 123), and the user you log on with in Windows has already been set up in the Dimensions system, that user's credentials are automatically applied to the Capture Application. In this scenario, the *Select an Operator* screen is skipped and the user is moved directly to the *Select Patient* screen as shown in step 5.

3. Choose an operator by selecting the applicable user name.

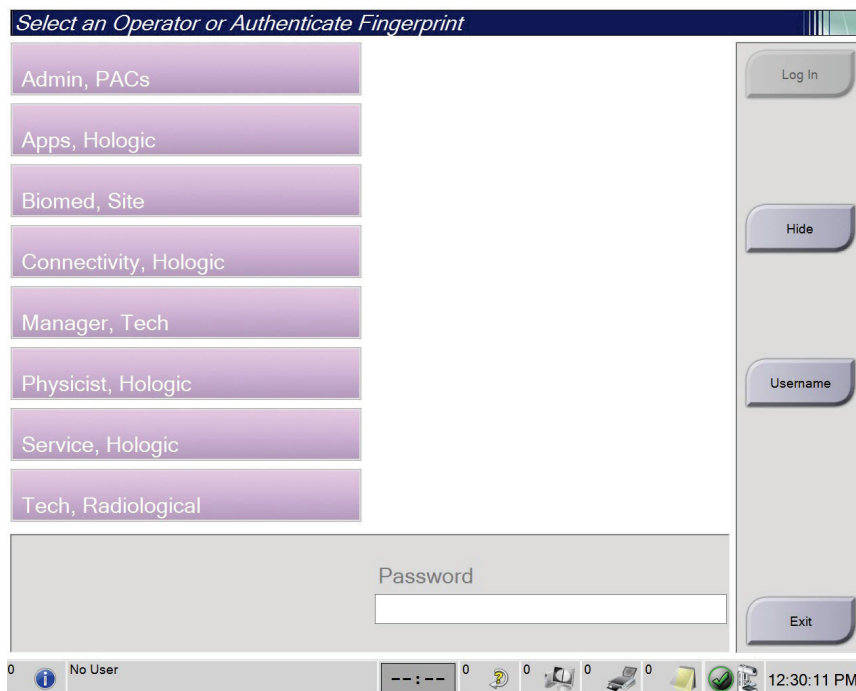


Figure 80: Select an Operator (Log In) screen, Show All view



4. Type in your password at the bottom of the screen and select **Log In**.

-OR-

Validate your fingerprint by pressing your finger in the fingerprint scanner.

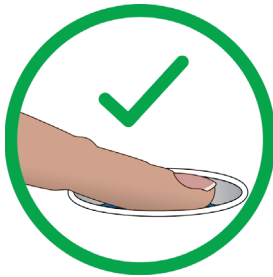
---



#### Note

Most of the unique, repeatable fingerprint information is from the pad of the finger, not the fingertip. Flat finger placement as shown in the left image results in fast and accurate fingerprint identification.

---



Correct operation



Incorrect operation



#### Note

If Quality Control tasks are due, the *Select Function to Perform* screen opens. You can perform the quality tasks or you can select **Skip**.

---



5. The *Select Patient* screen opens. Continue with the work you need to accomplish.

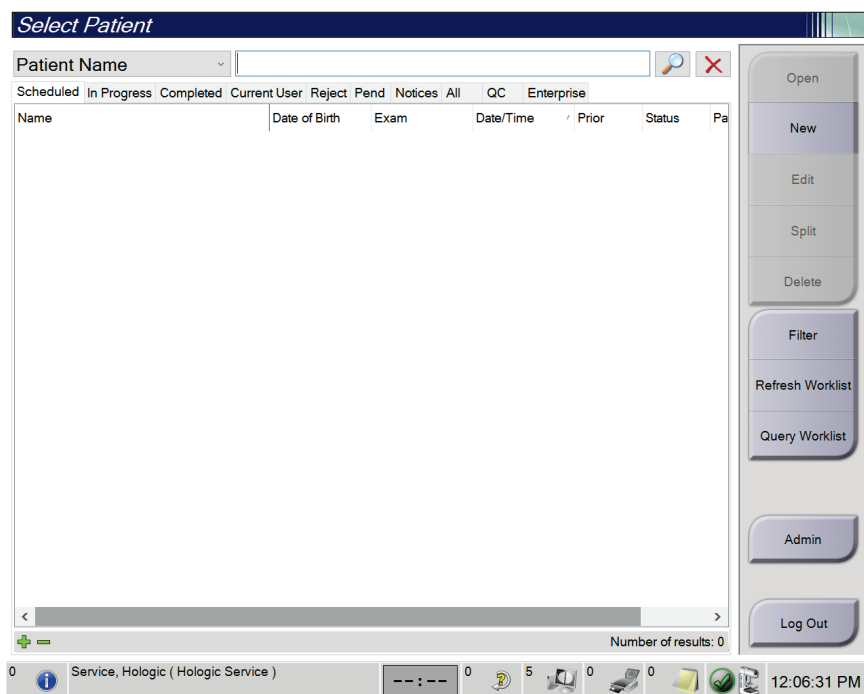


Figure 81: *Select Patient* screen



#### 4.4.4 Windows 10 User Account Control and the Capture Application

The Windows 10 User Account Control feature may affect some users logging in and out of the Capture application.

If a new user is logging in to the Capture application that should have Admin rights in Windows 10 but the previous user in the Capture application did not have Windows 10 Admin rights, no Admin rights will be granted to the new user. When this new user logs on, a warning message displays (see the following figure), reminding the new user of this condition.

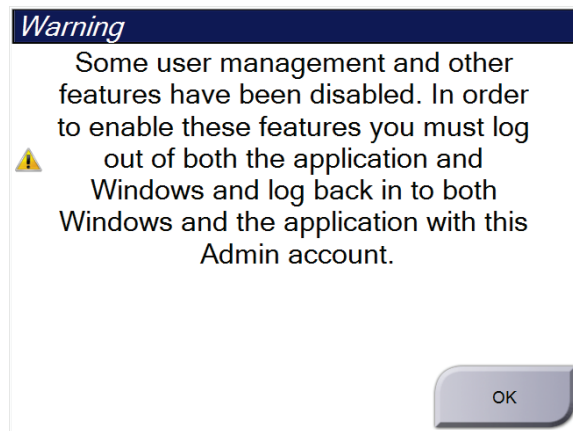


Figure 82: Log On Warning for Windows 10 Admin rights

If the new user wants full access to programs from the *Admin* screen that require Admin rights (such as System Tools or Windows OS Tools), they should:

- a. Log out of the Capture application by selecting **Logout** from the *Select Patient* screen or **Exit** from the *Select An Operator* screen.
- b. At the *Startup* screen of the Capture application, select **Log Out**.
- c. The Windows 10 login screen opens (see figure [Windows 10 login screen](#) on page 82). Log in with the correct Admin-level user.
- d. The Capture application restarts. At the *Startup* screen, select **Log In**.
- e. At the *Select An Operator* screen, login with the correct Admin-level user. The new user now has Windows 10 Admin rights.



#### 4.4.5 How to Exit the Capture Application to the Windows Desktop

When logged on as a Service user, use the following procedure to access the Windows desktop while exiting the Capture application.

1. Log out of the Capture application by selecting **Logout** from the *Select Patient* screen or **Exit** from the *Select An Operator* screen.
2. At the *Startup* screen, press **Ctrl** and simultaneously select **Shutdown**.

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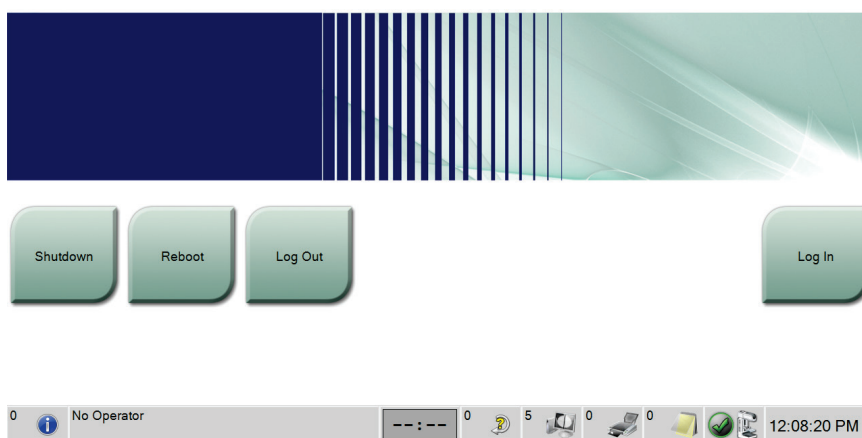


Figure 83: Startup screen

3. A DOS window opens for a few seconds as services are ended. At the *Start/Exit* screen, press **Ctrl** and simultaneously select **Exit**.

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V2.1.0.2

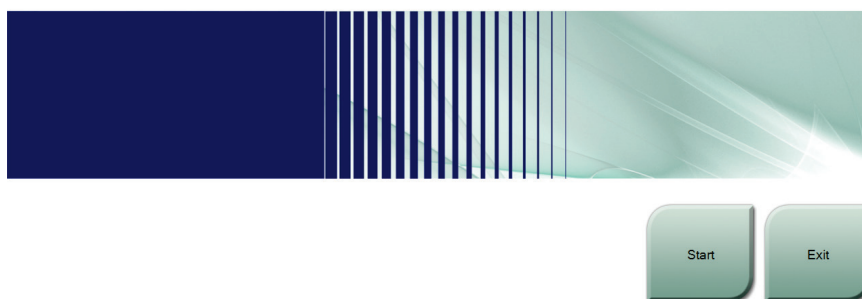


Figure 84: Start/Exit screen

4. The Windows desktop opens. Continue with the work you need to accomplish.



## 4.5 Perform Functional Tests

Perform the functional tests as described in the *User Guide*.



---

**Note**

To stop the C-Arm automatic rotation movement, press any button or the Emergency Stop switch.

---



---

**Warning:**

**Risk of entrapment. Make sure that the C-arm has 50 cm (20 inches) of clearance to any object during C-arm rotation. Do not use Auto Rotation when C-arm clearance is less than 50 cm (20 inches).**

---

## 4.6 Confirm Licensed Features

Confirm the licensed features for this system. In the system application, go to **Admin > About screen > Licensing** tab and verify the features and options installed.

If any additional features are required, locate the Sales Order number of the feature(s) and follow the directions in [Add Licensed Features](#) on page 121.

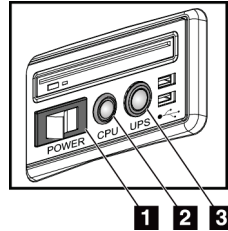
## 4.7 How to Turn Off the System

1. Close any open patient procedures.
2. From the Select Patient screen, select the **Log Out** button.
3. From the Select an Operator screen, select the **Exit** button.
4. From the Startup screen, select the **Shutdown** button.
5. Select the **Yes** button in the confirmation screen.



## 4.8 How to Remove All Power from the System

See the following figure for illustrations of the buttons and switches referenced in the following procedures.



**Figure Legend**

1. Acquisition Workstation Power Switch
2. Computer Power On/Reset Button
3. UPS Power Button

*Figure 85: Universal Acquisition Workstation Power Buttons*

To remove all power from the system:

1. Turn off the system.
2. If your system includes the UPS, press the UPS button (item 3).
3. Turn OFF the acquisition workstation power switch (item 1).
4. Unplug the acquisition workstation power cable from the AC outlet.
5. Turn OFF the Gantry circuit breaker.
6. Turn OFF the Facility Mains circuit breaker.



## Chapter 5 Setup, Configuration, and Connectivity

### 5.1 About Screen

The About screen provides information about the machine, such as system level, IP address, licensed features, and serial number. This type of data can be useful when working with Hologic to configure the system or resolve a system issue.

The screen is accessed in two ways:

- From the *Select Patient* screen - select the **Gantry** icon (on Taskbar), then select **About**.
- From the *Admin* screen - select **About** (in System Grouping)

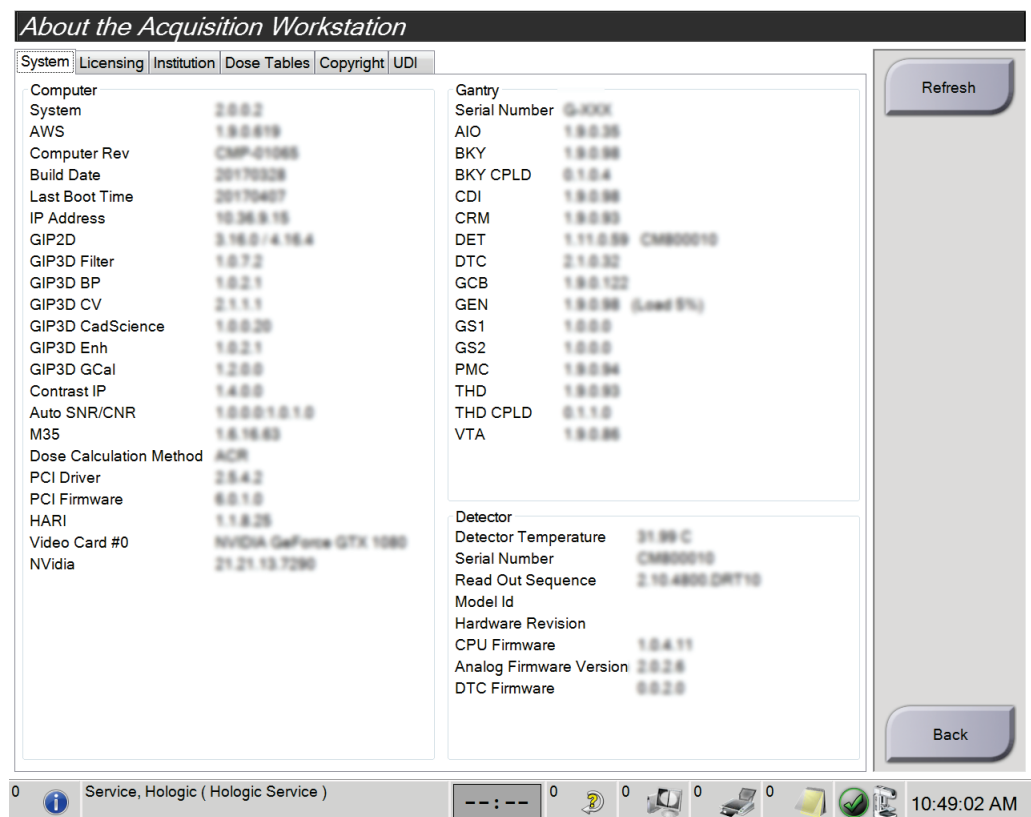


Figure 86: About Screen with the System Tab Showing (Service Login)

There are six tabs on the About screen:

- **System Tab** (default) - lists system configuration information
- **Licensing Tab** - lists the Hologic-licensed options installed on this machine
- **Institution Tab** - lists the station name, and the name and address of the organization assigned to this machine
- **Dose Tables Tab** - lists the dose tables used on the system
- **Copyright Tab** - lists the copyrights of Hologic and third-party software installed on this machine
- **UDI Tab** - lists the one or more unique device identifiers of this machine



## 5.2 Admin Screen

The Admin screen provides access to system calibrations, tests, and reports. To access this screen, do the following.

1. Log in to the Capture application as Service.
2. At the *Select Patient* screen, select **Admin** on the right side.
3. The *Admin* screen opens (see the following figure).



### Note

A Hologic Service user has access to all the functions on the Admin screen as shown in the following figure. Some items are not available (and do not display on screen) for lower-level users such as Technologist or Manager.



Figure 87: Admin Screen (Service Login)





Figure 88: Windows OS Tools subscreen

Refer to the following table for descriptions of the *Admin* screen functions.



### Note

Depending on the license settings for your system, you may not see all the buttons listed here.

Table 4: Admin Screen Functions (Service Login)

Section	Button Name	Function
Operators	<b>Manage Operators</b>	Add, delete, or change Operator information
	<b>My Settings</b>	Change the information for the current Operator, including worklist settings
Procedures	<b>Procedure Editor</b>	Add or Edit the procedures, or change the view order for each user
	<b>Procedure Order</b>	View and change the order for “Procedures” within a specific “Procedure Group” (such as Conventional, Combo, Tomo, TomoHD)
	<b>View Editor</b>	Add or edit the views
	<b>Contrast</b>	Access the contrast enhanced digital mammography functionality, such as the Contrast Agents, Entry Routes, and Concentration of the Contrast agent. It also has the default times for the Waiting Period and the Optimal Imaging Period.
Quality Control	<b>Quality Control</b>	Select a Quality Control (QC) task to perform or mark completed
	<b>QC Report</b>	Create a Quality Control (QC) Report
	<b>Test Patterns</b>	Select and send the test patterns to output devices
	<b>Reject and Repeat Report</b>	Create a Reject and Repeat Report



*Table 4: Admin Screen Functions (Service Login)*

Section	Button Name	Function
System	<b>System Tools</b>	The interface provided for Service to configure Dimensions based on customer site required workflow. Configuration information within System Tools may also assist in troubleshooting with devices interfaced to Dimensions.
	<b>System Defaults</b>	Sets the Gantry default values
	<b>System Diagnostics</b>	Displays the status of all subsystems and provides the ability to turn on or off the Gantry and to restart the detector.
	<b>Preferences</b>	Sets the system preferences
	<b>About</b>	Describes the system (refer to <a href="#">About Screen</a> on page 91)
	<b>Exposure Report</b>	Create a report of the number of exposures by modality
	<b>Log Viewer</b>	Review the system log files
	<b>Windows OS Tools</b>	Launches a subscreen that provides direct access to Computer Management, Local Security Policy, Local Users and Groups, and Local Group Policy in the Windows OS
	<b>Turn NPT On</b>	Puts the system in non-patient test mode (NPT), used specifically for system Node testing. When put into NPT mode, Gantry and Detector Nodes are put in a state unsuitable for clinical purposes.
	<b>STX Calibration</b>	Maps the needle coordinates to the detector space for the standard approach of a biopsy device
	<b>Lateral STX Calibration</b>	Maps the needle coordinates to the detector space for the lateral arm approach of a biopsy device
	<b>Biopsy Devices</b>	Lists available biopsy devices and provides the ability to configure biopsy devices
	<b>QAS</b>	Access the <i>QAS Needle Test</i> screen
	<b>Lateral QAS</b>	Access the <i>Lateral QAS Needle Test</i> screen
	<b>Eject USB</b>	Allows ejection of USB memory stick
Connectivity	<b>Query Retrieve</b>	Configure the Query/Retrieve devices
	<b>Import</b>	Import the data from a DICOM source
	<b>Manage Output Groups</b>	Add, delete, or edit output groups
	<b>Archive</b>	Send local studies to networked storage or export to removable media devices



## 5.3 Operating System Settings

### 5.3.1 Adjust the Region, Time, and Date for Locale

The default region, time, and date settings for the system is Eastern Standard Time in the USA using a 12-hour clock format and a M/d/yyyy date format. If you need to change one or more of these settings, follow these instructions as required.

1. Exit the Capture application but do not reboot or power down the system (refer to [How to Exit the Capture Application to the Windows Desktop](#) on page 88).
2. At the Windows desktop, left-click on the Windows start icon [img alt="Windows Start icon" data-bbox="745 285 775 305]] and select the **Settings** gear icon.
3. In the *Windows Settings* window, select **Time & language**.

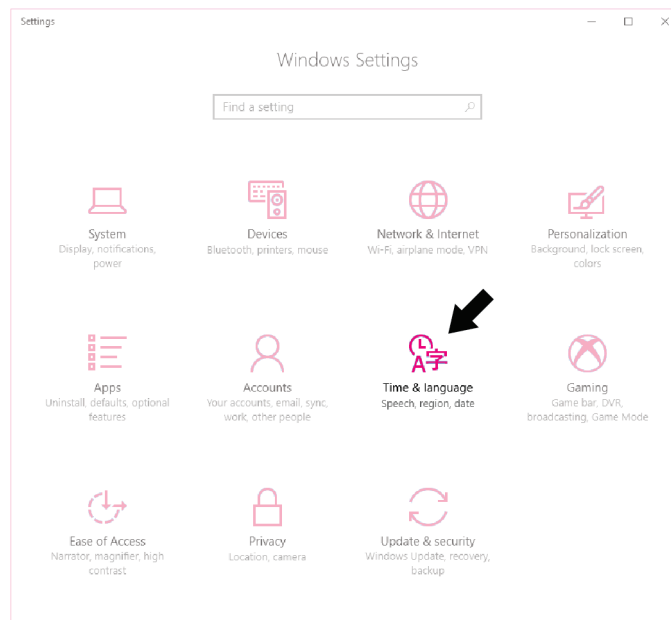


Figure 89: Windows Settings > Time & language



4. In the *Date & time* window, scroll to the bottom and select **Additional date, time, & regional settings**.

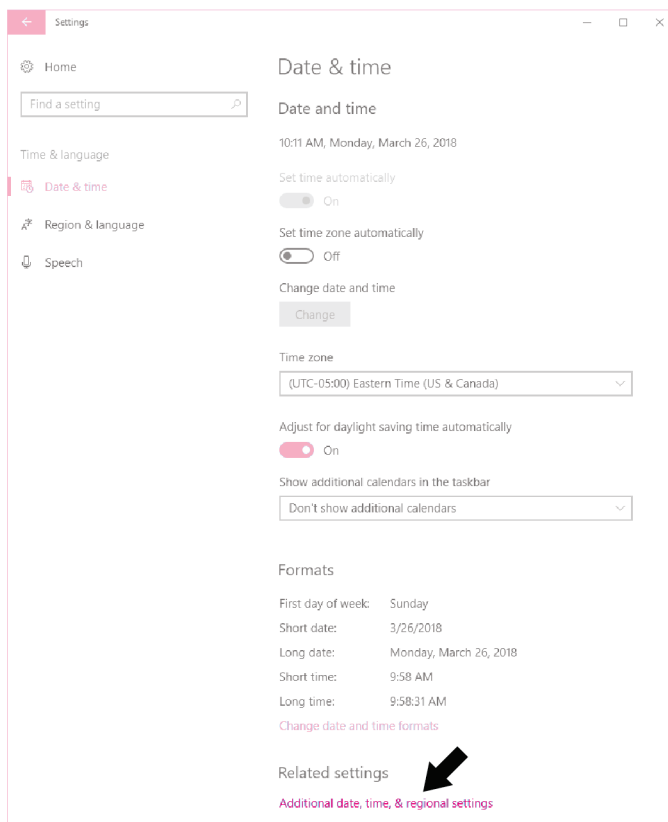


Figure 90: *Date & time > Additional date, time, & regional settings*

5. In the *Clock, Language, and Region* window under the Date and Time section, select **Set the time and date**.

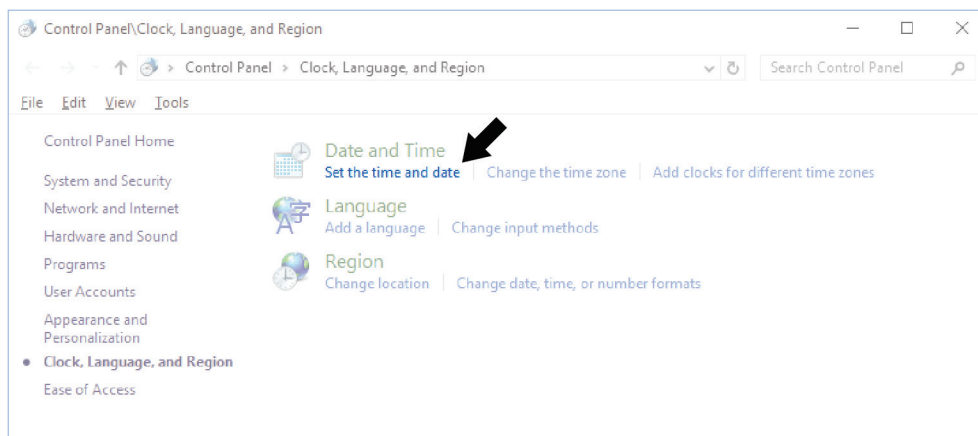


Figure 91: *Windows Clock, Language, and Region > Set the time and date*



6. The *Date and Time* dialog opens (see the following figure). In the Date and Time tab (the default), select **Change date and time**.

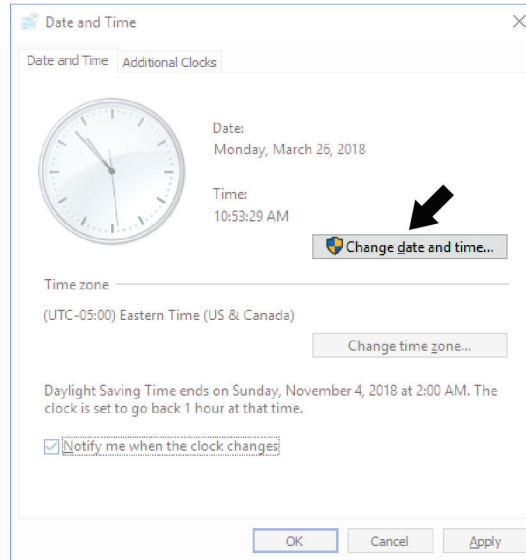


Figure 92: Windows Date and Time dialog

7. The *Date and Time Settings* dialog opens. Select the appropriate date and time for your location. Click **OK**.

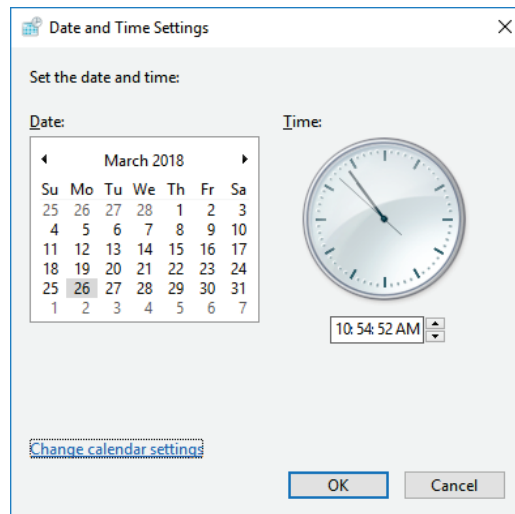


Figure 93: Windows Date and Time Settings



8. In the *Date and Time* dialog, select **Change time zone**.

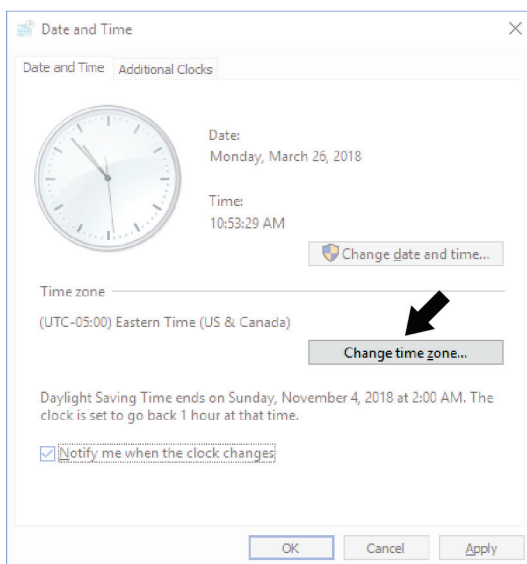


Figure 94: Windows Date and Time dialog

9. In the *Time Zone Settings* dialog, select the appropriate time zone from the drop-down list.

If Daylight Savings Time is used in this location, select the check box; otherwise, leave the check box unchecked. Click **OK** when done.

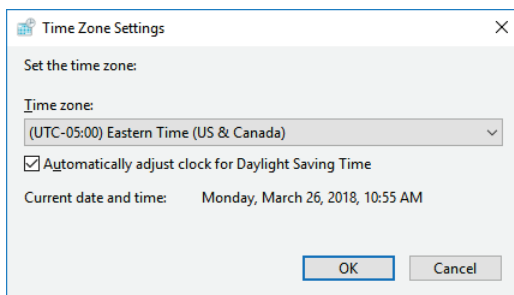
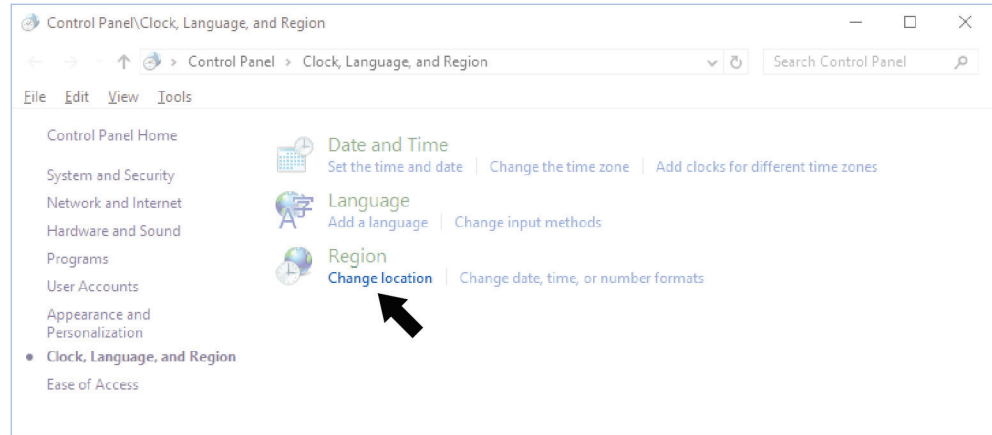


Figure 95: Windows Time Zones Settings dialog

10. In the *Date and Time* dialog, select **Apply**, then **OK**.

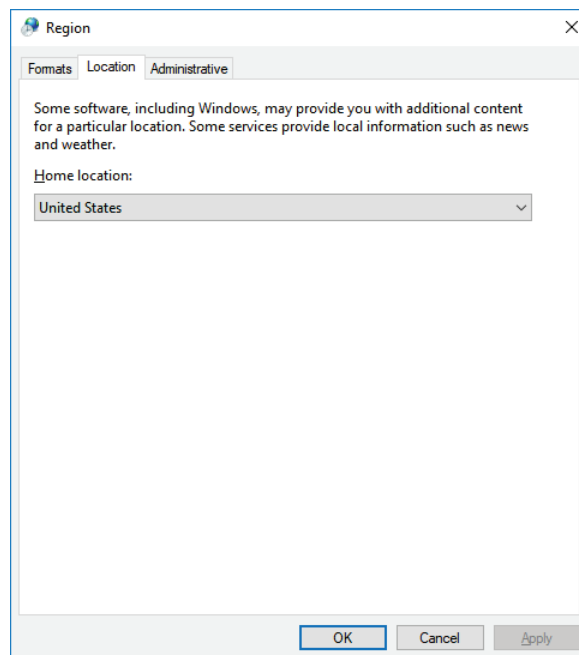


11. In the *Clock, Language, and Region* window under the Region section, select **Change location**.



*Figure 96: Windows Clock, Language, and Region > Change location*

12. In the *Region* dialog, select the **Location** tab.



*Figure 97: Windows Region > Location tab*

13. Select the desired location from the Home location field drop-down list.



14. Select the **Formats** tab.

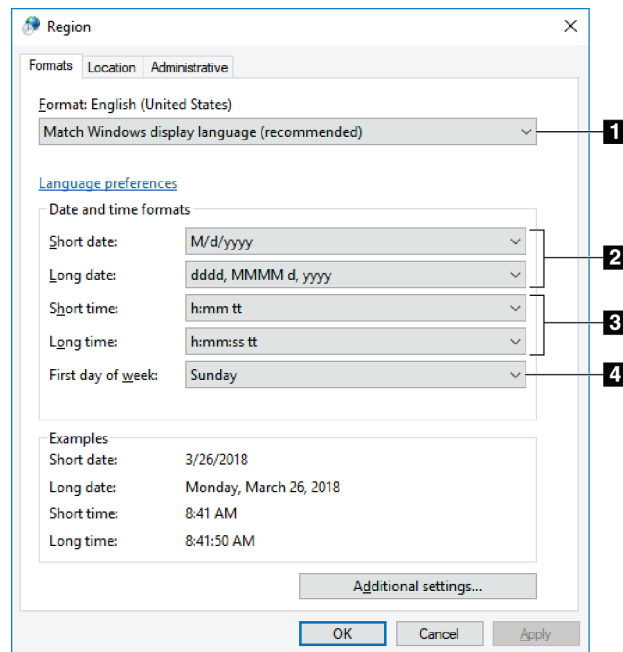


Figure 98: Windows Region > Formats tab

15. Make the appropriate choices (see the previous figure):
- In the Format field, leave the default choice of *Match Windows display language (recommended)*, unless your customer specifically requests a change (item 1).
  - Select the desired date format from the Short date and Long date drop-down lists (item 2).
  - Select the desired time format from the Short time and Long time drop-down lists (item 3)
  - Select the desired day from the First day of week drop-down lists (item 4).
  - Select **Apply**, then select **OK**.
16. Close the *Clock, Language, and Region* window.
17. Close the *Windows Settings* window.
18. Reboot the system for the changes to take effect.




### 5.3.2 Configure Network Parameters

The Capture application derives network identification parameters from entries you make in Windows Settings screens. Use the following procedure to enter the server host name, DNS server, IP address, subnet mask, and default gateway.



#### Note

Prior to the installation, contact the site to obtain all the necessary network information (such as IP Addresses, AE-Titles, and Ports) for both the Dimensions system and the equipment to which it will be connected.

1. Exit the Capture application but do not reboot or power down the system (refer to [How to Exit the Capture Application to the Windows Desktop](#) on page 88).
2. At the Windows desktop, left-click on the Windows start icon [  ] and select the **Settings** gear icon.
3. In the *Windows Settings* window, select **Network & Internet**.

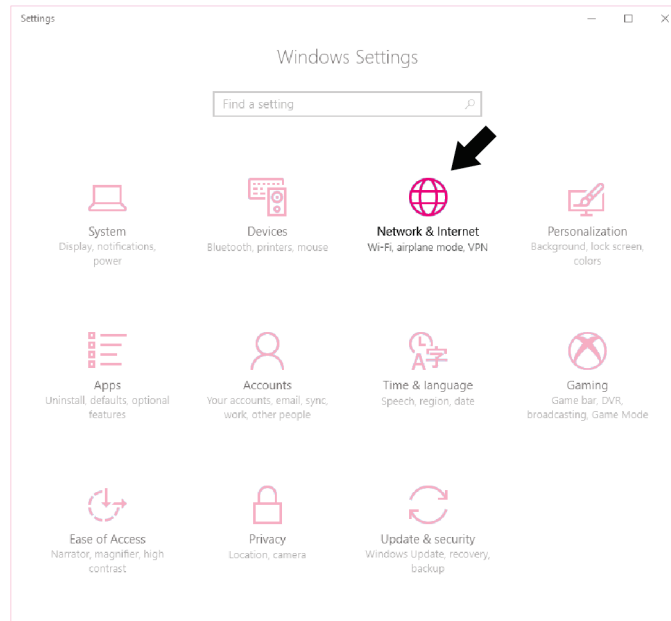
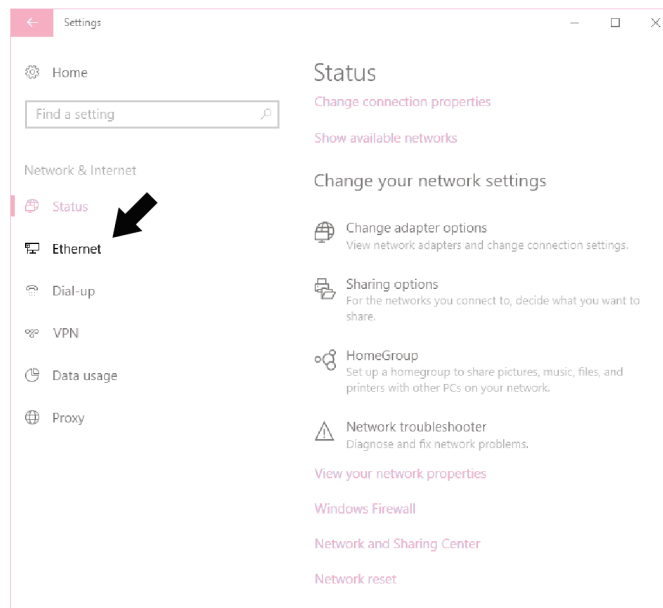


Figure 99: Windows Settings > Network & Internet

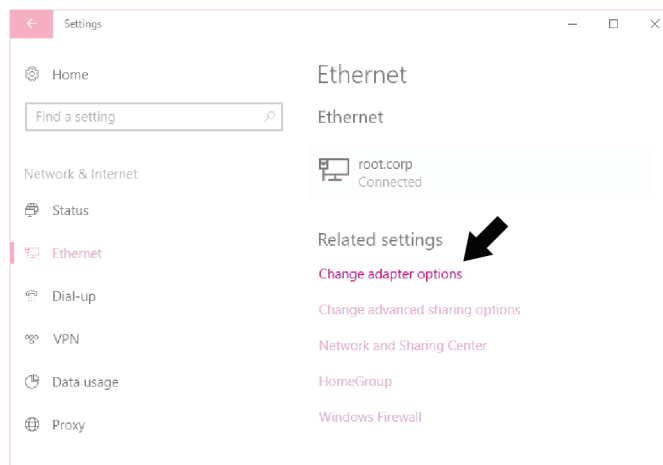


4. In the *Network Status* window, on the left select **Ethernet**.



*Figure 100: Change your network settings > Ethernet*

5. In the *Ethernet* window, select **Change adapter options**.



*Figure 101: Ethernet > Change adapter options*



6. In the *Network Connections* window, locate the Ethernet icon. Right-click on the **Ethernet** icon and select **Properties**.

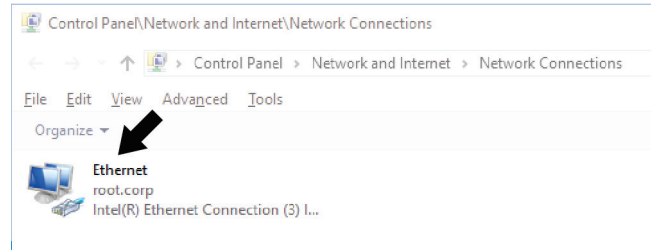


Figure 102: Network Connections > Ethernet icon

7. In the *Ethernet Properties* dialog, Networking tab, make sure **Internet Protocol Version 4 (TCP/IPv4)** is checked.

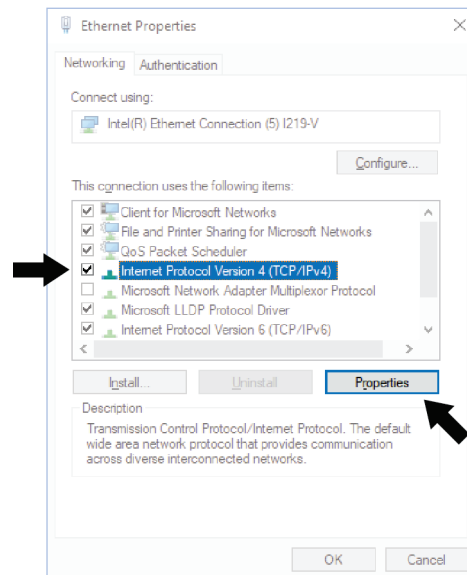
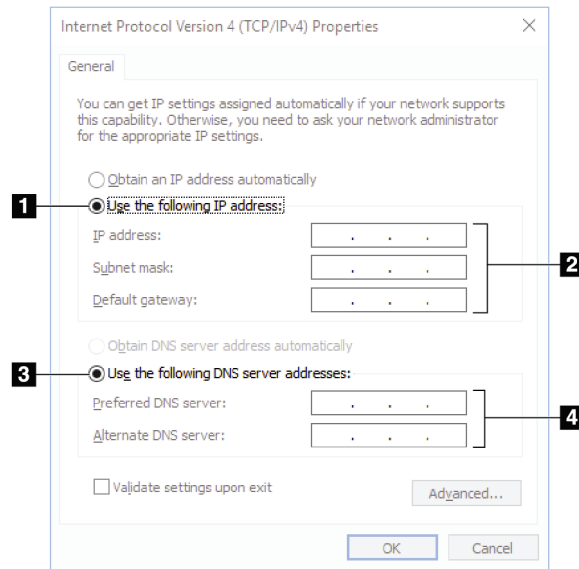


Figure 103: Ethernet Properties > Networking Tab

8. Left-click on **Internet Protocol Version 4(TCP/IPv4)** to highlight, then select **Properties** (see the previous figure).



9. The *Internet Protocol Version 4 (TCP/IPv4) Properties* dialog opens (see the following figure).
- a. Select **Use the following IP address** (item 1). Enter the site IP address, Subnet mask, and Default gateway (item 2) provided by the IT staff of the customer.
- b. Select **Use the following DNS server addresses** option (item 3). Enter the DNS server addresses (item 4) provided by the IT staff of the customer.
- c. Select **OK**.



*Figure 104: Internet Protocol Version 4 (TCP/IPv4) Properties*

10. At the *Ethernet Properties* dialog, select **OK**.
11. Close the *Network Connections* window.
12. Close the *Ethernet* window.



13. Use the following substeps to change the system host (computer) name.



### Note

Before changing the server host (computer) name, consult with the IT staff of the customer. Use naming conventions provided either by the customer, your Regional Connectivity Specialist, or those consistent with Hologic training.

- Select the Windows start icon [ ] and type **Control Panel**.
- Select the **Control Panel** app.
- Select **System and Security**, then **System**.
- In the *Windows 10* window, select **Change settings**.

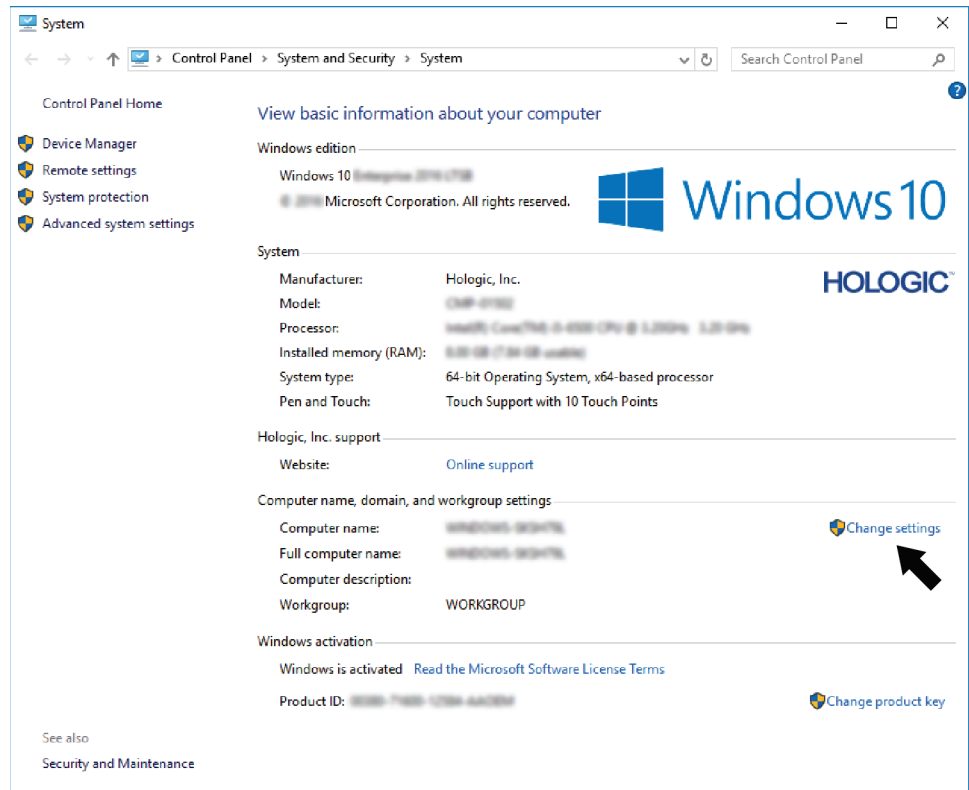


Figure 105: Windows 10 > Change Settings



- e. The *System Properties* dialog opens (see the following figure).

If provided by the customer, enter a description in the Computer description field (item 1), then select **Apply**. Next, select **Change** (item 2).

If no description is needed, just select **Change**.

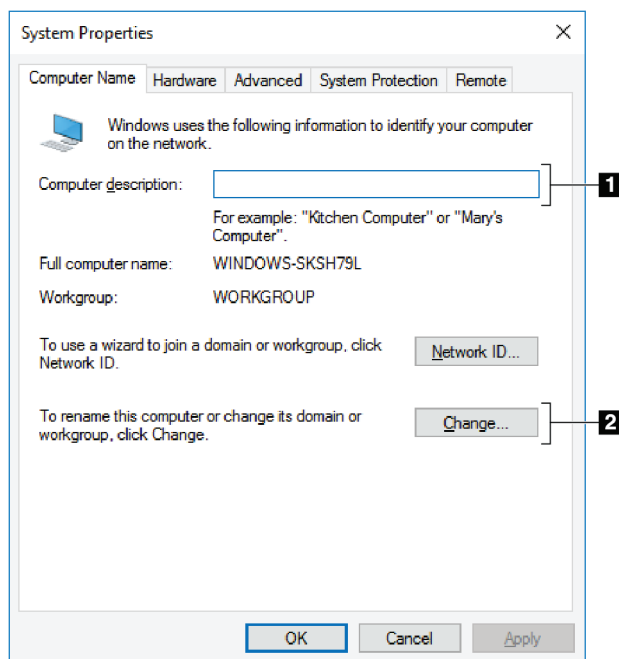


Figure 106: System Properties Dialog

- f. At the *Computer Name/Domain Changes* dialog, enter the proper name in the Computer name field and select **OK**.

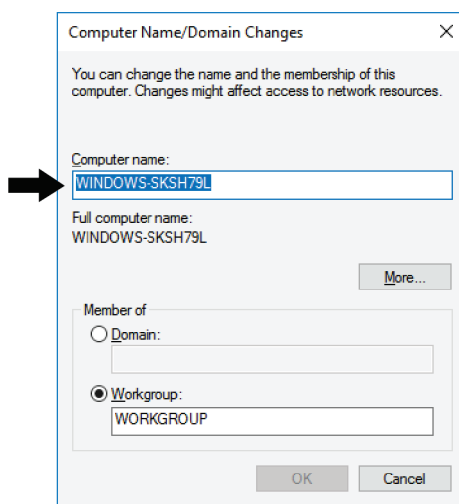
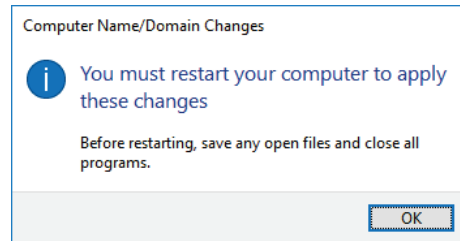


Figure 107: Computer Name Changes Dialog

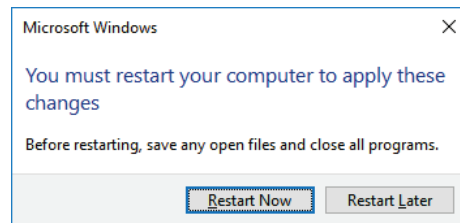


- g. At the prompt to remind you to restart your computer to apply these changes, select **OK**.



*Figure 108: Reminder to restart your computer dialog*

- h. At the *System Properties* dialog, select **OK**.
- i. At the prompt to restart your computer to apply these changes, select either:



*Figure 109: Restart your computer now or later dialog*

- **Restart Now** - The system closes all programs and reboots the system.



- **Restart Later** - The system returns to the Windows 10 settings window indicating the new name of the computer that will take affect after the next system reboot (see the following figure). Reboot the system when it is practical for the changes to take effect.

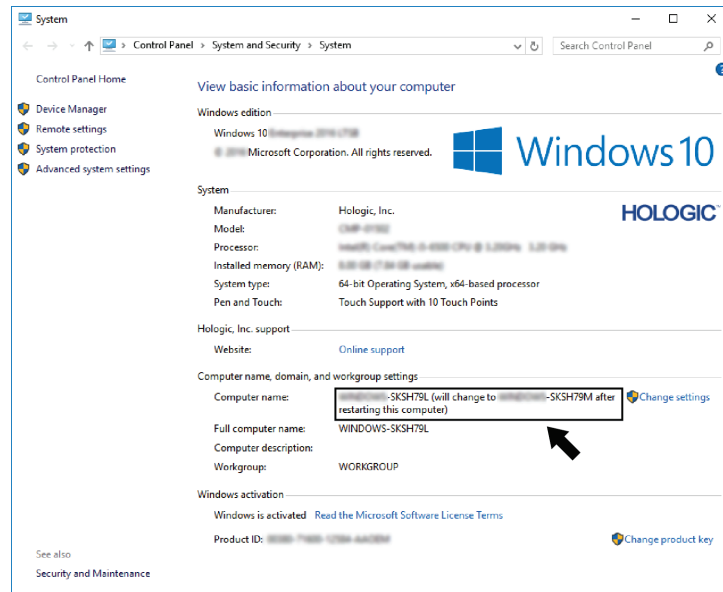


Figure 110: Windows 10 > Computer name setting showing proposed new name

## 5.4 Hologic Connect Configuration

Hologic Connect™ is a multi-functional, cloud-server based platform that provides system status via real-time monitoring and remote connection capabilities for any connected Hologic device. Hologic Connect allows Hologic Tech Support, Field Service, Applications, and Software Development to remotely access into a system for troubleshooting, maintenance, training, and data reporting purposes.

The following set of procedures explains how to configure Hologic Connect on the system using the Hologic Connect configuration tool.



### 5.4.1 Accessing the Hologic Connect Configuration Tool

1. Exit the Capture application but do not reboot or power down the system (refer to [How to Exit the Capture Application to the Windows Desktop](#) on page 88).
2. On the Windows desktop, find the Hologic Connect Configuration icon on the desktop and double-click it.

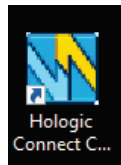


Figure 111: Hologic Connect Configuration Icon

### 5.4.2 Enter Site and Product Information for Hologic Connect

1. At the Hologic Connect Control Panel dialog, select the **Site Details** tab.

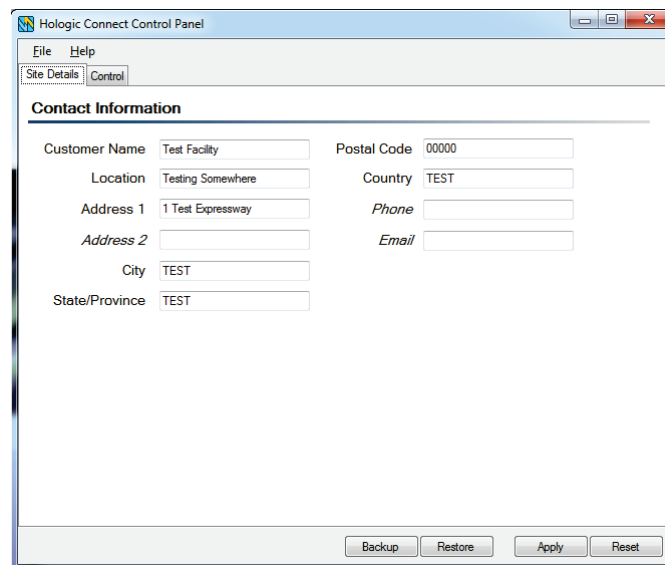
The image shows a screenshot of the "Hologic Connect Control Panel" window. The window has a title bar with the text "Hologic Connect Control Panel" and standard Windows window controls (minimize, maximize, close). Below the title bar is a menu bar with "File" and "Help". Under the menu bar are two tabs: "Site Details" (which is selected) and "Control". The main area of the window is titled "Contact Information" and contains several text input fields. The fields are arranged in two columns. The left column contains: "Customer Name" (with the text "Test Facility"), "Location" (with the text "Testing Somewhere"), "Address 1" (with the text "1 Test Expressway"), "Address 2" (empty), "City" (with the text "TEST"), and "State/Province" (with the text "TEST"). The right column contains: "Postal Code" (with the text "00000"), "Country" (with the text "TEST"), "Phone" (empty), and "Email" (empty). At the bottom of the window, there are four buttons: "Backup", "Restore", "Apply", and "Reset".

Figure 112: Hologic Connect Control Panel - Site Details tab

2. Enter the specific site information consistent with corporate naming conventions. If in doubt, consult the sales order or corporate system such as Oracle and Salesforce. Be attentive to names used for other equipment and/or locations. For example, do not use "St." at one location and "Saint" at another. Always use the standard two letter abbreviation for the state (such as "TX" for Texas).



3. When finished, select the **Control** tab.
- If the Hologic Connect process is running, click the **Stop** button.

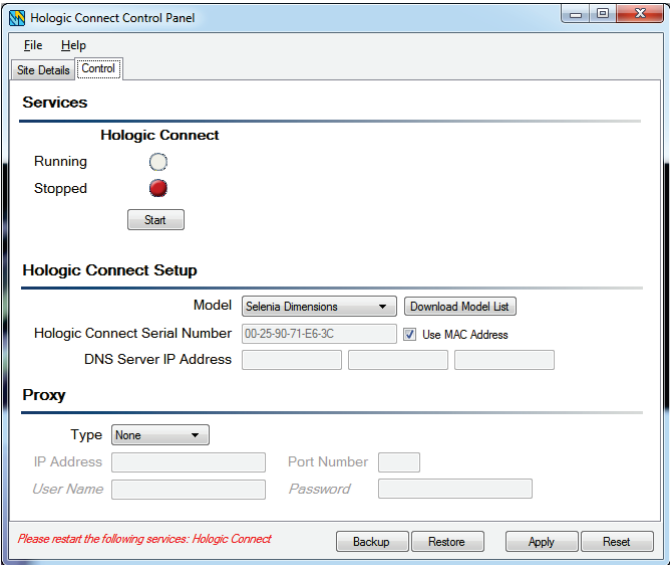


Figure 113: Hologic Connect Control Panel - Control Tab

4. In the Model field, choose **Selenia Dimensions** from the dropdown list.

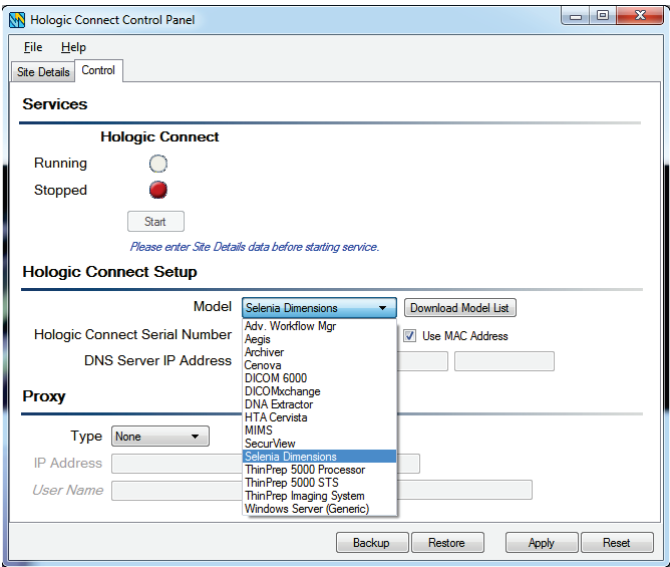


Figure 114: Hologic Connect Control Panel - Model Drop-Down Box



5. Unselect the **Use the MAC Address** checkbox (see the following figure).
6. Enter the System Serial Number in the Hologic Connect Serial Number field.

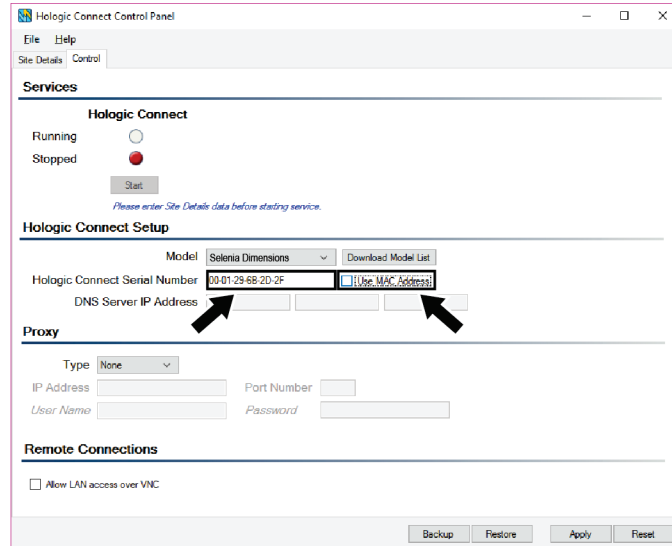


Figure 115: Hologic Connect Control Panel - Setup section

7. Under the Remote Connections section at the bottom, the "Allow LAN access over VNC" field is normally left unchecked (for not to enable this feature).  
If the customer needs the system to communicate via a LAN going over a VNC (which is not as secure as a regular LAN, but may be needed in certain circumstances), select the checkbox for this feature.

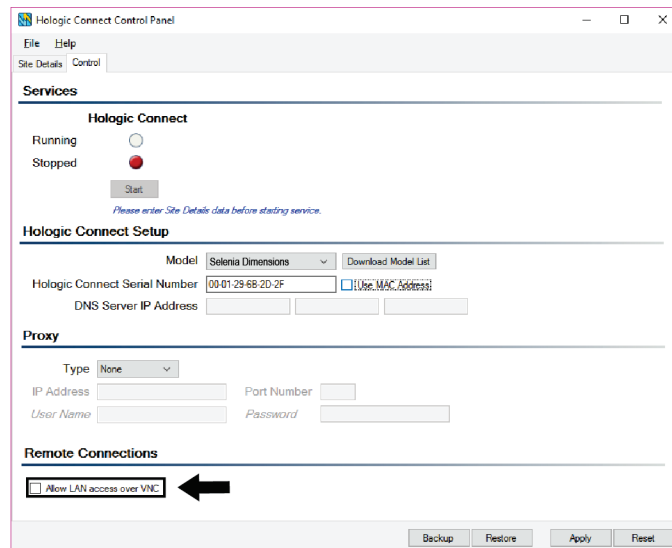


Figure 116: Hologic Connect Control Panel - Allow LAN access over VNC checkbox

8. Click **Apply** to save the settings. The server displays *Please restart the following service: Hologic Connect.*



9. Close the Hologic Connect Control Panel application.
10. Reboot the system.
11. Do the following, based on the situation:
  - If a proxy server is used by the site, continue with [Configure a Proxy Server \(If Needed\)](#) on page 112.
  - If no proxy server is used by the site, proceed to [Test/Verify Hologic Connect Internet Access](#) on page 113.

### 5.4.3 Configure a Proxy Server (If Needed)

A proxy server may sit between a client and the Internet. It serves as an intermediary gateway to pass acceptable requests from clients, then forwards those requests to other servers. Refer to the Connectivity Site Survey for proxy server information.



#### Note

If no proxy server is used with this system, proceed to [Test/Verify Hologic Connect Internet Access](#) on page 113.

1. From the Hologic Connect Control Panel, select the **Control** tab. Select the appropriate proxy type from the Proxy field dropdown list.

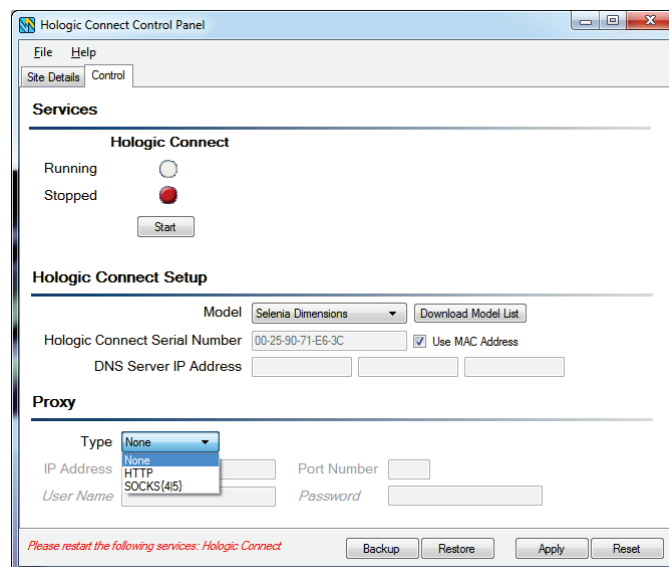


Figure 117: Hologic Connect Control Panel - Proxy Type

- *None*—No Proxy Server
- *HTTP*—The session connects through a Hypertext Transfer Protocol (HTTP) proxy server. HTTP is a communications protocol used to transfer information on intranet and the World Wide Web.
- *SOCKS{4|5}*—The session connects through SOCKS version 4 or 5 proxy server. SOCKS is an abbreviation for SOCKeT S, and is an Internet protocol that allows client-server applications to transparently use network firewall services.



2. Enter the appropriate IP Address, Port, User Name, and Password for the proxy server of the customer.
3. Click **Apply** to save the settings. The server displays *Please restart the following service: Hologic Connect*.
4. Reboot the system.
5. Verify the Internet connection (refer to [Test/Verify Hologic Connect Internet Access](#) on page 113).

#### 5.4.4 Test/Verify Hologic Connect Internet Access

1. Launch Internet Explorer and enter <https://www.hologic.com> in the URL field.  
If Internet Explorer is not easily accessible from the taskbar or as a desktop shortcut, do the following:
  - a. Right-click on the Windows start icon [ ] and select **Search**.
  - b. Enter <https://www.hologic.com> in the search field.
  - c. Internet Explorer opens.
2. Verify that the website launches.



---

**Note**

If the website does not appear, there is no connection to the internet. Verify that the Ethernet cable is attached to a working LAN port and refer to [Configure Network Parameters](#) on page 101 and [Configure a Proxy Server \(If Needed\)](#) on page 112 to review your network settings.

---

3. To update customer records, email Customer Support at [BreastHealth.Support@hologic.com](mailto:BreastHealth.Support@hologic.com). Please include:
  - customer name
  - system serial number
  - MAC address for each system
4. To contact Hologic Technical Support, call **1.800.760.8342**, or email [imgsupport@hologic.com](mailto:imgsupport@hologic.com).

### 5.5 System (Service) Tools

System Tools (aka "Service Tools") allows you to configure the system based on customer site required workflow. Configuration information within System Tools may also assist in troubleshooting devices interfaced to the system.



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**Note**

Depending on the system, there may be a shortcut to System Tools on the Windows desktop that allows you to launch System Tools without starting the Capture application.

---



1. If need be, launch the Capture application and log in as a Service user.



**Note**

If you see an Admin rights warning after logging in to the Capture application, you need to restart Windows and log in again (refer to [Windows 10 User Account Control and the Capture Application](#) on page 87). Otherwise, you won't have permissions to run System Tools.

2. At the *Select Patient* screen, select the **Admin** button.
3. At the *Admin* screen, select **System Tools**.
4. The *System Tools Login* screen opens. Login as a Service user and enter the appropriate password. Select **Log In**.

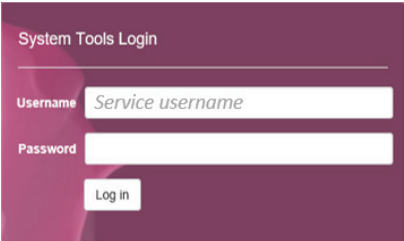


Figure 118: System Tools Login screen

5. The *System Tools Welcome* main screen opens.

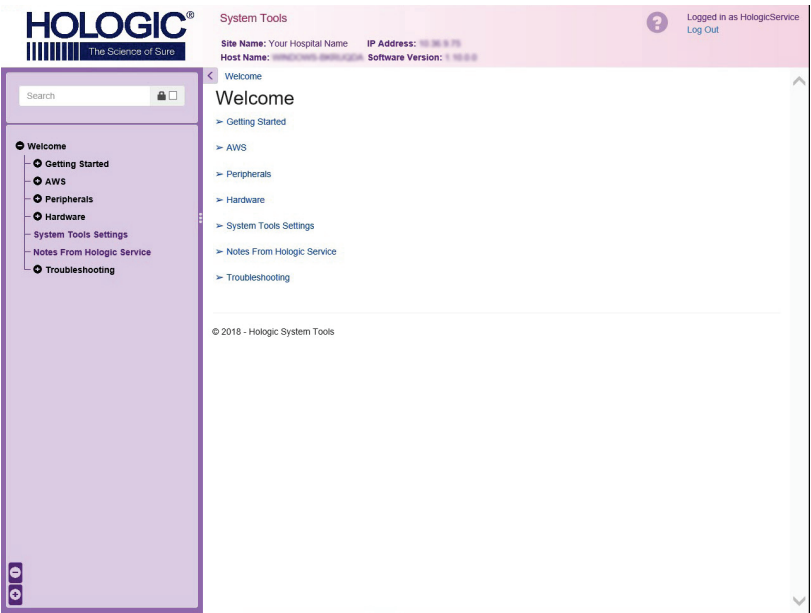


Figure 119: System Tools Welcome main screen (Service login)

Refer to the following table for descriptions of the System Tools functions.



Table 5: System (Service) Tools Functions (Service Login)

Item	Topic	Description
Getting Started	About	Introduction to using the service tool
	FAQ	List of frequently asked questions
	Glossary	List of terms and definitions
	Platform	List of directories, software version numbers, and system software statistics
	Shortcuts	List of Windows OS shortcuts
AWS [Acquisition Workstation]	Connectivity	Provides the ability to install, list, and configure output devices as related DICOM functionality
	Film and Image Information	View, import, and edit image processing parameters; configure Genius AI™ Detection, ImageChecker® CAD, and Quantra™ settings
	Licensing	List, add, and remove licenses
	Notices	Configure export settings
	Import	Configure DB mappings and Filters
	JSS	View JSS Dispatcher Job Type information
	Hanging Protocol	Configure Hanging Protocol
	Reclaimer	Configure Reclamation defaults
	Procedures	Configure Procedure parameters
	DICOM	Configure DICOM settings
	User Interface	Configure UI defaults
	Simulation	
	Internationalization	Configure language and culture
	Global	Configure system, Repository (sets threshold of hard drive capacity remaining before system message displays), Institution settings
	QC	Procedure, periodicity, calibrations, phantom thickness
	AWM	Enable AWM Cluster
Peripherals	Bar Code	Configure Bar Code
	Biometrics	Enable fingerprint scanner
	Removable Media	Configure image types exported to media



Table 5: System (Service) Tools Functions (Service Login)		
Item	Topic	Description
Hardware	Paddle Croppings	Lists Paddle ID and cropping size
	Calibration	Lists calibration parameters
	Subsystem (Global)	Acquisition Workstation Settings, Mag settings, Gantry distances, temperature limits
	Biopsy Device List	Device list
	Biopsy Config	Biopsy, QAS configuration parameters
	Monitors	Heartbeat, exposure count, monitors
	Detector Configuration	Maximum pixel value for conventional and tomographic images
	Tube Filter Outputs	Lists Filter Tube Output and HVL tables
	Tube EOL Configure	Configure tube EOL parameters
System Tools Settings		Idle Timeout
Notes from Hologic Service		Allows entry of Service PM/install notes in a database to track work done on visits
Troubleshooting	Troubleshooting AWS	Self-tests, Database Viewer/Setup, Mappings, Role Permissions, Tagged Images, DICOM dump, Get Images/Quality files
	Troubleshooting Computer	Windows Services/Processes, System Management, Network information
	Troubleshooting Log	Log: Downloader, Flags, Config, Management, Viewer, Audit Viewer, Screen image download
	Troubleshooting Backups	Backup: Create, Restore, Management, Parameters

### 5.5.1 Configure System Institution and Locale

The *Institution* screen of System Tools allows you to configure settings which are displayed within the Capture application and used to populate DICOM fields.

In addition, the *Institution* screen allows you to specify the locale (language and region) for the start-up and login screens of the Capture application. These locale settings are separate from any locale settings done through the Windows operating system.





### Note

After logging in to the system Capture application, the locale of screens used by an operator is determined by the settings in the Manage Operators feature. If you need to change the locale for *these* screens, go to **Admin > Manage Operators**. Select an operator, then go to **Edit operator > Next** screen and select a locale.

Perform the following instructions to configure the institution and locale information for the Capture application.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Global > Institution**. The *Institution* screen opens (see following figure).

Figure 120: System Tools > AWS > Global > Institution

3. Enter **Name** and **Address** values consistent with corporate customer naming conventions, or as directed by the customer to populate DICOM fields and text printed on film.
4. Enter a **Station** name consistent with the desired DICOM Station Name field content. This field may be used by Modality Worklist (MWL), Print, and Advanced Workflow Manager (AWM) interfaces, and should be noted among support records.



### Note

Station name is a case-sensitive field. When part of an Advanced Workflow Manager cluster, the Station name entered here must match the corresponding Station Name configured within the Advanced Workflow Manager.

5. Use the **Department Name** field to indicate location information more specific than the Address field.



6. If you do not need to change the default Locale, select **Update**.  
Otherwise; in the Locale field (see the following figure), select the desired Locale from the dropdown list, then select **Update**.



**Note**  
Changes in this screen do not take effect until the Capture application is restarted.

Figure 121: System Tools > AWS > Global > Institution > Updating Locale



- Restart the Capture application. The start-up and login screens should reflect the (new) locale (see the following figures).

### Selenia Dimensions

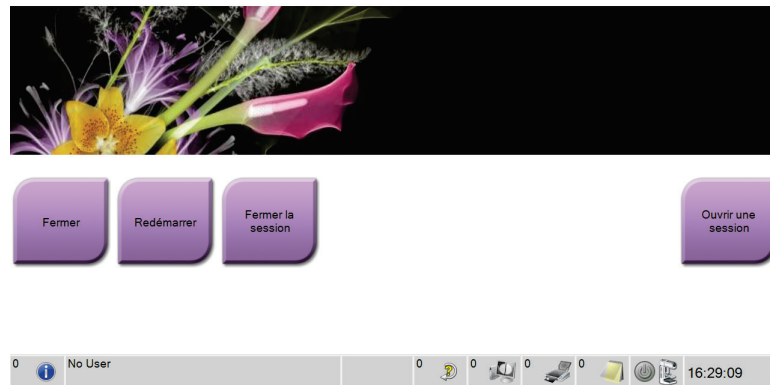


Figure 122: Capture application startup screen with new locale (French Canada)

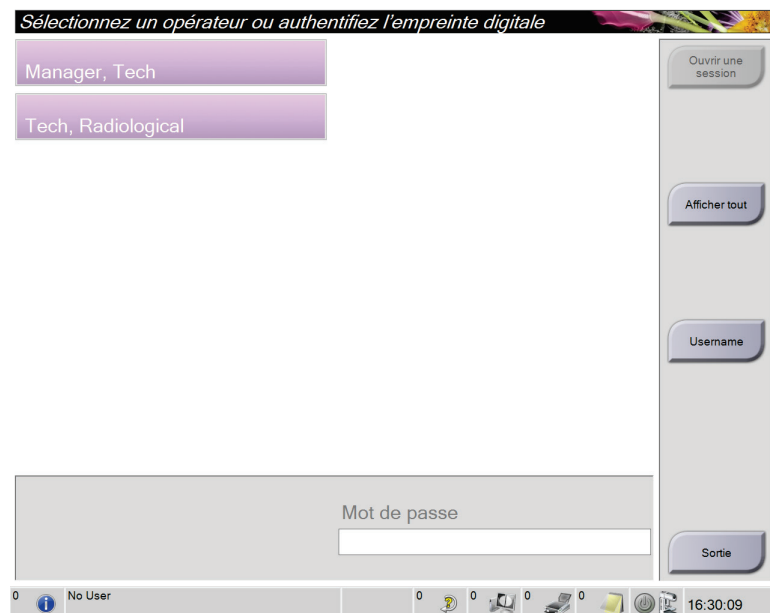


Figure 123: Capture application Select Operator (login) screen with new locale (French Canada)



### 5.5.2 Configure Serial Number in System Settings

Perform the following instructions to configure the system serial number. This setting populates the serial number in the DICOM header, which is used by other systems (such as CAD devices) to identify its licensed systems.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Global > System Settings**.
3. The *System Settings* screen opens. In the Serial Number field, enter the **System Serial Number** found on the system nameplate label on the back of the Gantry (see figure [Label Locations](#) on page 13).

The screenshot shows the 'System Settings' interface. On the left is a navigation menu with options: Welcome, Getting Started, AWS, Connectivity, Film & Image Information, Licensing, Notices, Import, JSS, Hanging Protocol, Reclaimer, Procedures, DICOM, User Interface, Simulation, Internationalization, and Global. The 'AWS' section is expanded. The main content area is titled 'System Settings' and contains two sections: 'Vendor' and 'Equipment'. The 'Vendor' section includes fields for Name (Hologic Inc.), Phone (781-999-7300), Address1 (250 Campus Drive), Address2 (Marlborough, MA 01752), Web Site Address (http://www.hologic.com/), and Email Address (support@hologic.com). The 'Equipment' section includes a 'Serial Number' field with the value 'G-XXX' and a 'Device UID' field with a long alphanumeric string. Below these fields are three buttons: 'Update' (blue), 'Reset to Defaults' (red), and 'Reset Changes' (yellow). A black arrow points to the 'Serial Number' field, and another black arrow points to the 'Update' button.

Figure 124: System Tools > AWS > Global > Global Configuration > Serial Number field

4. Click **Update**.



#### Note

For external CAD systems, the System Serial Number must match the CAD licensed serial number to produce CAD results from images acquired on this system. It is necessary to restart the system Capture application for the changes to take place.



### 5.5.3 Add Licensed Features

When installing a new licensed feature on a system, or doing a new software install as part of a computer replacement in the workstation, follow these steps.

1. Obtain the following, based on the situation:
  - *Installing a new feature* - Obtain the Sales Order number for that feature.
  - *New software installation as part of a computer replacement* - Obtain the SN# of the system (on the back of the Gantry)
2. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
3. Navigate to the **AWS > Licensing**. The *Licensing* screen opens (see the following figure).

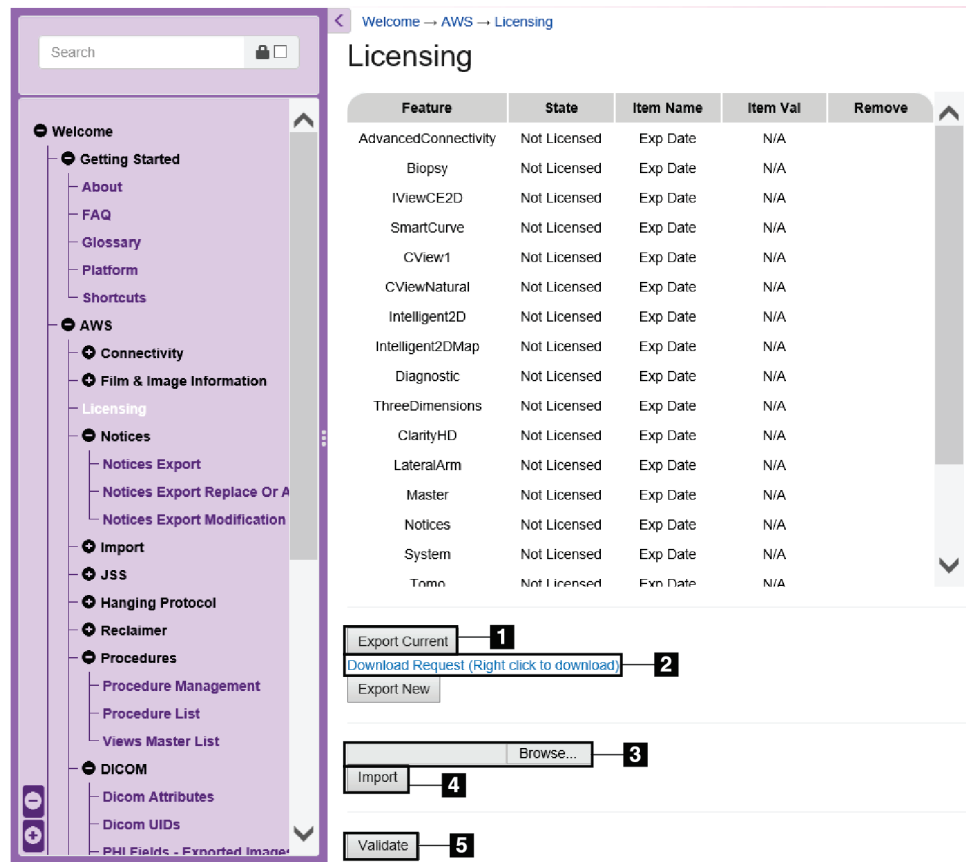


Figure 125: System Tools > AWS > Licensing screen



4. Generate a feature request file (xxxxxx.holx). This file includes all the features currently activated on the system and the MAC address of the computer. Refer to the previous figure for item references.
  - a. Click **Export Current** (item 1).
  - b. Click **Download Request** (item 2).
  - c. In the browser dialog, click **Save as**.
  - d. Navigate to the folder where you want to save the xxxxxx.holx file. Make sure **HOLX File** is selected as file type.
  - e. In the browser dialog, click **Save**.



---

**Note**

Depending on the browser used (for example, Google Chrome), you may only see "Download Request" as the link text and you may not be prompted for a folder and file name in a "Save as" dialog box.

---

5. Create an email and do the following, based on the situation:
  - *Installing a new feature* - Include the Sales Order # of the feature in addition to attaching the generated xxxxx.holx file. The Sales Order # is the only place where the new feature is identified in the license request procedure.
  - *New software installation as part of a computer replacement* - Include the SN # of the system in addition to attaching the generated xxxxx.holx file.
6. Send email to [3D@Hologic.com](mailto:3D@Hologic.com).
7. Receive a return email from [3D@Hologic.com](mailto:3D@Hologic.com) with a new activation file (xxxxxx.holx). This file includes all the features currently activated on the system plus the one or more newly requested features.
8. In the same screen as in step 3, import the new activation file. Refer to the previous figure for item references.
  - a. Select **Browse** (item 3).
  - b. In the browser dialog, navigate to the folder containing the new activation file, select the file, and click **Open**.



---

**Note**

Depending on the browser used (for example, Google Chrome), you may see "Choose File" instead of "Browse" as the link text.

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- c. Click **Import** (item 4).
  - d. Click **Validate** (item 5) to confirm that the proper software has been loaded for your system. (If successful, a "Validate Complete, no errors detected" message appears).
9. Exit from System Tools and reboot the computer.



10. In the Capture application, navigate to **Admin > About screen > Licensing** tab and verify that the one or more new software features and/or the correct system software level is installed.

**Important**

The remaining instructions in this System (Service) Tools section apply to *optional* features or settings. Consequently, depending upon the interests and requirements of your customer, these optional settings *may not need to be performed*. Consult with the customer and knowledgeable Hologic personnel, such as the Account Manager, Technical Sales Specialist, and Field Connectivity Specialist, regarding customer expectations.

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11. Once all the system configurations (optional and non-optional) have been completed, continue the installation process at [DICOM Interface Configurations](#) on page 133.

#### **5.5.4 Configure User Interface Security (Auto Login Feature) (Optional)**

There is an option in System Tools that allows a user to automatically log in to the Capture Application using the credentials of the currently logged-in Operating System (OS) user, if that user was also set up as a Dimensions system user as well.

For example, logging into Windows as a Dimensions system Tech Manager user would automatically start the Capture Application and log in as that user, bypassing the normal Capture Application login screen. This feature streamlines the login process for customers using unique Windows accounts to access the Dimensions system by removing a second login requirement.

The default system setting is to enable this feature. However, customers using a shared Windows account setup (that is, those customers not using unique OS user accounts) may want this feature disabled since automatically logging in as the current OS account may not make sense.

Follow these steps to disable this option.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > User Interface > User Interface Security**.



3. The *User Interface Security* screen opens. Under Local the section, unselect (uncheck) the "Auto Login Application Startup" check box.

## User Interface Security

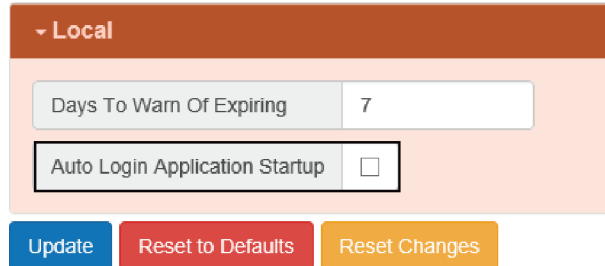


Figure 126: AWS > User Interface > Local

4. Click **Update**.



### Note

It is necessary to restart the system Capture application for changes to take place. Complete all connectivity configurations, then restart the Capture application.

### 5.5.5 Configure Reclaimer Settings Compatible with Storage Commitment Settings (Optional)

Images are reclaimed based on the user who captured the image. Consequently, the reclamation settings in System Tools are configured based on user roles.

The default Reclaimer settings are compatible with the choice NOT to configure DICOM Storage Commitment services with a connected archive device. This default is compatible with most customer choices not to activate Storage Commitment.

Perform the following instructions ONLY if Storage Commitment is enabled and the customer wants images to be protected from deletion until storage confirmation has been received from the archive device.



### Note

By default, Storage Commitment is not enabled.

If a Storage Commitment Ack becomes the selected choice, the system may need to remain on always, depending upon the operation of the archive device. Some archives perform permanent storage operations overnight.

If Storage Commitment is NOT in use with any active output, ensure that the Storage Commitment settings are NOT checked. Otherwise, images are not reclaimed and the hard drive could eventually fill to capacity.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Reclaimer > User Level**.



3. The *User Level* reclamation settings screen opens with a list of user roles (such as Biomedical Engineer, Manager, Radiologist) and their currently assigned reclamation settings in a table (see the following figure).

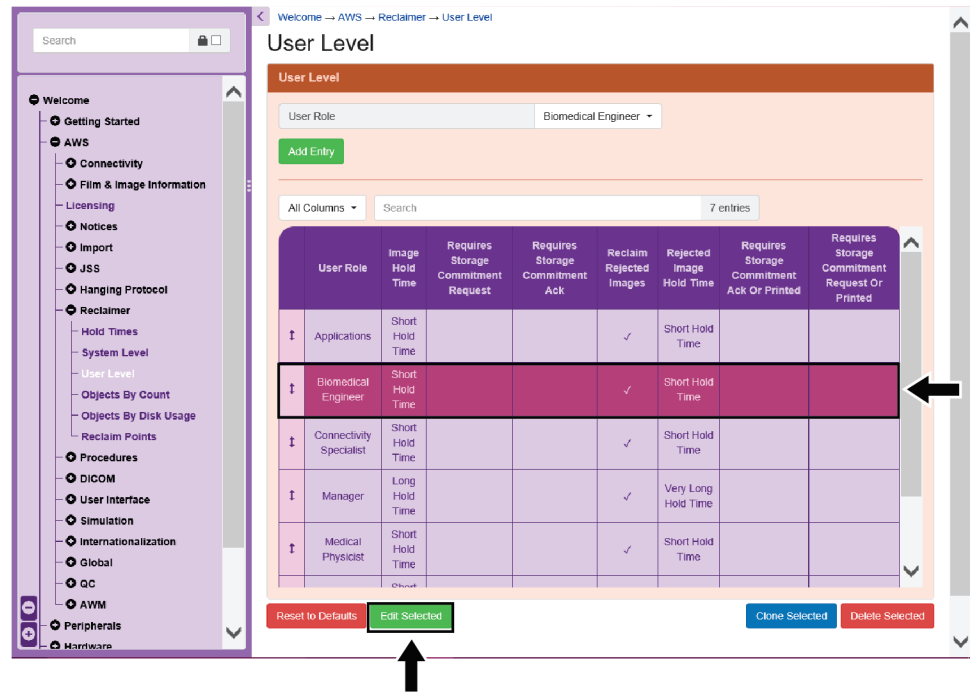


Figure 127: System Tools > AWS > Reclaimer > User Level reclamation settings



#### Note

By default, Storage Commitment is not enabled.

If Storage Commitment is NOT in use with any active output, ensure that the Storage Commitment settings are NOT checked for any users. Otherwise, images are not reclaimed and the hard drive could eventually fill to capacity.

If a User Level setting needs to be changed:

- a. Click the user role row you want to change and select **Edit Selected** (see the previous figure).



- b. The *User Level-Editing Entry* screen opens (see the following figure). Make any changes necessary for this user role and click **Update** (item 2).

For example, you may want to set up Storage Commitment for those users who acquire patient images, like a Radiological Technologist. At the same time, you may want to configure users who do not capture patient images (but may create test images, such as a Physicist or Biomed user) NOT to require Storage Commitment.

If Storage Commitment is being used with an archive device for a user role, select the appropriate checkbox choice (one of the choices in item 1).

The screenshot displays the 'User Level -- Editing Entry' configuration screen. The left sidebar lists various system tools, with 'User Level' selected under the 'Reclaimer' category. The main configuration area is titled 'User Level -- Editing Entry' and shows settings for the 'Biomedical Engineer' user role. Key settings include 'Image Hold Time' (Short Hold Time), 'Requires Storage Commitment Request' (unchecked), 'Requires Storage Commitment Ack' (unchecked), 'Reclaim Rejected Images' (checked), 'Rejected Image Hold Time' (Short Hold Time), 'Requires Storage Commitment Ack Or Printed' (unchecked), and 'Requires Storage Commitment Request Or Printed' (unchecked). A red box labeled '1' highlights the last two checkboxes. At the bottom left, a blue 'Update' button is highlighted with a blue box labeled '2'. Other buttons include 'Cancel', 'Clone Selected', and 'Delete Selected'. The footer indicates '© 2018 - Hologic System Tools'.

Figure 128: System Tools > AWS > Reclaimer > User Level

4. Navigate to **AWS > Reclaimer > System Level**.



5. The *System Level* reclamation settings screen opens. Scroll to the bottom of the screen to view the Default User Level Settings (see the following figure).

Seconds 0

**- TestPatternHoldTime**

The hold time length No Hold Time ▾

Days 0

Hours 0

Minutes 0

Seconds 0

**- Default User Level Settings**

Name Radiological Technologist

Image Hold Time Long Hold Time ▾

Requires Storage Commitment Request ☐

Requires Storage Commitment Ack ☐

Reclaim Rejected Images ☒

Rejected Image Hold Time Very Long Hold Time ▾

Requires Storage Commitment Ack Or Printed ☐ 1

Requires Storage Commitment Request Or Printed ☐

Update 2 Reset to Defaults Reset Changes

Image are reclaimed based on the user who captured the image. The System Level Reclamation Settings will only be used if the user who captured the image has been removed from the system.

Figure 129: System Tools > AWS > Reclaimer > System Level

6. Because images are reclaimed based on the user who captured the image, the Default User Level settings act as the base reclamation settings when creating new user roles (see step 2). These Default User Level settings also apply to those images captured by a user who has since been removed from the system.

We recommend that the Default User Level storage commitment settings (as shown in item 1 in the previous figure) be the same as the Radiological Technologist user under the User Level settings (see step 2). If changes are made, click **Update** (item 2).



### 5.5.6 Configure Advanced Workflow Manager (AWM) Cluster (Optional)

A Dimensions system can communicate with other Dimensions systems when an Advanced Workflow Manager is present. To communicate with the cluster, enable and configure the system to interface with the Advanced Workflow Manager using the following instructions.



#### IMPORTANT

There may be requirements placed on the compatibility among the specific software versions of Dimensions AWS and an Advanced Workflow Manager cluster. Consult the *Advanced Workflow Manager Service Manual* and release notes for details. Contact Technical Support if uncertain about compatibility.

Keep in mind that the Advanced Workflow Manager itself also needs to be configured to include the Dimensions system within its cluster.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > AWM > AWS Configuration for AWM Cluster**.
3. The *AWS Configuration for AWM Cluster* screen opens. To allow the system to participate in the Advanced Workflow Manager cluster, select the **Enabled** checkbox.

The screenshot shows the 'AWS Configuration for AWM Cluster' interface. On the left is a sidebar with a search bar and a list of categories: About, FAQ, Glossary, Platform, Shortcuts, AWS (selected), Connectivity, Film & Image Information, Licensing, Notices, Import, JSS, Hanging Protocol, Reclaimer, Procedures, DICOM, User Interface, Simulation, Internationalization, Global, QC, and AWM. The main content area has a breadcrumb trail: 'Welcome → AWS → AWM → AWS Configuration for AWM Cluster'. Below this is the title 'AWS Configuration for AWM Cluster' and a sub-header '- AWS Configuration for AWM Cluster'. A table of settings follows, with the 'Enabled' checkbox checked and highlighted by a black arrow. At the bottom are three buttons: 'Update' (highlighted with a black arrow), 'Reset to Defaults', and 'Reset Changes'.

- AWS Configuration for AWM Cluster	
Server Port	20000
Enabled	<input checked="" type="checkbox"/>
Max Results	500
PEP Auto Update Interval	1000
Add Image To JSS Incremental Pause	1000
Notices Polling Pause In Sec	9
AWSClientChannelManagerWCFTimeout	6
CCSInterfaceManagerAWMChannelWCFTimeout	6
AWSDataClientChannelManagerWCFTimeout	200
EnableWCFFileTransfers	<input checked="" type="checkbox"/>
MaxNumberOfConcurrentWCFFileTransfers	5
MaxNumberOfConcurrentWCFFileTransfersToASingleTarget	2
Update Display Timeout In Seconds	30

Figure 130: System Tools > AWS > AWM > AWS Configuration for AWM Cluster



#### IMPORTANT

Do NOT make any other configuration changes on this page. Any changes may inhibit communication within the cluster.



4. Click **Update**.



#### Note

It is necessary to restart the system Capture application for the change to take place.

When part of an AWM cluster, the Station name configured on each AWS must match the corresponding Station name configured within the AWM. Refer to [Configure System Institution and Locale](#) on page 116.

### 5.5.7 Configure the Bar Code Interpretation (Optional)

The default setting for the Bar Code scanning feature is to interpret the bar code as a Patient ID. If the customer wishes to interpret the bar code as an Accession Number or Required Process ID, you can change the bar code setting in System Tools to accommodate this request.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **Peripherals > Barcode**. The *Bar Code Config* screen opens (see the following figure).

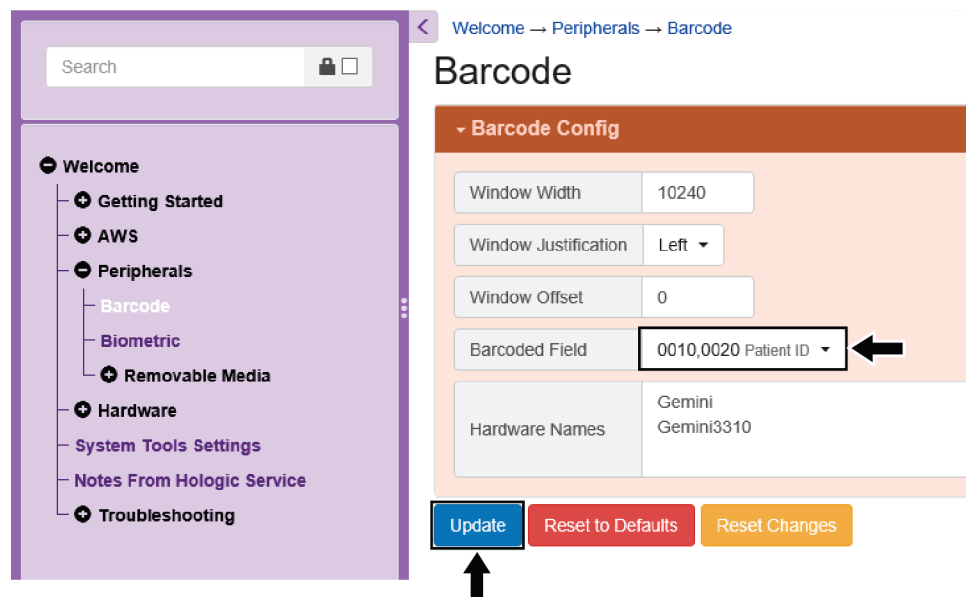


Figure 131: System Tools > Peripherals > Barcode > Barcoded field

3. In the Barcoded Field (see the previous figure), use the dropdown selection and choose the type of information that the bar code represents for the customer:
  - Patient ID (0010,0020)
  - Accession Number (0008,0050)
  - Requested Procedure ID (0040,1001)



4. Click **Update**.
5. Reboot the system.
6. Test the scanner by scanning actual bar codes used by the customer and verify that the system properly identifies the information. If necessary, tweak the settings in the Barcode Config fields in System Tools as required.

### 5.5.8 Configure Export to Removable Media (Optional)

Configuring Removable Media allows you to control the DICOM types and transfer syntax used when exporting images and related data to removable media as DICOM files.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **Peripherals > Removable Media > Removable Media Config**.
3. The *Removable Media Config* screen opens (see the following figure).

The screenshot shows the 'Removable Media Config' screen. On the left is a navigation menu with options: Welcome, Getting Started, AWS, Peripherals (selected), Barcode, Biometric, Removable Media (selected), Removable Media Config (selected), Transfer Syntax Overrides, Removable Media Readme, Dicom Dir, Dicom Dir Config, Dicom Dir Table, Dicom Dir Default Tags, Hardware, System Tools Settings, Notes From Hologic Service, and Troubleshooting. The main area is titled 'Removable Media Config' and contains a 'Settings' section with various configuration options. Below the settings is a table for 'Image Types To Export' with 'Unselected' and 'Selected' columns.

Settings	
Remove Tmp Files	<input checked="" type="checkbox"/>
Read Me File Name	README.TXT
Volume Name	Hologic
Eject After Burn	<input checked="" type="checkbox"/>
Auto Select File System	<input type="checkbox"/>
Debug	<input checked="" type="checkbox"/>
CD File System	3
DVD File System	4
Include Fixed Drive As Export Target	<input checked="" type="checkbox"/>
Include Internal IDE Cdrom	<input checked="" type="checkbox"/>
Internal IDE Cdrom Pattern	\\?ide#cdrom

Image Types To Export	
Unselected	Selected
3D Projections Raw (SCO)	2D (For Processing)
3D Projections (SCO)	2D (For Presentation)
3D Slices (SCO)	Misc Images (SC)
Notices (GSPS)	3D Slices (BTO)
Generated 2D (BTO)	Generated 2D (For Presentation)
3D Slices (Non-Hologic)	I-View LE (For Processing)

View Tag: 0018,1030 Prot Name

Series Name: Conventional For Processing, Conventional For Presentation

Figure 132: System Tools > Peripherals > Removable Media> Removable Media Config

4. Image Types to Export determine which types of image and related data are and are not exported to removable media. DICOM types located in the Selected box are exported to removable media. Refer to *To Change DICOM Type Settings in [Advanced Store Settings \(Optional\)](#)* on page 151 for a summary of the DICOM types.



- a. Locate the Image Types to Export section (see the following figure).

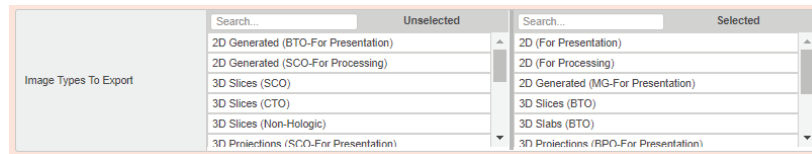


Figure 133: Image Types to Export section in Media Config screen

- b. To move an image type to export, click and drag the image type from the Unselected box to the Selected box or from the Selected box to the Unselected box.

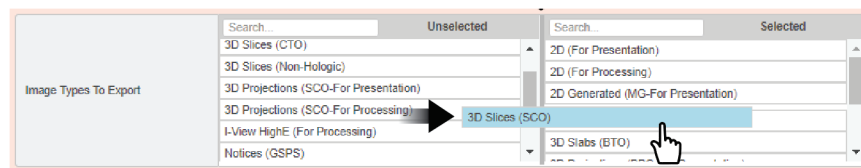


Figure 134: Moving Image Types to Export between Unselected and Selected states

- Image types located in the Selected box are exported to the removable media.
  - Image types located in the Unselected box are *not* exported to the removable media.
5. To change the transfer syntax used to encode the data in exported DICOM files, select the desired transfer syntax from the Default Transfer Syntax dropdown list. Some transfer syntaxes apply standardized compression algorithms to the pixel data in DICOM files.

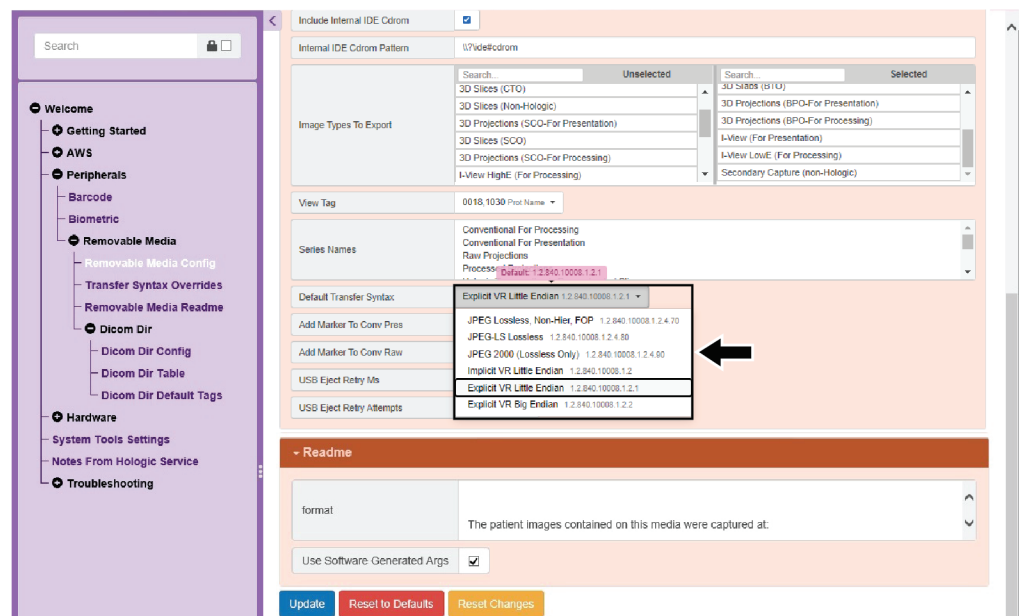


Figure 135: List of transfer syntaxes to encode data in exported DICOM files



- 6. Click **Update**.
- 7. Restart the Capture application for the change to take place.
- 8. Once all the system configurations (optional and non-optional) have been completed, continue the installation process at [DICOM Interface Configurations](#) on page 133.

5.5.9 **Configure Genius AI Detection Reading Priority Indicators (Optional)**

The default setting for the Genius AI Detection reading priority indicators is enabled. If the customer wishes to disable this feature, follow these instructions.

- 1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
- 2. Navigate to **AWS > User Interface > User Interface Behavior**. The *User Interface Behavior* screen opens (see the following figure).

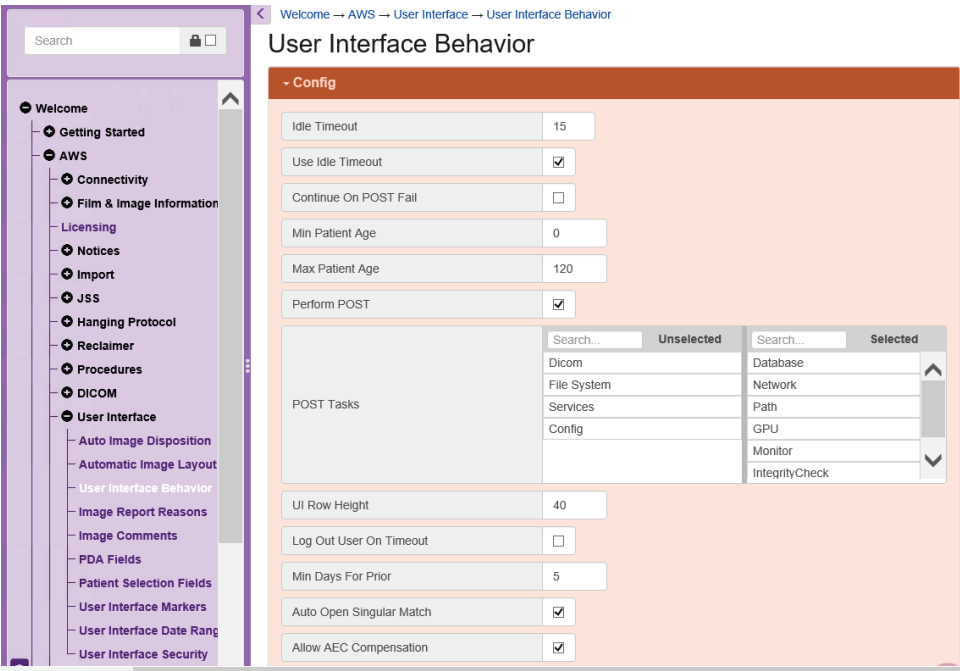


Figure 136: System Tools > AWS > User Interface > User Interface Behavior



3. Scroll to the Display Reading Priority Alerts field at the bottom of the window. Unselect (uncheck) the "Display Reading Priority Alerts" check box.

Display Reading Priority Alerts ☐

Auto Highlight Current User At Login ☒

**- Font**

Family: Microsoft Sans Serif

Size: 14

Style:

Unselected	Selected
Search...	Search...
Italic	Normal
Bold	

Intensity: 100

Update Reset to Defaults Reset Changes

*Figure 137: System Tools > AWS > User Interface > User Interface Behavior > Display Reading Priority Alerts*

4. Click **Update**.

## 5.6 DICOM Interface Configurations

### 5.6.1 Configure System Application Entity (AE) Title

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Connectivity (Global)**.



3. The *Connectivity (Global)* screen opens. In the System AE Title field, enter the **System AE Title** (collected in the Connectivity Site Survey).

Figure 138: AWS > Connectivity > Connectivity (Global) > AE Title field

4. Click **Update**.



**Note**

It is necessary to restart the system Capture application for changes to take place. Complete all connectivity configurations, then restart the Capture application.

**5.6.2 Configure the Store Output Devices**

**Install an Archive Interface (Required Unless all Images are Printed)**

The system is not designed to provide permanent storage for patient images. Installing an interface to a PACS or other DICOM storage devices allows you to archive the images and related objects sent from a Dimensions system.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Install a Device**.



3. The *Install a Device* screen opens. In the Category field, select **ImageStorage** from the dropdown list.

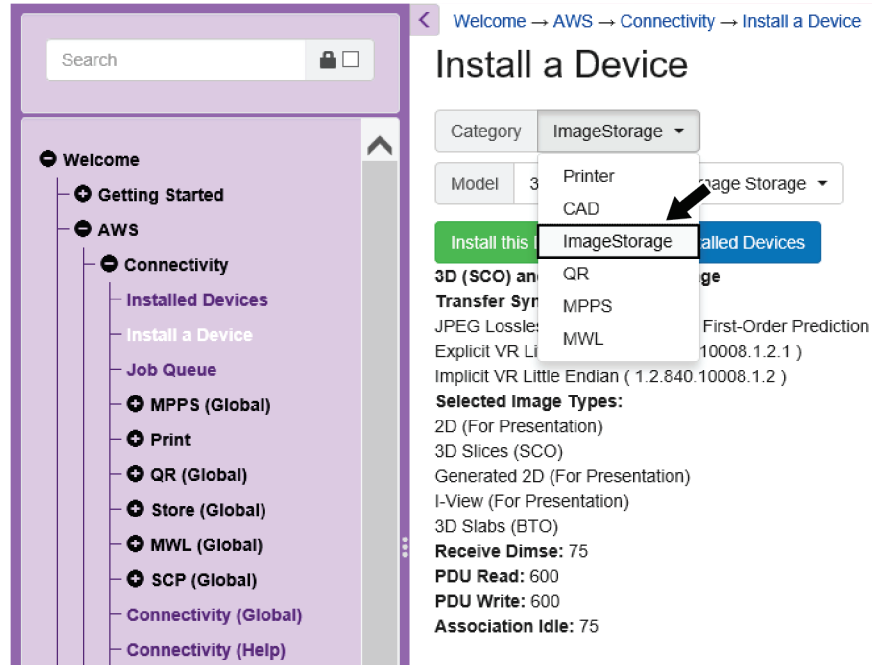


Figure 139: System Tools > AWS > Connectivity > Install a Device > ImageStorage Category field

4. In the dropdown list of the Model field, select the appropriate image storage for the environment of the customer.

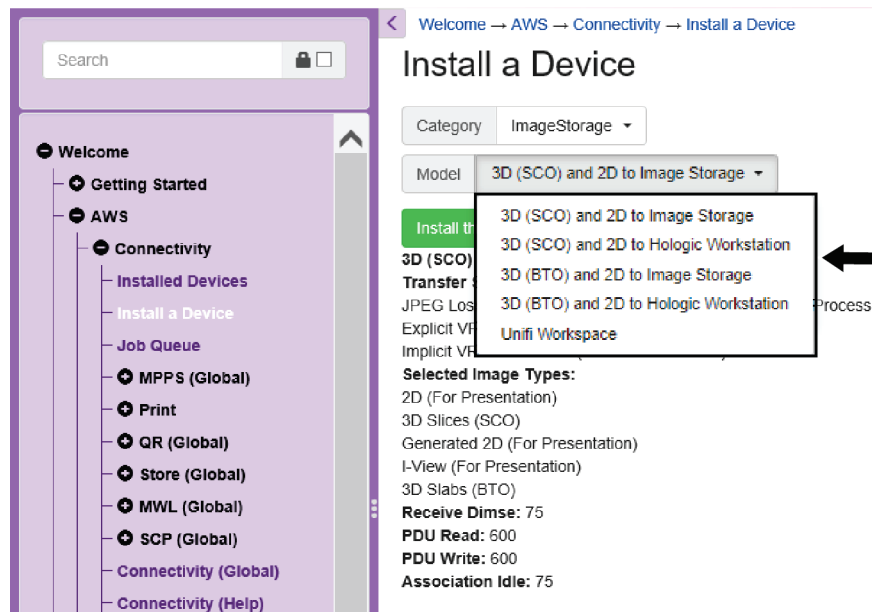


Figure 140: System Tools > AWS > Connectivity > Install a Device > Model field



- *3D (BTO) and 2D to Image Storage* – This choice is the preferred model file. Use this model file for all 2D-only installations and 3D systems where the Sales Order indicates that the Image Storage device of the customer supports DICOM Breast Tomosynthesis Image Objects (BTO).
- *3D (SCO) and 2D to Image Storage* - Use this model file where the Sales Order indicates the request of the customer for the DICOM Secondary Capture Image Object (SCO) to store proprietary 3D Mammography slice data. Use this model file when the environment of the customer does not support DICOM Breast Tomosynthesis Image Objects or when BTO data size is a concern.



**Caution:**  
Be cautious using SCO to archive 3D Mammography images. The 3D SCO Mammography images are NOT stored in an interoperable format. Only Hologic products can display these images. Future charges may apply to convert 3D Mammography SCO tomosynthesis slice data to an interoperable format (BTO).

5. The configurations for Transfer syntax, Selected Image Types, and other settings of the selected model are displayed. Click **Install this device**.
6. The *Installed Devices* screen for a new ImageStorage device opens. Move your mouse pointer over **Basic**, then click **Basic Store**.

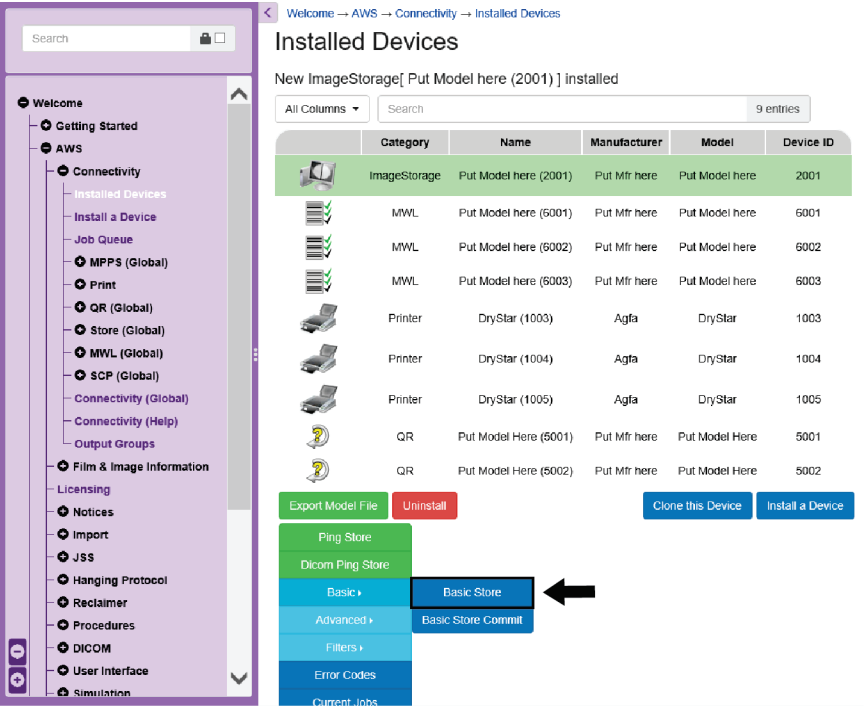


Figure 141: System Tools > AWS > Connectivity > Installed Devices > Basic Options



7. The *ImageStorage Basic Store* screen opens.

ImageStorage[ Put Model here (2001) ]: Basic Store

**- Basic Store**

Name	Put Model here (2001)
Device Identifier	2001
Notes	This model file supports sending Conventional 2D For Presentation Images with Markers and Tomo Processed Diagnostics and SQ Reconstruction
Manufacturer	Put Mfr here
Model	Put Model here
Version	
Suspended	<input type="checkbox"/>

**- Network**

Host	127.0.0.1
Port	104
Called AE Title	CALLED_AE_TITLE
Use System Calling AE Title	<input checked="" type="checkbox"/>
Calling AE Title	DIRECT_DIGXRAY

Back Update Reset to Defaults Reset Changes Set Commit Ad

The calling AE title that will be t

Figure 142: System Tools > AWS > Connectivity > Installed Devices > ImageStorage Basic Store

Enter the following information:

- *Name* - the name used in the Output Group to identify the device
- *Manufacturer* - the manufacturer of the device (such as GE, Philips, Agfa)
- *Model* - the model (such as Centricity, IntelliSpace, Impax)
- *Version* - the version at the time of configuration of this device
- *Host* - the IP address of the device
- *Port* - the TCP listening port on the device
- *Called AE Title* - the AE Title of the device



**Note**

It is critical that the Manufacturer, Model, and Version of PACS or other DICOM storage devices be entered. Verify this information with the PACS admin, vendor, or site IT to ensure the correct information is entered during this process for data fidelity.



8. Do one of the following:
  - If System AE Title is being used, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen. Note that the System AE Title is configured at AWS > Connectivity > Connectivity (Global) screen.
  - If the System AE Title is not being used, enter the Store SCU application AE Title to use with this specific device in the **Calling AE Title** text box.
9. Click **Update**.
10. To confirm that all required data types to be sent to the device are included among the Selected DICOM Types, move your mouse pointer over **Advanced**, then click **Advanced Store**. Refer to [Advanced Store Settings \(Optional\)](#) on page 151 for configuring those settings. Consult with your Connectivity Specialist or Technical Support for any questions.
11. At the *Installed Devices* screen:
  - a. Click **Ping Store**. The system indicates if the network ping was successful or failed. If the ping failed, check the IP address entered for that device.
  - b. Click **Dicom Ping Store**. The system indicates if the DICOM ping (C-ECHO) was successful or failed. If the DICOM ping failed, check the Called AE Title, Calling AE Title and/or Port fields.
12. Repeat these steps for other image storage interfaces as required.

### **Install a Workstation Interface (Optional)**

Workstations may receive images in different ways; directly from the Selenia Dimensions/3Dimensions system, through a PACS, or through an intermediary device (such as a SecurXchange router). Follow these instructions to install the proper type of workstation for your system, if applicable.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Install a Device**.



3. The *Install a Device* screen opens. In the Category field, select **ImageStorage** from the dropdown list.

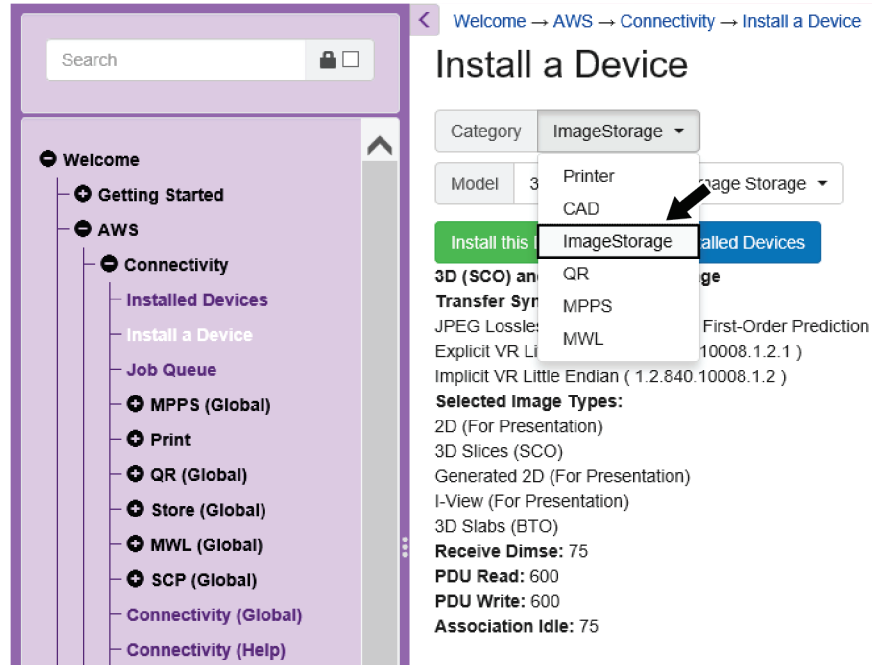


Figure 143: System Tools > AWS > Connectivity > Install a Device > ImageStorage Category field

4. In the dropdown list of the Model field, select the most appropriate workstation interface for the environment of the customer.

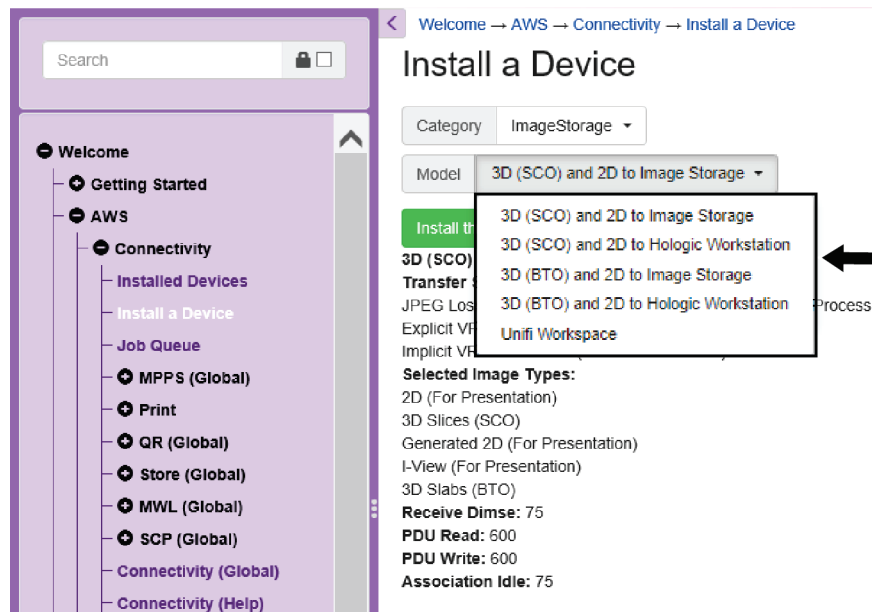


Figure 144: System Tools > AWS > Connectivity > Install a Device > Model Field



#### Hologic Workstations

Hologic Workstation model files include sending both 3D Mammography Slice images (BTO or SCO format) and 3D Mammography projection images in SCO format. For more information on supported Image Types, refer to [Advanced Store Settings \(Optional\)](#) on page 151.



#### Note

CAD and Quantra Image [data] Types are not included in the “Hologic Workstations” settings by default. These data types are included Unifi™ Workspace default settings. Refer to [Advanced Store Settings \(Optional\)](#) on page 151 for instructions on adding or removing Image Types.

---

- *3D (BTO) and 2D to Hologic Workstations* – This option is the preferred model file for Hologic workstations (such as SecurView), including 2D-only systems. The Sales Order indicates if the customer environment supports DICOM Breast Tomosynthesis Image (BTO) for tomosynthesis slice images for 3D Mammography. Note that the type of tomosynthesis slice object (BTO or SCO) sent to the PACS should be the same as what is sent to SecurView.
- *3D (SCO) and 2D to Hologic Workstations* – Use this model file where the Sales Order indicates the request of the customer to store 3D Mammography slice data as Secondary Capture Image Objects (SCO) to storage devices. Also, use this model file when the environment of the customer cannot support the DICOM Breast Tomosynthesis Image Object or BTO data size is a concern.
- *Unifi Workspace* - This option is the preferred model file for Hologic’s Unifi Workspace workstations. It includes 2D images, 3D Slices (BTO), SmartSlices, 3D Projections (SCO), I-View, Quantra, CAD, and Notices Image [data] Types. Licensing controls which objects are actually sent. Note that the type of tomosynthesis slice object (BTO or SCO) sent to the PACS should be the same as what is sent to Unifi Workspace. To make changes, refer to [Advanced Store Settings \(Optional\)](#) on page 151.

#### Non-Hologic Workstations

Typically, PACS workstations access mammography images through the PACS interface. If it is necessary to send image data directly to a Non-Hologic workstation, select one of the following models:



#### Note

CAD, Quantra, 3D Projections (BPO), Notices (GSPS) and other Image [data] Types are not included in the Image Storage settings by default. These data types are included in the Advanced Store Settings. Refer to [Advanced Store Settings \(Optional\)](#) on page 151 for instructions on adding or removing Image Types.

---



- *3D (BTO) and 2D to Image Storage* – This option is the preferred model file for Non-Hologic workstations. Use this file for all 2D-only installations and 3D systems where the Sales Order indicates that the environment of the customer supports DICOM Breast Tomosynthesis Image (BTO) for tomosynthesis slice images.
  - *3D (SCO) and 2D to Image Storage* – This model file should not be used for sending images to Non-Hologic workstations without modification to the Image Types under Advanced Store. Consult Technical Support or Field Connectivity Specialists for additional information.
5. The configurations for Transfer syntax, Selected Image Types, and other settings are displayed for that selected model. Click **Install this device**.
  6. The *Installed Devices* screen for a new ImageStorage device opens. Move your mouse pointer over **Basic**, then click **Basic Store**.

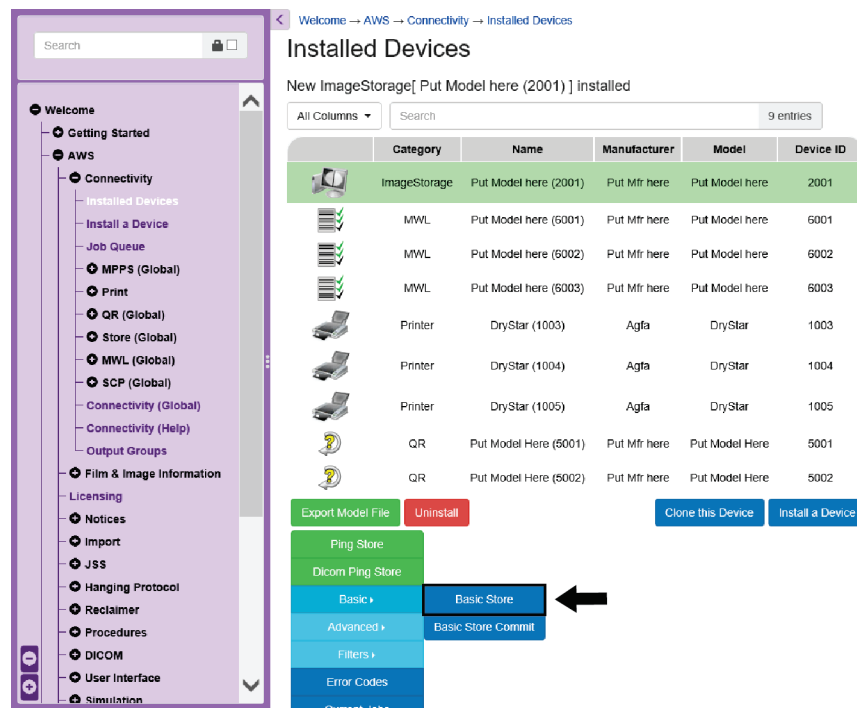


Figure 145: System Tools > AWS > Connectivity > Installed Devices > Basic choices



7. The *ImageStorage Basic Store* screens opens.

Figure 146: System Tools > AWS > Connectivity > Installed Devices > ImageStorage Basic Store

Enter the following information:

- *Name* - the name used in the Output Group to identify the device
- *Manufacturer* - the manufacturer of the device (such as GE, Philips, Agfa)
- *Model* - the model (such as Centricity, IntelliSpace, Impax)
- *Version* - the version at the time of configuration of this device
- *Host* - the IP address of the device
- *Port* - the TCP listening port on the archive device
- *Called AE Title* - the AE Title of the archive device



**Note**

It is critical that the Manufacturer, Model, and Version of PACS or other DICOM storage devices be entered. Verify this information with the PACS admin, vendor, or site IT to ensure the correct information is entered during this process for data fidelity.

8. Do one of the following:

- If System AE Title is being used, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen.
- If the System AE Title is not being used, enter the Store SCU application AE Title to use with this specific device in the **Calling AE Title** text box.

We recommend that you do not enable Storage Commitment for a non-Hologic or Hologic workstation.



9. Click **Update**.
10. To confirm that all required data types to be sent to the device are included among the Selected DICOM Types, move your mouse pointer over **Advanced**, then click **Advanced Store**. Refer to [Advanced Store Settings \(Optional\)](#) on page 151 for configuring those settings. Consult with your Connectivity Specialist or Technical Support for any questions.
11. At the *Installed Devices* screen:
  - a. Click **Ping Store**. The system indicates if the network ping was successful or failed. If the ping failed, check the IP address entered for that device.
  - b. Click **Dicom Ping Store**. The system indicates if the DICOM ping (C-ECHO) was successful or failed. If the DICOM ping failed, check the Called AE Title, Calling AE Title and/or Port fields.
12. Repeat these steps for other direct send interfaces to workstation devices as required.

### Install a CAD Device Interface (Optional)

Follow these instructions if the customer wants images sent to an external CAD device, such as Cenova™ running ImageChecker® CAD [Computer Aided Detection] or Quantra™ breast density assessment software. For 3D systems, refer to [Advanced Store Settings \(Optional\)](#) on page 151 to add 3D Projections Raw (SCO) and/or Generated 2D Raw (SCO) to the Selected DICOM Types for an installed CAD device.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Install a Device**.
3. The *Install a Device* screen opens. In the Category field, select **CAD** from the dropdown list.

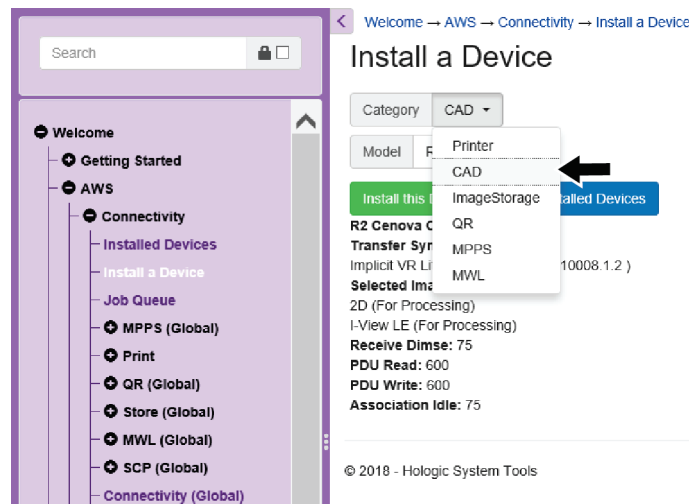


Figure 147: System Tools > AWS > Connectivity > Install a Device > Category field



4. In the Model field, select **R2 Cenova CAD** from the dropdown list.

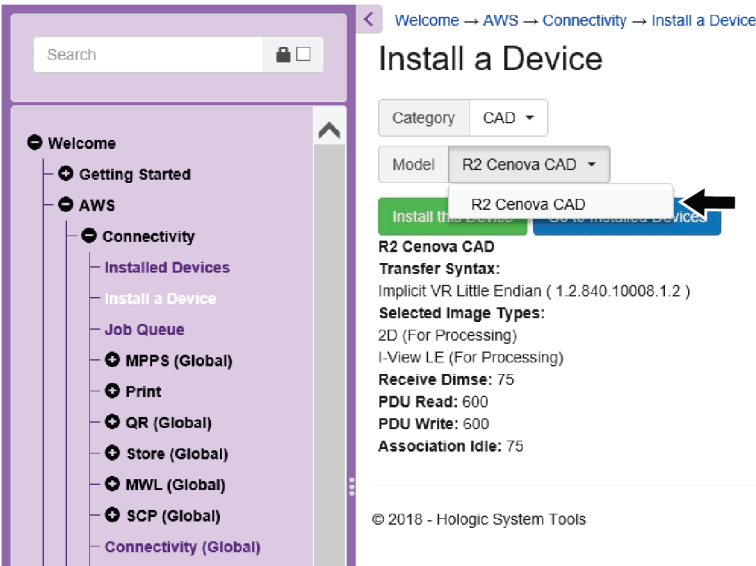


Figure 148: System Tools > AWS > Connectivity > Install a Device > Model field

5. Click **Install this device**.
6. The *Installed Devices* screen for a new CAD device opens. Move your mouse pointer over **Basic**, then click **Basic Store**.

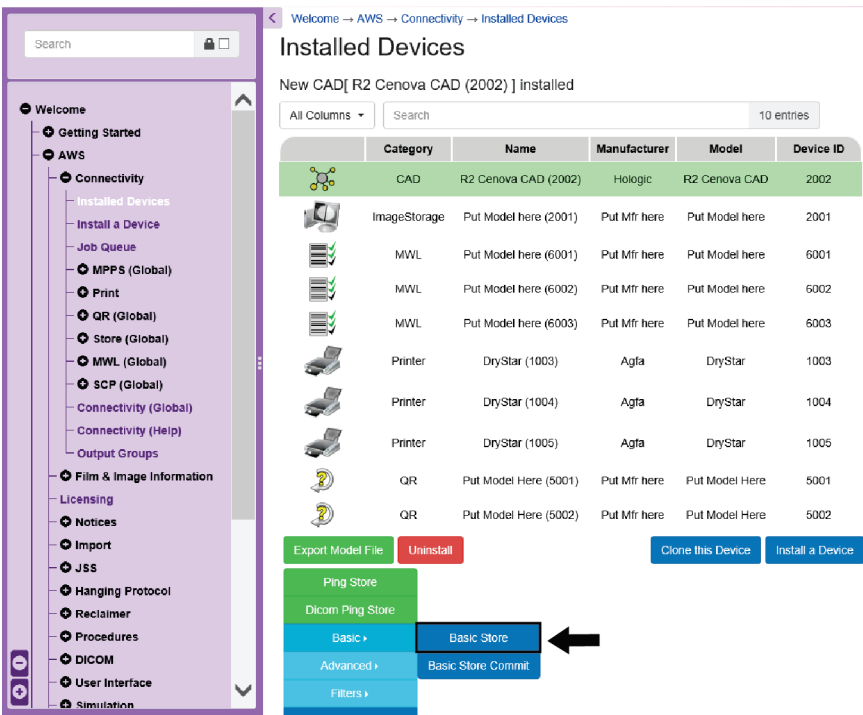


Figure 149: System Tools > AWS > Connectivity > Installed Devices > Basic choices



7. The CAD Basic Store screens opens.

Figure 150: System Tools > AWS > Connectivity > Installed Devices > CAD Basic Store

Enter the following information:

- *Name* - the name used in the Output Group to identify the CAD device
- *Manufacturer* - the manufacturer of the CAD device (such as Hologic, iCAD, Volpara)
- *Model* - the model of the CAD device (such as Cenova)
- *Version* - the version at the time of configuration of the CAD device
- *Host* - the IP address of the CAD device
- *Port* - The TCP listening port on the CAD device
- *Called AE Title* - the AE Title of the CAD device



#### Note

It is critical that the Manufacturer, Model, and Version of non-Hologic CAD devices be entered. For non-Hologic devices, verify this information with the CAD vendor or site IT to ensure the correct information is entered during this process for data fidelity.

8. Do one of the following:

- If System AE Title is being used, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen.
- If the System AE Title is not being used, enter the Store SCU application AE Title to use with this specific device in the **Calling AE Title** text box.



9. Click **Update**.
10. To confirm that all required data types to be sent to the device are included among the Selected DICOM Types, move your mouse pointer over **Advanced**, then click **Advanced Store**. Refer to [Advanced Store Settings \(Optional\)](#) on page 151 for configuring those settings. Consult with your Connectivity Specialist or Technical Support for any questions.
11. At the *Installed Devices* screen:
  - a. Click **Ping Store**. The system indicates if the network ping was successful or failed. If the ping failed, check the IP address entered for that device.
  - b. Click **Dicom Ping Store**. The system indicates if the DICOM ping (C-ECHO) was successful or failed. If the DICOM ping failed, check the Called AE Title, Calling AE Title and/or Port fields.

### **Install a Genius AI Detection, ImageChecker CAD, and/or Quantra Results Interface (Optional)**

The system has the ability to perform Genius AI Detection, ImageChecker CAD, and/or Quantra breast density assessment processing through licensed options. The system can send the results as DICOM Mammography CAD Structured Report (SR), or DICOM Secondary Capture Image (SC) with burned in results. Follow these instructions if the system is licensed for Genius AI Detection, ImageChecker CAD, and/or Quantra; and the customer wants to view the results on an output device, such as a workstation or PACS.



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#### **Note**

Some customers may not have a Genius AI Detection, ImageChecker CAD, and/or Quantra license and want to continue using an external device that produces CAD and/or breast density assessment results from image data. Refer to [Install a CAD Device Interface \(Optional\)](#) on page 143 for instructions on configuring an interface to a CAD device.

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#### **Note**

The Genius AI Detection, ImageChecker CAD, and Quantra breast density assessment features each require a license.

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#### **Note**

Hologic SecurView version 11.0 is the minimum version that supports display of Genius AI Detection results as CAD (SR). If a non-Hologic review workstation is used, check if the workstation is capable of displaying Genius AI Detection results as CAD (SR).

---

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to the **AWS > Licensing**. The *Licensing* screen opens.



3. Scroll to the bottom of the screen and verify that the Genius AI Detection, ImageChecker CAD, and/or Quantra feature state is set to *Licensed* (see the following figure).



Figure 151: System Tools > AWS > Licensing

4. You can configure the Genius AI Detection, ImageChecker CAD, or Quantra results to an output device in two ways:
  - You can install a separate device to send just the Genius AI Detection, ImageChecker CAD, and/or Quantra results. If this is the case, continue with step 5.
  - You can refer to [Advanced Store Settings \(Optional\)](#) on page 151 to select the preferred results DICOM type(s) for an existing installed device. Consult with your Connectivity Specialist or Technical Support for any questions. After configuring the Advance Store Settings, continue installation instructions at [Configure Query/Retrieve \(Optional\)](#) on page 158.
5. Navigate to **AWS > Connectivity > Install a Device**.



6. The *Install a Device* screen opens. In the Category field, select **ImageStorage** from the dropdown list.

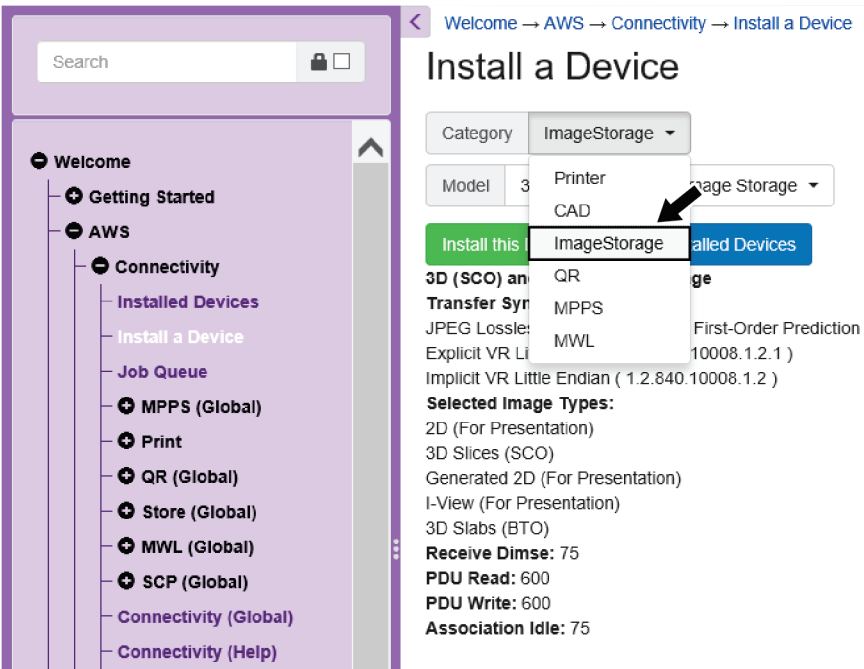


Figure 152: System Tools > AWS > Connectivity > Install a Device > ImageStorage Category field

7. In the Model field, select the appropriate image storage for the environment of the customer from the dropdown list.

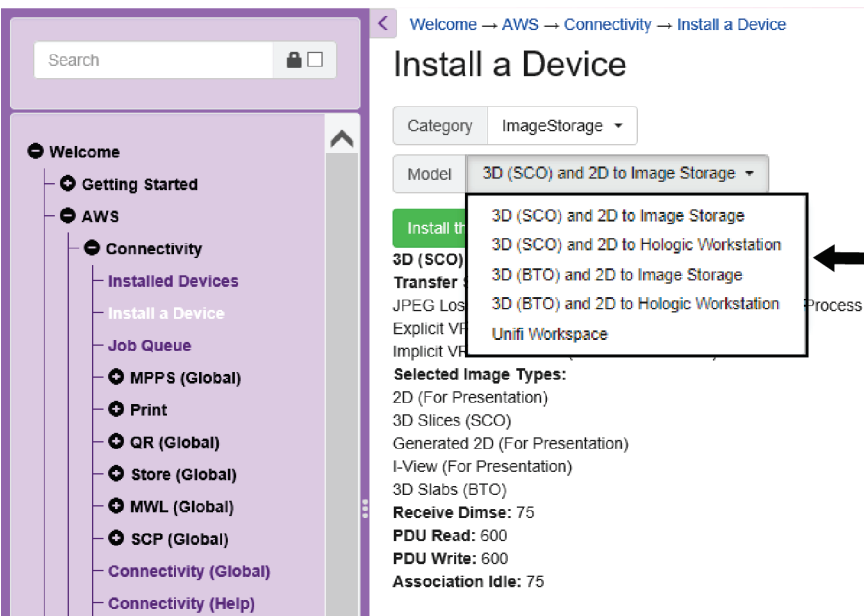


Figure 153: System Tools > AWS > Connectivity > Install a Device > Model field



8. Click **Install this device**.
9. The *Installed Devices* screen for a new ImageStorage device opens. Move your mouse pointer over **Basic**, then click **Basic Store**.

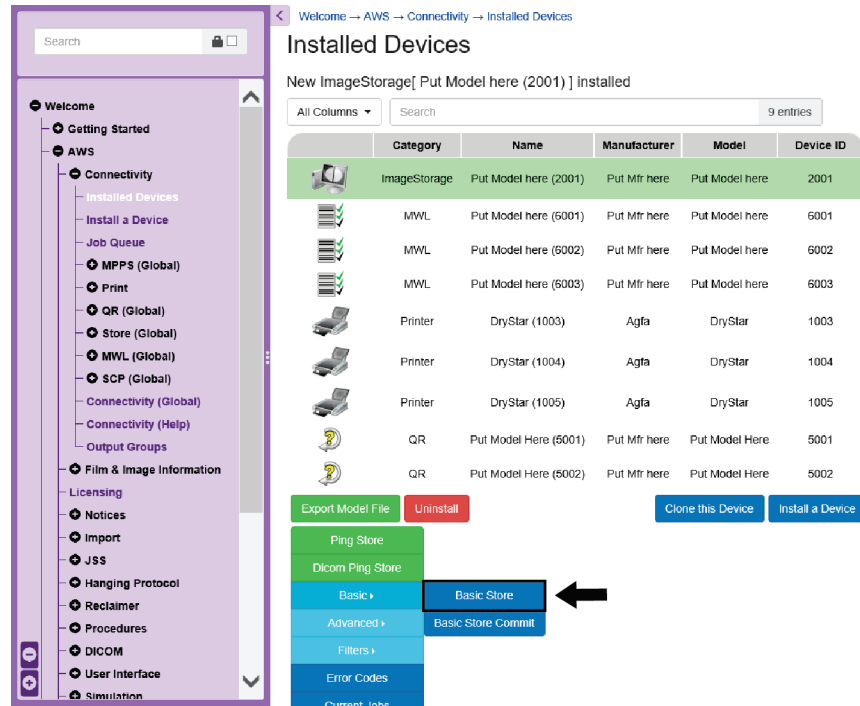


Figure 154: System Tools > AWS > Connectivity > Installed Devices > Basic Options



10. The *ImageStorage Basic Store* screens opens.

Search

ImageStorage[ Put Model here (2001) ]: Basic Store

**- Basic Store**

Name	Put Model here (2001)
Device Identifier	2001
Notes	This model file supports sending Conventional 2D For Presentation Images with Markers and Tomo Processed Diagnostics and SQO Reconstructed
Manufacturer	Put Mfr here
Model	Put Model here
Version	
Suspended	<input type="checkbox"/>

**- Network**

Host	127.0.0.1
Port	104
Called AE Title	CALLED_AE_TITLE
Use System Calling AE Title	<input checked="" type="checkbox"/>
Calling AE Title	DIRECT_DIGXRAY

Back Update Reset to Defaults Reset Changes The calling AE title that will be t

Basic > Advanced > Filters >

Set Commit Ad

Figure 155: System Tools > AWS > Connectivity > Installed Devices > ImageStorage Basic Store

Enter the following information:

- *Name* - the name used in the Output Group to identify the device receiving Genius AI Detection/ImageChecker CAD/Quantra results
- *Manufacturer* - the manufacturer of the device receiving Genius AI Detection/ImageChecker CAD/Quantra results
- *Model* - the model of the device receiving Genius AI Detection/ImageChecker CAD/Quantra results
- *Version* - the version at the time of configuration of the device
- *Host* - the IP address of the device receiving Genius AI Detection/ImageChecker CAD/Quantra results
- *Port* - The TCP listening port on the device receiving Genius AI Detection/ImageChecker CAD/Quantra results
- *Called AE Title* - the AE Title of the device receiving Genius AI Detection/ImageChecker CAD/Quantra results



**Note**

It is critical that the Manufacturer, Model, and Version of PACS or other DICOM storage devices be entered. Verify this information with the PACS admin, vendor, or site IT to ensure the correct information is entered during this process for data fidelity.



11. Do one of the following:
  - If System AE Title is being used, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen.
  - If the System AE Title is not being used, enter the Store SCU application AE Title to use with this specific device in the **Calling AE Title** text box.
12. Click **Update**.
13. To confirm that all required data types to be sent to the device are included among the Selected DICOM Types, move your mouse pointer over **Advanced**, then click **Advanced Store**. Refer to [Advanced Store Settings \(Optional\)](#) on page 151 for configuring those settings. Consult with your Connectivity Specialist or Technical Support for any questions.
14. At the *Installed Devices* screen:
  - a. Click **Ping Store**. The system indicates if the network ping was successful or failed. If the ping failed, check the IP address entered for that device.
  - b. Click **Dicom Ping Store**. The system indicates if the DICOM ping (C-ECHO) was successful or failed. If the DICOM ping failed, check the Called AE Title, Calling AE Title and/or Port fields.

### **Advanced Store Settings (Optional)**

Use these instructions to customize advanced store settings for image storage, workstation, and CAD device interfaces. Advanced store settings include transfer syntaxes, supported image types, and burned in markers.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Installed Devices**.



- 3. The *Installed Devices* screen opens.
  - a. Select a device to be configured (it becomes highlighted) in the list of installed devices.
  - b. Move your mouse pointer over **Advanced**, then click **Advanced Store**.

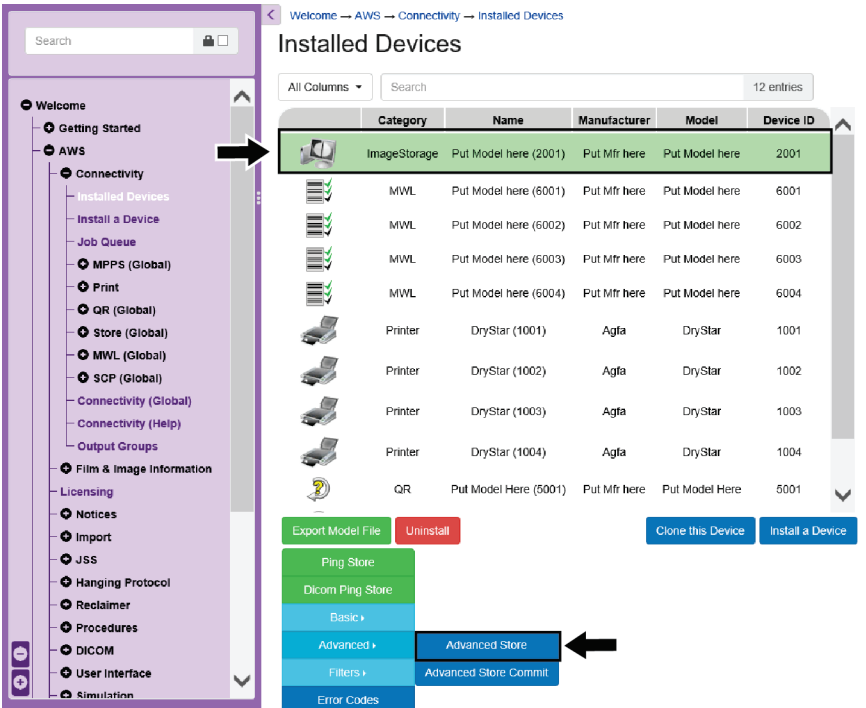


Figure 156: System Tools > AWS > Connectivity > Installed Devices



- The *Advanced Store* screen open. The following figure shows the *ImageStorage Advanced Store* screen for the 3D (BTO) and 2D to Image Storage model.

The screenshot displays the 'Advanced Store' configuration interface. On the left is a sidebar with a search bar and a navigation menu. The main content area is titled 'ImageStorage[ Put Model here (2001) ]: Advanced Store' and contains several sections:

- Network:** Includes input fields for 'Ping Timeout' (15), 'Max PDU Size' (16384), 'AssociationIdleTimeoutSeconds' (75), 'PduReadTimeoutSeconds' (3000), 'PduWriteTimeoutSeconds' (3000), and 'ReceiveDimseTimeoutSeconds' (75).
- Transfer Syntaxes:** A table with two columns: 'Unselected' and 'Selected'. It lists various DICOM transfer syntaxes and their associated SOP classes.
- Config:** Includes a dropdown for 'Output Mode' (set to 'Send Images As Accepted') and another table for selecting specific transfer syntaxes for different purposes.

Figure 157: System Tools > AWS > Connectivity > Installed Devices > Advanced Store

### To Change Transfer Syntax Settings

Transfer syntaxes determine how the data is encoded into bytes when transmitted over a network. Some transfer syntax selections also apply standardized compression algorithms to pixel data before transmission. The transfer syntaxes negotiated with a device are listed in the Transfer Syntaxes (Selected) column. Choices are presented to the connected device from the bottom up. When sending data, the Dimensions system chooses from the top to the bottom of the list among those transfer syntaxes supported by the connected device (indicated through a DICOM association response).



- a. Locate the Transfer Syntaxes section under the Network group section (see the following figure).

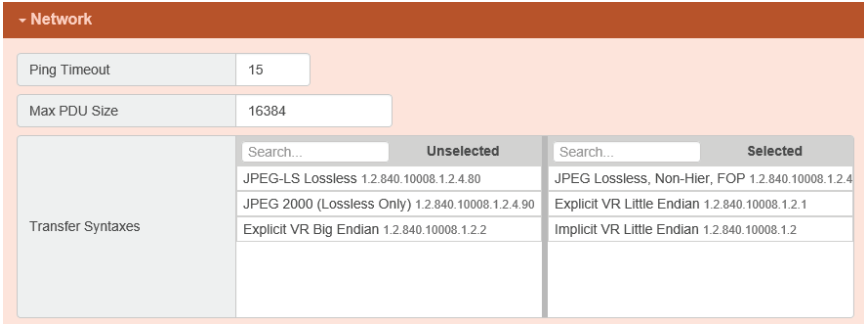


Figure 158: Transfer Syntaxes section in Advanced Store screen

- b. To move a transfer syntax, click and drag the transfer syntax from the Unselected box to the Selected box or from the Selected box to the Unselected box.

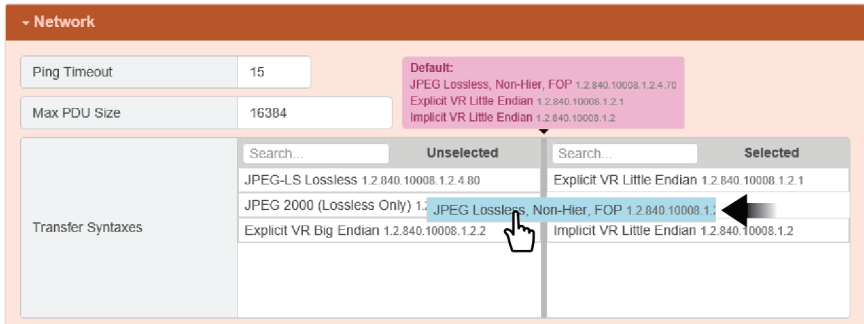


Figure 159: Moving Transfer Syntaxes between Unselected and Selected states

- Transfer syntaxes located in the Selected box are sent to the device.
  - Transfer syntaxes located in the Unselected box are *not* sent to the device.
- c. Click **Update**.

### To Change DICOM Type Settings

Selected Dicom Type settings determine which types of image and related data are sent to a specific device. Use the Unselected and Selected control boxes to configure which DICOM types are sent to the specific device.

- 2D (For Presentation) – use for sending conventional 2D processed images for storage or display as DICOM Digital Mammography X-Ray Image – For Presentation
- 2D (For Processing) – use for sending conventional 2D raw images for external CAD/breast density assessment processing or research as DICOM Digital Mammography X-Ray Image – For Processing



- 2D Generated (BTO-For Presentation) – use for sending synthesized 2D (C-View™, Intelligent 2D™) processed images for storage or display as single-frame DICOM Breast Tomosynthesis Image
- 2D Generated (MG-For Presentation) – use for sending synthesized 2D (C-View, Intelligent 2D) processed images for storage or display as DICOM Digital Mammography X-Ray Image – For Presentation
- 2D Generated (SCO-For Processing) – use for sending raw synthesized 2D images for external CAD processing or research as DICOM Secondary Capture Image with Hologic private pixel data
- 3D Slices (BTO) – use for sending processed 3D reconstructed slices for storage or display as DICOM Breast Tomosynthesis Image (preferred for interoperability)
- 3D Slices (SCO) – use for sending processed 3D reconstructed slices for storage or display as DICOM Secondary Capture Image with Hologic private pixel data
- 3D Slices (CTO) – use for sending processed 3D reconstructed slices for storage or display as DICOM Computed Tomography (CT) Image (rarely used alternate for interoperability)
- 3D Slices (Non Hologic) – use for sending non-Hologic tomosynthesis images that were received or retrieved from an external source as DICOM Breast Tomosynthesis Image
- 3D Slabs (BTO) – use for sending processed 3D reconstructed slabs (SmartSlices generated from licensed 3DQuorum™ processing) for storage or display as DICOM Breast Tomosynthesis Image
- 3D Projections (BPO-For Presentation) – use for sending processed 3D projection images for interoperable storage or display as DICOM Breast Projection X-Ray Image – For Presentation
- 3D Projections (SCO-For Presentation) – use for sending processed 3D projection images for storage or display as DICOM Secondary Capture Image with Hologic private pixel data
- 3D Projections (BPO-For Processing) – use for sending raw 3D projection images for research as DICOM Breast Projection X-Ray Image – For Processing
- 3D Projections (SCO-For Processing) – use for sending raw 3D projection images for external CAD/breast density assessment processing or research as DICOM Secondary Capture Image with Hologic private pixel data
- I-View (For Presentation) – use for sending contrast low energy and subtraction processed images for storage or display as DICOM Digital Mammography X-Ray Image – For Presentation. This is the output to select to send 2D I-View and/or Affirm® Contrast Biopsy images to external devices.
- I-View HighE (For Processing) – use for sending 2D contrast high energy raw images for research as DICOM Digital Mammography X-Ray Image – For Processing



- I-View LowE (For Processing) – use for sending 2D contrast low energy raw images for external CAD/breast density assessment processing or research as DICOM Digital Mammography X-Ray Image – For Processing
  - Notices (GSPS) – use for sending user drawn markings/annotations for storage or display as DICOM Grayscale Softcopy Presentation State
  - Radiation Dose (SR) – use for sending patient radiation dose information per procedure for storage or statistical analysis as DICOM X-Ray Radiation Dose Structured Report
  - Quantra (SC) - use for sending Quantra breast density assessment results as a DICOM Secondary Capture Image
  - Quantra (SR) - use for sending Quantra breast density assessment results as a DICOM Mammography CAD Structured Report
  - CAD (SR) - use for sending ImageChecker CAD or Genius AI Detection results as a DICOM Mammography CAD Structured Report
  - CAD (SC) - use for sending ImageChecker CAD or Genius AI Detection results as burned-in annotations on images in a DICOM Secondary Capture Image
- a. Scroll down and locate the Support DICOM Types section under the Config group section (see the following figure).

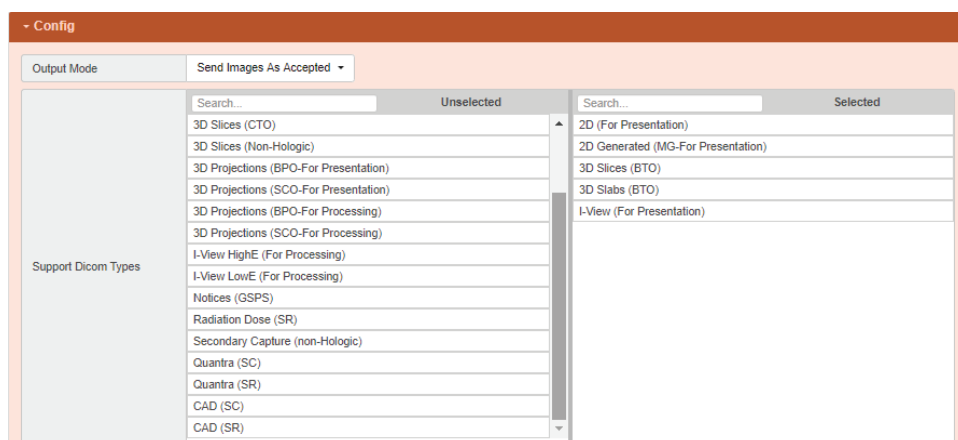


Figure 160: Dicom Type in Advanced Store screen



- b. To move a DICOM type, click and drag the DICOM type from the Unselected box to the Selected box or from the Selected box to the Unselected box. The following figure shows how to add sending Genius AI Detection and/or ImageChecker CAD results to an Image Storage device, using the Selected DICOM Type, CAD (SR), which sends CAD results as a DICOM Mammography Structured Report.

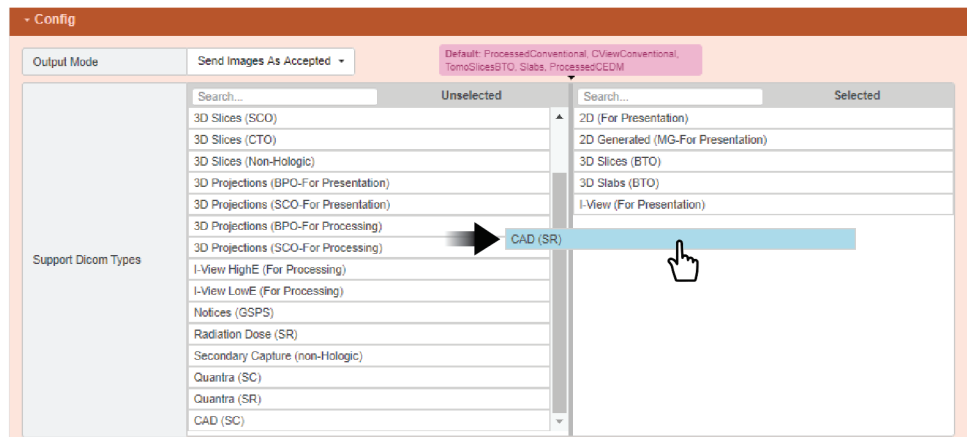


Figure 161: Moving Support Dicom Types between Unselected and Selected states

- DICOM types located in the Selected box are sent to the device.
  - DICOM types located in the Unselected box are *not* sent to the device.
- c. Click **Update**.

### To Add Burned in Markers to 2D images

The IHE Radiology Mammography Image profile states that mammography savvy workstations should not have markers burned into the image. Instead, the profile guides workstation vendors through requirements to create digital markers from DICOM header information. SecurView and 3D View workstations follow the IHE Radiology Mammography Image profile as do other vendors. However, not all PACS workstations are capable of creating digital markers. Follow these settings for customers requesting burned in markers for 2D images.



- a. In the *ImageStorage Advanced Store* screen, scroll down and locate the checkboxes under the Config group section (see the following figure).

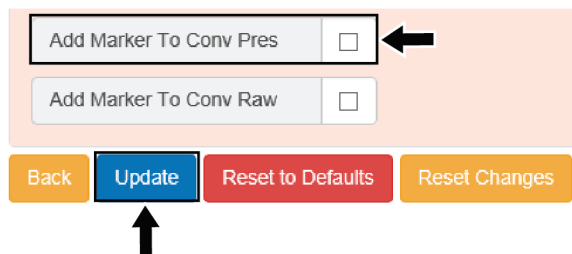


Figure 162: Add Marker checkboxes in Advanced Store screen

- b. To add Markers to 2D conventional images, select the checkbox for Add Marker To Conv Pres.
- c. Click **Update**.
- d. Click **Back** to return to the *Installed Devices* screen.

### 5.6.3 Configure Query/Retrieve (Optional)

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Install a Device**.
3. The *Install a Device* screen opens. In the Category field, select **QR** from the dropdown list.

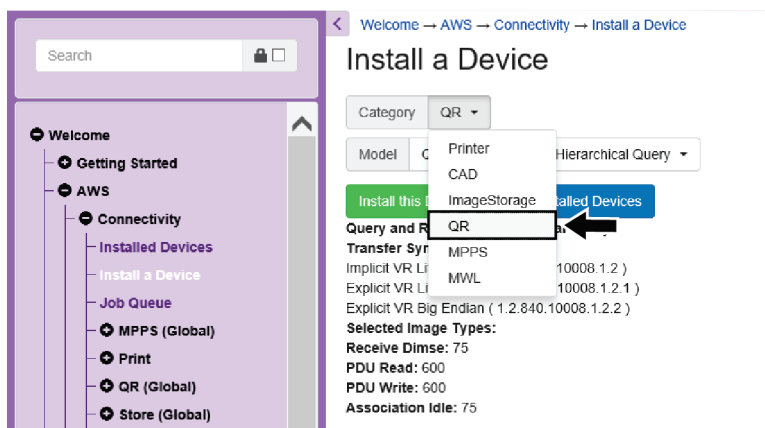


Figure 163: System Tools > AWS > Connectivity > Install a Device > QR Category field



4. In the Model field, select the most appropriate model for the environment of the customer from the dropdown list.

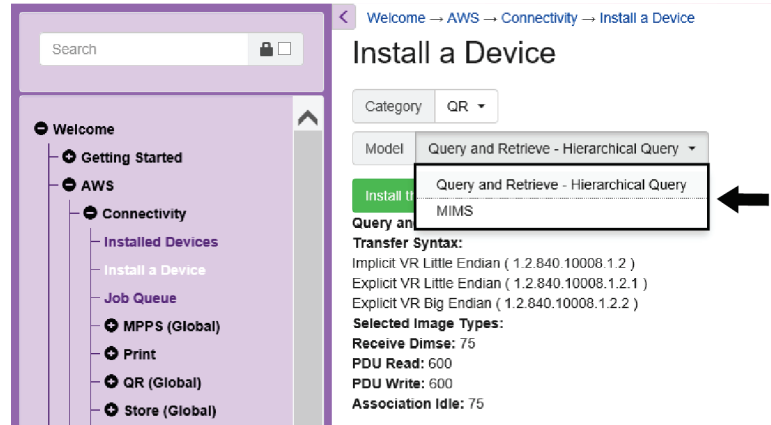


Figure 164: System Tools > AWS > Connectivity > Install a Device > QR Model field

- *MIMS* – This model is based on the relational query model. Use this model if the DICOM conformance statement of the device confirms support for relational queries. SecurXchange and MIMS support relational queries.
  - *Query and Retrieve – Hierarchical Query* – This model is based on the hierarchical query model, which DICOM query providers must support by default. Use this model unless the DICOM conformance statement of the device confirms support for the relational query.
5. Click **Install this Device**.



6. The *Installed Devices* screen for a new QR model opens. Move your mouse pointer over **Basic**, then click **Basic Query**.

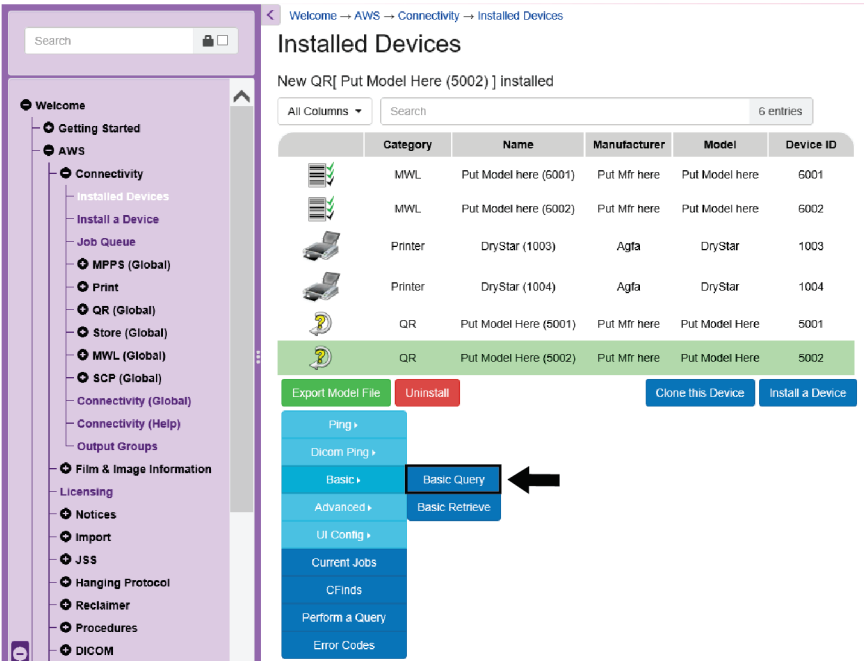


Figure 165: System Tools > AWS > Connectivity > Installed Devices > Basic choices



7. The *QR Basic Query* screen opens.

Welcome → AWS → Connectivity → Installed Devices → Basic Query

### QR[ Put Model Here (5002) ]: Basic Query

Basic Query

Name

Put Model Here (5002)

Device Identifier

5002

Notes

This Q/R model file supports the Hierarchical Query model. All C-FIND SCP's (e.g. the PACS) must be capable of processing a hierarchical

Manufacturer

Put Mfr here

Model

Put Model Here

Suspended

☐

Address

Host

127.0.0.1

Port

104

Called AE Title

CALLED\_AE\_TITLE

Use System Calling AE Title

☒

Calling AE Title

DIRECT\_DIGXRAY

Back

Update

Reset to Defaults

Reset Changes

Basic

Advanced

UI Config

Figure 166: System Tools > AWS > Connectivity > Installed Devices > Basic Query

Enter/change the following information:

- *Name* - the name used to identify this query device
- *Manufacturer* - the manufacturer of the query device (such as GE, Siemens, Philips)
- *Model* - the model and software version (such as Centricity, Syngo, IntelliSpace)
- *Host* - the IP address of the query device
- *Port* - the TCP listening port on the query/retrieve device
- *Called AE Title* - the AE Title of the query/retrieve device



#### Note

It is critical that the Manufacturer, Model, and Version of Query/Retrieve devices be entered. Verify this information with the Query/Retrieve device vendor or site IT to ensure the correct information is entered during this process for data fidelity



8. Do one of the following:
  - If the System Calling AE Title is being used for queries, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen.
  - If a customized Calling AE Title needs to be used for queries, uncheck **Use System Calling AE Title** and enter the appropriate **Calling AE Title**.
9. Click **Update**. Notice the global AE Title in red being used at the bottom.
10. Do one of the following:
  - If the query device is the same as the retrieve device:
    - a. Select **Set Retrieve address to this**. The message “Retrieve address now matches the Query address field on this screen” appears at the top of the screen.
    - b. Click **Back**.
  - If the query device is different from the retrieve device:
    - a. Click **Back**.
    - b. The *Installed Devices* screen opens. Move your mouse pointer over **Basic**, then click **Basic Retrieve**.





- c. The *QR Basic Retrieve* screen opens.

The screenshot shows the 'QR Basic Retrieve' configuration screen. The sidebar on the left lists navigation options: Welcome, Getting Started, AWS, Connectivity (selected), Installed Devices, Install a Device, Job Queue, MPPS (Global), Print, QR (Global), Store (Global), MWL (Global), SCP (Global), Connectivity (Global), Connectivity (Help), Output Groups, Film & Image Information, Licensing, Notices, Import, JSS, and Hanging Protocol. The main content area has a breadcrumb trail: Welcome → AWS → Connectivity → Installed Devices → Basic Query. The title is 'QR[ Put Model Here (5001) ]: Basic Retrieve'. Below this is a 'Basic Retrieve' section with the following fields: Name (Put Model Here (5001)), Address (Host: 127.0.0.1, Port: 104), Called AE Title (CALLED\_AE\_TITLE), Use System Calling AE Title (checked checkbox), and Calling AE Title (DIRECT\_DIGXRAY). At the bottom of the form are buttons: Back, Update, Reset to Defaults, and Reset Changes. A 'Basic' button is also present. A red text label 'The calling' is visible at the bottom right.

Figure 167: System Tools > AWS > Connectivity > Installed Devices > QR Basic Retrieve

Enter the following information:

*Name* - the name used to identify the retrieve device

*Host* - the IP address of the device from which to retrieve (this address may or may not be the same as the IP address of the query device)

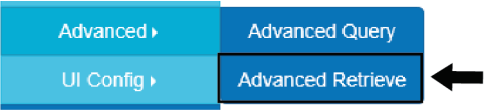
*Port* - the port of the retrieve device (this port may or may not be the same as the query device)

*Called AE Title* - the AE Title of the retrieve device (this title may or may not be the same as the query device)

- d. Do one of the following:
- If the System AE Title is being used, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen.
  - If the System AE Title is not being used, enter the **Retrieve SCU application AE Title** to use with this specific device in the Calling AE Title text box.
- e. Click **Update**.
- f. Click **Back**.



11. At the *Installed Devices* screen, move your mouse pointer over **Advanced**, then click **Advanced Retrieve**.



12. The *QR Advanced Retrieve* screen opens.

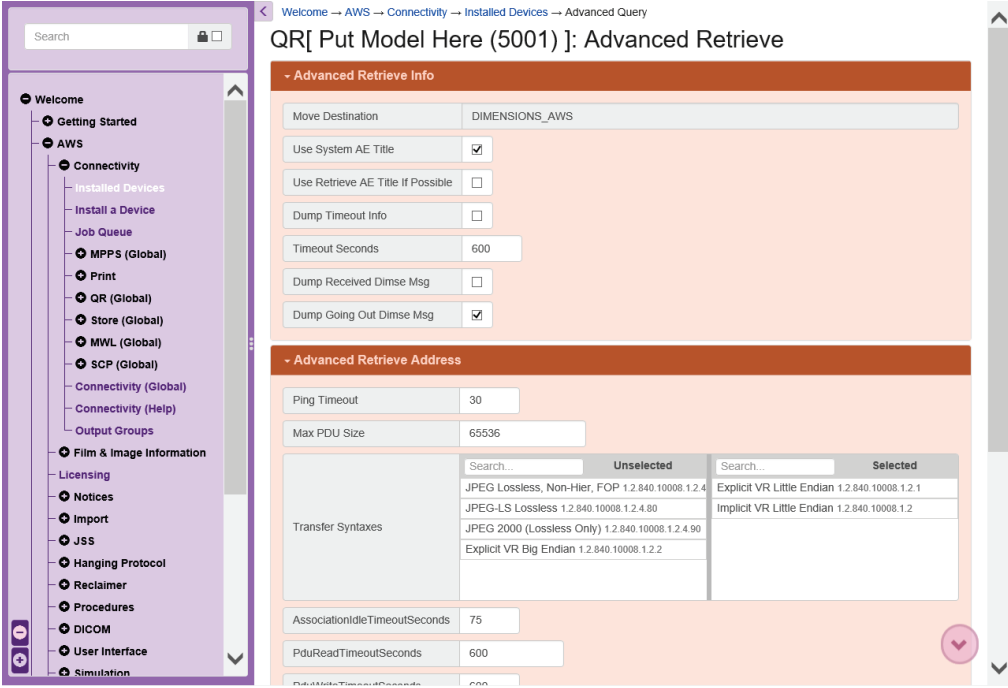


Figure 168: System Tools > AWS > Connectivity > Installed Devices > QR Advanced Retrieve

Note that the default setting for the Move Destination is the Dimensions system making the query. To set the Move Destination for the retrieve request, do one of the following:

- If the System AE Title is to be used as the Move Destination, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen.
- If the Retrieve Service is using a customized Calling AE Title (set under the Basic Retrieve configuration screen), select **Use Retrieve AE Title If Possible** to allow the customized Calling AE Title as the **Move Destination**.
- If a Move Destination is different than the System AE Title and any customized retrieve service Calling AE Title, uncheck **Use System AE Title**, uncheck **Use Retrieve AE Title If Possible**, and enter the retrieve destination AE Title in the **Move Destination** field.

13. Click **Update**.
14. Navigate to **AWS > Connectivity > SCP (Global) > Server**.



15. The SCP Server screen opens.

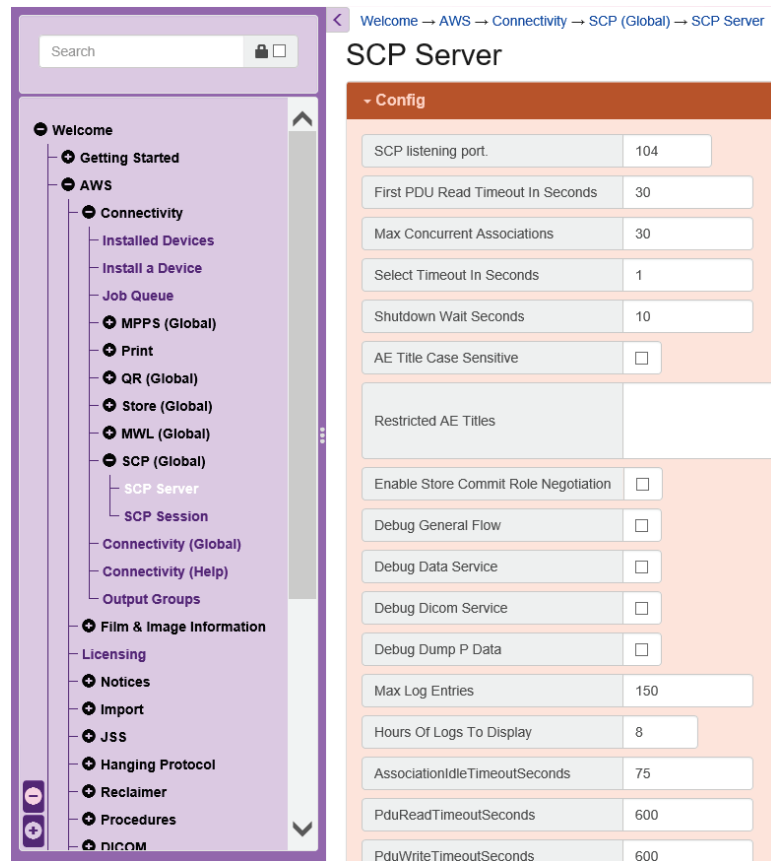


Figure 169: System Tools > AWS > Connectivity > SCP (Global) > SCP Server

Verify/enter the following information:

- SCP Listening Port: should be **104**

16. If changes were made, click **Update**.



### 5.6.4 Configure Modality Worklist (Optional)

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Install a Device**.
3. The *Install a Device* screen opens. In the Category field, select **MWL** (for Modality Worklist).

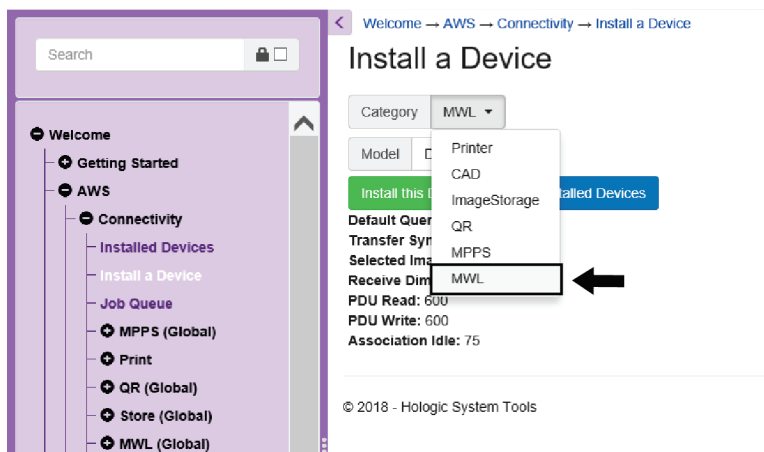


Figure 170: System Tools > AWS > Connectivity > Install a Device > MWL Category field

4. In the Model field, click the down arrow and select the MWL Provider of the customer (such as Sectra). If the specific MWL provider is not listed, select **Default Query**.

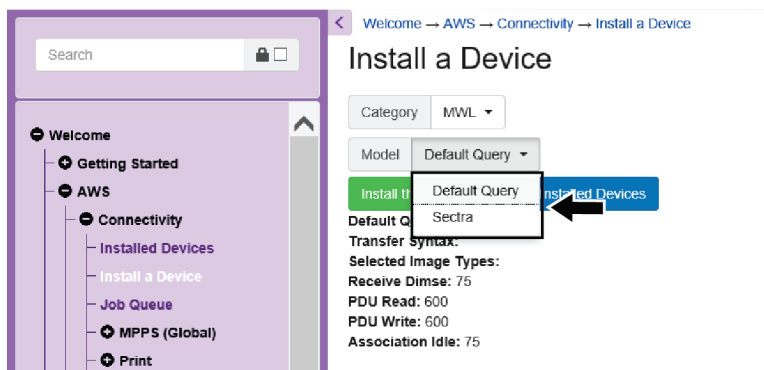


Figure 171: System Tools > AWS > Connectivity > Install a Device > MWL Model field

5. Click **Install this device**.



6. The *Installed Devices* screen for a new MWL model opens. Click **Basic MWL**.

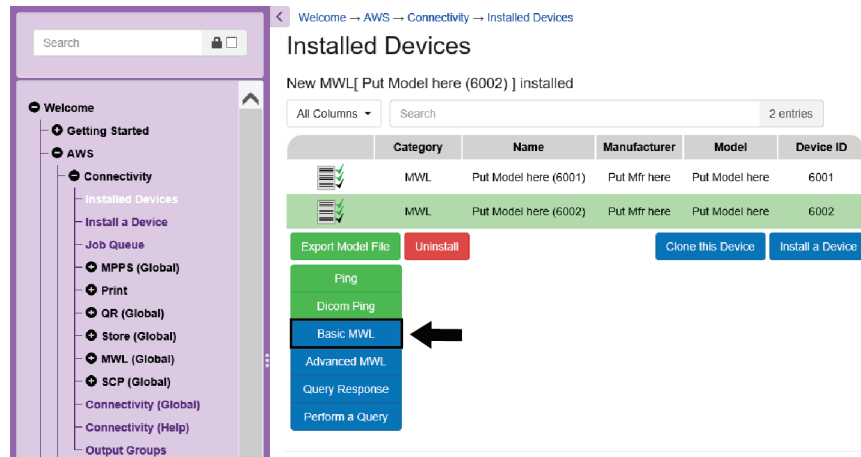


Figure 172: System Tools > AWS > Connectivity > Installed Devices

7. The *MWL Basic MWL* screen opens.

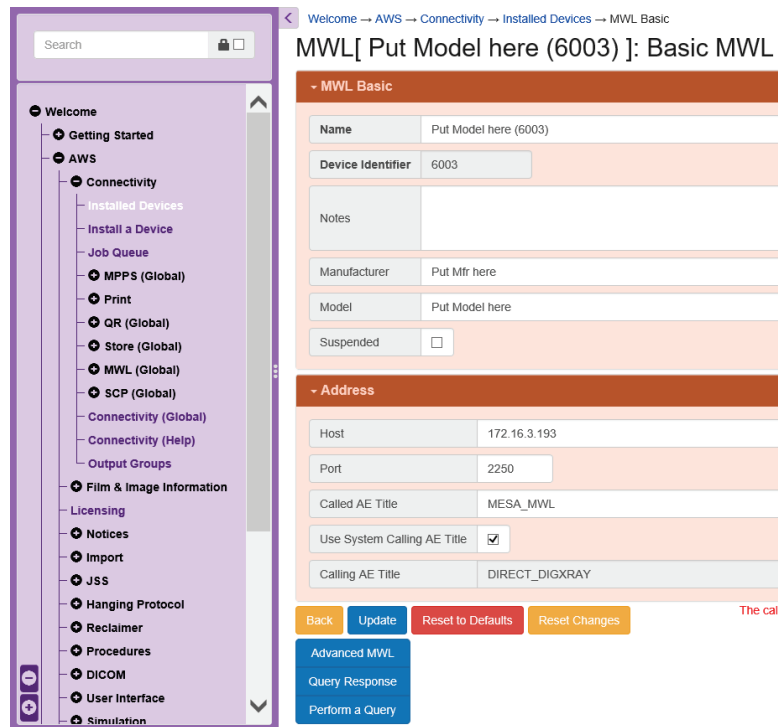


Figure 173: System Tools > AWS > Connectivity > Installed Devices > MWL Basic



Enter the following information in these fields:

- *Name* - the human readable name assigned to the worklist (such as Agfa)
- *Manufacturer* - the name of MWL provider vendor
- *Model* - the model name of the MWL provider application (such as Impax)
- *Host* - the IP Address of the MWL (Modality Worklist) provider
- *Port* - the TCP listening port on the MWL provider
- *Called AE Title* - the AE (Application Entity) Title used by the MWL provider



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**Note**

It is critical that the Manufacturer, Model, and Version of Modality Worklist provider devices be entered. Verify this information with the Modality Worklist provider device vendor or site IT to ensure the correct information is entered during this process for data fidelity

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8. Make the appropriate choice for the service of the worklist AE Title. The actively configured worklist AE Title appears at the bottom of the screen.
  - *Checked* - the modality worklist service uses the AE Title of the Selenia Dimension/3Dimensions system.
  - *Unchecked* - the modality worklist service uses the customized AE title entered into the Calling AE Title field.
9. Click **Update**. Verify any calling AE Title changes at the bottom of the screen.
10. Click **Back**.
11. The *Installed Devices* screen opens. Click **Advanced MWL**.





12. The *MWL Advanced MWL* screen opens.

Welcome → AWS → Connectivity → Installed Devices → MWL Advanced

### MWL[ Put Model here (6003) ]: Advanced MWL

#### MWL Advanced

Query Timeout: 30

Max Results: 500

Study Code: 0032,1064,0008,0100 Req Proc Code Seq, Code Val

Enable Polling: ☐

Search...	Unselected	Search...	Selected
	If ScheduledProcedure_AccessionNumber is longer t		Assign MG to ScheduledProcedure_Modality.
	If View_StationName is longer than 16 characters, or		
	If PerformedProcedure_PerformedProcedureStepSta		
	Assign 0008,1111,0008,1155 to PerformedProcedure		
	If View_PerformedStationAETitle is null or empty, as		
	If View_PerformedStationName is null or is empty, as		

#### Network

Ping Timeout: 3

Max PDU Size: 16384

AssociationIdleTimeoutSeconds: 75

PduReadTimeoutSeconds: 600

PduWriteTimeoutSeconds: 600

ReceiveDimseTimeoutSeconds: 75

Back Update Reset to Defaults Reset Changes

Figure 174: System Tools > AWS > Connectivity > Installed Devices > MWL Advanced

Check that the Study Code field matches the field used by the MWL Provider for RIS codes. Refer to the PACS Administrator for MWL SCP configuration information if needed.

- If uncertain, set to the IHE Radiology Technical Framework choice. Click the down arrow and change the default value of *Req Proc Code Seq, Code Val* to **SPS Seq, Sched Prot Code Seq, Code Val**.
- If interfacing to older McKesson worklist providers (which do not provide RIS codes), click the down arrow and change the default value of *Req Proc Code Seq, Code Val* to **SPS Seq, SPS Desc**.

13. Click **Update**.

14. Click **Back**.

15. The *Installed Devices* screen opens.

- Click **Ping** to test. (An indication is presented if the test was successful or failed.)
- Click **DICOM Ping** to test. (An indication is presented if the C-ECHO test was successful or failed.)
- Click **Perform a Query**.

16. The *DICOM MWL* screen opens. Click **Query Response**.



17. The *MWL Query Response* screen opens. Use the right scrollbar to scroll the entire query.

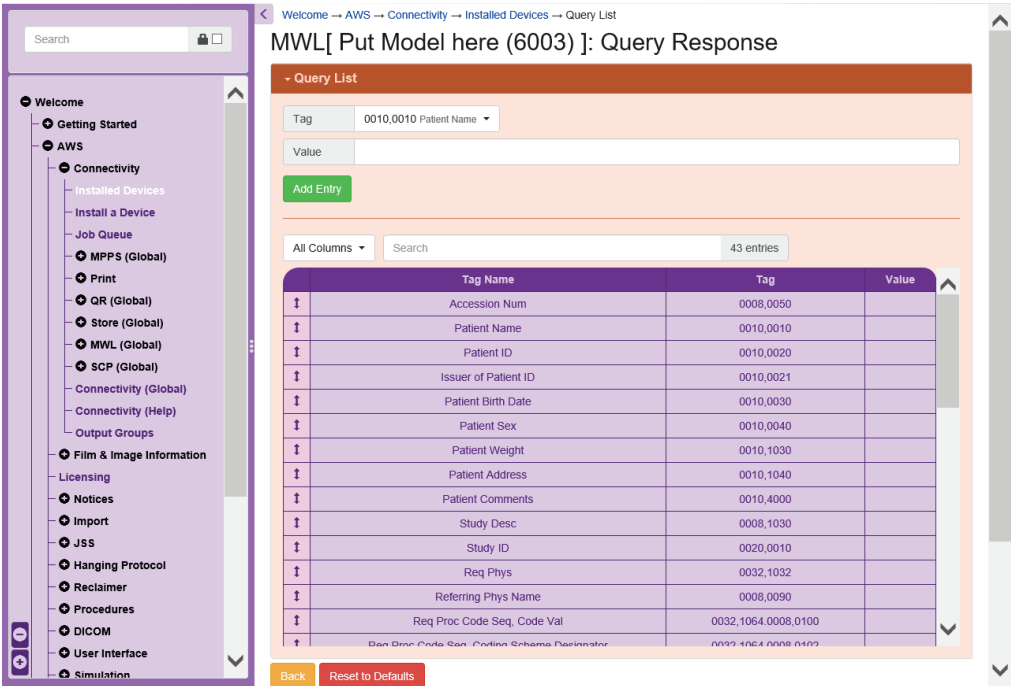


Figure 175: System Tools > AWS > Connectivity > Installed Devices > MWL Query Response

In the Results window, the C-FIND-RQ sent to the MWL provider is displayed. If the MWL Provider returned any scheduled patients, the C-FIND-RSPs are also displayed in the Results window. Use this information to confirm the tag selected for the Study Code field.

18. Repeat these steps if another modality worklist source is required by the customer. A maximum of two MWL providers may be configured.
19. Reboot the system.



### 5.6.5 Configure Printers (Optional)

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to **AWS > Connectivity > Install a Device**.
3. The *Install a Device* screen opens. In the Category field, select **Printer** from the dropdown list.

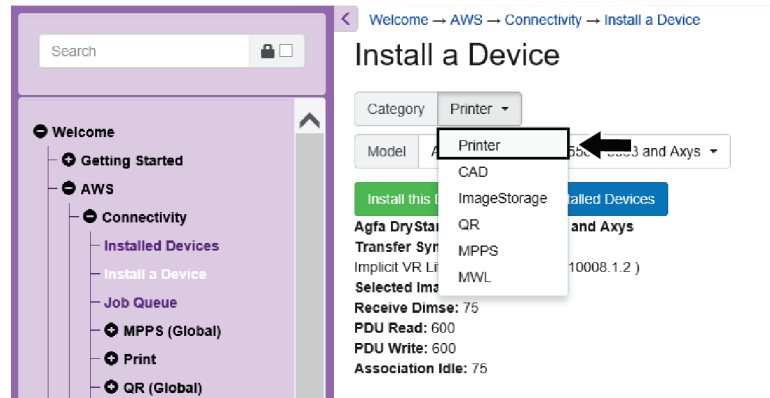


Figure 176: System Tools > AWS > Connectivity > Install a Device > Printer Category field

4. In the Model field, select the printer model from the dropdown list for the environment of the customer. Contact Technical Support if the model is not listed.

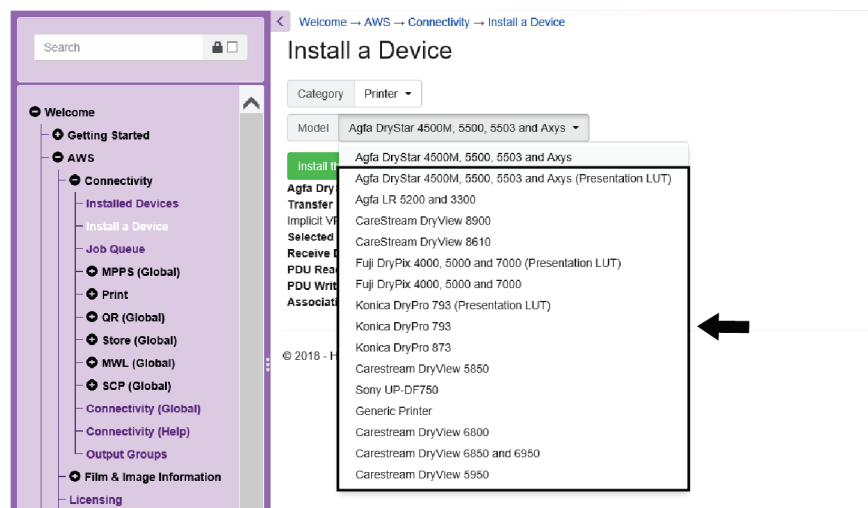


Figure 177: System Tools > AWS > Connectivity > Install a Device > Printer Model field

5. Click **Install this device**.



6. The *Installed Devices* screen for a new printer opens. Click **Basic Printer**.

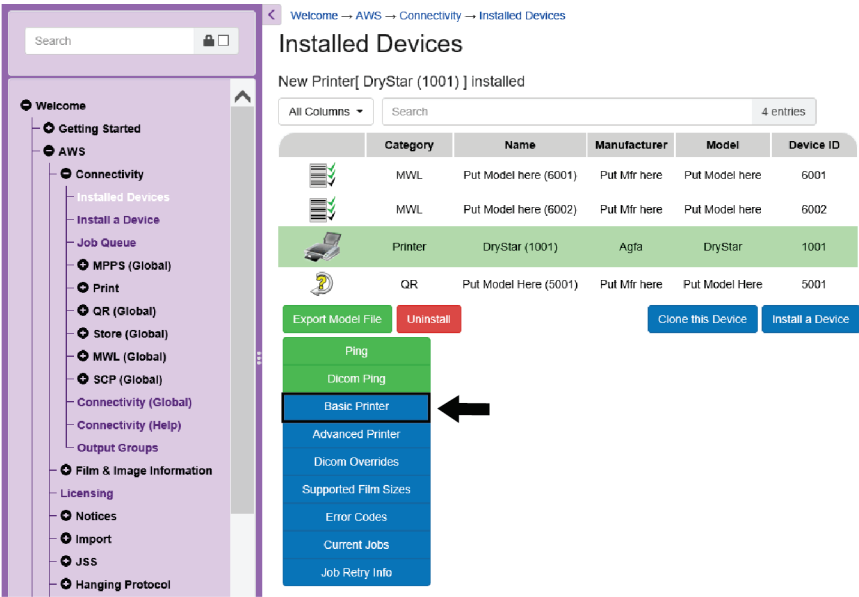


Figure 178: System Tools > AWS > Connectivity > Installed Devices > Basic Printer field

7. The *Printer Basic Printer* screen opens.

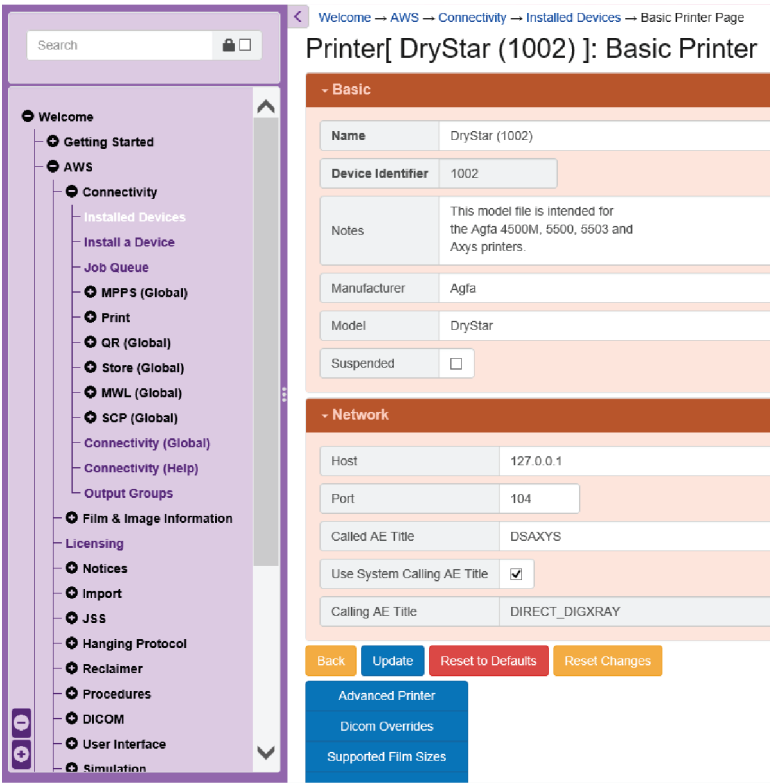


Figure 179: System Tools > AWS > Connectivity > Installed Devices > Basic Printer



Enter/change the following information:

- *Name* - the name used in the Output Group to identify the printer
- *Manufacturer* - the manufacturer of the device (such as Agfa, Carestream)
- *Model* - the model (such as DryStar 4500M, DryView 6800)
- *Version* - the version at the time of configuration of this device
- *Host* - the IP address of the printer
- *Port* - the TCP listening port on the printer
- *Called AE Title* - the AE Title of the printer



### Note

It is critical that the Manufacturer, Model, and Version of Printer devices be entered. Verify this information with the Printer device vendor or site IT to ensure the correct information is entered during this process for data fidelity

- Do one of the following:
  - If System AE Title is being used, select the **Use System Calling AE Title** checkbox. The system AE Title displays on the bottom of the screen.
  - If the System AE Title is not being used, enter the **Store SCU application AE Title** to use with this specific device in the Calling AE Title text box.
- Click **Update**.
- Click **Back**.
- In the *Installed Devices* screen, click **Supported Film Sizes**.

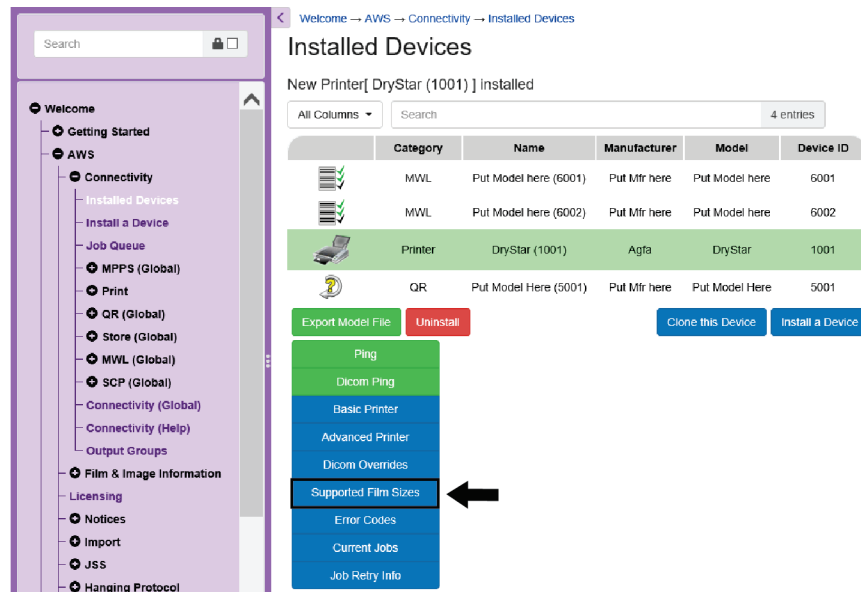


Figure 180: System Tools > AWS > Connectivity > Install a Device > New Printer Installed > Supported Film Sizes Field



12. The *Printer Supported Film Sizes* screen opens.

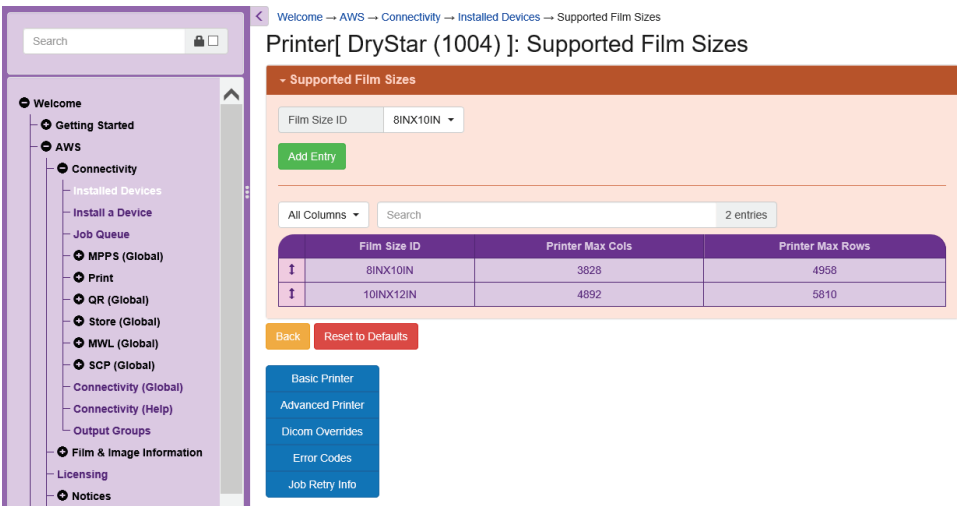
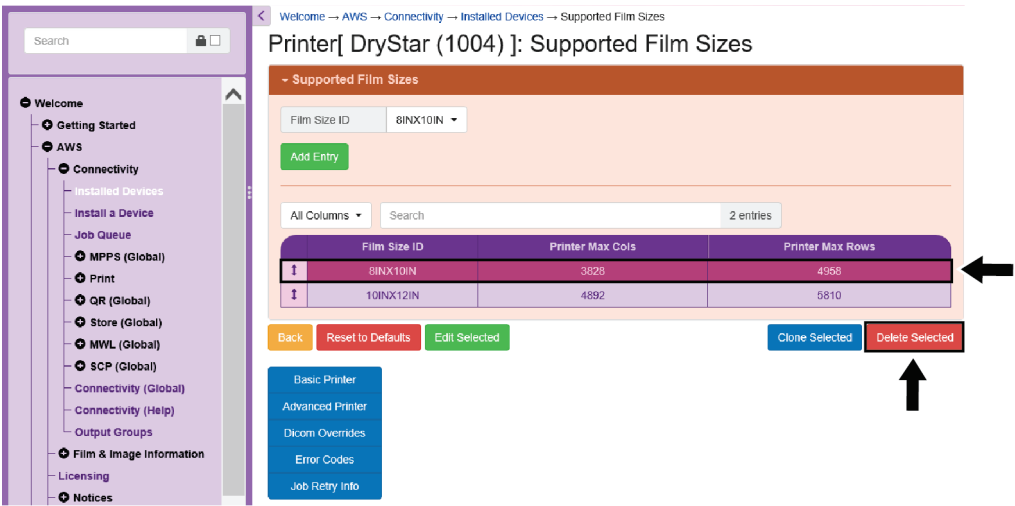


Figure 181: System Tools > AWS > Connectivity > Install a Device > Printer > Supported Film Sizes

On this screen, you can:

- *Add Entry* (add film sizes not listed) - Contact Technical or Connectivity Support for assistance on correct settings and syntax.
- *Remove film sizes not stocked by the site* - Select the row of the film size you want to delete (it becomes highlighted in dark pink). Click **Delete Selected**. (See the following figure.)



System Tools > AWS > Connectivity > Install a Device > Printer > Supported Film Sizes to Delete

13. Click **Back**.



14. In the *Installed Devices* screen, do the following tests:

- Click **Ping**. The system indicates if the network ping was successful or failed. If the ping failed, check the IP address entered for that device.
- Click **Dicom Ping**. The system indicates if the DICOM ping (C-ECHO) was successful or failed. If the DICOM ping failed, check the Called AE Title, Calling AE Title and/or Port fields.

15. Repeat these steps for other printers as needed.

### 5.6.6 Configure Radiation Dose (SR) Reporting (Optional)

You can configure the system to send the DICOM Radiation Dose (SR) to DICOM Store SCP devices that support receiving DICOM X-Ray Radiation Dose Structured Report.



#### Note

The Radiation Dose (SR) Reporting feature requires an Advanced Connectivity license.

1. Launch System Tools (refer to [System \(Service\) Tools](#) on page 113).
2. Navigate to the **AWS > Licensing**. The *Licensing* screen opens.
3. Verify that the Advanced Connectivity feature state is set to *Licensed* (see the following figure).

Feature	State	Item Name	Item Val	Remove
AdvancedConnectivity	Licensed	Exp Date	N/A	
Biopsy	Not Licensed	Exp Date	N/A	
IViewCE2D	Not Licensed	Exp Date	N/A	
SmartCurve	Not Licensed	Exp Date	N/A	
CView1	Not Licensed	Exp Date	N/A	
CViewNatural	Not Licensed	Exp Date	N/A	
Intelligent2D	Not Licensed	Exp Date	N/A	
Intelligent2DMap	Not Licensed	Exp Date	N/A	
Diagnostic	Not Licensed	Exp Date	N/A	
ThreeDimensions	Not Licensed	Exp Date	N/A	
ClarityHD	Not Licensed	Exp Date	N/A	
LateralArm	Not Licensed	Exp Date	N/A	
Master	Not Licensed	Exp Date	N/A	
Notices	Not Licensed	Exp Date	N/A	
System	Not Licensed	Exp Date	N/A	
Tram	Not Licensed	Exp Date	N/A	

Figure 182: System Tools > AWS > Licensing



4. You can set up the Radiation Dose (SR) Reporting feature in System Tools in two ways:
  - You can create a new ImageStorage device and configure it just for this purpose (such as for a patient radiation dose tracking application). Continue with step 5.
  - You can modify an existing ImageStorage device if that device is also receiving other DICOM Types from Dimensions (such as PACS). If this is the case, follow these substeps:
    - a. Navigate to **System Tools > AWS > Connectivity > Installed Devices**.
    - b. Select the device you want to modify (it becomes highlighted).
    - c. Move your mouse pointer over **Advanced**, then click **Advanced Store**.
    - d. Continue with step 15 in this procedure to add the Radiation Dose (SR) DICOM Type to the Selected list.
5. Navigate to **System Tools > AWS > Connectivity > Install a Device**.
6. The *Install a Device* screen opens. In the Category field, select **ImageStorage** from the dropdown list.

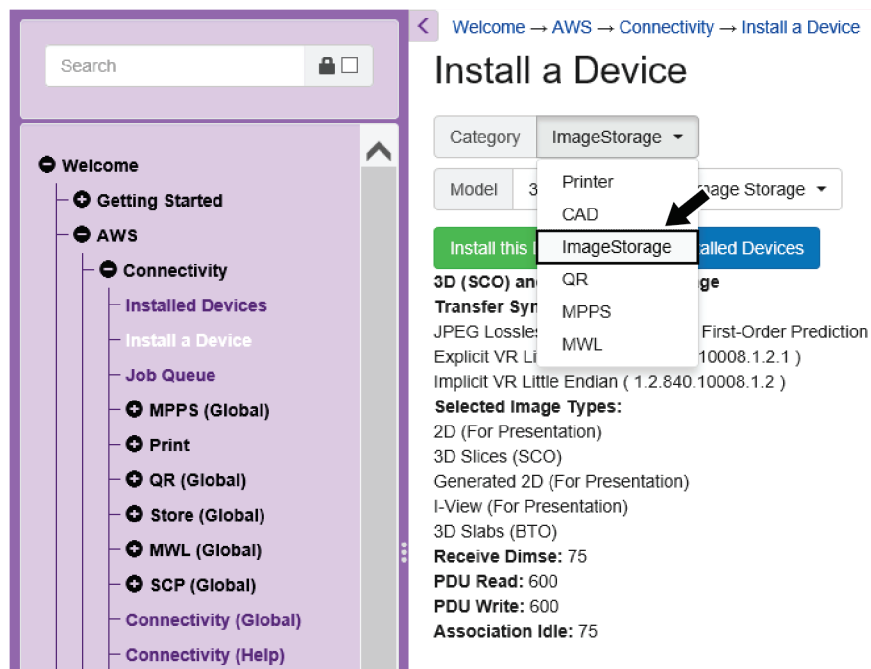


Figure 183: System Tools > AWS > Connectivity > Install a Device > ImageStorage Category field



7. In the dropdown list of the Model field, select the appropriate image storage for the environment of the customer. Refer to [Install an Archive Interface \(Required Unless all Images are Printed\)](#) on page 134 for explanations of the various choices.

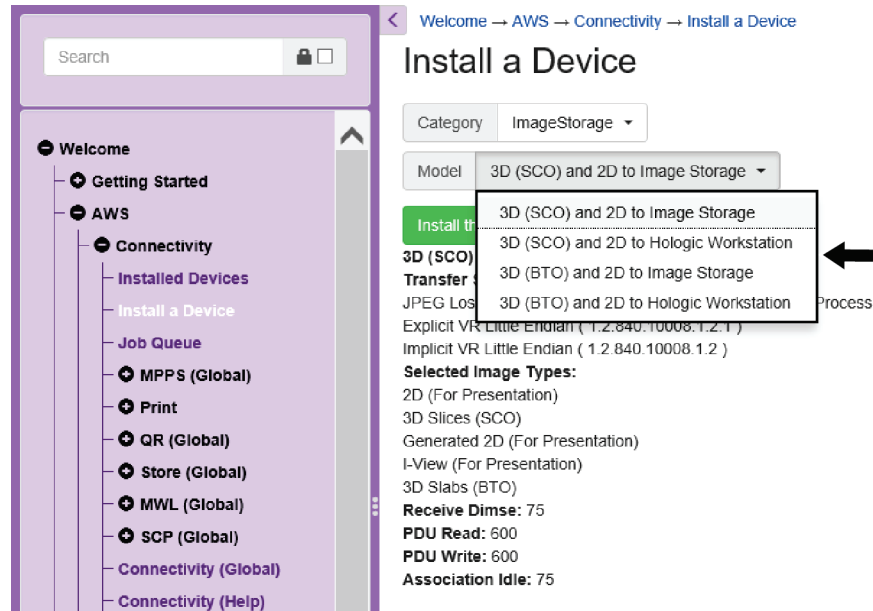


Figure 184: System Tools > AWS > Connectivity > Install a Device > Model field

8. Click **Install this Device**.



9. The *Installed Devices* screen for a new ImageStorage device opens. Select the device you just created (it becomes highlighted).

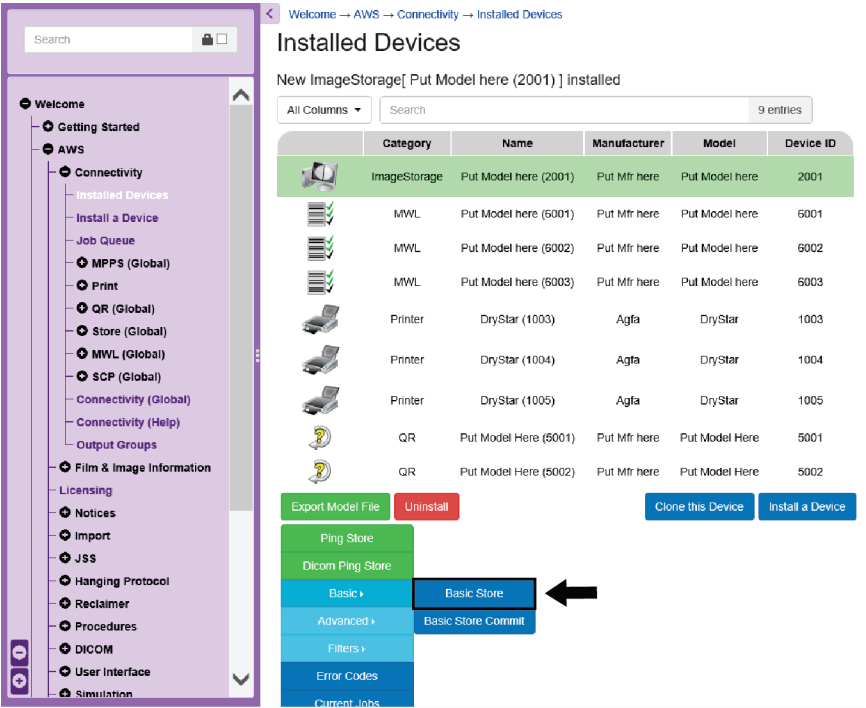


Figure 185: System Tools > AWS > Connectivity > Installed Devices > Basic Options

10. Move your mouse pointer over **Basic**, then click **Basic Store**.



11. The *ImageStorage Basic Store* screens opens.

Figure 186: System Tools > AWS > Connectivity > Installed Devices > ImageStorage Basic Store

12. Enter/verify the following information:

- *Name* - the name should identify the device as a patient radiation dose tracking application (such as the model name)
- *Manufacturer* - the manufacturer of the device (such as GE, Philips, Sectra)
- *Model* - the model (such as DoseWatch, DoseWise, DoseTrack)
- *Version* - the version at the time of configuration of this device
- *Host* - the IP address of the device
- *Port* - the TCP listening port on the device
- *Called AE Title* - the AE Title of the device (should reference Dose SR)



#### Note

It is critical that the Manufacturer, Model, and Version of Radiation Dose storage devices be entered. Verify this information with the Radiation Dose storage device vendor or site IT to ensure the correct information is entered during this process for data fidelity.

13. Click **Update**.

14. Move your mouse pointer over **Advanced**, then click **Advanced Store**.



15. The *Advanced Store* screens opens.

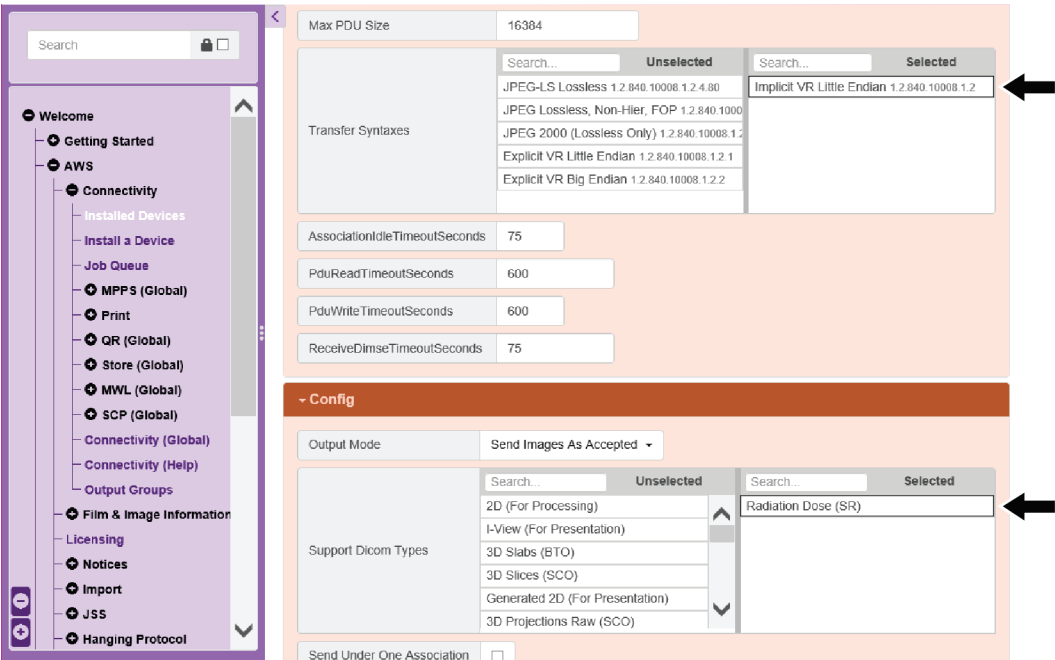


Figure 187: System Tools > AWS > Connectivity > Installed Devices > Advanced Store

16. Set the Transfer Syntax to include **Implicit VR Little Endian** or **Explicit VR Little Endian** and the Support DICOM Types to include **Radiation Dose (SR)**. For a device that expects only Radiation Dose (SR), move all other DICOM types to Unselected (see the previous figure).
17. Click **Update**.
18. Navigate to **System Tools > AWS > Connectivity > Connectivity (Global)**.



19. The *Connectivity (Global)* screens opens.

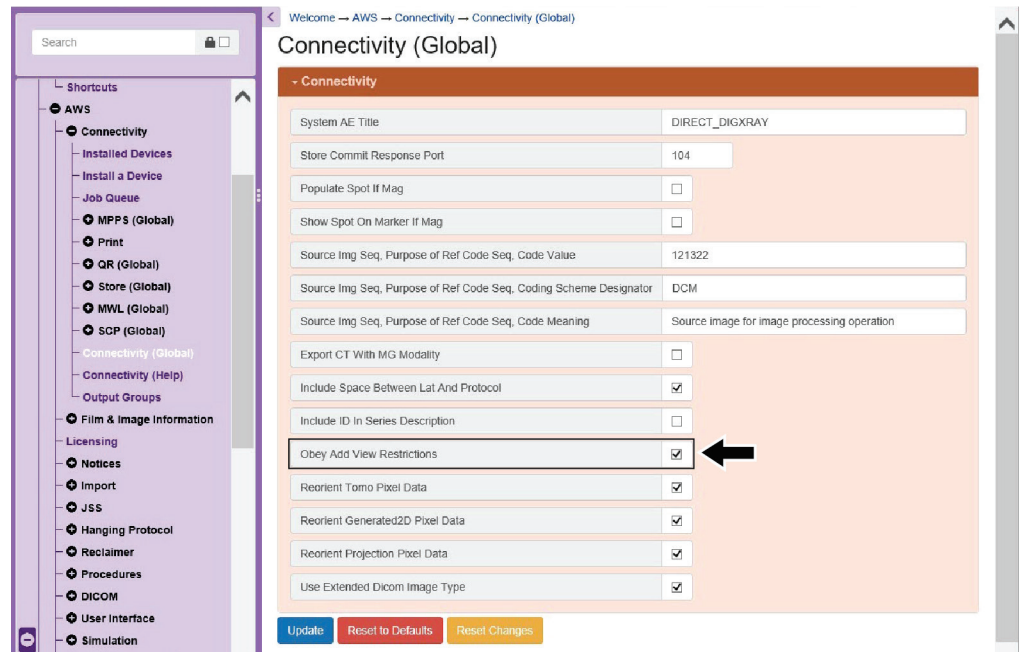


Figure 188: System Tools > AWS > Connectivity > Connectivity (Global)

20. Select the checkbox for the *Obey Add View Restrictions* parameter (see the previous figure). Enabling this parameter prevents the user from adding views to a procedure that has already been completed.



#### Note

Keep in mind the following:

- Consult with the department manager or lead technologist when enabling the Obey Add View Restrictions parameter. Once this parameter is enabled, adding views to an already completed procedure is not allowed.
- Adding views to an already completed procedure may result in inaccurate radiation dose information.
- Once the procedure has been closed and has a status of Completed, resending the Radiation Dose (SR) can only be done manually using the On-Demand or Admin Archive utilities.

21. Click **Update**.

22. Restart the Capture application for the changes to take place.



23. Do the following, based on how you configured the Radiation Dose (SR) DICOM type:
- If you modified an existing ImageStorage device that is also receiving other DICOM Types from Dimensions (such as PACS), continue with step 24.
  - If a separate ImageStorage device was installed specifically for Radiation Dose (SR) (for example, for an independent patient radiation dose tracking application), continue with these substeps:
    - a. Login to the Capture application as Service.
    - b. At the *Select Patient* screen, select **Admin**.
    - c. At the *Admin* screen, select **Manage Output Groups**.
    - d. The *Manage Output Groups* screen opens.

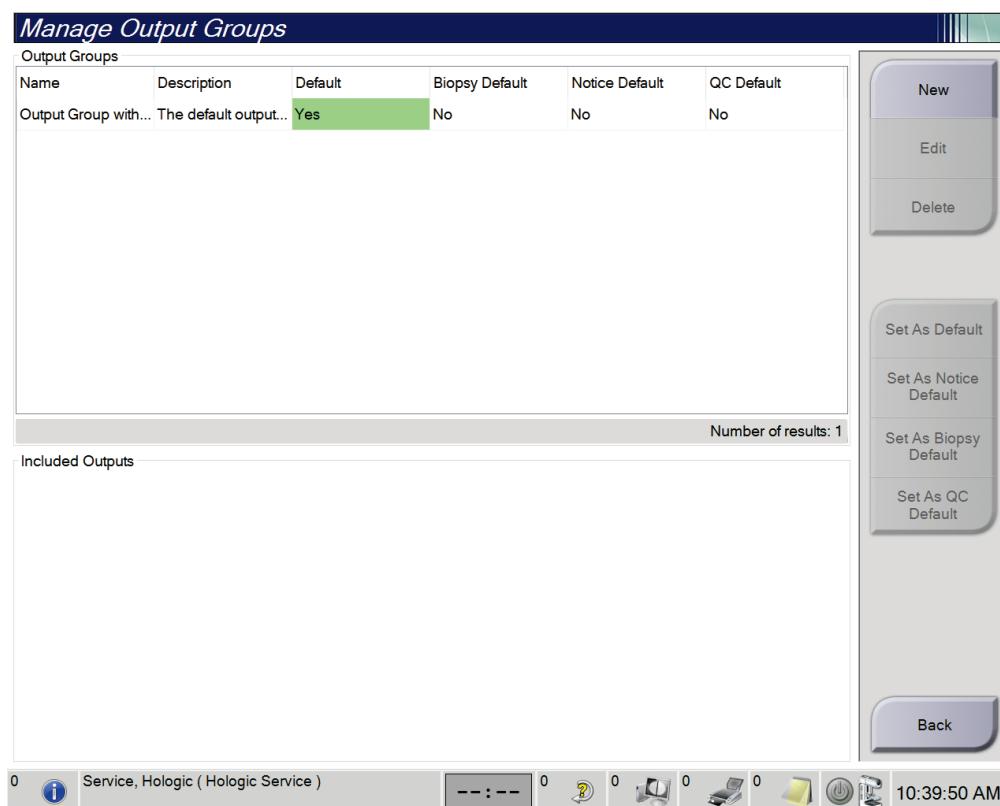


Figure 189: Admin > Manage Output Groups

- e. Select the Output Group (it becomes highlighted) to which you want to add the Radiation Dose (SR) device and click **Edit**.



- f. Select the checkbox for the ImageStorage Radiation Dose (SR) device you created (see the following figure).

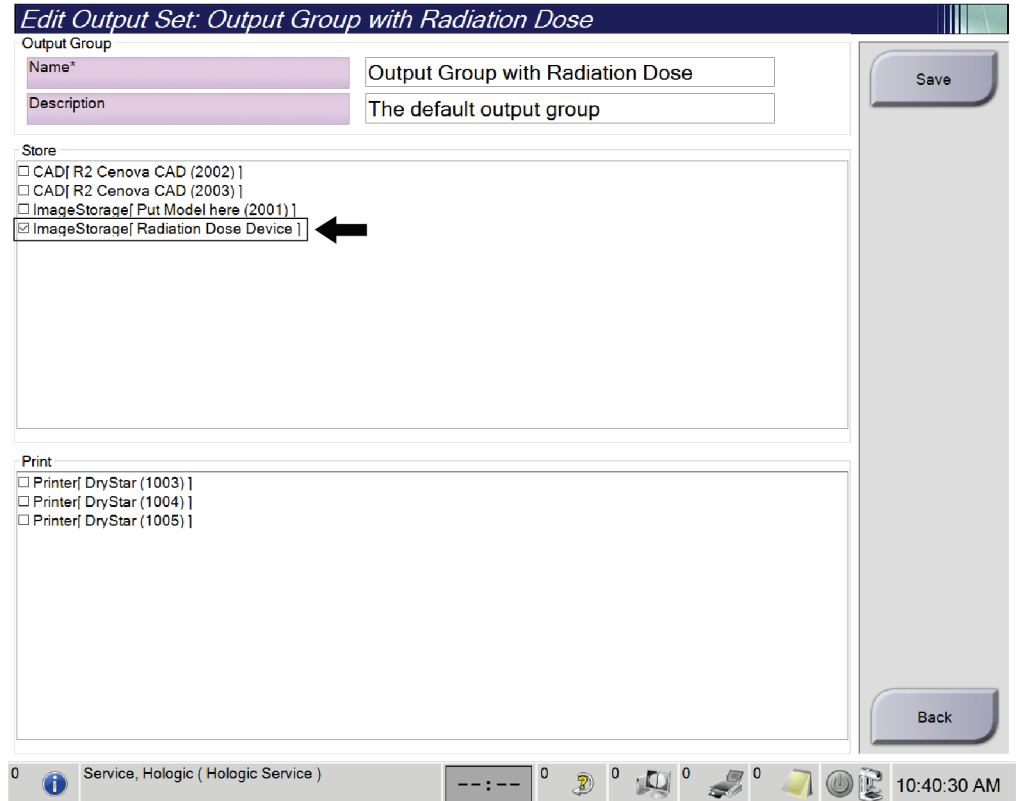


Figure 190: Admin > Manage Output Groups > Edit Output Set

- g. Click **Save**. At the *Update Successful* prompt, select **OK**.  
h. Restart the Capture application for the changes to take place.



**Note**

Consult with the department manager when including the Radiation Dose ImageStorage device to the one or more appropriate Output Groups. Radiation Dose (SR) includes all Accepted and Rejected images including 2D, Tomo, Contrast, and Biopsy.

24. Run a test to verify that the Dimensions system is sending the Radiation Dose (SR) to the configured ImageStorage device.



25. When finished, navigate to the **Admin** screen > **Log Reviewer** and review the system logs to verify the:
- DICOM association between Dimensions system and the ImageStorage device was successful
  - C-STORE-RQ for the X-Ray Radiation Dose SR object was sent
  - C-STORE-RSP has a status of success (status of 0).

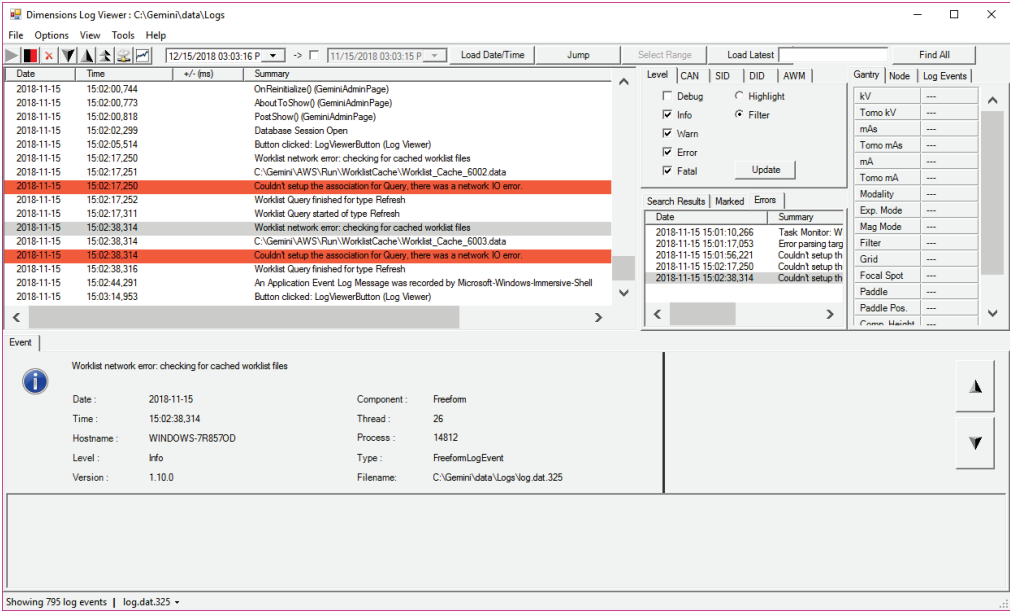


Figure 191: Admin screen > Log Viewer

## 5.7 Height Adjust for Universal Acquisition Workstation

The height adjust memory function of the powered height adjustment is an option on the Universal Acquisition Workstation.

This section provides instructions for enabling and setting the height adjust memory to engage automatically when a specific user logs in.

This section also provides instructions for enabling and setting a default height to engage automatically when any user logs out. Only users with Administrator privileges can set the default height.



### 5.7.1 Enable and Set the Height Adjust Memory for a Specific User

To enable and set the height adjust memory to engage automatically when a specific user logs in:

1. Log in to the system as the user whose settings you need to establish.
2. In the *Select Function to Perform* screen, select **Admin**.
3. In the *Admin* screen, select **My Settings**.

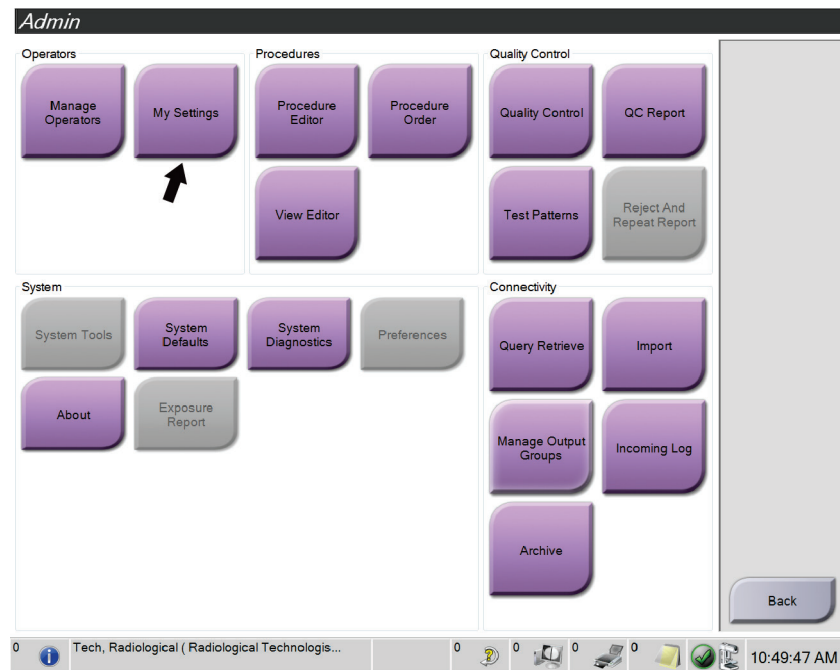


Figure 192: Admin screen (Radiological Tech login)



4. In the *Edit Operator* screen:
  - a. Select the **Console** tab.
    - To enable the height adjust memory option, select the radio button to the right of the Auto-Height adjustment on login field. (A check mark appears.)
    - OR -
    - Clear the radio button to disable the height adjust memory option.

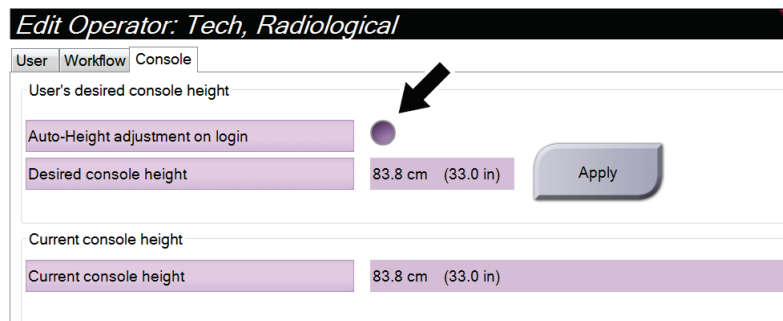


Figure 193: Edit Operator Screen

- b. To achieve the desired height, press the ▲ UP and ▼ DOWN buttons on the height adjust control panel as shown in the following figure.

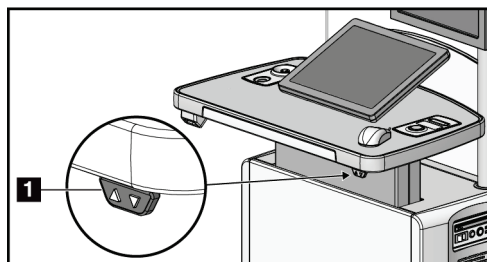


Figure 194: Height Adjust Control Panel



The Desired console height field displays the height as it is now positioned. (See the following figure.) The Current console height field displays the most recently saved height. (See the following figure.)

*Edit Operator: Tech, Radiological*

User Workflow Console

User's desired console height

Auto-Height adjustment on login ☒

Desired console height 83.8 cm (33.0 in) Apply

Current console height

Current console height 99.8 cm (39.3 in)

Figure 195: Desired Console Height and Current Console Height fields

- c. To save your height setting (as it is now positioned), select **Apply**, then select **Save**.
- d. In the Update Successful dialog box, select **OK**.

### 5.7.2 Enable and Set the Default Height

To enable and set a default height to engage automatically when any user logs out:

1. Log in to the system as an Admin or Manager user.
2. In the *Select Function to Perform* screen, select **Admin**.



3. In the *Admin* screen, select **Preferences**. (See the following figure.)

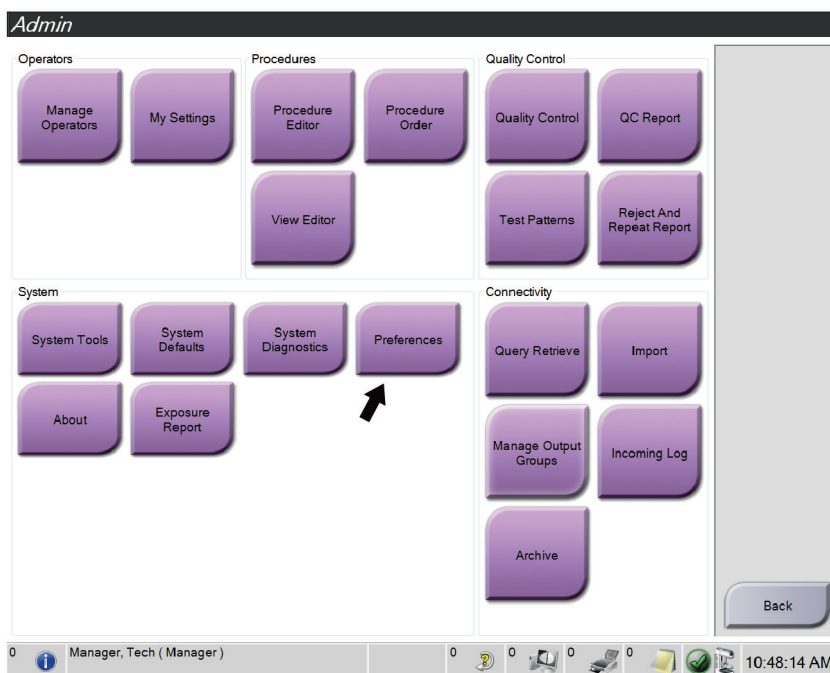


Figure 196: Admin screen (Admin or Manager login)

4. In the *System Preferences* screen:
  - a. Select the **Console** tab.
    - To enable the default height option, select the radio button to the right of the Auto Height adjustment on logout field. (A check mark appears.)
    - Clear the radio button to disable the height adjust memory option.

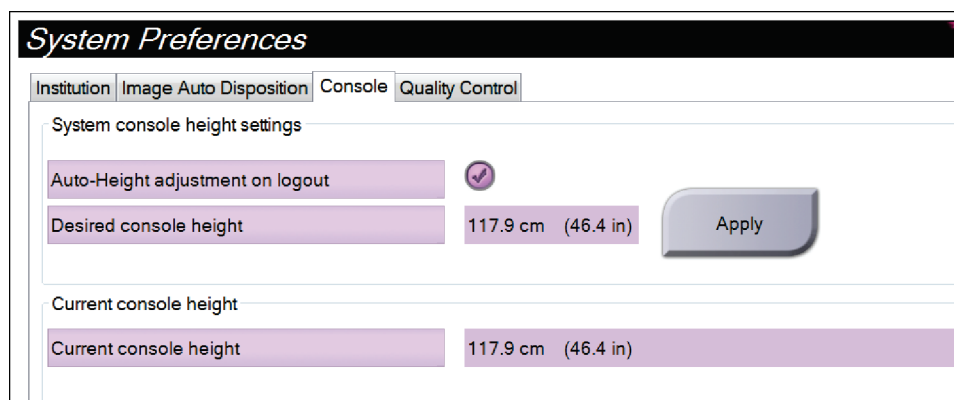


Figure 197: Enabling and setting default height

- b. To achieve the desired height, press the ▲ UP and ▼ DOWN buttons on the height adjust control panel as shown in the following figure.



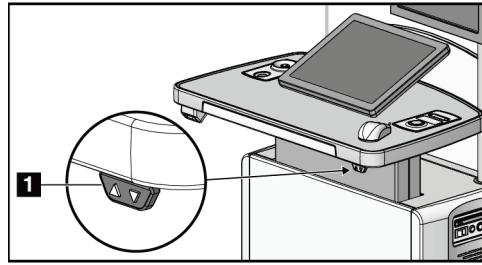


Figure 198: UP and DOWN buttons on height adjust control panel

The Desired console height field displays the height as it is now positioned. (See the following figure.) The Current console height field displays the most recently saved height. (See the following figure.)

Figure 199: Desired Console Height and Current Console Height fields

- c. To save your height setting (as it is now positioned), select **Apply**, then select **Save**.
- d. In the Update Successful dialog box, select **OK**.



## 5.8 Adjust the LED Collimator Light Settings

You can change the LED collimator light configuration through two settings in CalTool.

1. Launch CalTool (CalTool.bat) from the normal location/directory.
2. Click **AdvancedForm** and navigate to the **Util Config** tab > **GCB** tab.
3. Scroll down the GCB list and locate 55: THD LAMP TIMEOUT and 56: ENABLE TOMO LIGHT FIELD.

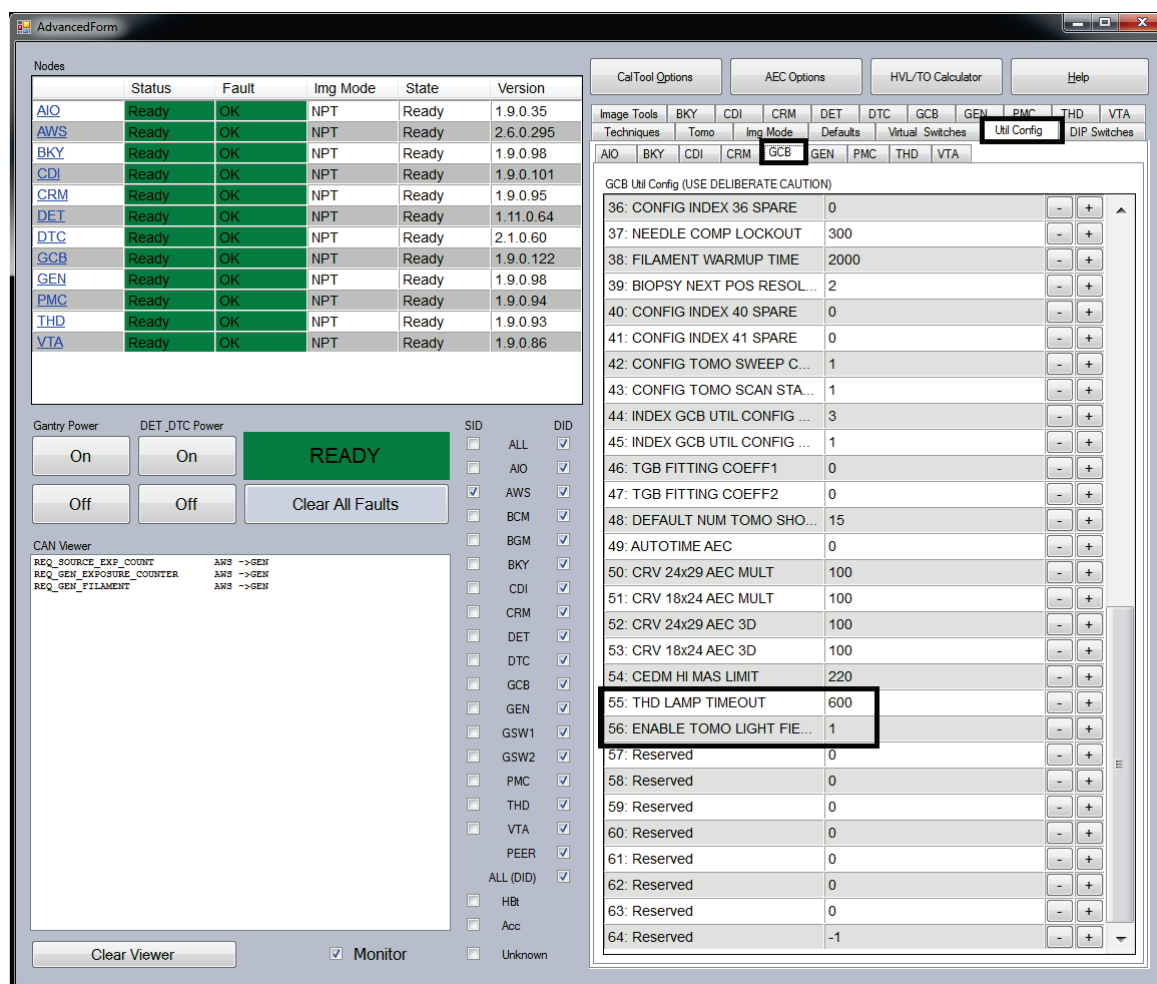


Figure 200: CalTool > AdvancedForm > Util Config < GCB list



- 55: THD LAMP TIMEOUT - This setting refers to how long the collimator light stays on after certain types of biopsy paddles are installed.

When a biopsy or needle loc paddle is installed, you can set how long the light stays on. This setting is variable from 30 seconds to 1200 seconds (20 minutes). The default setting is 600 seconds (10 minutes).

If a paddle other than a biopsy or needle loc paddle is installed, the light stays on for a set period of 120 seconds (2 minutes); that time is not configurable.

NOTE: The configurable setting is overridden by any of these conditions; a paddle other than a biopsy or needle loc paddle is installed, the collimator switch is pressed a second time, or the paddle is removed.

- 56: ENABLE TOMO LIGHT FIELD - This setting refers to the restricted collimator light field feature when doing a tomosynthesis or combo procedure using an 18" x 24" paddle.

If set to "1"(ON), the light field shows an 18" x 24" size (the actual 2D and tomosynthesis reconstruction size).

If set to "0" (OFF), the light field shows an 18" x 29" size (the actual tomosynthesis beam width).

4. When finished, exit CalTool and reboot the computer.







## Chapter 6 System Calibration and Performance Tests

### 6.1 Overview

This chapter outlines the Preventive Maintenance Schedule, calibration procedures, and performance tests.

Most system calibrations use a software-based Calibration Tool (refer to [Calibration Tool \(CalTool\)](#) on page 196), some adjustments use software tools from the Admin screen (refer to Admin Screen), and some refer you to use the Quality Control Manual for instructions.



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#### Note

The procedures in this chapter are written for conventional (invasive) testing equipment. To use non-invasive testing equipment and techniques, follow the instructions provided by the manufacturer of the test equipment.

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### 6.2 Preventive Maintenance Schedule



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#### Note

The Preventive Maintenance Schedule for the User is in the *User Guide*.

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Refer to [Universal Acquisition Workstation Maintenance](#) on page 283 for detailed cleaning and inspection procedures of the Acquisition Workstation.



*Table 6: Service Engineer Preventive Maintenance*

Maintenance Task Description	Recommended Frequency	
	Semiannually	Annually
Clean and Inspect the Gantry and Acquisition Workstation	✓	
Inspect the radiation shield for chips, cracks, breaks, and for tight attachments.	✓	
Check all primary power connections	✓	
Check interlocks, safety and limit switches	✓	
Inspect/Lubricate C-arm	✓	
C-arm / Verify all C-arm buttons	✓	
Verify C-arm and Rotational Calibration	✓	
Replace Breast Platform Filter	✓	
Verify Compression Force Calibration	✓	
Verify Compression Thickness Calibration	✓	
Inspect LED Collimator Lamp for dust and dirt	✓	
Clean & lubricate collimator, and worm screws	✓	
Perform Rotational Brake verification	✓	
Verify X-ray Field / Light Field Calibration	✓	
Verify kV Calibration and Tube Current Calibration	✓	
Check HVL Evaluation	✓	
Verify Target Dose Verification	✓	
Verify AEC Exposure Compensation 2D	✓	
Perform System Resolution Test *	✓	
Perform Phantom Image Quality Evaluation *	✓	
Perform Image Artifact Evaluation *	✓	
Backup Acquisition Workstation files	✓	
Evaluate UPS Performance Status/ Batteries Status	✓	
Backup all Calibration Data	✓	
* Refer to Quality Control Manual		



## 6.3 System Calibration



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**Note**

For dose calibration, refer to MAN-02461 Selenia Dimensions Dose Calibrations, CalTool.

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The primary software tool is the Calibration Tool. This software application is resident on the Acquisition Workstation.



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**Caution:**

**Before performing your calibration tests:**

- **Verify in CalTool that the Grid Type field is set to the proper type ("Linear" or "HTC") used on the system. If the wrong Grid Type field is set, the calibration values will be extremely off and incorrect. Go to CalTool > Advanced Form > BKY tab > Grid Type field. If necessary, select Set Grid Type and change as required.**
  - **Verify grid configuration (dip switch settings match grid revision and detector).**
- 



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**Note**

Contact Hologic Technical Support for assistance using this tool if required.

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### 6.3.1 Calibration Tool (CalTool)

A dongle needs to be connected to start the Calibration Tool (CalTool). If you do not have a dongle, contact [3D@hologic.com](mailto:3D@hologic.com) and request a code for a temporary license.

1. Launch CalTool (CalTool.bat) from the normal location/directory.
2. In the InitialForm, for CAN Mode, select **Real Gantry**.

Figure 201: CalTool Initial Form screen

3. For Role, select **Field Service**.

Role options include:

- Biomed
- Manufacturing
- Field Service
- Upgrade
- Array Test
- Developer

The Field Service role is used for all Hologic service calibrations.

4. Select **Go** to open CalTool.
  5. Click the **TASK BAR** to view tasks.
  6. Select a task.
  7. Perform the task.
- Click **Help** for more information.

	<b>Welcome</b>
	Welcome
	<b>Verification</b>
	EUREF AEC Verification
	AEC Scaling Verification
	HVL Spot Check
	<b>Compression</b>
	Paddle ID
	Paddle Mode
	Paddle Shift
	Compression Force
	Comp. Thickness
	Paddle Height Offsets
	Comp. Thickness (FAST)
	<b>Biopsy</b>
	Guidance Hardware
	<b>C Arm</b>
	Tomo Brake Adjustment
	Tomo Zero Positioning
	Hall Effect Sensor
	CArm Zero Positioning
	Face Shield
	VTA Height Limits
	VTA Gains Calibration
	VTA Tomo Motion Calibration
	<b>Generator</b>
	Tube Warm-up
	Generator kV
<b>T</b>	LG Filament (35kV)
<b>A</b>	Gen mA Task (35kV)
<b>S</b>	LG Filament (20kV-49kV)
<b>K</b>	SM Filament (30kV)
	SM Filament (20kV-39kV)
	Tube Output / HVL
	<b>Xray And Light Field</b>
	Self Adjusting X-Ray Field: LFS
	Self Adjusting X-Ray Field: SFS
<b>B</b>	X-Ray Field: LFS
<b>A</b>	X-Ray Field: LFS Shift
<b>R</b>	X-Ray Field: SFS
	Light Field Alignment
	<b>Detector</b>
	Bad Pixel Map 2D (1x1)
	Bad Pixel Map 3D (2x2)
	Dark Offset
	Goaltab Generation
	Goaltab Scale
	Goaltab Scale for Mag Mode Task
	Tomo Biopsy Scale Factors
	k Factor
	Transfer Detector Defect Files Task
	<b>Grid Device</b>
	Grid Calibration
	<b>Diagnostics</b>
	Upload Code
	Transfer To Node
	Transfer From Node
	Upgrade PCI Firmware
	System Backup Task

Figure 202: CalTool Task Bar





**Note**

Depending on Licensing (2D or 3D™), CalTool notifies availability of selected calibrations.

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### 6.3.2 Configure the Remote X-Ray On Light

The system gives the user the ability to operate remote lights which indicate when the system is On and when x rays are being taken. These lights are normally installed outside the exam room, above the door. If these lights have been installed (refer to [Remote X-ray On/Power On Lamp Connection](#) on page 31), then you also need to set this feature in CalTool.

1. Exit the AWS application to the Windows desktop and launch CalTool.
2. Click on the **Advanced Form** button.
3. Click the **Util Config** tab.
4. Click the **GCB** tab.
5. Locate **Soft Switch #18, EXT RELAY DURING BOOST** and do the following:
  - Set to **1** to turn on X-ray On light during preload and the actual x-ray (this is the recommended choice)
  - Set to **0** to turn on X-ray On light during the actual x-ray only
6. Test the system to verify the X-ray On lights are working properly.

### 6.3.3 Configure the Vertical Height Adjustment

If you install the system in a room or a coach (mobile installation) where a low ceiling height is a consideration, in addition to the standard Calibration Tool parameters, you can perform the optional Vertical Height Adjustment. Refer to [Gantry Vertical Height Upper Limit Adjust](#) on page 409.

For additional information about the Calibration Tool, refer to the [Calibration Tool \(CalTool\)](#) on page 196.



#### 6.3.4 Inverter Drawer Calibration

##### Calibrating the Replacement Generator Inverter Drawer (ASY-05788)

Two Generator configurations are currently in use:

- Inverter (ASY-05788) and Multiplier (ASY-05340) pair.
- Inverter (ASY-01272) and Multiplier (ASY-01273) pair.

This procedure describes the calibration of the Generator Assembly Inverter Drawer (ASY-05788).



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**Note**

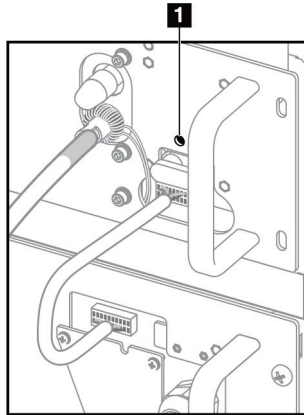
The Inverter (ASY-05788) and Multiplier (ASY-05340) Drawer pair require adjustments to ensure proper waveform flatness. If the Drawers are not replaced as a pair, kV waveform edge adjustments are required.

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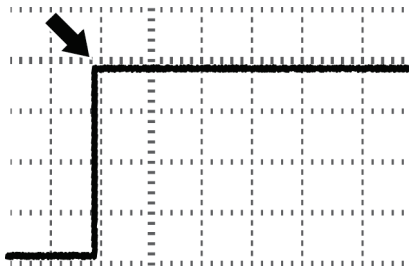
1. For access to adjustments, remove the plastic cover on the front panel of the Inverter.
2. kV leading waveform edge (Multiplier trim pot adjust).
  - a. Use a Divider Tank to monitor kV waveforms with an Oscilloscope.
  - b. Using CalTool, take 35kV, 100mA, 200mAs, Manual, Grid Out, LFS exposures and monitor the waveform.



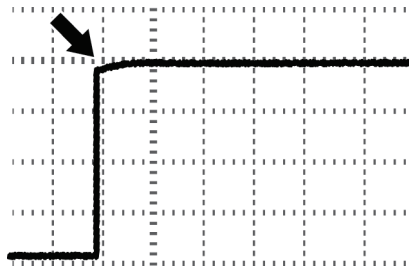
- c. Adjust the feedback trim pot located on the Multiplier Drawer above the mAs plug to obtain a square leading edge waveform. (See the following figures.)



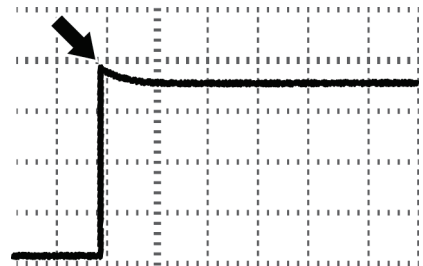
*Figure 203: Adjusting the Multiplier Feedback Trim Pot (item 1)*



*Figure 204: Correct Square Edge*



*Figure 205: Undershoot, Adjustment Required*



*Figure 206: Overshoot, Adjustment Required*



3. Standby voltage (Inverter): Filament idle current (standby voltage) is factory set to 2.5 amps. Verify the following:
  - a. Monitor Filament idle current sense at TSTH1 pins 1-2 with voltmeter = 0.25 v (0.1 v = 1 amp)
  - b. Acceptable range is 2.48 - 2.52 amps. Adjustment is done with FIL ADJ R14. If necessary, adjust before performing filament calibration.

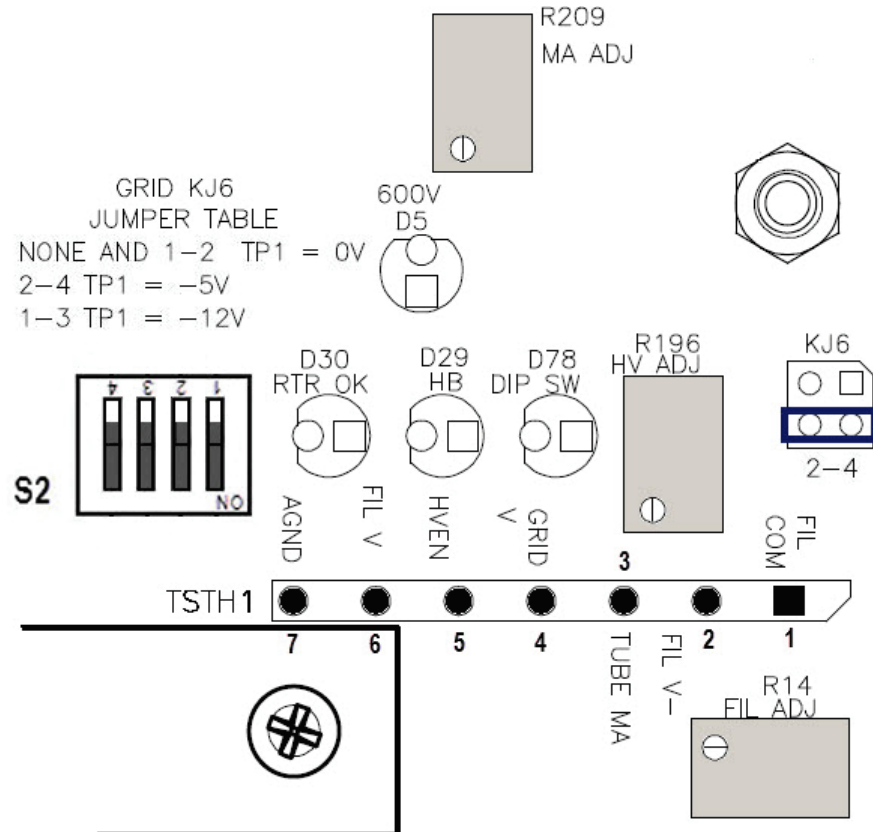


Figure 207: Front Panel Inverter Drawer (ASY-05788)

4. kV voltage (Inverter):
  - a. "kV" output voltage adjustment is done with potentiometer R196 HV ADJ.
  - b. Monitor the waveform levels using a tank and oscilloscope or measure voltage with a DVM.
  - c. Use CalTool to verify Generator kV.
5. Tube current (Inverter):
  - a. Tube current adjustment is done with MA ADJ R209. This potentiometer is factory set; adjust only if the measured mA is not correct.
  - b. Use CalTool to verify Generator mA.



6. Grid voltage (Inverter):
  - a. Grid voltage is a legacy parameter and is not used. The voltage is factory set to -5 ( $\pm 3$ ) volts by jumper on KJ6 pins 2 and 4.
  - b. Verify with voltmeter (+) to TSTH1 pin 4, voltmeter (-) to TSTH1 pin 7.

### Calibrating the Generator Inverter Drawer (ASY-01272)

Two Generator configurations are currently in use:

- Inverter (ASY-05788) and Multiplier (ASY-05340) pair.
- Inverter (ASY-01272) and Multiplier (ASY-01273) pair.

This procedure describes the calibration of Generator Inverter Drawer (ASY-01272).

1. Standby Voltage:
  - No external adjustment is available.
2. kV voltage (Inverter):
  - a. kV output voltage adjustment is done with kV ADJ located on the front of the Inverter Drawer.
  - b. Use CalTool to verify Generator kV.
3. Tube current (Inverter):
  - a. Tube current adjustment is done with mA ADJ located on the front of the Inverter Drawer.
  - b. Use CalTool to verify Generator mA.

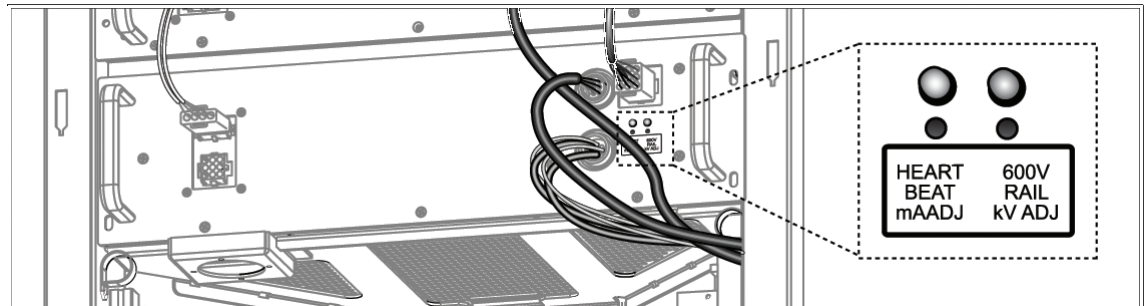


Figure 208: Using CalTool to Verify Generator mA

4. Grid Voltage
  - No external adjustment is available.



### 6.3.5 Acquisition Workstation Calibrations

When you need to perform Detector Gain Calibration and Geometry Calibration, start each procedure from the Acquisition Workstation. Log in to the system as Service. Then go to **Admin > Quality Control**. Follow the on-screen instructions.

### 6.3.6 Quality Control Manual Calibrations

When you need to perform Geometry Calibration (Tomosynthesis or Biopsy option), follow the instructions in the Quality Control Manual.

## 6.4 System Performance Tests

This section contains the procedures for testing the system performance. Use the following table to locate a specific procedure and form.

Test Name	Page	Appendix F Form
Tube Current/Exposure Time Product	<a href="#"><i>Tube Current/Exposure Time Product</i></a> on page 203	<a href="#"><i>Tube Current/Exposure Time Product Forms</i></a> on page 456
Peak Tube Potential	<a href="#"><i>Peak Tube Potential</i></a> on page 205	<a href="#"><i>Peak Tube Potential Form</i></a> on page 456
X-ray Field Size Determination	<a href="#"><i>X-ray Field Size Determination</i></a> on page 208	<a href="#"><i>X-ray Field Size Determination Forms</i></a> on page 457
Alignment of Visually Defined X-ray Fields	<a href="#"><i>Alignment of Visually Defined X-ray Fields</i></a> on page 209	<a href="#"><i>Alignment of Visually Defined X-ray Fields Form</i></a> on page 458
Beam Quality Half Value Layer	<a href="#"><i>Beam Quality Half Value Layer</i></a> on page 210	<a href="#"><i>Beam Quality Half Value Layer Form</i></a> on page 458
Linearity	<a href="#"><i>Linearity</i></a> on page 211	<a href="#"><i>Linearity Form</i></a> on page 459
Reproducibility	<a href="#"><i>Reproducibility</i></a> on page 212	<a href="#"><i>Reproducibility Form</i></a> on page 460



### 6.4.1 Tube Current/Exposure Time Product



**Warning:**  
**Always follow the safety precautions for x-ray exposures.**

Equipment Required:

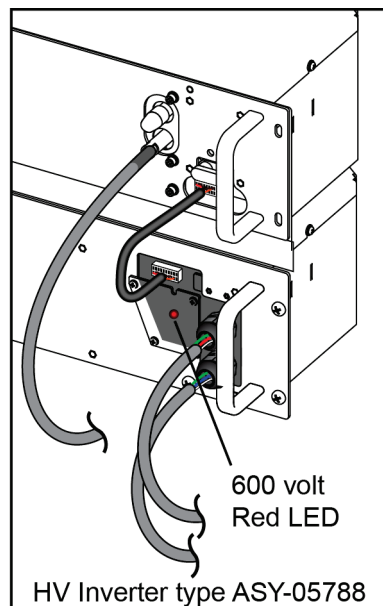
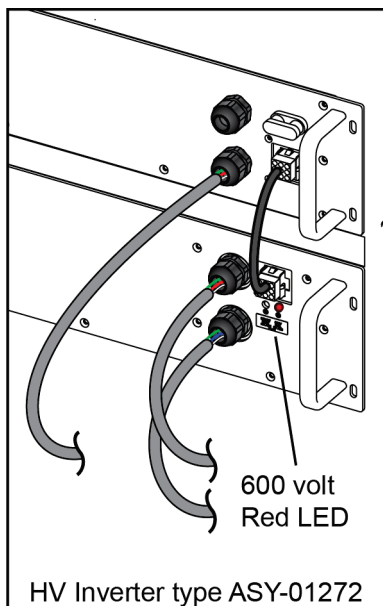
- mAs Meter (invasive mAs meter or equivalent)
- Tube Current Exposure Time Product Form—see Tube Current/Exposure Time Product Forms.

#### Setup

1. Turn the Gantry Power Off.

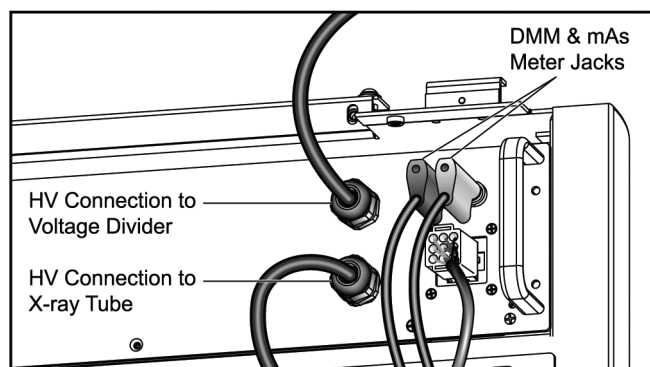


**WARNING!**  
To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.





- Remove the mA shorting jumper and insert the mAs meter probes as shown in the following figure.



- If an image receptor is present, cover it with a lead apron.

### Test

- Turn the Gantry power on.
- Configure the Exposure Techniques:

Modality	Mode	Filter	Grid	FS
Screen	MAN	Rh	In or Out	Large

- Refer to the Large Focal Spot Form. Configure the mAs and kV as shown in the first row and column—10 mAs, 25 kV.
- Take an exposure and record the mAs output measured in the Form.
- Reset the mAs meter for the next measurement.
- Repeat the exposure sequence above for each of the remaining mAs and kV combinations. Do not take an exposure for any of the cells which are highlighted in **bold**.
- Configure the Exposure Techniques:

Modality	Mode	Filter	Grid	FS
Screen	MAN	Rh	In or Out	Small



### Note

The small focal spot is not available on the 2D screening system.

- Refer to the Small Focal Spot Form. Configure the mAs and kV as indicated in the first row and column—10mAs, 25kV.
- Take an exposure and record the mAs output measured on the Form.
- Reset the mAs meter for the next measurement.
- Repeat the exposure sequence above for each of the remaining mAs and kV combinations.
- Turn the Gantry Power Off.





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**WARNING!**

To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.

---

13. Remove the mAs meter probes from the HV Multiplier Drawer and replace the mAs shorting jumper.

### 6.4.2 Peak Tube Potential



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**Warning:**

Always follow the safety precautions for x-ray exposures.

---

Equipment Required:

- Invasive high voltage divider or a non-invasive system
- Digital voltmeter
- Coaxial cable and BNC to banana plug
- Adapter cable to connect the divider to the test receptacle on the HV Generator
- Peak Tube Potential Form—see [Peak Tube Potential Form](#) on page 456.



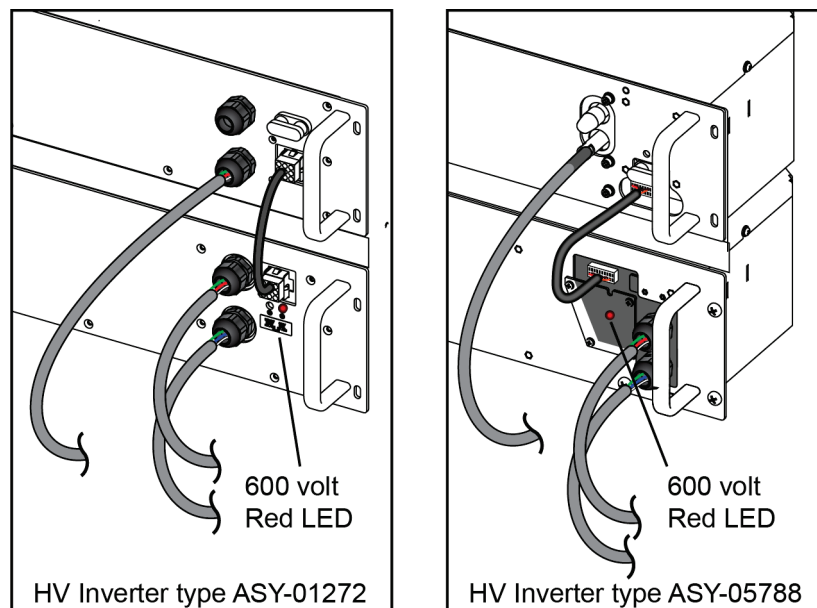
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**WARNING!**

To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.

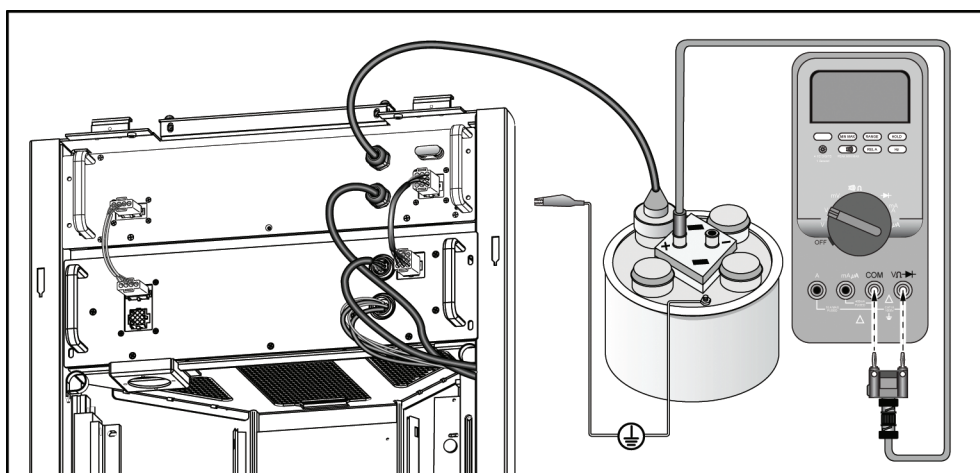
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### Setup

1. Shut down the system.
2. Connect a voltmeter:
  - Connect a DC voltmeter to the **low voltage terminals** of a **1,000:1 Voltage Divider**.
- Or
  - Use a coaxial cable and a BNC to banana plug splitter to connect a digital voltmeter to the anode terminal of the voltage divider.
3. Position the meter where it can be read from behind the radiation shield.



*Figure 209: Tube Voltage Calibration*



4. Connect the ground lug of the high voltage divider to a chassis ground point located on the HV Multiplier Assembly.
5. Loosen the locking collar from the HV test jack located on the HV Multiplier Assembly.
6. Connect one end of the high voltage adapter cable into the voltage divider receptacle and the opposite end into the HV Multiplier Assembly test jack. Ensure the adapter cable is firmly seated and tighten the locking collar.

### **Test**

1. Boot up the computer, close out all applications, and open Caltools.
2. Click **Advanced Form**, then click the **Technique** tab.
3. Set up the manual mode KV's and mA's accordingly. Click the **Arm** button.
4. Using the Peak Tube Potential (kV) Form make an exposure at the first kV, mAs setting in the table, and record the meter reading.
5. Confirm that the meter reading falls into the range shown on the Form.
6. Repeat steps 4 and 5 for each of the remaining exposures.
7. Shut down the system.
8. Remove the test equipment.



### 6.4.3 X-ray Field Size Determination



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**Warning:**

**Always follow the safety precautions for x-ray exposures.**

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- X-Ray Field Size Test Fixture, TLS-01063
- X-Ray Field Size Determination Form—see [X-ray Field Size Determination Forms](#) on page 457.

#### Setup

1. Set the aperture size to 15 x 15.
2. Go to **CalTool > Task Bar > X-Ray and Light Field** and run the appropriate program to adjust the collimator.
3. Install the intensifying screen on top of the breast tray.
4. Set the exposure techniques:

Modality	Mode	Filter	kV	mA	mAs	Grid	FS
Screen	MAN	Rh	35	80	160	out	Large

#### Test

1. View the Intensifying screen and take an x-ray exposure.
2. Verify that the x-ray field as evidenced by the glowing phosphorescent image lies within the corresponding set of field alignment lines.
3. If the x-ray field is not aligned repeat the calibration sequence.
4. Repeat the exposure and viewing sequence for each of the remaining aperture positions.
5. Visually verify that each x ray edge lies within the corresponding field lines. Record all observations on the Form.



#### 6.4.4 Alignment of Visually Defined X-ray Fields



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**Warning:**

**Always follow the safety precautions for x-ray exposures.**

---

Equipment Required:

- X-ray Field Size Test Fixture, TLS-01063

**Setup**

1. Install the intensifying screen on the Breast Platform.
2. Open Caltools and go to **Task Bar > X-Ray and Light Field > Light Field Alignment**.
3. Follow the procedure outlined in Caltools.

**Test**

1. Install the intensifying screen on the X-ray platform.
2. Use the Aperture Select Switch to cycle the Collimator to the setting that is to be verified. Verify that the correct aperture size is displayed on the collimator display.
3. Verify that the light field lies within the corresponding set of field alignment lines.
4. If the light field requires adjustment, repeat the adjustment procedure found in **Caltools > Task Bar > X-Ray and Light Field > Light Field Alignment**.



### 6.4.5 Beam Quality Half Value Layer



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**Warning:**

**Always follow the safety precautions for x-ray exposures.**

---

Equipment Required:

- 24 x 29 cm screening paddle
- A non-invasive system, or a Calibrated mammography ionization chamber and electrometer per the *1999 ACR Mammography Quality Control Manual*, "Beam Quality Assessment" section
- Aluminum 1145 or 1100 alloy sheets per the *1999 ACR Mammography Quality Control Manual*, "Beam Quality Assessment" section (eight sheets of 0.1 mm thickness and six sheets of 0.5 mm thickness)
- 0.5 mm or thicker lead block, wide enough to cover entire surface of the digital receptor
- Beam Quality Half Value Layer Form—see [Beam Quality Half Value Layer Form](#) on page 458.

#### Setup

1. Cover the Image Receptor with a lead blocker found in the HVL test kit TLS-02407, and install a 24 x 29 Full Field compression paddle.
2. Setup the meter for a radiation measurement.
3. Place the radiation probe 2.5 cm above the breast tray. A probe holder or BR12 may be used to attain proper probe height of 4.2 cm above the breast tray.
4. The center of the sensor should be 4.0 cm from the chest-wall and positioned so it lies directly above the vertical centerline of the array.
5. Verify the probe position by lowering the paddle a few inches from the top surface of the probe. If the probe is positioned properly, the sensor is located directly under AEC position 2 when viewed from above the paddle.
6. Move the compression paddle to its highest position (closest to the tube).
7. Measure the distance from the breast tray to the red volume centerline of the sensor probe. (4.2 cm). Note that the lead apron width is approximately 0.2 cm.
8. Enter the measured height, in mm, on the spreadsheet as the **distance above breast platform**.



---

**Note**

As an additional check of probe alignment, the probe should appear to be centered within the illuminated region.

---

#### Test

Follow the "Beam Quality Half Value Layer test in the QC manual. Rh and Ag filters should be checked, each at one kVp only.



### 6.4.6 Linearity



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**Warning:**

**Always follow the safety precautions for x-ray exposures.**

---

Equipment Required:

- Radiation Meter (for example, Rad Cal 2026C Series, Unfors, or equivalent)
- Linearity Form—see [Linearity Form](#) on page 459.

#### Setup

1. Connect the radiation probe per product manufacturer's instructions.
2. Place the readout/logic module where it can be easily read.
3. Select exposure in milliroentgen on the function switch.
4. If an image receptor is present, cover it with lead supplied with TLS-02407.
5. Position the x-ray meter probe on the breast tray centered along the chest wall and 1 cm from the edge of the receptor. The plane of the probe surface must be aligned so that it is perpendicular to the x-ray beam axis.

#### Test

##### Large Focal Spot

1. Configure the Exposure Techniques:

Modality	Mode	Filter	kV	mA	Grid	FS
Screen	MAN	Rh	35	200	out	Large

2. Set the mAs to 10 and take an exposure.
3. Record the milliroentgen output on the Form.
4. Reset the meter.
5. Repeat the exposure sequence for each of the remaining mAs settings.
6. Remove the meter from the breast tray.

##### Small Focal Spot



---

**Note**

The small focal spot is not available on the 2D screening system.

---

1. Configure the Exposure Techniques:

Modality	Mode	Filter	kV	mA	Grid	FS
Screen	MAN	Rh	35	50	out	Small

2. Set the mAs to 10 and take an exposure.
3. Record the milliroentgen output on the Form.



4. Reset the meter.
5. Repeat the exposure sequence for each of the remaining mAs settings.
6. Remove the meter from the breast tray.

#### 6.4.7 Reproducibility



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**Warning:**  
**Always follow the safety precautions for x-ray exposures.**

---

Equipment Required:

- Radiation Meter (for example, Rad Cal 2026C Series, Unfors, or equivalent)
- Rad Cal 20x6-6 mm Probe (or equivalent)
- Reproducibility Form—see [Reproducibility Form](#) on page 460.

##### Setup

1. Connect the radiation probe per product manufacturers instructions.
2. Place the readout/logic module where it can be easily read.
3. Select exposure in milliroentgen on the function switch.
4. If an image receptor is present, cover it with lead supplied with TLS-02407.
5. Position the x-ray meter probe on the breast tray centered along the chest wall and 1 cm from the edge of the receptor. The plane of the probe surface must be aligned so that it is perpendicular to the x-ray beam axis.
6. Configure the Exposure Techniques:

Modality	Mode	Filter	kV	mA	Grid	FS
Screen	MAN	Rh	25	60	out	Large

##### Test

1. Take an exposure and record the milliroentgen output measured on the Form.
2. Reset the Meter.
3. Reset the kV and mAs settings to values different than those listed in the table, and then return them to their original values.
4. Repeat the exposure sequence as indicated above until 10 complete exposures have been taken.
5. Calculate the Coefficient of Variation for all 10 readings:  
Coefficient of Variation = (Standard Deviation/Mean)
6. Remove the meter from the breast tray.



#### **6.4.8 Artifact Evaluation**

Follow the "Artifact Evaluation" test in the Quality Control Manual.

#### **6.4.9 AEC Function Performance Test**

Follow the "AEC Function Performance" test in the Quality Control Manual. If it fails, perform the AEC calibration in the Calibration Tool ('Detector' calibration).

#### **6.4.10 Breast Entrance Exposure, AEC Reproducibility, and Average Glandular Dose**

Follow the "Breast Entrance Exposure, AEC Reproducibility, and Average Glandular Dose" test in the Quality Control Manual.

#### **6.4.11 Signal to Noise Ratio**

Follow the "SNR/CNR Measurement" test in the Quality Control Manual.

#### **6.4.12 Compression Force Test**

Follow the "Compression Test" test in the Quality Control Manual.

#### **6.4.13 Compression Thickness Accuracy Test (Standard Mode)**

Equipment Required:

- BR-12 phantom blocks of 2, 4, 6, and 8 cm thickness
- 18 x 24 cm Compression Paddle
- 24 x 29 cm Compression Paddle
- 7.5 cm Spot Contact Compression Paddle

##### **Setup**

1. Center 2 cm of BR-12 laterally on the image receptor and position it so the chest-wall edge of the block is aligned with the chest wall side of the image receptor.
2. Install the 18 x 24 cm screening paddle in the Compression Device.

##### **Test**

1. Apply Full Automatic Compression of approximately 30 pounds to the phantom.
2. Note the thickness indicated on the compression device. The compression thickness indicator shall always be within  $\pm 0.5$  cm of the actual thickness.
3. If the indicator is not within  $\pm 0.5$  cm, perform the thickness calibration in the Calibration Tool, and then repeat this test.
4. Repeat steps 1 to 3 for thicknesses of 4 cm, 6 cm, and 8 cm.
5. Install the 24 x 29 cm paddle.
6. Repeat steps 1 to 3 for 2 cm through 8 cm of BR-12.
7. Install the 7.5 cm Spot Contact Compression Paddle.
8. Repeat steps 1 to 3 for 2 cm through 8 cm of BR-12.



#### **6.4.14 Compression Thickness Accuracy Test (FAST Mode)**

Equipment Required:

- BR-12 phantom blocks of 2, 4, 6, and 8 cm thickness
- 18 x 24 cm Compression Paddle
- 24 x 29 cm Compression Paddle

##### **Setup**

1. Place 2 cm of BR-12 laterally on the image receptor and position it 2 cm in front of the chest wall.
2. Install the 18 x 24 cm screening paddle in the Compression Device.

##### **Test**

1. Activate FAST Paddle™ mode (FAST Paddle™ tilting paddle system) by pushing the purple bar to the left or right.
2. Apply Full Automatic Compression of approximately 30 pounds to the phantom.
3. Note the thickness indicated on the compression device. The compression thickness indicator shall always be within  $\pm 0.5$  cm of the actual thickness.
4. If the indicator is not within  $\pm 0.5$  cm, perform the thickness FAST calibration in the Calibration Tool, and then repeat this test.
5. Repeat steps 2 to 4 for thicknesses of 4 cm, 6 cm, and 8 cm.
6. Install the 24 x 29 cm paddle.
7. Repeat steps 2 to 4 for 2 cm through 8 cm of BR-12.



## Chapter 7 Gantry Maintenance

### 7.1 Introduction

This chapter describes maintenance information and instructions for the Gantry, including:

- Removing covers and panels
- Component identification
- Component replacement procedures

Component replacement procedures are sub-divided by topics:

- X-ray and Imaging components
- Circuit boards, firmware, and circuit components
- Mechanical components and related assemblies
- Electrical power components and assemblies
- Preventive maintenance procedures

**WARNING!****Disconnect system power before removing components!**

---

**Warning:****Always follow the safety precautions for x-ray exposures.**

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**Caution:****Always obey Electrostatic Discharge (ESD) precautions when working with electronics and electronic components.**

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**Note****If a procedure instructs you to remove any covers or panels, do not install the covers until all required procedures are completed.**

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Only Hologic-authorized, trained service engineers can service this system. The system is designed for module-level repair.

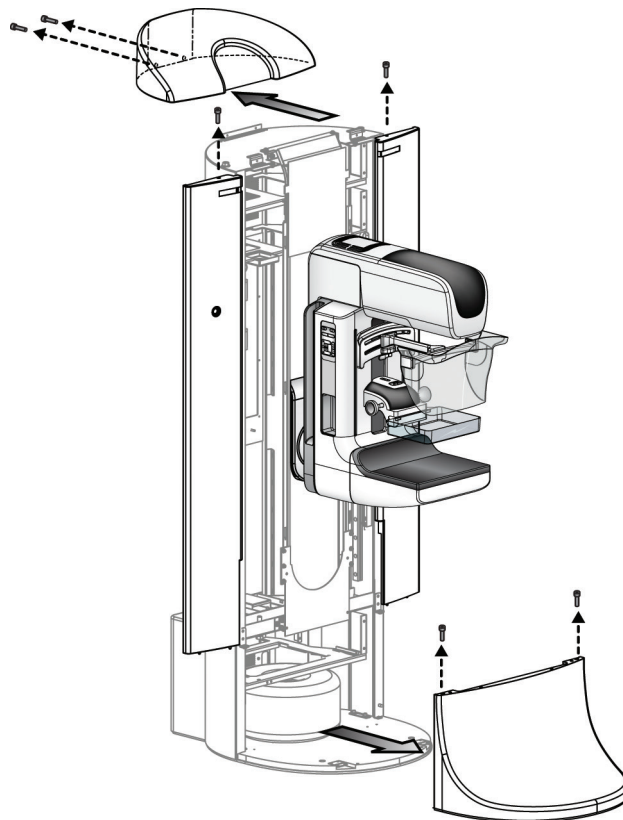


## 7.2 Remove Gantry Covers and Bellows

Maintenance procedures in this chapter require removal of Gantry or C-arm covers, panels and bellows to gain access to the interior.

Do not install any covers or panels until all required procedures are completed.

### 7.2.1 Gantry Cover Removal



*Figure 210: Gantry Covers Removal*

#### Top, Side, and Bottom Covers Removal

1. Remove the two screws that fasten the Gantry top cover and remove the cover.
2. Remove the bolts located at the top of each Gantry side cover
3. Slide the covers up, and use the inside hooks on the covers, and outer slots on the frame to support the covers while performing the next step.
4. Remove the screws that fasten the bottom cover, and remove it by sliding the cover down from the retaining pins and forward.



**Upper Rear Access Panel Removal**

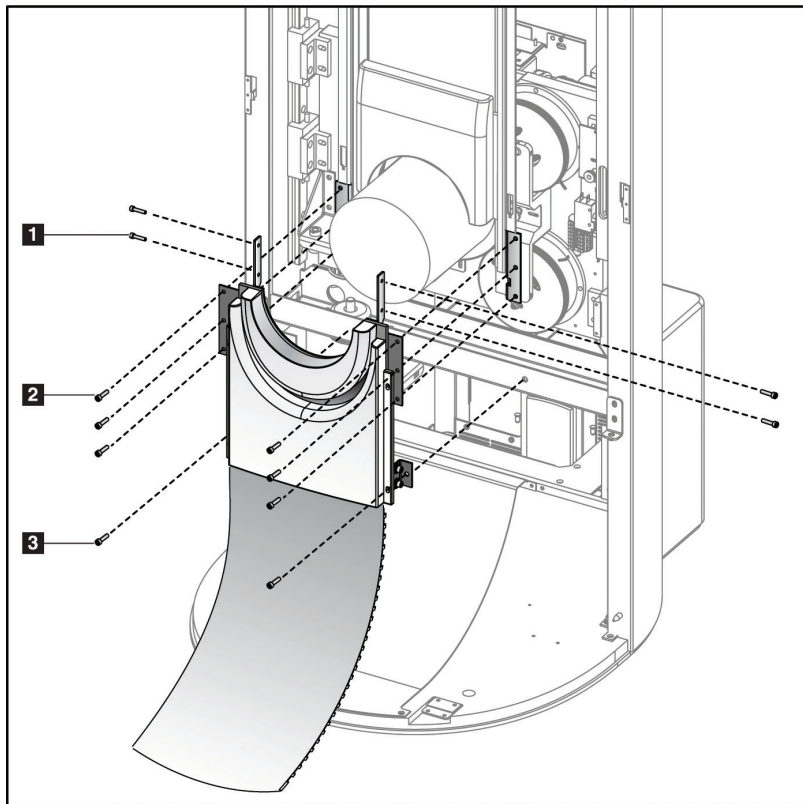
1. Remove the screws that fasten the Upper Rear Access Panel to the Gantry.
2. Lift the panel off.

**Lower Rear Access Panel**

1. Remove the screws that fasten the Lower Rear Access Panel to the Gantry.
2. Lift the panel off.

**Lower Gantry Bellows Removal**

1. Remove the Top, Sides, and Bottom covers—see figure [Gantry Cover Removal](#) on page 216.
2. Remove the four socket head screws from the right and left side of the bellows frame. See item 1 in the following figure.
3. Remove the three hex-head flat screws from each side of the lower housing. See item 2.
4. Remove the two socket head screws from the front of the lower bellows frame. See item 3.
5. Slide the lower frame and lower bellows out from the bottom.



*Figure 211: Lower Bellows Removal*



#### Upper Gantry Bellows Removal

1. Remove the lower frame and bellows—See figure [Lower Gantry Bellows Removal](#) on page 217.
2. Remove the two socket head screws from the top of the upper bellow frame. See item 1 in the following figure.
3. Tilt the upper frame with attached upper bellows to the side and out.

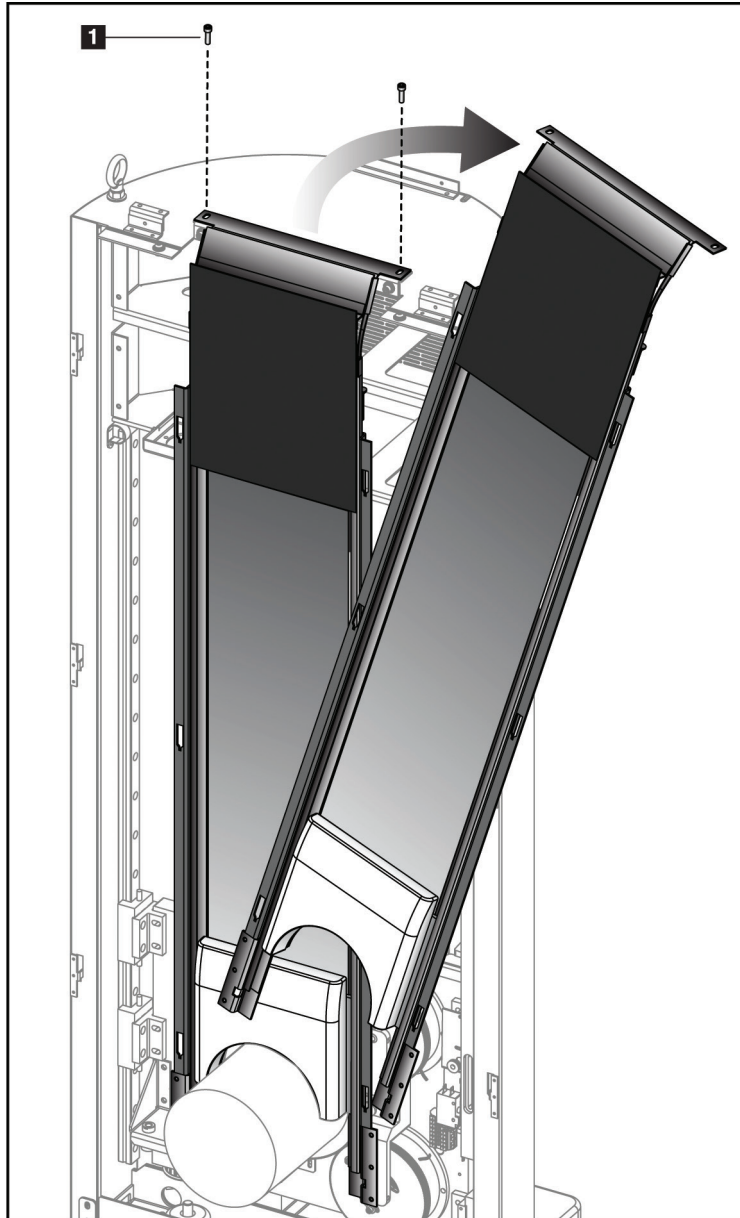


Figure 212: Upper Bellows Removal



## 7.2.2 C-Arm Cover Removal

Access to the serviceable components and assemblies of the C-arm are through:

- X-ray Tube Arm (Tubehead) Covers
- C-Arm Housing
- Compression Device Covers
- Compression Bellows Assembly

### Top X-ray Tube Arm (Tubehead) Cover Removal

Remove the Top X-ray Tube Arm (Tubehead) Cover. See the following figure.

1. Lower the C-arm, and tilt in either direction to access rear mounting screws.
2. Remove the rear mounting screws.
3. Return the C-arm to the vertical position.
4. Remove the front (inner) mounting screws.
5. Lift the rear of the cover, to release the integral snaps on the cover.
6. Slide the cover forward and off.

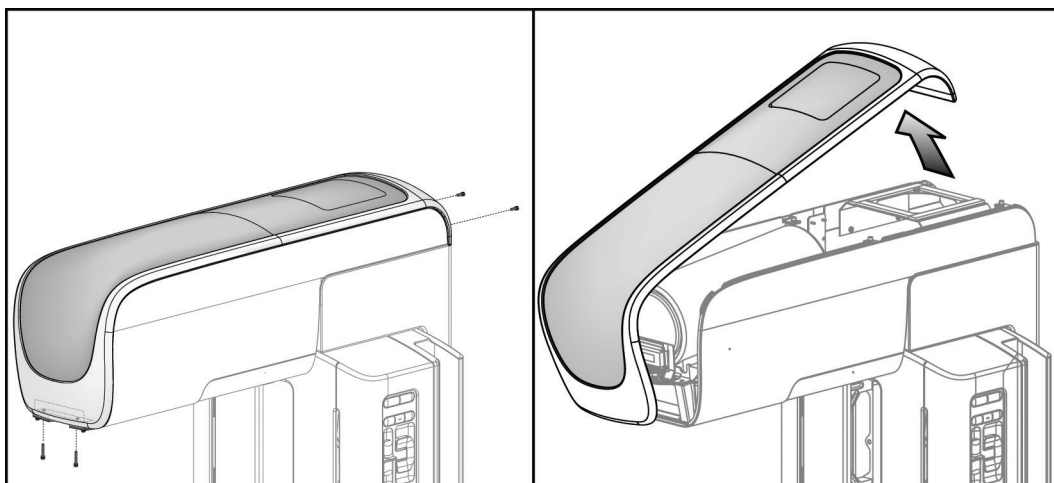


Figure 213: Top X-ray Tube Arm (Tubehead) Cover Removal



#### Bottom Tubehead Cover Removal

To remove the Bottom X-ray Tube Arm (Tubehead) Cover, see the following figure.

1. Remove the Top Cover.
2. Loosen the six hex-head screws in the fastening brackets. See exploded view.
3. Position the brackets *inward toward the tubehead* to release the tabs that fasten the top cover.
4. Remove the two screws (outer) at the front of the Bottom Cover.
5. Remove the cover.
6. Remove the lower tubehead cover bracket.

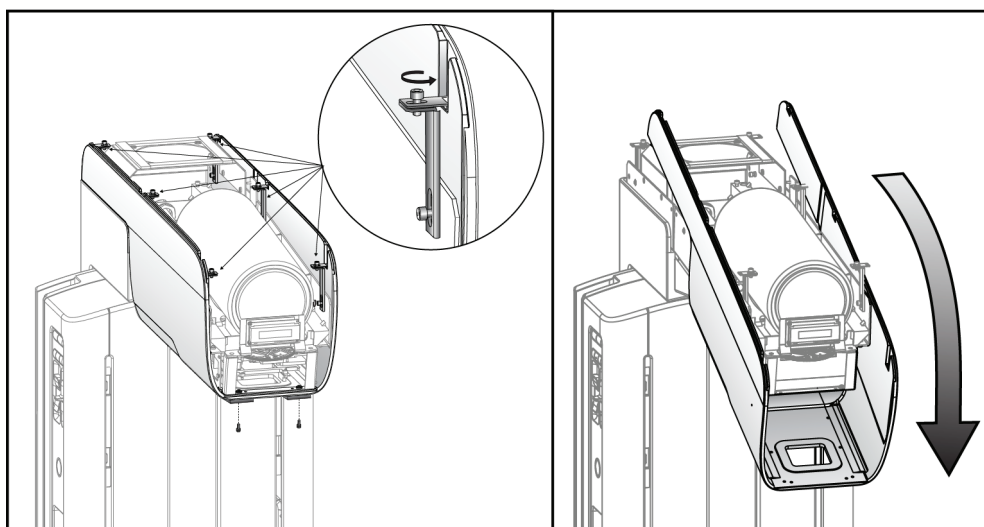


Figure 214: Bottom Tubehead Cover Removal



## C-Arm Housing Removal



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**Note**

An 8-inch 5/32 inch T-handle hex wrench with ball head is required for removing the inner cover of the C-Arm Housing.

---

1. Remove the X-ray Tube Arm (Tubehead) covers—refer to the [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 219, and [Bottom Tubehead Cover Removal](#) on page 220.
2. Remove the Breast Platform—refer to [Remove the Breast Platform and Image Receptor](#) on page 234.
3. Remove the Detector (IRSD)—refer to [Remove the Breast Platform and Image Receptor](#) on page 234.
4. Remove the Grid Assembly—refer to the topic [Remove the Breast Platform and Image Receptor](#) on page 234 .
5. Remove the upper and lower Compression Device covers—refer to the topic [Compression Device Covers](#) on page 222. (The Device is not shown for clarity.)
6. Using an 8-inch 5/32 inch T-handle hex wrench, loosen the two retaining screws from the inner cover—see the following figure.
7. Manually lower the Compression Device, and tilt the inner cover up and out being careful not to scrape the cover against the Compression Device displays.
8. Remove the six C-Arm Housing screws that fasten the housing to the C-arm frame. Be careful not to drop the screws. A magnetic bit would be helpful here.
9. Slide out the detail filler cover at the bottom of the C-Arm Housing.
10. Retract the C-Arm Housing approximately 2 inches, and disconnect the switch panel cables and ground connections.
11. Slide the C-Arm Housing forward gently to remove.



12. Reverse the above steps to install the C-Arm Housing. Be careful not to pinch the cables.

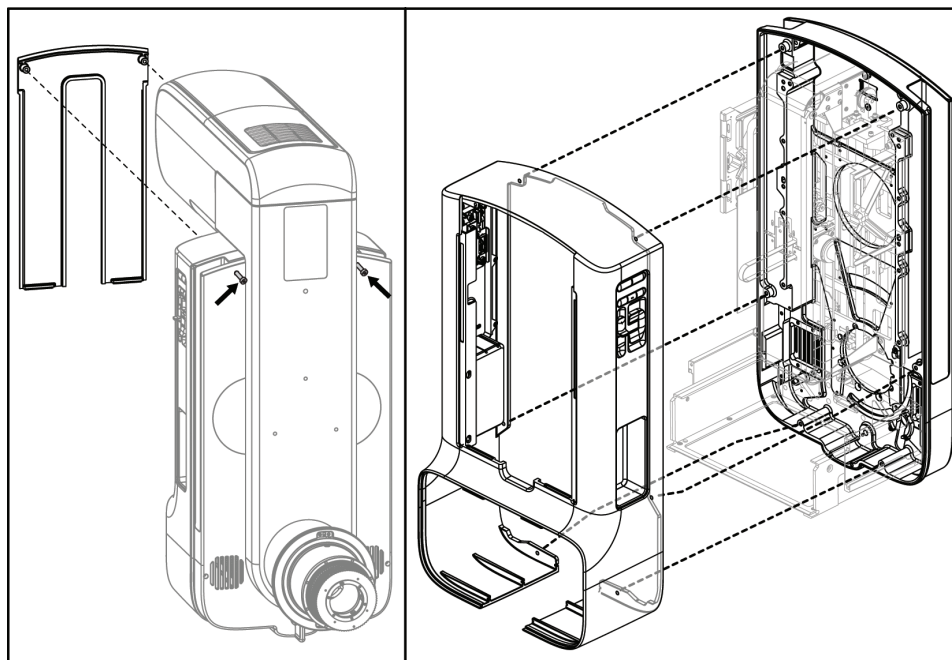


Figure 215: C-Arm Housing Removal

### Compression Device Covers

Access to the serviceable components are through the Upper and Lower Compression Device Covers (see the following figure).

To remove the upper and lower covers:

1. Manually raise the Compression Device to access the bottom cover.
2. Remove the two screws that fasten the bottom cover and remove (item 1).
3. Loosen, but do not remove, the two set screws (from the bottom) in each compression knob, and slide the knobs off the shaft (item 2).
4. Remove the four screws that fasten the top cover at the bottom of the Compression Device Interface Board mounting plate (item 3).



---

#### Note

When reassembling the Compression Device Knobs to the shafts ensure that the key on the knob fits into the key of the compression device.

---



5. Place a small amount of Loctite 222 (2-580-0525) to the (4) 8-32 x ¼ inch set screws. Align the set screws holes in the knobs to the dimples on the shafts. Assemble and tighten the set screws.

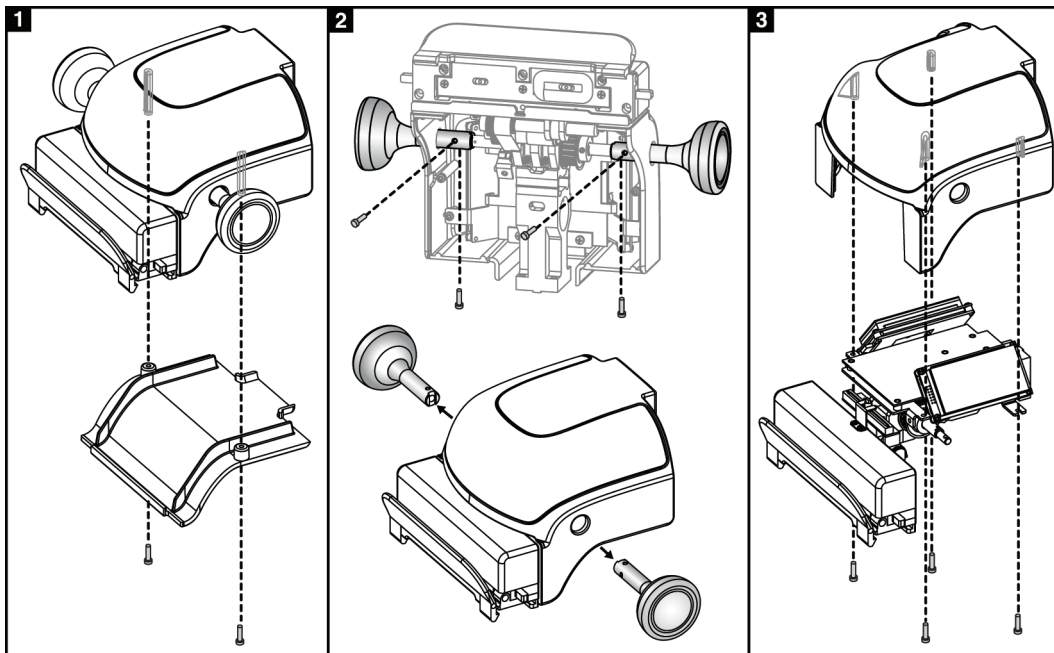


Figure 216: Compression Device Covers



#### C-Arm Compression Bellows Assembly—Removal

1. Remove the top X-ray Tube Arm (Tubehead) cover—see [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 219.
2. Remove the bottom tubehead cover—see [Top, Side, and Bottom Covers Removal](#) on page 216.
3. Remove the C-arm housings, breast platform, and grid assembly—see [C-Arm Housing Removal](#) on page 221.
4. Remove the external compression device—see [Remove the External Compression Device](#) on page 267.
5. Release the bellows metal straps from the top and bottom drive pins that fasten the bellows to the compression device front plate. See the following figure.
6. Remove the 3 upper (item 3) and 4 lower (item 2) screws from the bellows assembly.

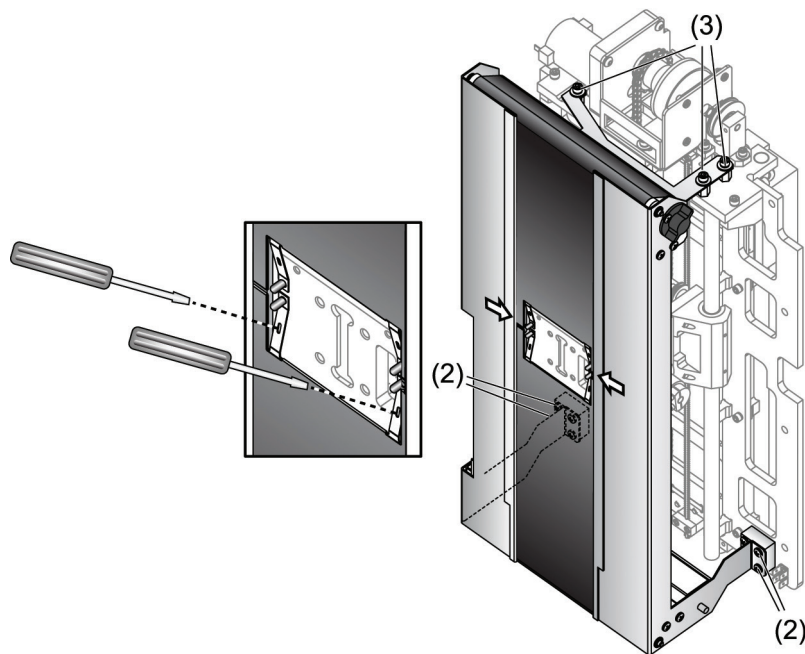


Figure 217: C-Arm Bellows Removal



**C-Arm Compression Bellows Assembly—Install**

1. Attach the lower bellows assembly with two screws in each block.
2. Attach the upper bellows assembly with three screws in the upper standoffs.
3. Attach the bellows metal straps to the top and bottom pins on the mounting block.

**Note**

Use two small 1/8-inch blade screwdrivers in the slots of the straps to install. DO NOT over extend the straps.

---

4. Make sure you can access the circuit harness and the gear belt at the front.
5. Verify clearance from the carriage components to the bellows track.
6. Replace the compression device.
7. Reverse the procedures described in [C-Arm Cover Removal](#) on page 219, and [C-arm](#) on page 227 to install the previously removed covers, the breast platform, and grid assembly.
8. Verify the Compression Force, and Compression Thickness from the Calibration Tool.



7.3 Component Identification

7.3.1 Gantry

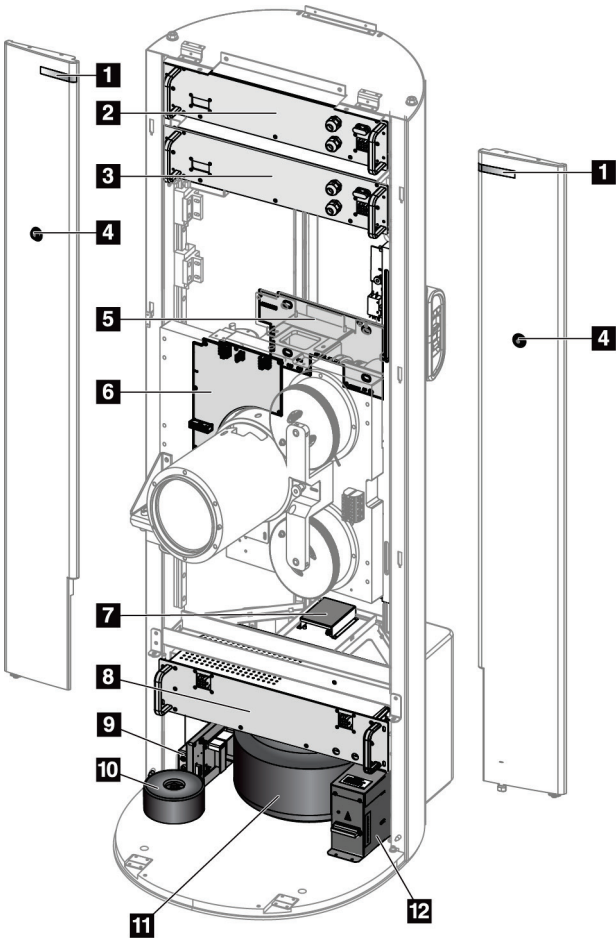


Figure 218: Gantry Component Location

Item	Section
1. Rotation Angle Display (2)	<a href="#">Rotation Angle Display Board(s)</a> on page 252
2. HV Multiplier Drawer	<a href="#">Remove the HV Multiplier Drawer</a> on page 236
3. HV Inverter Drawer	<a href="#">Remove the HV Multiplier and HV Inverter Drawers</a> on page 236
4. Emergency Off Switch (2)	<a href="#">Emergency Off Switch</a> on page 260
5. VTA Control Board	<a href="#">VTA Control Board</a> on page 253



Item	Section
6. VTA Drive Board	<a href="#">VTA Drive Board</a> on page 253
7. Gantry Service Port Board	<a href="#">Gantry Service Port Board</a> on page 252
8. Power Distribution Drawer	<a href="#">Power Distribution Drawer</a> on page 261
9. 24 V Power Supply and External User Indicator Boards	<a href="#">24 V Power Supply and External User Indicator Board</a> on page 263
10. Detector Isolation Transformer	<a href="#">Detector Isolation Transformer</a> on page 262
11. Isolation Transformer	<a href="#">Isolation Transformer</a> on page 261
12. Capacitor and Bridge	<a href="#">Capacitor and Bridge Assembly</a> on page 263

### 7.3.2 C-arm

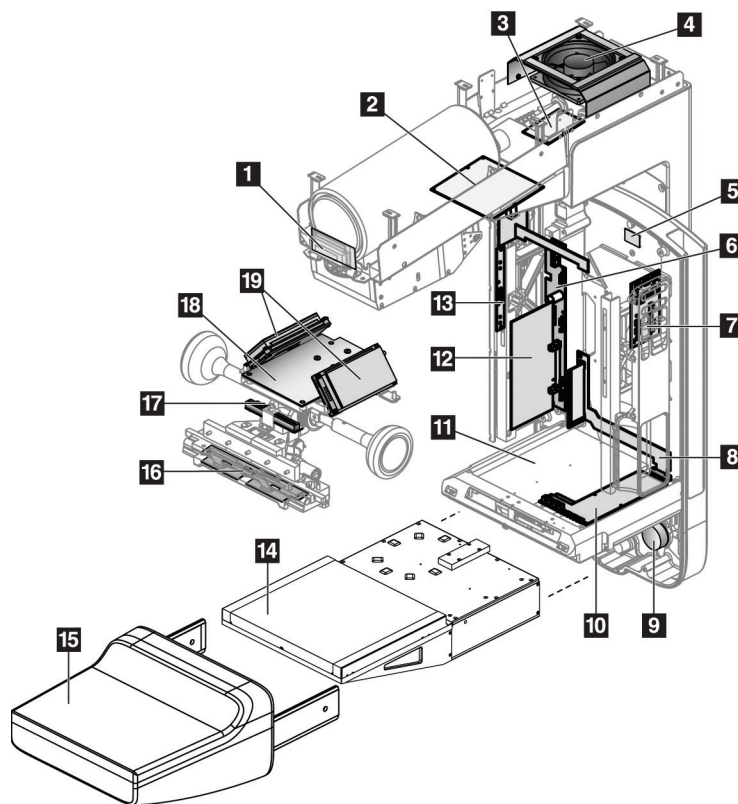


Figure 219: C-Arm Component Location

Item	Section
1. C-arm Angle Display Board	<a href="#">C-Arm Angle Display Board</a> on page 245
2. Tubehead Microprocessor Board	<a href="#">Tubehead Microprocessor Board</a> on page 245



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3. Filament Protect Board	<a href="#"><i>Filament Protect Board</i></a> on page 246
4. Tubehead Cooling Fan	<a href="#"><i>Tubehead Cooling Fan</i></a> on page 257
5. Zero Position Board (not visible)	<a href="#"><i>Zero Position Board</i></a> on page 254
6. C-arm Transition Board	<a href="#"><i>C-Arm Transition Board</i></a> on page 247
7. C-arm Switch Board (2)	<a href="#"><i>C-Arm Switch Boards</i></a> on page 247
8. Grid Transition Board	<a href="#"><i>Grid Transition Board</i></a> on page 249
9. Tomo Angle Pot (Tomosynthesis option)	<a href="#"><i>Tomo Angle Potentiometer (Tomosynthesis Option)</i></a> on page 255
10. Grid Interface Board	<a href="#"><i>Grid Interface Board</i></a> on page 249
11. Grid Assembly	<a href="#"><i>Install the Grid Assembly</i></a> on page 235
12. C-arm Board	<a href="#"><i>C-Arm Board</i></a> on page 249
13. Mag Sense Board	<a href="#"><i>Mag Sense Board</i></a> on page 249
14. Image Receptor	<a href="#"><i>Remove the Breast Platform and Image Receptor</i></a> on page 234
15. Breast Platform	<a href="#"><i>Remove the Breast Platform and Image Receptor</i></a> on page 234
16. RFID Board	<a href="#"><i>RFID (Radio Frequency Identification) Board</i></a> on page 251
17. Paddle Position Sensor Board	<a href="#"><i>Grid Transition Board</i></a> on page 249
18. Compression Device Interface Board	<a href="#"><i>Compression Device Interface Board</i></a> on page 250
19. Compression Displays	<a href="#"><i>Compression Device Display Boards</i></a> on page 249



### 7.3.3 Compression

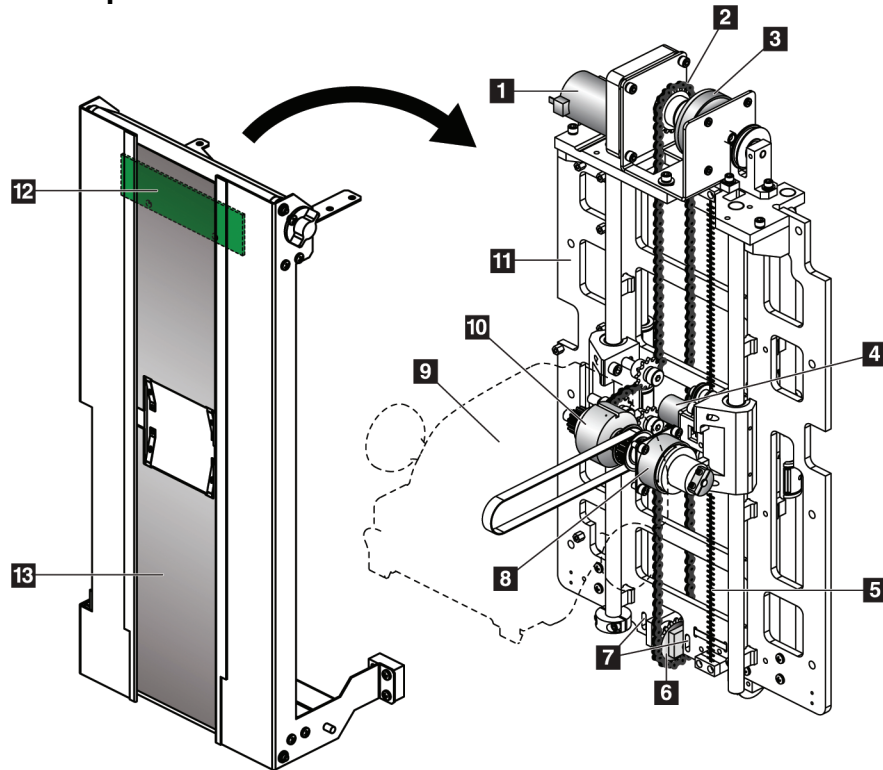


Figure 220: Compression System Components

Item	Section
1. Compression Motor	<a href="#">Compression Motor and Brake</a> on page 272
2. Compression Chain	<a href="#">Compression Chain Adjustment</a> on page 274
3. Compression Motor Brake	<a href="#">Compression Motor and Brake</a> on page 272
4. Compression Thickness Potentiometer	<a href="#">Compression Thickness Potentiometer</a> on page 271
5. Compression Thickness Timing Belt	<a href="#">Compression Timing Belt</a> on page 274
6. Chain Idler Gear	<a href="#">Compression Chain Adjustment</a> on page 274
7. Chain Adjustment Points	<a href="#">Compression Chain Adjustment</a> on page 274
8. Slip Clutch/Brake Magnet and Armature	<a href="#">Remove Slip Clutch, Brake and Armature, and Bi-Directional Brake</a> on page 270
9. External Compression Device	<a href="#">Remove the External Compression Device</a> on page 267
10. Bi Directional Brake	<a href="#">Remove Slip Clutch, Brake and Armature, and Bi-Directional Brake</a> on page 270
11. Internal Compression Device	<a href="#">Remove the Internal Compression Device</a> on page 269
12. Face Shield Sense Board	<a href="#">Face Shield Sense Board</a> on page 254
13. C-arm Bellows	<a href="#">C-Arm Compression Bellows Assembly—Removal</a> on page 224



**7.3.4 VTA and Rotation**

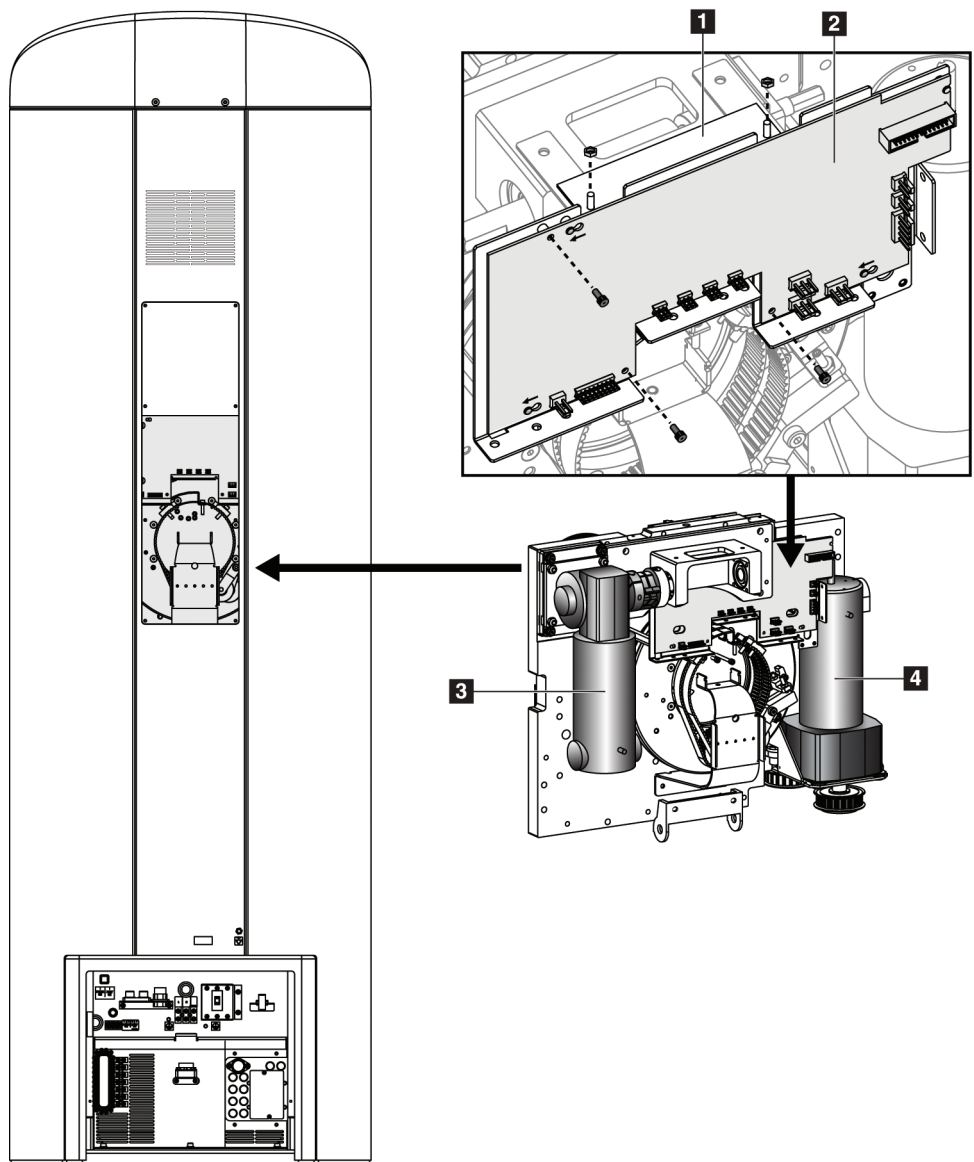


Figure 221: C-Arm Rotation and Vertical Travel Components

Item	Section
1. VTA Power Filter Board (not shown)	<a href="#">VTA Power Filter Board</a> on page 253
2. VTA Control Board	<a href="#">VTA Control Board</a> on page 253
3. C-Arm Rotation Drive Motor and Gearbox	<a href="#">C-Arm Rotation Drive Motor and Gear Box</a> on page 264
4. C-Arm Vertical Drive Motor and Gearbox	<a href="#">C-Arm Vertical Drive Motor</a> on page 266



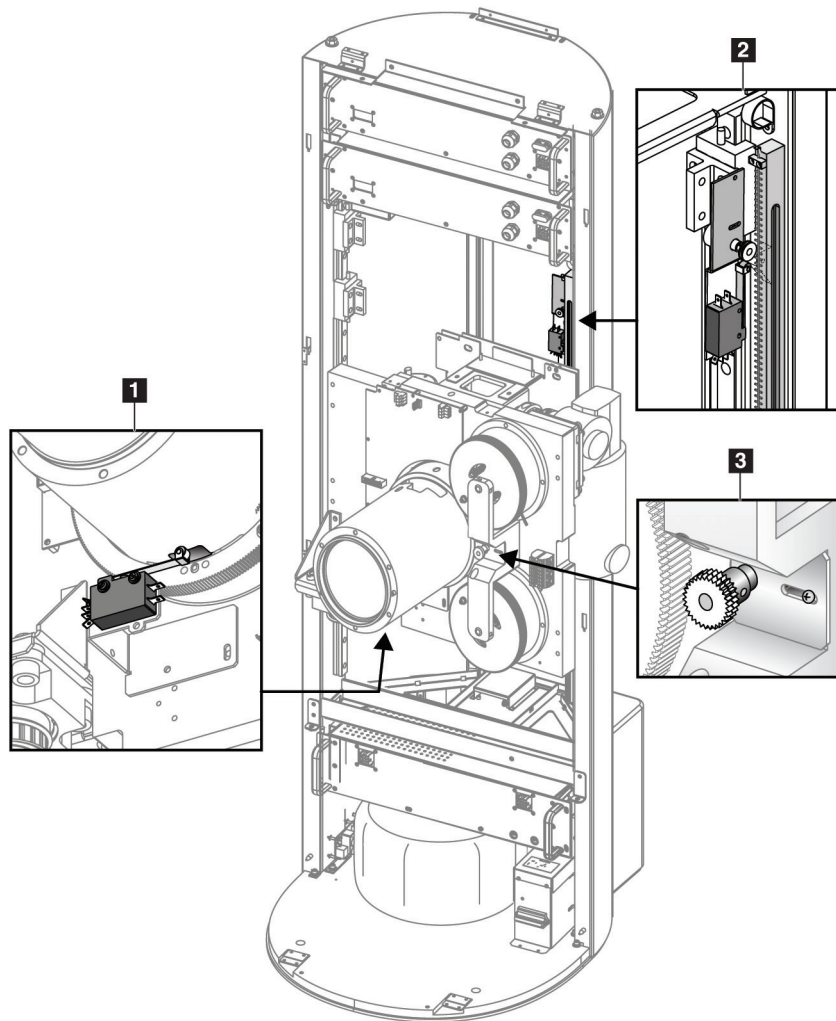
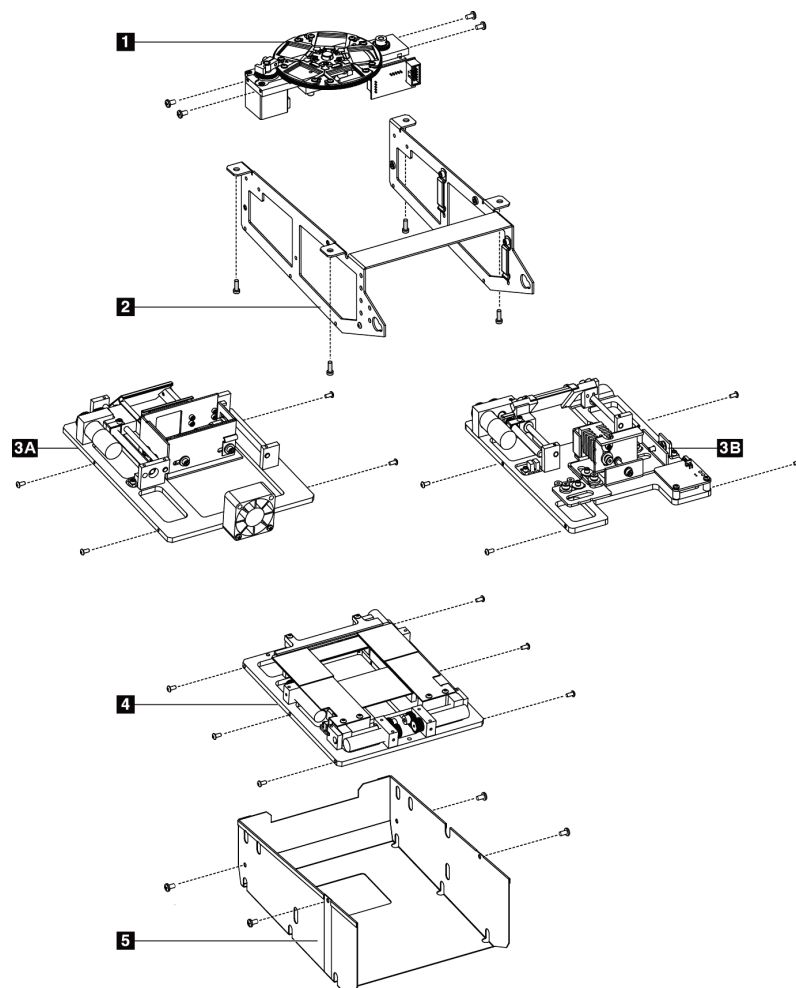


Figure 222: C-Arm Rotation and Vertical Travel Adjustments

Item	Section
1. C-Arm Rotation Limit Switch	<a href="#">C-Arm Rotation Limit Switch</a> on page 254
2. C-Arm Vertical Travel Limit Switch	<a href="#">C-Arm Vertical Travel Limit Switch</a> on page 254
3. C-Arm Rotation Limit Potentiometer	<a href="#">C-Arm Rotation Potentiometer</a> on page 255



#### 7.3.5 Beam Limiting Assembly



#### Figure Legend

- 1. Filter Wheel
- 2. Beam Limit Bracket
- 3A. Mirror Assembly
- 3B. LED Mirror Assembly
- 4. Collimator Assembly
- 5. Assembly Cover

*Figure 223: Beam Limiting Device*



## 7.4 Replace X-ray and Imaging Components

This section describes the replacement of x-ray and imaging components:

- Fiber Optic Cabling
- Image Receptor
- HV Multiplier Assembly
- HV Inverter Assembly
- Beam Limiting Assembly
- X-ray Tube

### 7.4.1 Fiber Optic Cabling

The Fiber Optic cable that connects the Gantry to the Acquisition Workstation goes to the bottom of the connector. The Fiber Optic cable from the Detector attaches to the top of the connector. At initial installation, remove the plastic protective covers from the connector.

#### Remove the Fiber Optic Cables

1. Remove the lower rear Gantry panel.
2. Remove the Acquisition Workstation (or Detector) Fiber Optic cable from the connector. See the following figure.

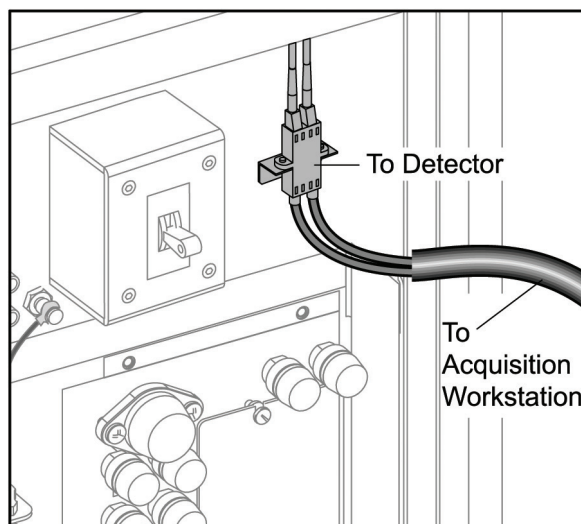


Figure 224: Fiber Optic Cable



#### 7.4.2 Remove the Breast Platform and Image Receptor

See the following figure.

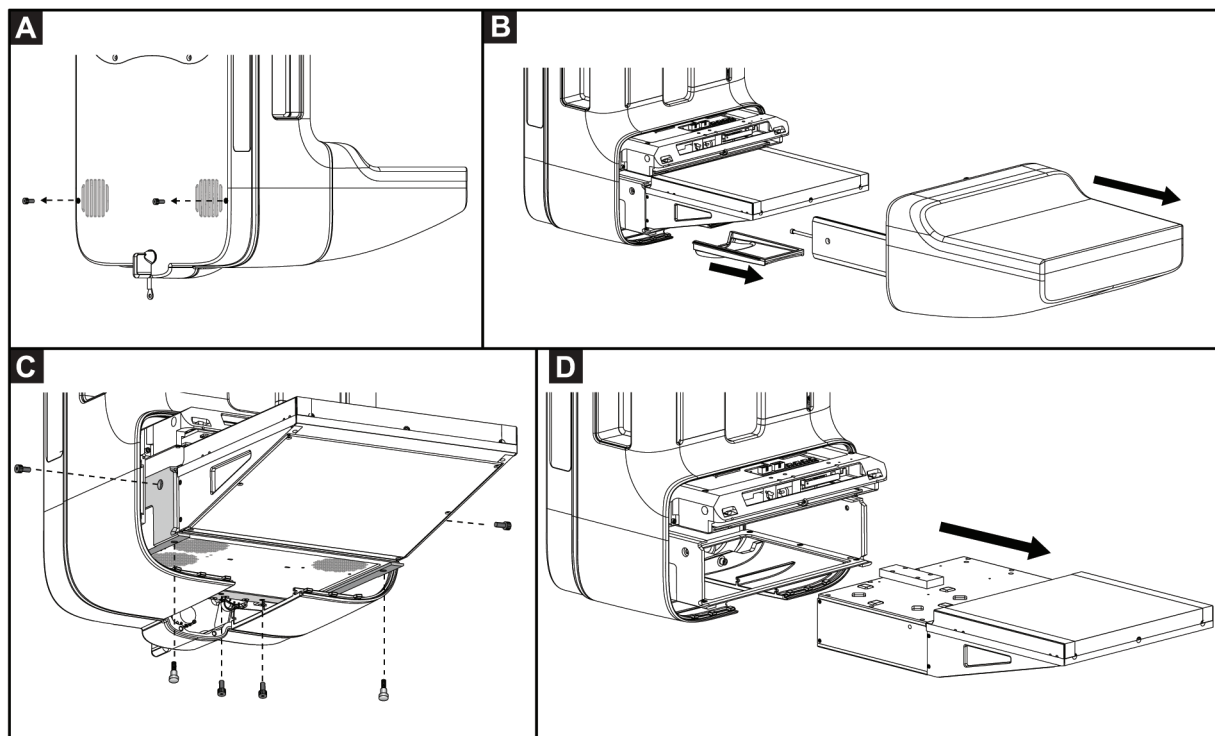


Figure 225: Breast platform and image receptor

1. Remove the two hex head screws at the rear of the C-arm that fasten the breast platform. Retain the hardware—**A**.
2. Slide the breast platform forward—**B**.
3. Slide the bottom detail insert at the rear of the C-arm forward—**B**.
4. Remove the two hex head screws in each side of the platform mount brackets—**C**.
5. Remove the two hex head screws at the bottom rear of the image receptor—**C**.
6. Remove the two shoulder bolts at the bottom front of the image receptor—**C**.
7. Remove the image receptor from the platform mount brackets—**D**.



### 7.4.3 Replace the Grid Assembly

#### Remove the Grid Assembly

1. Remove the Breast Platform; refer to [Remove the Breast Platform and Image Receptor](#) on page 234.
2. Remove the Image Receptor.
3. Loosen the two captive screws located at the lower front of the Grid Assembly. Refer to [Install the Grid Assembly](#) on page 235 item 1.
4. Slide the Grid Assembly forward and out.

#### Install the Grid Assembly

1. Slide the Grid Assembly into the frame until the Grid Assembly engages the ball plungers and connector at the rear.
2. Apply downward thumb pressure at the vertical arrows in the following figure, and tighten each captive screw on the Grid Assembly—item 1.
3. Install the Image Receptor.
4. Install the Breast Platform.

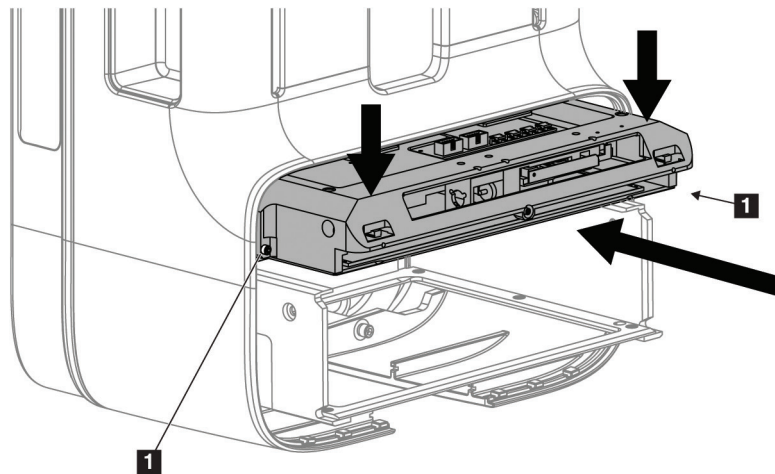


Figure 226: Install the Grid Assembly

5. Launch CalTool and run **Grid Calibration**.
6. In CalTool, run **AEC Scaling Calibration**.



#### 7.4.4 Remove the HV Multiplier and HV Inverter Drawers

To access the HV Multiplier and Inverter Drawers, remove the Gantry covers and Bellows—refer to [Gantry Cover Removal](#) on page 216.

##### Remove the HV Multiplier Drawer

1. Apply power, lower and rotate the C-arm to expose the two drawers.
2. After the C-arm is in a good spot to access the multiplier, turn off power to the gantry.



---

##### Note

Wait at least 5 minutes after turning off power to the Gantry before disconnecting the cables from the front of the drawer.

---

3. Disconnect the cables from the front of the drawer.
4. Remove the screws from the corners of the drawer.
5. Slide the drawer out.

##### Remove the HV Inverter Drawer

Follow the procedure for removal of the HV Multiplier Drawer.

#### 7.4.5 Remove the Image Receptor Cooling Fans

1. Remove the Image Receptor—see [Remove the Breast Platform and Image Receptor](#) on page 234.
2. Remove the grid tray:
  - Remove the six hex-head screws in the center of the frame
  - Pull out the grid tray
3. Unplug the fan(s), and remove the four screws that fasten the fan(s).



### 7.4.6 Beam Limiting Assembly - Replacement

See [Beam Limiting Assembly](#) on page 232 for reference.



---

**Warning:**

**The Beam Limiting Assembly contains lead. Return the replaced assembly to Hologic for proper disposal.**

---

The following procedures explain removal of the Beam Limiting Assembly.

1. Remove the top and bottom tubehead covers. See figure [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 219, and figure [Bottom X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 220.
2. Remove the four screws that fasten the Beam Limit Bracket to the X-ray Tube Arm (Tubehead) frame.
3. Tilt the Beam Limit Bracket downward for servicing.



---

**Note**

To remove the assembly for complete servicing, continue with the following steps:

---

4. Noting each cable position and orientation, disconnect all cables from the Beam Limiting Device.
5. Move the Beam Limit assembly slightly backward to disengage the assembly from the holding studs and gently remove the assembly from the X-ray Tube Arm (Tubehead) cradle.
6. Remove the Beam Limit Assembly cover.
7. Remove the two screws on each side of the filter wheel frame.
8. Carefully remove filter wheel assembly and set aside.
9. Remove the four small hex screws that fasten the Mirror Assembly to the Beam Limit Bracket.
10. Carefully remove the Mirror Assembly and set aside.
11. Remove the hardware that fastens the Collimator Assembly to the Beam Limit Bracket.
12. Carefully remove the Collimator Assembly and set it aside. Use care not to damage the lead on the collimator blades.
13. Reverse the steps to install the replacements, noting the following: When mounting the Mirror Assembly to the Beam Limit Bracket, it must be parallel to the bracket to avoid binding or interference. Preload the mirror assembly up and then tighten the four screws. During this process, use care not to damage the lead on the collimator blades.



14. Using the Calibration Tool, perform the X-Ray and Light Field Alignment.

If the correct calibration instructions are not appearing, reset the THD module:

- a. Go to the Advanced Form in CalTool.
- b. Click the "THD" link in the "Nodes" list on the left side of the screen.
- c. Click the "Module Reset" button in the pop-up window that appears.
- d. Close the pop-up window.

When the module is finished resetting, the THD Status and State in the Nodes list displays "Ready".

#### 7.4.7 X-ray Tube Maintenance

##### Equipment Required

*Table 7: Equipment Required for X-ray Tube Maintenance*

No.	Name	Part Number	Notes
1	Tube Alignment, Upper	TLS-00804	
2	Tube Alignment, Lower	TLS-00803	
3	Acrylic Block (Gain Calibration)	3-605-1876	Block and Case ASY-01621



##### Note

This procedure requires that the array be mounted to the Gantry, and that the appropriate defect map files are present. The C-arm and Tomo arm angle must also be calibrated. The detector cradle must be aligned with the C-arm using the alignment dowel if it has not been aligned.

##### Preparation

1. Rotate the C-arm to zero degrees if it is not already at that position.
2. Lower the c-arm to a workable height so you will be able to work on the upper portion of the tube head where the x-ray tube is installed and the lower portion where the beam limiting assembly resides.



##### WARNING!

**Ensure that system power is Off and the Gantry circuit breaker is in the Off position.**

---



3. Remove the upper and lower tube head covers; see figure [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 219 and figure [Bottom X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 220 so you can gain access to the x-ray tube and the beam limiting assembly.
4. Remove the lower cover mounting bracket located in front of the beam limiting assembly by removing the two cap head Allen screws. (See item 1 in the following figure.)
5. Next, unplug the tube head display and remove the display assembly (See item 2 in the following figure.)

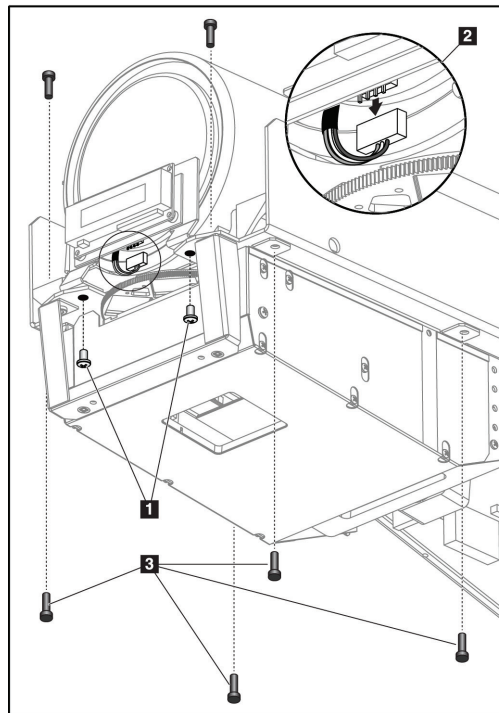


Figure 227: Lower Cover Mounting Bracket Removal and Display Connection

6. Mark the location of the beam limiting assembly against the tube head cradle assembly using a pencil (This will aid in alignment when reinstalling the beam limiting assembly). Remove the 4 cap head Allen screws that retain the beam limiting assembly to the tube head (See item 3 in the previous figure).



7. Lower the Collimator and allow it to hang vertically as shown in item 1 in the following figure.

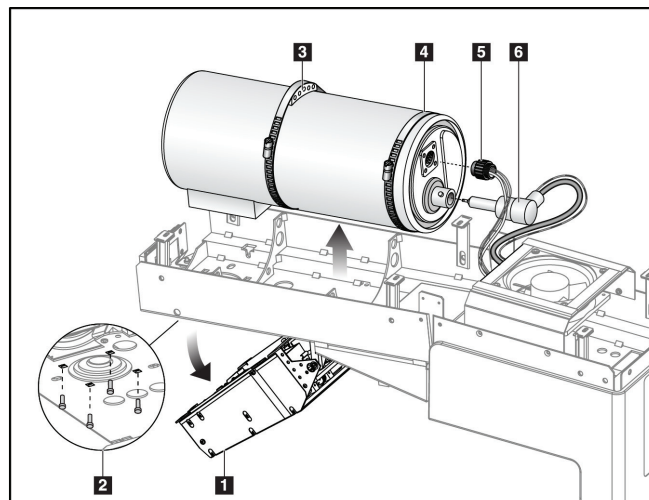


Figure 228: X-ray Tube, Beam Limiting Assembly

### Removal and Replacement of the X-ray Tube

1. Disconnect the connections from the back of the x-ray tube. (See item 5 and item 6 in the previous figure.)
2. Remove the x-ray tube thermal sensor and the clamp from the x-ray tube so it can be installed on the replacement x-ray tube. (See item 3 in the previous figure.)
3. Remove the 4 tube mounting screws; item 2 and tube retention strap item 4 in the previous figure.
4. Remove the old X-ray tube from the unit and install the replacement x-ray tube.
  - a. Transfer the adjustment bracket from the old x-ray tube to the new x-ray tube.
  - b. Reinstall the rear 2 cap head Allen screws previously removed from around the x-ray port. **DO NOT TIGHTEN** the screws; leave them loose for adjusting the x-ray tube. Do not install the front 2 front cap head Allen screws or damage may occur to the filter wheel assembly.
  - c. Reconnect the connections to the rear of the x-ray tube. Be sure that there is sufficient HV grease applied to the HV connection so arcing will not occur (refer to Tech Bulletin TB-00661).
  - d. Install the thermal temperature sensor and retention strap onto the replacement x-ray tube.
5. Reposition the beam limiting assembly and secure it in place to the tube cradle with the 4 screws previously removed. Leave the tube head cover mounting bracket and display unplugged. The beam limiting assembly is removed again after final adjustments have been made.



6. Move the tube to full forward position and all the way to the left position using the side and front adjustment screws. (See the following figure.)

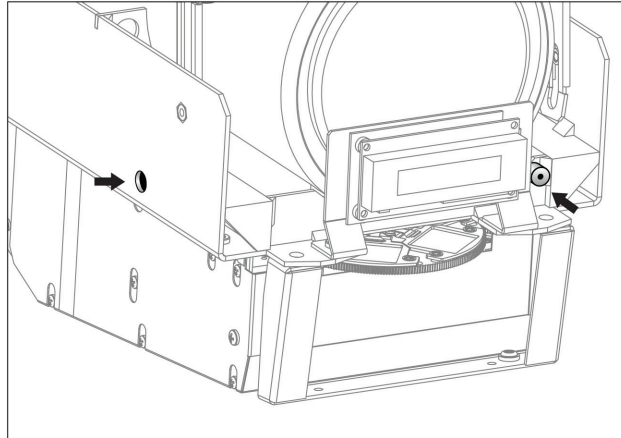


Figure 229: Alignment Adjustment Screws

### Installation of the Alignment Templates (TLS-00804 and TLS-00803)

1. Place the Gantry circuit breaker in the On position, and the system power On.
2. Confirm tomosynthesis zero calibration and adjust as needed. This step creates a perpendicular x-ray beam for tube alignment.
3. Place the TLS-00804 (Upper alignment template) on the breast platform and Install the TLS-00803 (Lower alignment template) into the compression device as shown in the following figure.

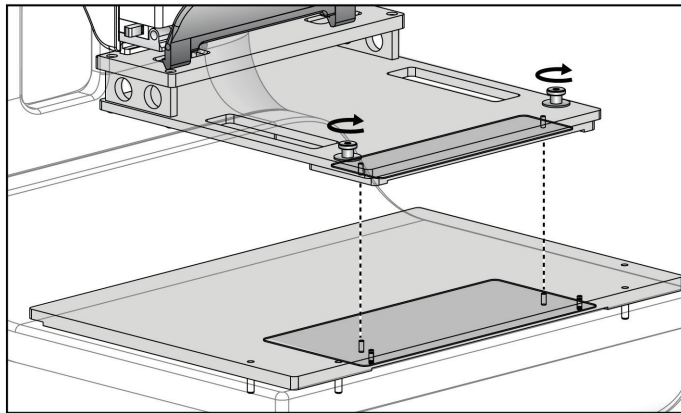


Figure 230: X-ray Alignment Templates and Pin Alignment

4. Loosen the two thumb screws on the upper alignment template.
5. Assure that the locator pins (two at the front , one on the left, and one on the right ) associated with the lower alignment template are all mounted squarely to their respective edges of the breast platform.
6. Lower the upper alignment template onto the lower alignment template, aligning the two dowel pins of the upper template into the holes of the lower template.
7. Tighten the two thumb screws once the alignment is complete.



- 8. Raise the compression device and temporarily remove the lower template from the breast platform.
- 9. Raise compression device so that the height measured from the surface of the breast platform to the lower most portion of upper template measures 13.25 inches.
- 10. Replace the lower template (TLS-00803) onto the breast platform and assure that the locator pins (two on the front , one on the left, one on the right) associated with the lower template are all mounted squarely to their respective edges of the breast platform. Place the acrylic block (item 1 in the following figure) on top of the lower alignment template.

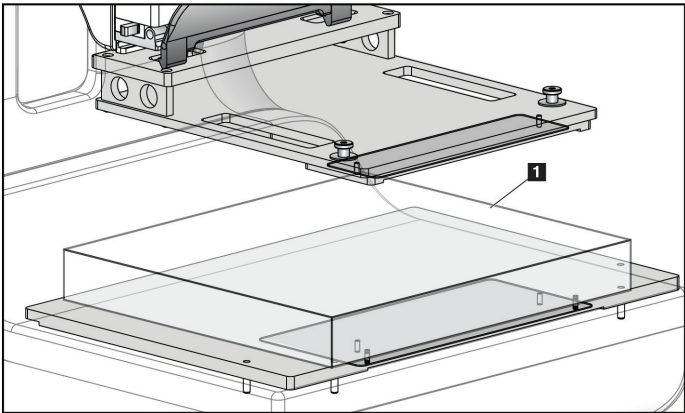


Figure 231: Acrylic Block on Top of the Lower Template

Adjusting the X-ray Tube

- 1. Launch Caltool and click on the "Advanced" menu and select the "Technique " tab. Configure the Exposure Techniques as indicated in the table below:

Modality	Mode	Filter	Kv	mA	mAs	Grid	FS
Conventional	MAN	1	30	140	160	Out	Large

- 2. In the "Image tools" tab, click on the "Click to Arm" button and take an exposure by pressing the x-ray switches.



3. Once the exposure has been acquired it should be visible on the monitor. The image is oriented with the chest wall at the right hand side. An example of indications from Vernier scales and direction is shown in the following figure (the image has been rotated in the example). **You will be not be able to rotate the image in Caltool.**

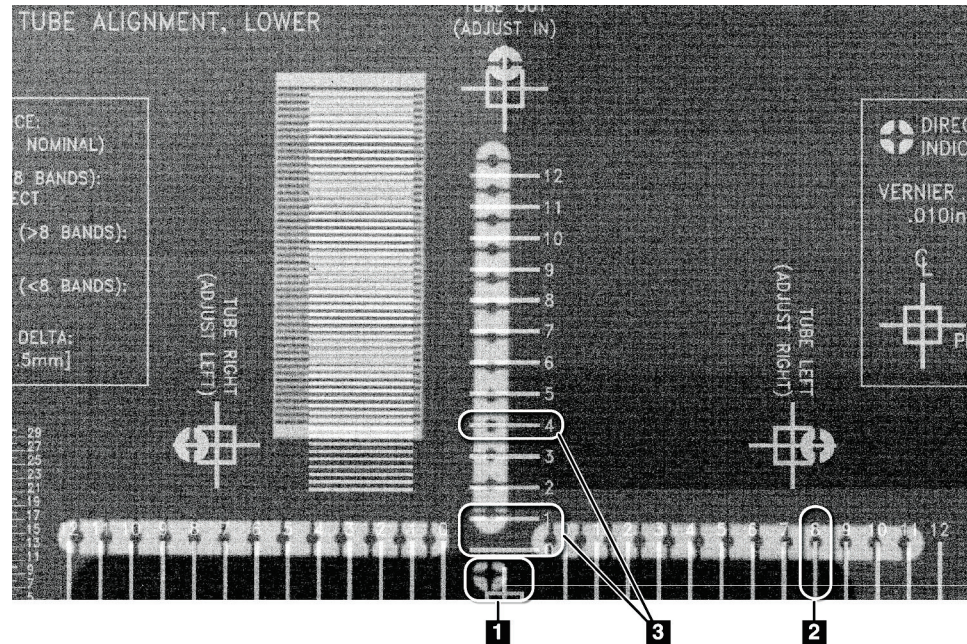


Figure 232: Exposure Example Showing the Vernier Scale

- The direction indicator shows the tube is out or forward and to the right (#1 in the previous figure).
  - The direction indicator also shows the tube X axis is off by .08 to the right by less than .11 (marker aligns between 7 and 9) — item 2 in the image above.
  - The Y axis is out greater than .11 Y adjustment would be  $.04 + .10 = .14$  inches (marker between 0 and 1 is off the scale and marker aligns between 3 and 5) — item 3 in the previous figure.
4. Make adjustments to the tube alignment using the X and Y (refer to figure [Alignment Adjustment Screws](#) on page 241) axis adjustment screws so the tube alignment is less than .11 inches and take new exposures to confirm tube locations. Readjust and perform exposures as needed to get the markers to align at zero.
  5. Once the Tube has been aligned, power off the gantry and lower the beam limiting assembly by removing the 4 Allen head screws.
  6. Install the 2 front cap head screws and carefully tighten the tube head mounting bolts, being careful not to move the tube.
  7. Once the tube mounting bolts have been tightened, tighten the rear mounting strap.
  8. Reposition the beam limiting assembly and secure it in place to the tube cradle.
  9. Secure the bottom cover mounting bracket and plug the tube head display back in.



10. Power on the system and perform one last exposure to verify that the tube is aligned properly after tightening the retention bolts and strap. The alignment should be less than .11 inches in both the x and y direction, .11 inches is the maximum allowed and calibration should exceed this specification and be aligned as best as possible to get the markers to align at zero.
11. Remove the acrylic block from the breast platform and the upper and lower alignment templates.
12. Reattach and secure the upper and lower tube head covers.

### Calibration



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#### Note

The small focal spot is not available on the 2D screening system.

---

1. Perform the following calibrations and adjustments:
  - a. Reset the exposure counter by launching Caltool, and clicking on the "Advanced" menu.
  - b. Click on the "GEN" tab. Then click the "CLR" button next to "Exposure Count"—Caltool.
  - c. Tube Warm-up —Caltool (If your Caltool version does not have the procedure acquire several 28kV, 200mAs, Rhodium filter, Large focal spot exposures)
  - d. Generator kV—Caltool.
  - e. mA Calibration—Caltool.
  - f. Filament Calibration Large and Small Focal spot—Caltool.
  - g. X-ray Field Large Focal Spot and Small Focal Spot—Caltool.
  - h. Light Field Alignment—Caltool.
  - i. Half Value Layer (HVL) adjustment—Caltool or spreadsheet.
  - j. Gain Calibration in the Acquisition Workstation application
  - k. Dark offset—Caltool.
  - l. Goaltab Generation—Caltool.
  - m. Goaltab Scale—Caltool.
  - n. Goaltab Scale mag—Caltool.
  - o. If the Unit is equipped with an Affirm™ breast biopsy guidance system, the Geometry calibration and STX calibration will need to be re-performed in the Acquisition Workstation application.
2. Evaluate the systems operation, AEC performance, Dosage, Exposure index of the system and schedule for physicist review.



## 7.5 Replacing Circuit Boards and Circuit Components



### Note

The correct CAN software should be installed on the boards for the version of software installed on the computer.

### 7.5.1 Introduction

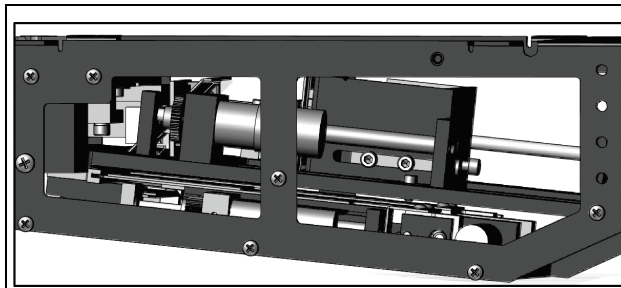
The procedures in this Section require removal of covers or panels to gain access to circuit boards.

### 7.5.2 C-Arm Angle Display Board

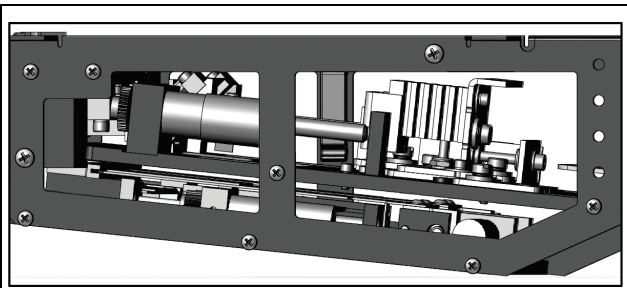
1. Remove the cable.
2. Remove the screws.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests" in the *User Guide*.

### 7.5.3 Tubehead Microprocessor Board

1. Apply power and raise the C-arm to access the Tubehead Microprocessor Board.
2. Remove power.
3. Note the cable locations and remove all cables.
4. Remove the screws that fasten the board to the x-ray tube assembly frame.
5. Remove the board.
6. Reverse the procedure to install the replacement board.
7. Look inside beam limit assembly and determine which version of the mirror assembly is installed. (See the following figure.)



Halogen Bulb Mirror Assembly



LED Mirror Assembly

Figure 233: Beam Limit Assembly Side View



8. If the Halogen Bulb Mirror Assembly is installed, ensure that dip switch S1-4 on new board is switched OFF. (See the following figure, left.) If LED Mirror Assembly is installed, ensure that dip switch S1-4 on new board is switched ON. (See the following figure, right.)

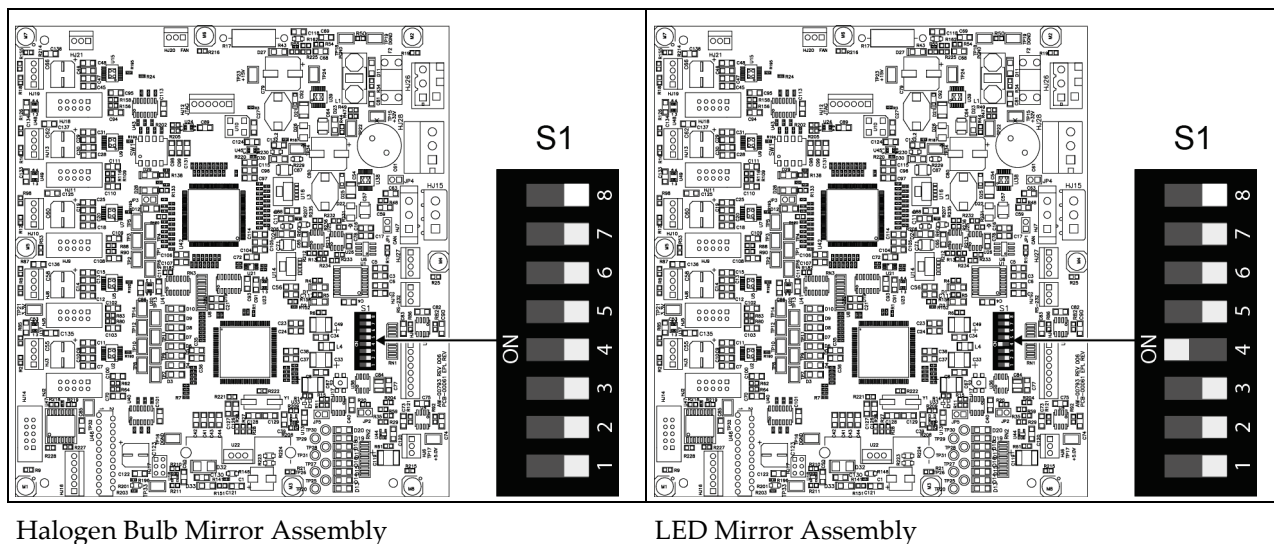


Figure 234: PCB-00061 Dip Switch S1-4 Configuration

9. Complete "Perform the Functional Tests" in the *User Guide*.

#### 7.5.4 Filament Protect Board

1. Lower the C-arm to access the board.
2. Remove the fan and bracket assembly to access board.
3. Note the cable locations and remove all cables.
4. Remove the screws that fasten the board.
5. Remove the board.
6. Reverse the procedure to install the replacement board.
7. Complete "Perform the Functional Tests" in the *User Guide*.



### **7.5.5 C-Arm Transition Board**

1. Note the cable locations and remove them.
2. Remove the screws that fasten the board to the frame.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests" in the *User Guide* before returning the system to service.

### **7.5.6 C-Arm Switch Boards**

1. Remove the Breast Platform and detector—see [Remove the Breast Platform and Image Receptor](#) on page 234.
2. Remove the Tubehead covers—see figure [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 219, and figure [Bottom X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 220.
3. Remove the C-Arm Compression covers—see [Compression Device Covers](#) on page 222.
4. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 221.
5. Note the cable locations and ground wires, and remove them.
6. Carefully slide the C-Arm Housing forward.
7. Place the Housing, switch panel down on a soft cloth.
8. Remove the screws that fasten the circuit board. Be careful to make sure that the switch springs do not eject.
9. Remove the board.
10. Reverse the procedure to install the replacement board(s).
11. Complete "Perform the Functional Tests" in the *User Guide* before returning the system to service.

### **7.5.7 Gantry C-Arm Switch Assemblies**

1. Lower the C-arm to its lowest vertical position.
2. Remove system power.
3. Remove the Gantry bellow covers and front covers (see [Remove Gantry Covers and Bellows](#) on page 216).
4. Inside the Gantry, locate the appropriate left or right C-arm switch assembly and note the cable locations.



5. Unfasten the five screws mounting the assembly to the inside of the Gantry.

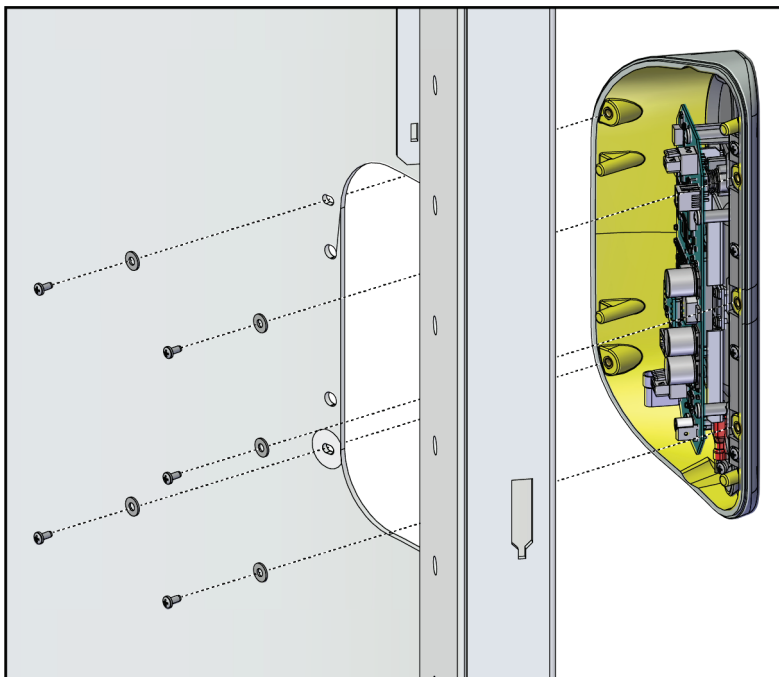


Figure 235: Mounting of C-Arm switch assembly (right side)

6. Unfasten the p-clamp and the ground cable for the switch assembly inside the Gantry. Let the switch assembly hang loosely outside of the Gantry.
7. While outside the Gantry and holding the switch assembly, detach the cables and remove the switch assembly.
8. While holding the new switch assembly outside of the Gantry, re-attach the cables and let the assembly dangle.
9. Inside the Gantry, bring in close the new switch assembly to the Gantry and fasten the p-clamp and the ground cable to the Gantry inside frame.
10. Fasten the five mounting screws inside the Gantry.
11. Reinstall the Gantry bellow covers and front covers.
12. Power up the system.
13. Complete "Perform the Functional Tests" in the *User Guide*.



### 7.5.8 Grid Transition Board

1. Remove the External and Internal Compression Device—see [Remove the External Compression Device](#) on page 267, and [Remove the Internal Compression Device](#) on page 269.
2. Note the connector locations and remove them.
3. Remove the screws that fasten the board.

### 7.5.9 Grid Interface Board

1. Remove the Breast Platform—see [Remove the Breast Platform and Image Receptor](#) on page 234.
2. Remove the Image Receptor—see [Remove the Breast Platform and Image Receptor](#) on page 234.
3. Note the cable locations and remove them.
4. Remove the Grid Assembly—see [Replace the Grid Assembly](#) on page 235.
5. Remove the screws that fasten the Grid Interface Board to the Grid Assembly.

### 7.5.10 C-Arm Board

1. Remove the screws that fasten the board to the C-Arm Transition Board connector.
2. Pull board from the C-Arm Transition Board connector.
3. Reverse the procedure to install the replacement board(s).
4. Complete "Perform the Functional Tests" in the *User Guide* before returning the system to service.

### 7.5.11 Mag Sense Board

1. Remove the cable.
2. Remove the screws.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests" in the *User Guide*.

### 7.5.12 Compression Device Display Boards

1. Remove the Compression Device Covers—see figure [Compression Device Covers](#) on page 223.
2. Cut the cable tie, and unplug the harness to the display board.
3. Remove the four screws at the corners of the display(s).
4. Reverse the procedure to install the replacement board(s).
5. Complete "Perform the Functional Tests" in the *User Guide* before returning the system to service.



#### 7.5.13 Compression Device Interface Board

1. Remove the Compression Device Covers—see figure [Compression Device Covers](#) on page 223 .
2. Note the cable locations and remove them.
3. Remove the three screws at the top of the board. Remove the bracket and attached board.
4. Remove the bracket.
5. Remove the screws and the integral washers from the underside of the bracket.
6. Remove the board.
7. Reverse the procedure to install the replacement board.
8. Complete "Perform the Functional Tests" in the *User Guide* before returning the system to service.

#### 7.5.14 Paddle Position Sensor Board

1. Remove the Compression Device covers. See figure [Compression Device Covers](#) on page 223.
2. Remove the cable from the Paddle Position Sensor Board.
3. Remove the two socket head screws that fasten the board.
4. Slide the board out through the optical interrupter switches.
5. Reverse the procedure to install the replacement board.
6. Complete "Perform the Functional Tests" in the *User Guide*.



### 7.5.15 RFID (Radio Frequency Identification) Board

The first part of the procedure describes the removal of the FAST Paddle Assembly; the second part describes the removal of the RFID Board. See the following figure and the figure [FAST Paddle Assembly](#) on page 252 .

#### FAST Paddle Assembly Removal

1. Cut the cable ties and unplug all cables from the Compression Device Interface Board.
2. Remove two socket head screws that fasten the motor mount to the drive block. See the following figure, item 1.
3. Remove five socket head screws from bottom of FAST Paddle Assembly, item 2.
4. Remove the FAST Paddle Assembly.

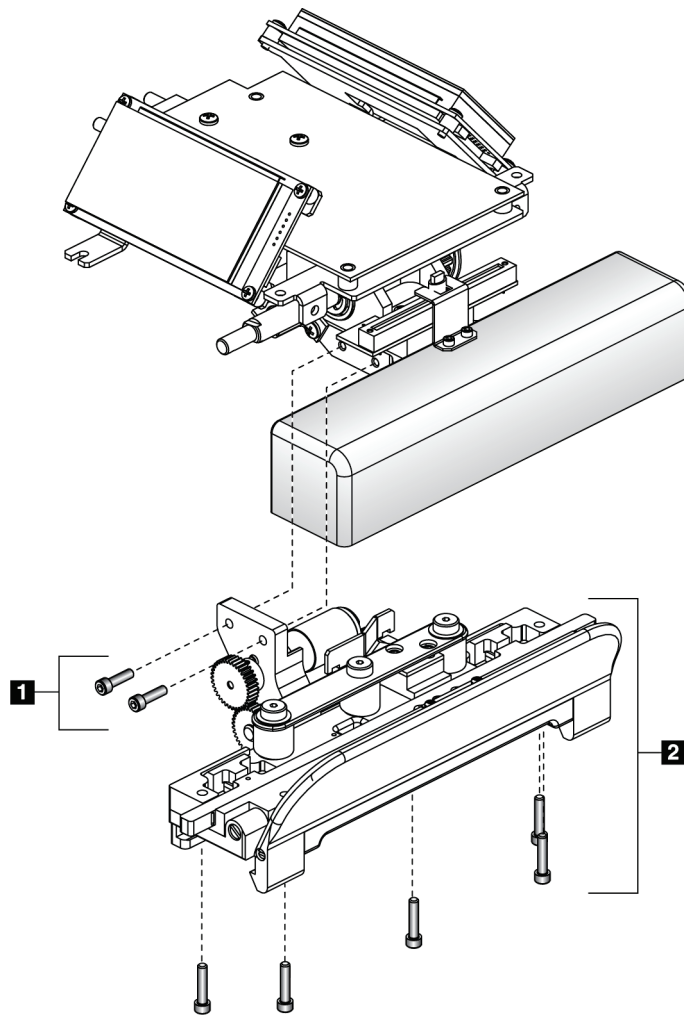


Figure 236: FAST Paddle Assembly



#### RFID Board Removal

1. From the bottom of the FAST Paddle Assembly, remove the three flat-head screws that fasten the RFID Board.
2. Remove the cable ties that fasten the RFID from the wire retainer bracket.
3. Remove the slide release bar (purple bar) by sliding out either side.
4. Remove the board and cable through the opening of the mount.
5. Reverse the procedure to install the replacement board(s).
6. Complete "Perform the Functional Tests" in the *User Guide*.

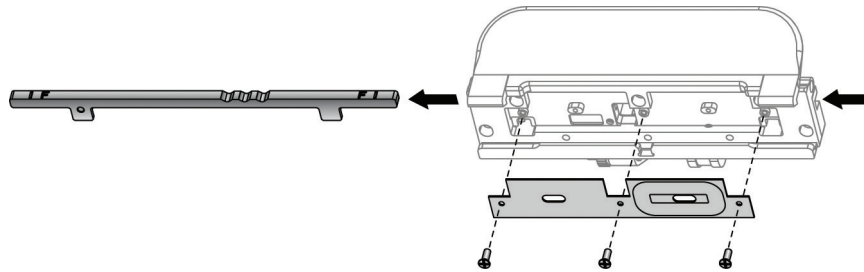


Figure 237: RFID Board

#### 7.5.16 Rotation Angle Display Board(s)

1. Remove the Gantry side covers—see [Remove Gantry Covers and Bellows](#) on page 216.
2. Note the cable locations and remove them.
3. Remove the screws that fasten the board(s).
4. Remove the board(s).
5. Reverse the procedure to install the replacement board(s).
6. Complete "Perform the Functional Tests" in the *User Guide*.

#### 7.5.17 Gantry Service Port Board

Allows Service Engineers to set up and troubleshoot the system through the 9-pin serial jack attached to the board and located at the rear of the Gantry.

1. Raise the C-arm.
2. Remove power.
3. Remove the four screws and connectors from the Gantry Service Port Board.
4. Remove the board from the front.
5. Reverse the procedure to install the replacement board.
6. Complete "Perform the Functional Tests" in the *User Guide*.



### **7.5.18 VTA Power Filter Board**

1. Note the cable locations and remove them.
2. Remove the two nuts that fasten the board.
3. Remove the board.
4. Reverse the procedure to install the replacement board(s).
5. Complete "Perform the Functional Tests" in the *User Guide*.

### **7.5.19 VTA Control Board**

See figure [C-Arm Rotation and Vertical Travel Components](#) on page 230 .

1. Remove the rear panel.
2. Manually raise the C-arm to access the VTA Control Board.
3. Remove the power.
4. Note the cable locations and remove them.
5. Remove the three screws from the board.
6. Remove the board:
  - a. Slide the board to the left along the elongated holes in the board, and remove.
  - b. Record the DIP switch positions on the board to transfer to the replacement board.
7. Install the replacement board:
  - a. Reverse the procedure to install the replacement board.
  - b. Set the DIP switches to the positions recorded in step 6b.
8. Turn Gantry power on and adjust circuit board voltage.
  - a. Use a DVM to measure and adjust voltage on TP29 (ref TP4 gnd).
  - b. Adjust potentiometer R3 for a voltage of +21.7 vdc.
9. Complete "Perform the Functional Tests" in the *User Guide* before returning the system to service.

### **7.5.20 VTA Drive Board**

See figure [C-Arm Rotation and Vertical Travel Components](#) on page 230.

1. Note the cable locations and remove them.
2. Remove the screws that fasten the board to the frame.
3. Remove the board.
4. Reverse the procedure to install the replacement board.
5. Complete "Perform the Functional Tests" in the *User Guide* before returning the system to service.



#### 7.5.21 Zero Position Board

1. Remove the External and Internal Compression Device—see [Remove the External Compression Device](#) on page 267, and [Remove the Internal Compression Device](#) on page 269.
2. Move the black plastic protective guard to expose the board.
3. Remove the connector on the board.
4. Loosen the clamp screw.
5. Remove board.

#### 7.5.22 Face Shield Sense Board

See figure [Compression System Components](#) on page 229 for location of the board.

1. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 221.
2. Remove the two screws that fasten the board to the frame.
3. Unplug the board harness from the Face Shield Sense Board.

#### 7.5.23 C-Arm Vertical Travel Limit Switch

1. Locate the Vertical Travel Limit Switch in figure [C-Arm Vertical Travel Limit Switch](#) on page 231 item 2.
2. Remove the three screws holding the switch to its bracket.
3. Noting their location, remove the wires from the switch.
4. Mount the new switch to the bracket.
5. Verify operation of the C-arm.

#### 7.5.24 C-Arm Rotation Limit Switch

1. Locate the C-Arm Rotation Limit Switch in figure [C-Arm Rotation Limit Switch](#) on page 231 item 1.
2. Remove the two screws holding the switch to its bracket.
3. Note the wires from the switch and remove them.
4. Mount the new switch to the bracket; do not tighten.
5. Adjust the C-Arm Rotation Limit Switch.

#### 7.5.25 Auxiliary C-Arm Switch Assembly

1. Remove the bottom C-arm housing—see [C-Arm Housing Removal](#) on page 221.
2. Remove the set screw that fastens the switch lever to the switch shaft.
3. Disconnect the harness.
4. Replace the switch assembly.
5. Replace the bottom cover.
6. Attach the lever to the switch shaft.
7. Verify operation of the C-arm.



### **7.5.26 C-Arm Rotation Potentiometer**

See figure [C-Arm Rotation Limit Switch](#) on page 231 item 3 for the location of the C-Arm Rotation Potentiometer.

1. Raise the C-arm.
2. Remove power.
3. Remove the Gantry side covers—see [Remove Gantry Covers and Bellows](#) on page 216.
4. Remove the screw that fastens the potentiometer mounting bracket to the VTA.
5. Disconnect the harness.
6. Remove the bracket with the attached potentiometer/harness and sprocket.
7. Note alignment of the potentiometer on the mounting bracket—mark with felt pen.
8. Loosen the hex set screw on the end of the potentiometer shaft, and remove the sprocket.
9. Remove the hex nut and washer that fastens the potentiometer to the mounting bracket, and remove the potentiometer.
10. Unsolder the potentiometer wires.
11. Reverse steps 4 to 9 to install the replacement potentiometer.
12. Perform the procedure in the C-arm adjustments section of the Calibration Tool.
13. Replace the Gantry covers.

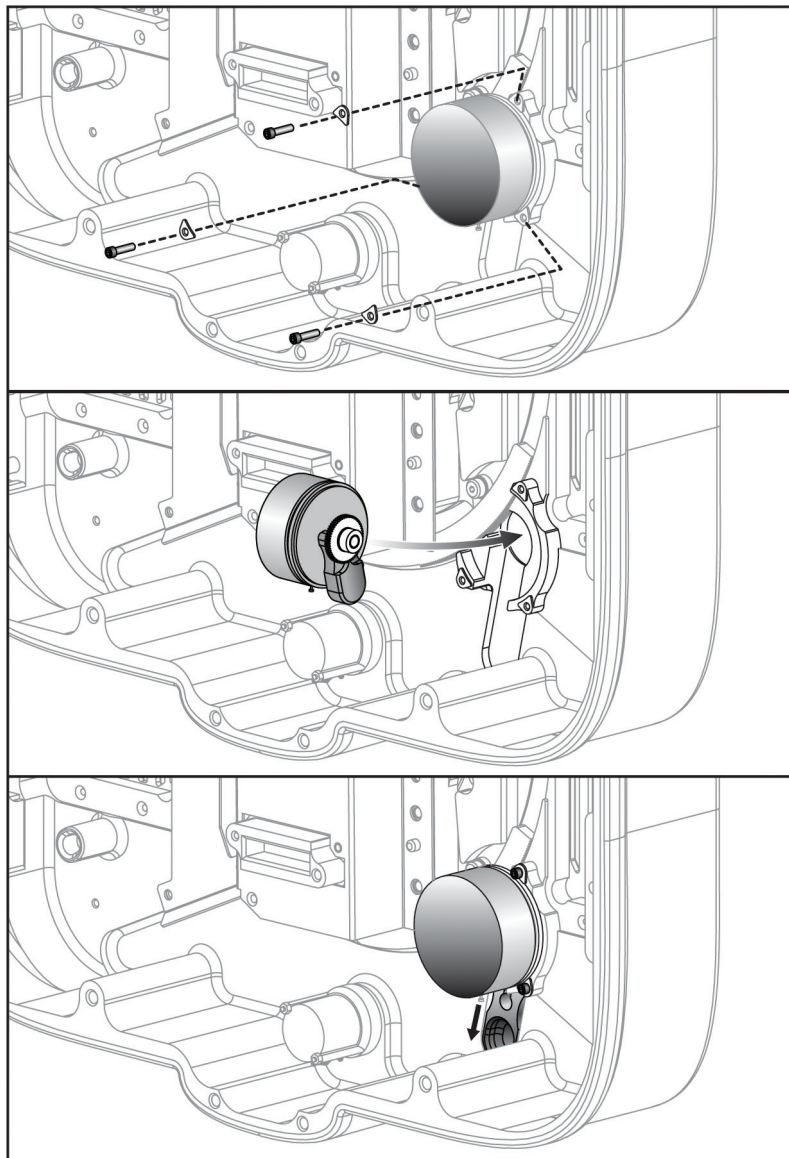
### **7.5.27 Tomo Angle Potentiometer (Tomosynthesis Option)**

See the following figure.

1. Remove power.
2. Remove the Breast Platform—see [Remove the Breast Platform and Image Receptor](#) on page 234.
3. Remove the Image Receptor.
4. Remove the Grid Assembly—see [Replace the Grid Assembly](#) on page 235.
5. Remove the grid tray—six counterbored hex-head screws.
6. Remove the pot connector.
7. Remove the three hex-head screws that fasten the pot to the frame.
8. Remove the pot anti-backlash gear.



9. Place the anti-backlash tool TLS-00922 against the replacement pot shaft in line with the pot pins.



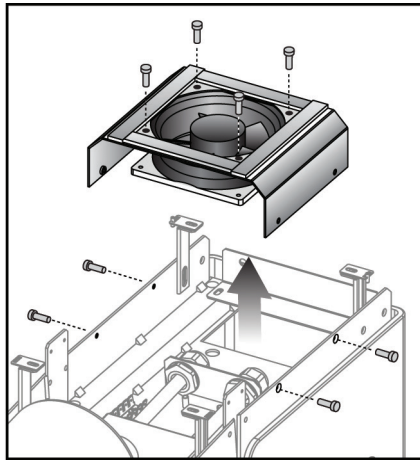
*Figure 238: Tomo Angle Potentiometer (Tomosynthesis Option)*

10. Attach the anti-backlash gear to the new pot shaft.
11. With an ohmmeter, center the pot at 5K.
12. Rotate the movable section of the anti-backlash gear (while holding the non-moving section) until it stops, then return it one or two teeth.
13. Holding the gear in this position, push the anti-backlash tool into the gears that fasten them in place.



14. With the adjustment tool in the recessed area of the frame, mesh the anti-backlash gear to the gear segment and fasten the pot to the frame with the previously removed screws.
15. When the pot is installed, remove the anti-backlash tool.
16. Recheck the 5k center adjustment.
17. Replace the connector.

### 7.5.28 Tubehead Cooling Fan



*Figure 239: Tubehead Cooling Fan*

1. Remove the X-ray Tube Arm (Tubehead) top cover. See [Top X-ray Tube Arm \(Tubehead\) Cover Removal](#) on page 219.
2. Disconnect the fan power cable.
3. Remove all cable ties from the power cable.
4. Remove the four screws that fasten the cooling fan mounting bracket to the X-ray Tube Arm (Tubehead) frame.
5. Lift out the fan and bracket assembly.
6. Remove the hardware that fastens the cooling fan to the mounting bracket.
7. Reverse these steps to install the replacement cooling fan. Position for proper air flow (out).
8. Verify fan is operating before returning to service.



## 7.6 Replace Electrical Components and Assemblies

The procedures in this Section require removal of covers or panels to gain access to the components.

### 7.6.1 Fuse Panel



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**WARNING!**

**Ensure that system power is Off and the Gantry circuit breaker is in the Off position.**

---



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**WARNING!**

**Make sure that the wall circuit breaker is in the Off position.**

---

See figure [Circuit Breaker and Fuse Panel](#) on page 259.

1. Remove the Gantry lower rear panel (four screws).
2. Remove the screws that fasten the Fuse Panel to the frame.
3. Pull the Fuse Panel out.
4. Unplug the wires from the fuse holder to be replaced.
5. Replace the fuse holder, and attach the wires.
6. Fasten the Fuse Panel to Gantry.



### 7.6.2 Circuit Breaker



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**WARNING!**

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.

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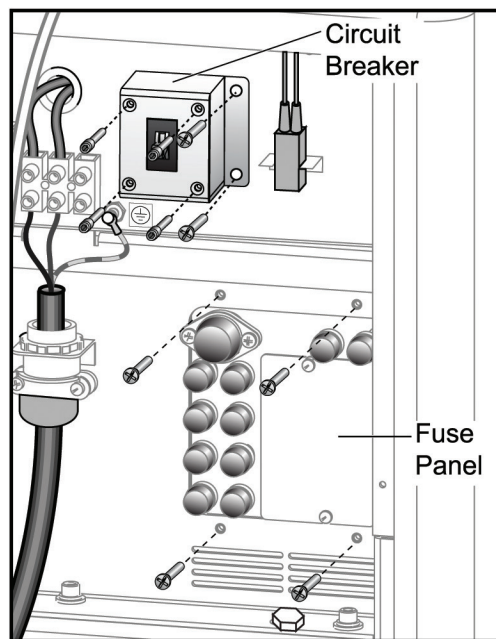


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**WARNING!**

Make sure that the wall circuit breaker is in the Off position.

---



*Figure 240: Circuit Breaker and Fuse Panel*

1. Remove the Gantry lower rear panel.
2. Remove the two screws from the Circuit Breaker Bracket.
3. Remove the six hex flat-head screws that fasten the circuit breaker to the bracket.
4. Noting their location, remove the wires to the circuit breaker.
5. Replace the circuit breaker, and attach the wires.



#### 7.6.3 Emergency Off Switch



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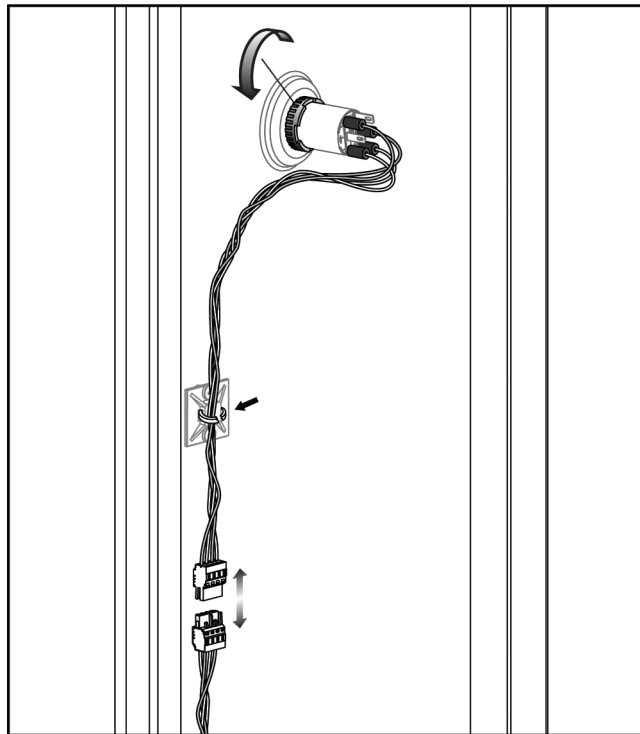
**WARNING!**

**Make sure that the wall circuit breaker is in the Off position.**

---

See the following figure.

1. Remove the applicable Gantry side cover.
2. Remove the cable tie that fastens the switch harness to the cover harness, and remove the connector.
3. Loosen the ring nut and back the ring nut and the lock washer off the switch assembly.
4. From the front of the Gantry cover, pull the switch and connector through the cover.
5. Reverse steps to install the new switch assembly.
6. Test switch for functionality.



*Figure 241: Emergency Off Switch*



#### 7.6.4 Power Distribution Drawer



---

**WARNING!**

**Make sure that the wall circuit breaker is in the Off position.**

---

To access the Power Distribution Drawer, remove the Gantry covers and Bellows—see [Remove Gantry Covers and Bellows](#) on page 216.

1. Remove the screws from the corners of the drawer.
2. Remove the cables from the front of the drawer.
3. Slide the drawer out.
4. Remove the cables from the rear of the drawer.



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**WARNING!**

**To reduce the risk of hazardous electrical shock, do not attempt service until the Red LED on the HV Inverter is extinguished (this takes approximately 5 minutes). Once the Red LED is extinguished, do not proceed until an additional 1 minute has elapsed.**

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#### 7.6.5 Isolation Transformer



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**WARNING!**

**Ensure that system power is Off and the Gantry circuit breaker is in the Off position.**

---



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**WARNING!**

**Make sure that the wall circuit breaker is in the Off position.**

---

1. Remove the Power Distribution Drawer—see [Power Distribution Drawer](#) on page 261.
2. Note the cable locations and remove the fuse panel and cables going to the Isolation Transformer—see [Isolation Transformer](#) on page 261.
3. Remove the connector from the Capacitor and Bridge Assembly, then remove.
4. Remove the two seven-inch bolts at the top center of the Isolation Transformer.
5. Slide the transformer forward.



#### 7.6.6 Detector Isolation Transformer



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**WARNING!**

Ensure that system power is Off and the Gantry circuit breaker is in the Off position.

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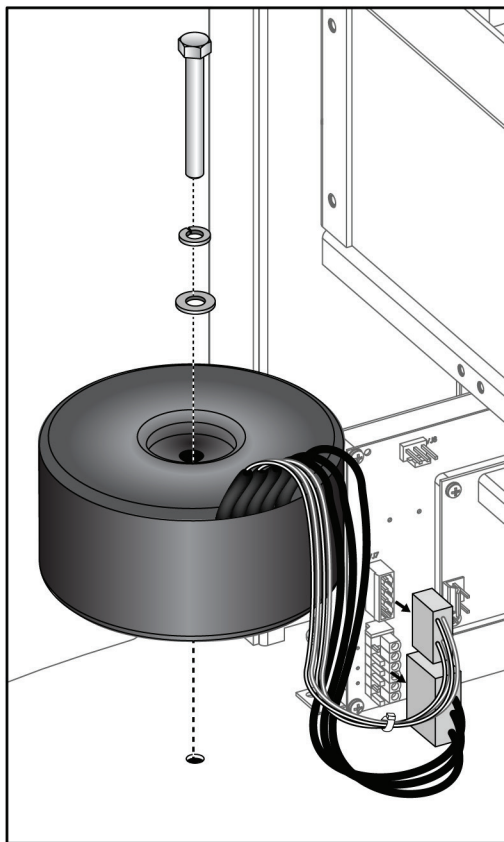
**WARNING!**

Make sure that the wall circuit breaker is in the Off position.

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See the following figure.

1. Remove the Power Distribution Drawer—see [Power Distribution Drawer](#) on page 261.
2. Note the cable locations and remove the cables going to the Detector Isolation Transformer.
3. Remove the bolt at the top center of the Detector Isolation Transformer.
4. Remove the transformer.



*Figure 242: Detector Isolation Transformer*



### 7.6.7 24 V Power Supply and External User Indicator Board



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**WARNING!**

**Make sure that the wall circuit breaker is in the Off position.**

---

To access these boards, remove the Gantry covers; see figure [Gantry Covers Removal](#) on page 216.

1. Remove cable ties as needed.
2. Note the wires from the boards and capacitor and remove them.
3. Remove the rear screw from the bracket—this is a 'blind' screw, remove by feel. A short screwdriver with magnetic bit eases removal.
4. Remove the front screw.
5. Remove the bracket with boards attached.

### 7.6.8 Capacitor and Bridge Assembly



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**WARNING!**

**Make sure that the wall circuit breaker is in the Off position.**

---

To access the Capacitor and Bridge Assembly, remove the Gantry covers; see figure [Gantry Covers Removal](#) on page 216 .

1. Note the wire locations and remove them.
2. Remove the two screws from the front of the assembly.
3. Slide the assembly out from the rear hold-down bracket.

## 7.7 Replace Mechanical Components and Assemblies

Removal and replacement procedures in this Section require removal of covers and/or panels to gain access to the components.



#### 7.7.1 C-Arm Rotation Drive Motor and Gear Box

##### Remove the Rotation Drive Motor and Gear Box Assembly

1. Remove the rear panel.
2. Raise the C-arm to expose the Rotation Drive Motor and Gear Box Assembly.
3. Turn off power to the Gantry.
4. Cut the cable ties and remove the drive motor cable.
5. Note the VTA cable locations and remove them
6. Remove the four socket head screws through the elongated holes in the VTA board that fastens the Rotation Drive Motor and Gear Box Assembly to the mounting plate—see the following figure.
7. Remove the mounting plate with the attached Rotation Drive Motor and Gear Box from the rear.
8. To remove the subassemblies see [Remove the Rotation Drive Motor](#) on page 265, and [Remove the Gear Box](#) on page 266.

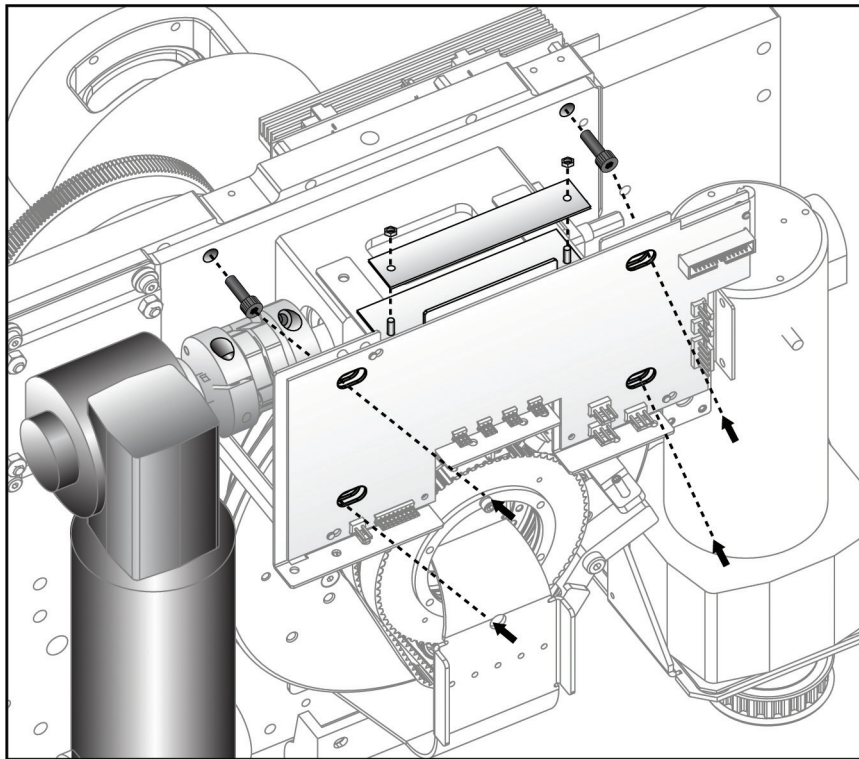


Figure 243: Rotation Drive Motor/Gear Box Assembly

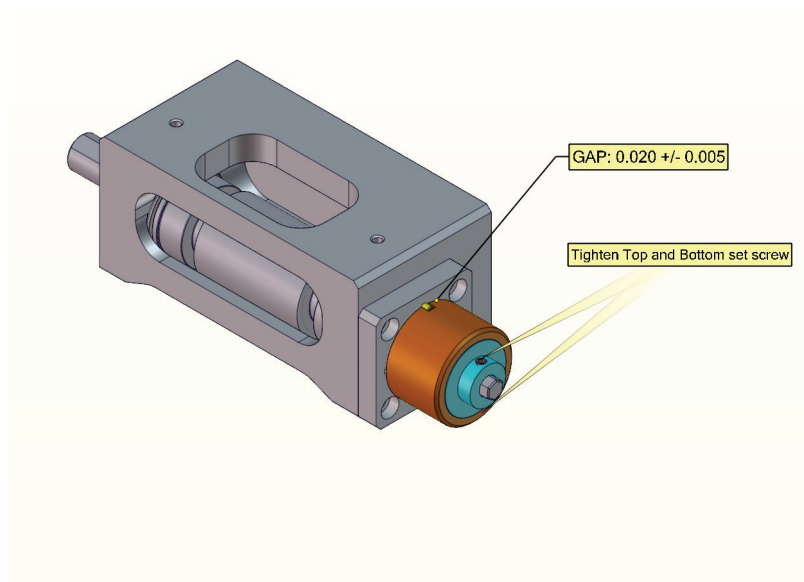


**Remove the Rotation Drive Motor**

1. Remove the four shoulder socket head screws that fasten the drive motor plate to the mounting plate.
2. Loosen the coupler from the motor shaft.
3. Remove the motor and plate.
4. Remove the four captive nuts that fasten the motor.
5. Remove the motor.
6. Reverse the procedure to replace the motor.

**Remove the Rotational Drag Clutch**

1. The drag clutch is mounted on the worm mount assembly shaft end, opposite the rotational gear motor.
2. Loosen the top and bottom set screws located on the end of the drag clutch sleeve. Remove the clutch.
3. Reverse the procedure to replace the drag clutch.
  - a. Install the drag clutch over the exposed shaft and ensure that the shim spacer is in place between the clutch and mount. The shim provides a 0.020 in. gap between the drag clutch and worm shaft mount.
  - b. Tighten the upper set screw on the clutch, snug against the flat of the shaft, then fully tighten the bottom set screw. Complete installation by fully tightening the upper set screw.



*Figure 244: Installing the Drag Clutch with Proper Gap on Shaft*



#### Remove the Gear Box

1. Remove the four flat socket head screws on the rear of the mounting plate. (The mounting plate must be removed to view the screws.)
2. Loosen the two coupler cap screws that fasten the coupler to the motor shaft and the gear box shaft.
3. Remove the gear box assembly.
4. Reverse the procedure to replace the gear box.

#### 7.7.2 C-Arm Vertical Drive Motor

1. Remove the front left Gantry cover—see [Remove Gantry Covers and Bellows](#) on page 216.
2. Raise the Rotation Drive Motor and Gear Box Assembly to access the bottom of the Vertical Drive Motor and drive pulley.
3. Turn off power to the Gantry.
4. Remove the cable ties and the motor cable.
5. Remove the two 5/16 inch (black) bolts from the taper-lock fitting.
6. Replace the bolts you just removed and place them in the other pair of threaded holes in the taper-lock (this arrangement is used to remove the drive pulley from the motor shaft).
7. Using a ratchet with 5/16 inch socket, alternately thread these two bolts upwards into the drive pulley to remove the pulley.
8. Remove the four 5/16 inch bolts that fasten the motor to the bracket.
9. Remove the motor.

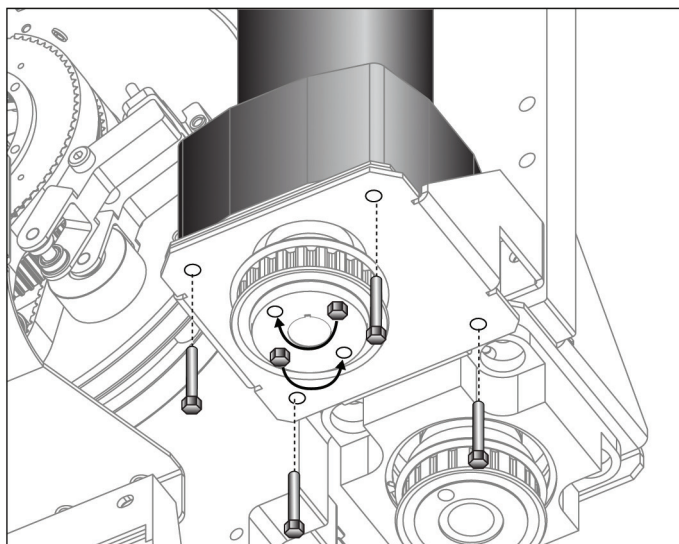


Figure 245: Vertical Drive Motor



### **7.7.3 Remove the External Compression Device**

1. Remove the Compression Device Covers. See the figure [Compression Device Covers](#) on page 223.
2. Note the location of the connectors (not shown) and remove the Compression Device Interface Board, Displays, and attached bracket by removing the three screws at the top of the board. See the figure [External Compression Device](#) on page 268.
3. Locate the four 10-32 socket head screws at the rear of the External Compression Device.
4. Loosen these screws with a hex key, then remove with a long-handled ball end hex wrench.
5. Swing the External Compression Device to the right to free the gear belt, and remove.



#### 7.7.4 Compression Force Load Cell

The Compression Force Load Cell is an integral part of the CDA Drive Block. The block and Force Load Cell are replaced as an assembly.

1. Remove the FAST Paddle Assembly. See [FAST Paddle Assembly Removal](#) on page 251.
2. Remove the Paddle Position Sensor Board—see the following figure.
3. Remove the Compression shaft and pulley:
  - Remove the e-ring from the left-side of the shaft
  - Remove the shaft and shim from the right-side
4. Reverse the procedure to install a new CDA Drive Block with Force Load Cell.

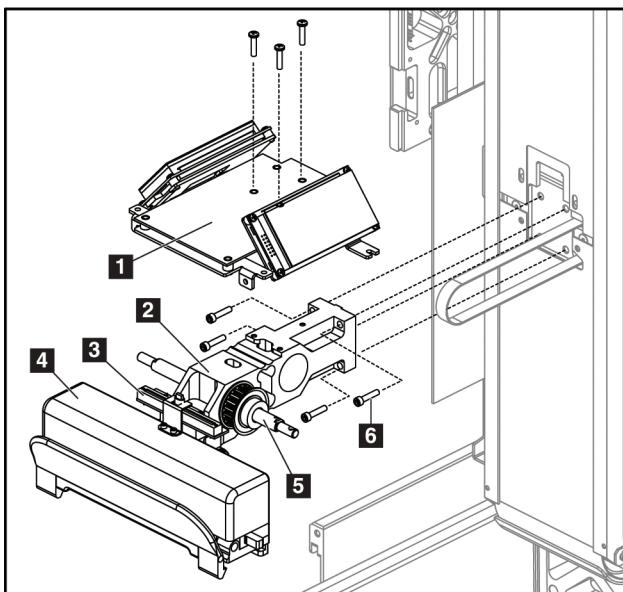


Figure 246: External Compression Device

#### Figure Legend

1. Compression Device Interface Board and Displays.
2. CDA Drive Block and Load Cell
3. Paddle Position Board.
4. Fast Paddle Assembly
5. Compression Knob Shaft
6. CDA Drive Block Screws



### 7.7.5 Remove the Internal Compression Device

1. Remove the External Compression Device—see [Remove the External Compression Device](#) on page 267.
2. Note the cable locations on the C-Arm Transition Board and remove them.
3. Remove the black mounting brackets on both sides of the Internal Compression Device.
4. Remove the six hex-head socket head screws and the two nuts that fasten the Internal Compression Device—see the figure [C-Arm Component Location](#) on page 227.
5. Carefully remove the Internal Compression Device assembly.

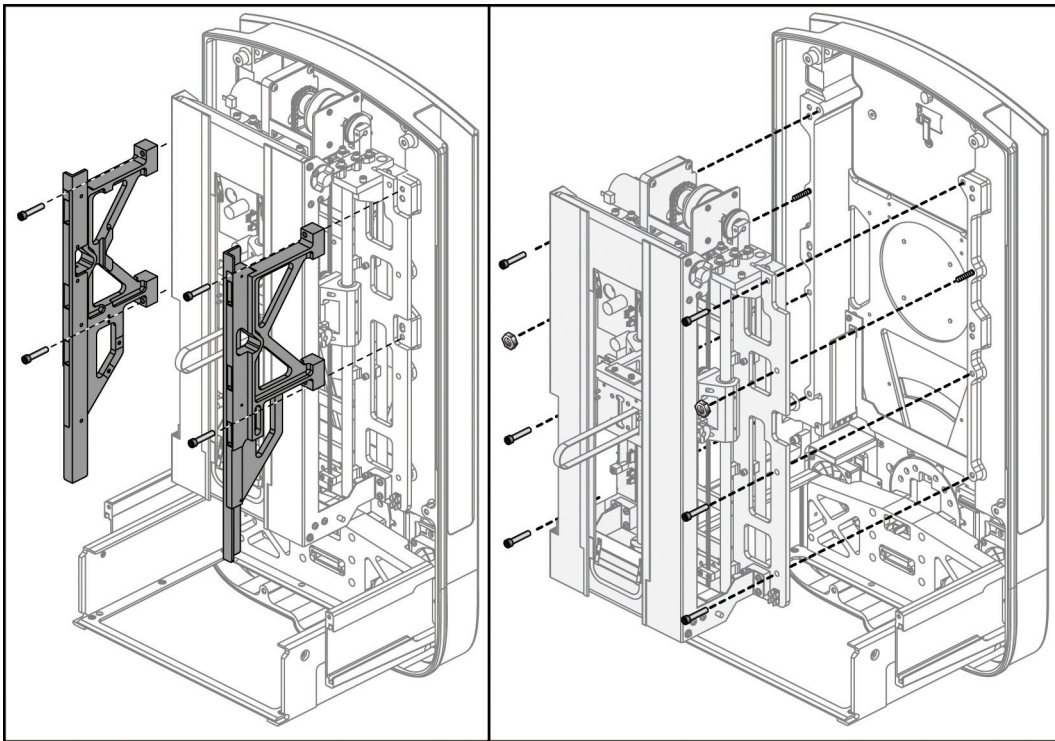


Figure 247: Internal Compression Device

## 7.8 Compression Device Drive Assembly

The Compression Device Drive Assembly houses a slip clutch/brake, and a bi-directional brake assembly.



#### 7.8.1 Remove Slip Clutch, Brake and Armature, and Bi-Directional Brake

##### Slip Clutch:

1. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 221.
2. Remove the External Compression Device—see [Remove the External Compression Device](#) on page 267.
3. Loosen the two slip clutch shaft clamp screws.
4. Slide the slip clutch off the shaft.
5. If necessary, continue the disassembly.

##### Brake and Armature:

1. Cut the cable tie on the bi-directional brake bracket.
2. Unplug the brake wire connector.
3. Remove the four socket head cap screws that fasten the brake/armature to the housing.
4. Remove the brake and armature.
5. Refer to [Adjust the Assembly](#) on page 271 for adjustment.

##### Bi-Directional Brake:

1. Remove the two screws that fasten the bi-directional brake bracket.
2. Loosen the two sprocket hub set screws.
3. Loosen the two bi-directional brake clamp screws.
4. Slide the shaft out.
5. Remove the bi-directional brake.

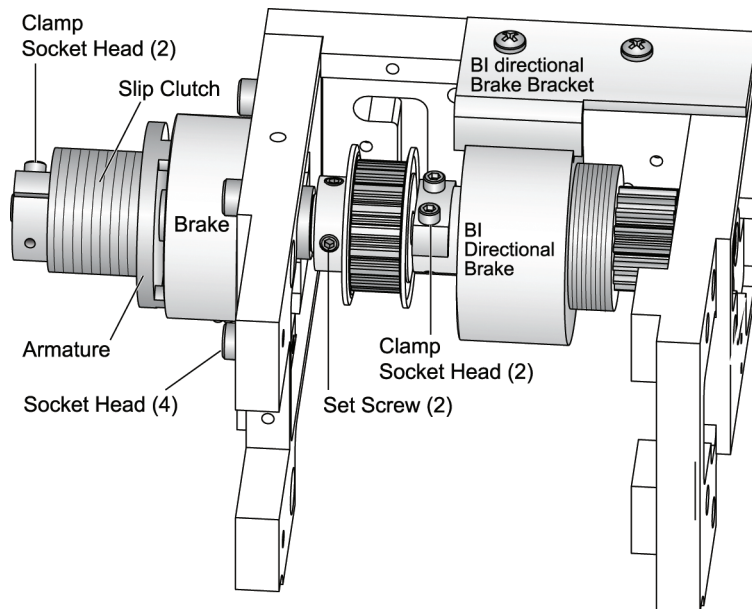


Figure 248: Slip Clutch, Brake/Armature and Bi-Directional Brake



### 7.8.2 Adjust the Assembly

1. Place a 0.015 inch feeler gauge (or shim stock) between the armature and brake, and press the armature against the feeler gauge.
2. Tighten the brake clamp screws.
3. Remove the feeler gauge, and verify a 0.010 to 0.020 inch gap, with no left-to-right play in the brake/armature assembly.

### 7.8.3 Compression Thickness Potentiometer

1. Remove the top and bottom Compression Device covers—see the figure [Compression Device Covers](#) on page 223 .
2. Remove the Compression Bellows—see [C-Arm Compression Bellows Assembly—Removal](#) on page 224.
3. Loosen the two hex screws that fasten the Compression Timing Belt item 2 to the bottom clamp item 1. See the following figure.
4. Remove the timing belt from the bottom clamp.
5. Carefully thread the timing belt up and out of the sprockets.
6. Inspect the timing belt. If damaged, replace the belt—see [Compression Timing Belt](#) on page 274.
7. Remove the top hex socket shoulder screw, and then remove the sprocket and screw to access the potentiometer clamp.
8. Loosen the clamp screw on the end of the potentiometer shaft, and slide clamp and sprocket off the potentiometer shaft.
9. Remove the hex nut (using a small open-end wrench) that fastens the potentiometer to the mounting bracket. Slide the potentiometer off the bracket.
10. Noting the color of the wire for each pin, unsolder the three wires from the potentiometer.
11. Reverse the steps to install the replacement potentiometer, and the timing belt.



#### Note

Loosen the timing belt, and with the Compression Device against the bottom stop, verify that the compression pot is 550 to 590 ohms measured on the brown and black wires of the pot. Adjust as necessary. Tighten the belt.

12. Start up the system.
13. Before returning the system to service, perform the Compression Thickness procedure in the Calibration Tool.
14. Install the Compression Bellows.



15. Install the Compression Device covers.

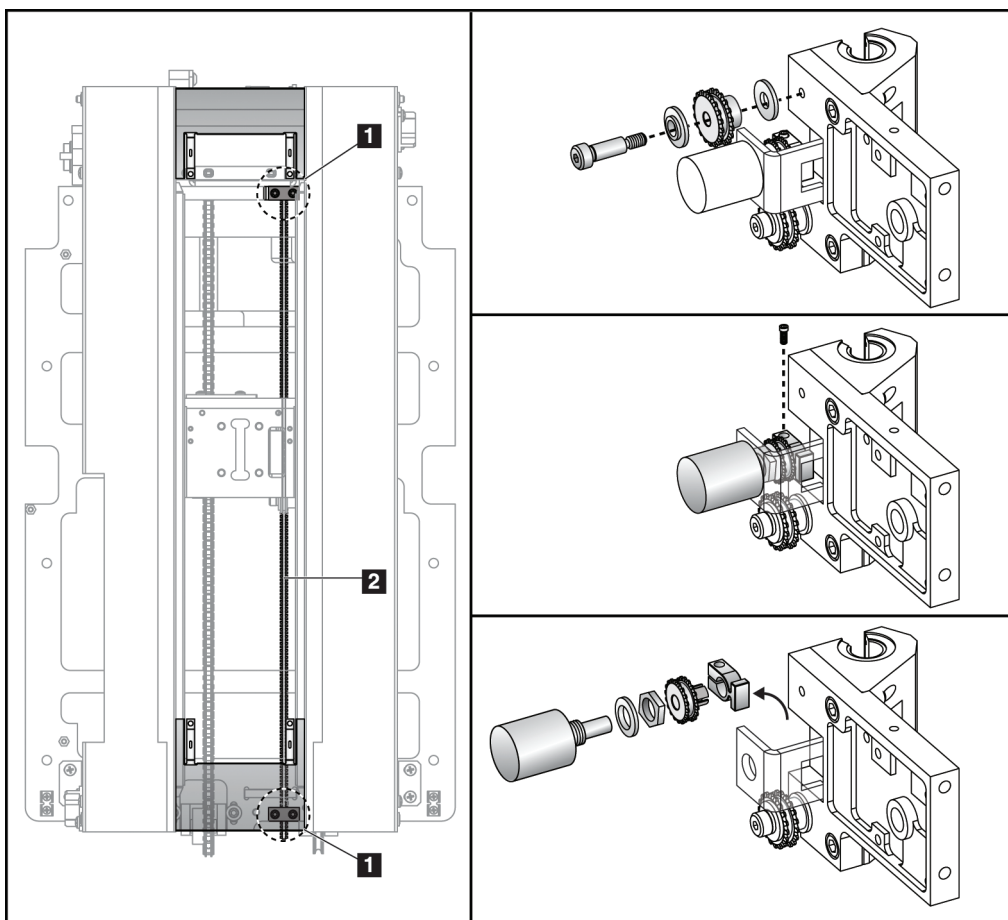


Figure 249: Compression Thickness Potentiometer and Timing Belt

## 7.9 Compression Motor and Brake

The Compression Motor drives the compression chain through a series of gears to move the Compression Device up or down. The Compression Motor Brake prevents compression back-drive.



### 7.9.1 Remove the Compression Motor and Brake Assembly

1. Remove the C-Arm Housing—see [C-Arm Housing Removal](#) on page 221.
2. Remove the External and Internal Compression Device. See [Remove the External Compression Device](#) on page 267, and [Remove the Internal Compression Device](#) on page 269.
3. Cut the cable ties that fasten the motor/brake wires.
4. Remove the motor/brake connectors on the C-Arm Transition board.
5. Disconnect the master link on the drive chain, and remove the chain from the sprocket.
6. Remove the two socket head screws that fasten the motor/brake bracket to the frame—see the following figure.
7. Remove the motor and brake assembly.

#### Remove the Compression Motor/Brake:

1. Loosen the set screws that fasten the motor shaft to the motor sprocket.
2. Remove the screws that fasten the compression motor to the mounting bracket
3. Remove the motor.
4. Remove the screws that fasten the brake to the mounting bracket.
5. Remove the brake.
6. Reverse the procedure to replace the motor or brake.
7. After replacing the assembly and master link, align the mounting bracket (sprocket) with the chain utilizing the elongated holes in the mounting bracket.

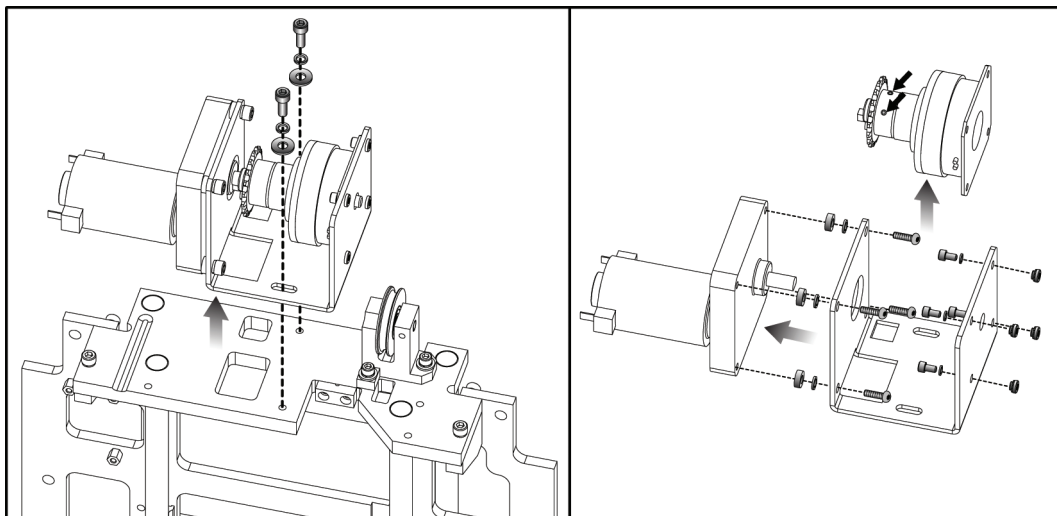


Figure 250: Compression Motor and Brake Assembly



#### 7.9.2 Compression Timing Belt

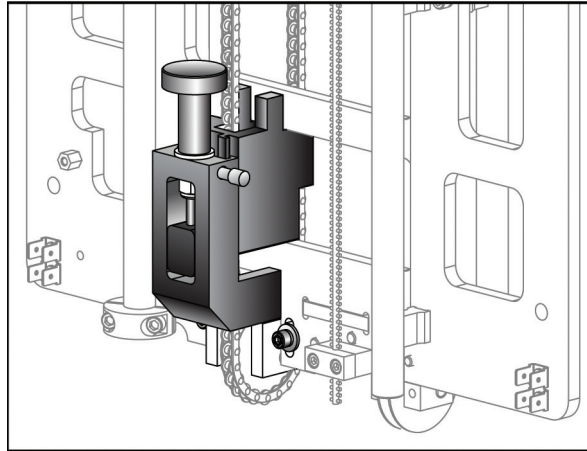
1. Remove the Compression Device covers and compression bellows—refer to [Compression Device Covers](#) on page 222.
2. Manually center the Compression Device on the C-arm.
3. Loosen the screws that fasten the Compression Timing Belt item 2 to the bottom clamp item 1—see the figure [Compression Thickness Potentiometer and Timing Belt](#) on page 272.
4. Remove the timing belt from the bottom clamp.
5. Thread the timing belt up and out of the sprockets.
6. Loosen the two hex screws that fasten the timing belt in the upper clamp block item 1.
7. Remove the belt and discard it.
8. Insert the new timing belt through the upper clamp.
9. Thread the timing belt through the sprockets to the bottom clamp.
10. Apply Blue Loctite 242 and retighten the hex screws.

#### 7.9.3 Compression Chain Adjustment

1. Remove the Compression Device covers and compression bellows—see [Compression Device Covers](#) on page 222 and [C-Arm Compression Bellows Assembly—Removal](#) on page 224.
2. Manually center the Compression Device on the C-arm.
3. Loosen the socket head screws on the sprocket mount—see the following figure.
4. Install the Compression Chain Tension Tool—TLS-01361as shown in the following figure.
5. Attach an ammeter in series with the compression motor.
6. With the ammeter on the DC range, turn on the power, and increase the tension on the chain (counter-clockwise of tool knob) until the motor is drawing between 350 - 400 mA. Run for a complete cycle.
7. Tighten the right socket head screw on the sprocket mount, then the left screw.



8. Loosen and remove TLS-01361.



*Figure 251: Compression Chain Adjustment*

## **7.10 Preventive Maintenance Procedures**

---



### **Note**

Refer to [Preventive Maintenance Schedule](#) on page 193 for the Service Engineer Preventive Maintenance Schedule.

---

Tools and materials required to perform cleaning and inspection:

- Lint Free Cloths
- Brush
- Synthetic Lubricant PN 2-580-0207
- Small Vacuum Cleaner
- CRT Wipes

### **7.10.1 Gantry - Clean and Inspect**

When the system is down for service:

1. Inspect the Gantry for:
  - Cleanliness
  - Loose or missing panels or covers, and loose or worn wires or cables
2. Vacuum around the light field window and image receptor fans.
3. Clean the Face Shield and displays with a CRT wipe. Clean any fingerprints and stains from the painted surfaces.



#### Replace the Breast Platform Filter

- Required equipment, FAB-10761 (Filter with three Velcro strips)

Refer to the following text and figure.

1. Remove power from the system.
2. Remove the Breast Platform from the C-arm. See [Remove the Breast Platform and Image Receptor](#) on page 234.
3. Vacuum any accumulated debris from the bottom of the detector, and from the inside of the breast platform.
4. Slide the slotted vent forward from the bottom of the breast platform.
5. Place the inside of the vent facing upwards on a work surface.
6. Remove the three Velcro strips from the filter material in FAB-10761.
7. Remove the protective backing from the adhesive on the Velcro strips and place onto the inside of the vent as shown in the following figure.
8. Align the filter material with the vent and firmly press the filter onto the Velcro strips making sure that it is firmly attached to the Velcro.
9. Slide the vent back into the breast platform.
10. Reinstall the breast platform:
  - a. Slide the Breast Platform into the C-arm.
  - b. Fasten the Breast Platform with the previously removed hex-head screws.

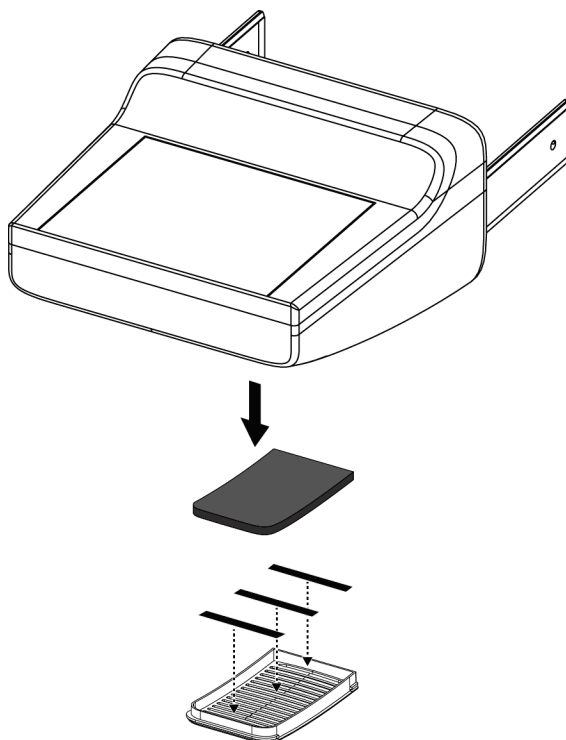


Figure 252: Breast Platform Filter



### 7.10.2 C-Arm Rotation Gear Assembly Inspection and Lubrication

See [Compression](#) on page 229, and perform this procedure annually or as required. If the upper rear access panel is off the Gantry for service, inspect the rotation gear assembly.

1. Turn the system off.
2. Remove the Gantry upper rear access panel—see [Gantry Cover Removal](#) on page 216.
3. Locate and inspect the gear assembly for loose hardware.
4. Inspect harnesses for proper dress and clearances.
5. Clean and lightly lubricate (if required) the C-arm rotation gear assembly, using approximately one tablespoon of synthetic lubricant (PN 2-580-0207). Apply with a brush. Make sure the gear teeth and worm gear are evenly coated.
6. Turn the system on.
7. Rotate the C-arm through full operational travel.
8. Remove any excess lubricant.
9. Replace upper rear access panel.

### 7.10.3 Cleaning the Gantry C-arm Rotational Brakes

This section provides the procedure for cleaning the Gantry C-arm rotational brakes.



---

**Note**

Ensure that you have the brake power supply test tool (TLS-01064) available before starting this maintenance procedure.

---

**Before You Begin**

1. Ensure that the C-arm is at the zero degree position.
2. Turn OFF the power to the Gantry.
3. Turn OFF the rear circuit breaker on the rear of the unit.
4. Remove the Gantry front covers (see [Gantry Cover Removal](#) on page 216) to gain access to the right side of the unit VTA assembly.



#### Procedure

1. Loosen the screw holding the C-arm rotation potentiometer and slide the bracket back away from the pivot tube gear. (See item 1 in the following figure.) This step allows the anti-backlash gear on the C-arm potentiometer to disengage from the pivot tube gear.

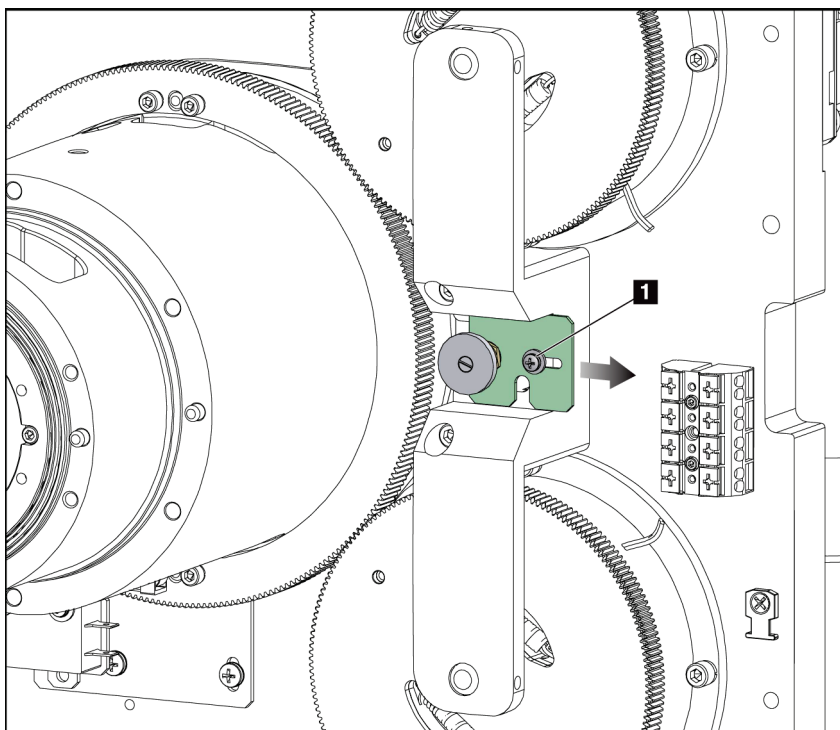


Figure 253: Loosening the Screw, Sliding the Bracket

2. Unplug the C-arm rotation potentiometer from the VTA harness connection. This step allows you to remove the gear mount bracket assembly and set it aside.



3. Remove the gear mount bracket (see the following figure, item 1):
  - a. Loosen the four set screws.
  - b. Remove the two 1/4-20 screws that hold the gear mount bracket assembly.
  - c. Remove the gear mount bracket.

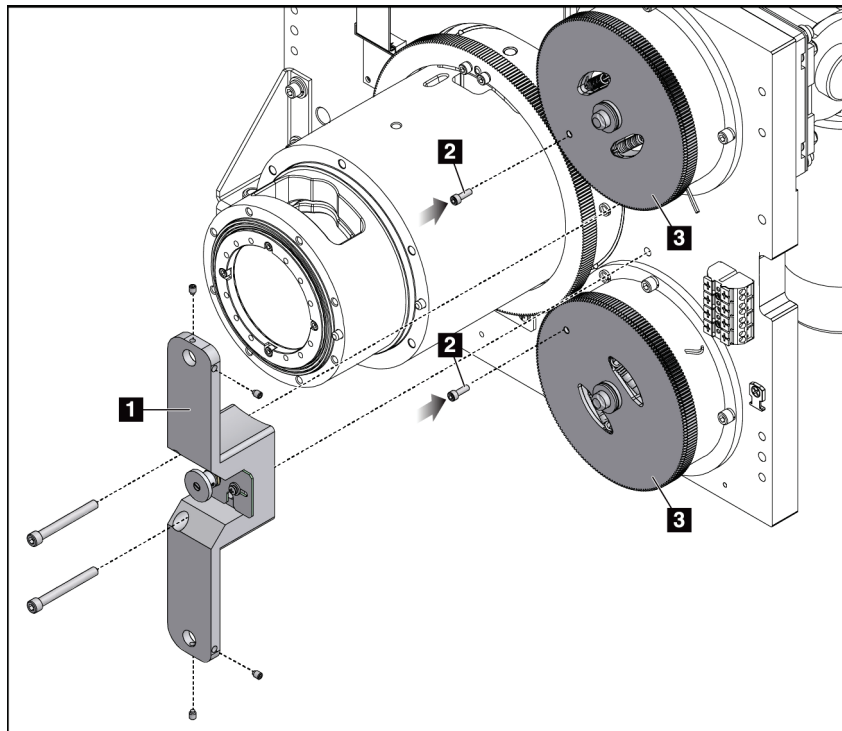


Figure 254: Gear Mount Bracket and Anti-Backlash Gears

4. Remove the flat washers and spring washers from the upper brake assembly. (See the previous figure.)
5. Insert an 8-32 socket head screw (item 2 in the previous figure) into the anti-backlash gear plates (item 3 in the previous figure) to hold them together.



### Note

Ensure the screws used for this purpose are not more than 1.25 cm (0.5 inch) long.

6. Connect the brake power supply test tool (TLS-01064) to the system.
7. Energize the rotation brakes. This step releases the upper anti-backlash gear (see the figure [Gear Mount Bracket and Anti-Backlash Gears](#) on page 279, item 3, upper) from the upper brake.
8. Pull the anti-backlash gear off the upper brake, then de-energize the brakes.



9. Clean and inspect the brake:
  - a. Clean the brake with a clean cloth and alcohol.
  - b. Inspect the surface for wear.
  - c. Verify that there are no particles or foreign matter attached to the surface of the magnet.
10. Clean the anti-backlash gear with alcohol in a similar manner and ensure that there is no residue.
11. Apply a small amount of lead screw lubricant (2-50-0216) to the shaft (see item 2 in the following figure) and the inner diameter of the anti-backlash gear (see item 1 in the following figure).

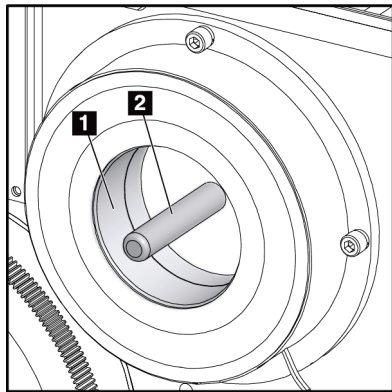


Figure 255: Lubricating the Shaft and Inner Anti-Backlash Gear

12. Repeat step 7 through step 10 for the lower anti-backlash gear.
13. For the anti-backlash gear of the UPPER brake assembly:
  - a. Energize the upper brake assembly to disable the magnet.
  - b. Test with a screwdriver to ensure that the magnet is OFF.



---

#### Warning:

**Make sure that the magnet is OFF before proceeding with either the upper or lower brake assembly. If left on, the magnet is strong enough to cause the anti-backlash gear to move which could result in pinched or injured fingers.**

---

- c. Take the upper anti-backlash gear and slowly place it over the shaft of the upper brake.
- d. When you are over the shaft, be careful to align the teeth of the gear with the teeth of the VTA wheel.
- e. Place the spring washer, then the flat washer over the shaft of the upper brake assembly.
- f. De-energize the brake to pull in the anti-backlash gear and remove the #8 socket head screw previously installed.



14. For the anti-backlash gear of the LOWER brake assembly, repeat all of step 12.
15. Replace the gear mount bracket assembly using the two 1/4-20 x 2-1/4 inch socket head cap screws and two 1/4-20 high collar lock washers removed in step 3.
16. Tighten the four set screws loosened in step 3.
17. Reposition the rotation potentiometer and bracket, ensuring that the potentiometer is in the middle of its range (five turns counter-clockwise from its mechanical stop).
18. Engage the potentiometer:
  - a. Holding the potentiometer shaft in position, twist the backlash gear in the opposite direction against the anti-backlash spring until they are offset by three teeth.
  - b. Holding the gears in this position, slide potentiometer bracket to engage with the VTA gear and tighten the potentiometer bracket.



---

**Note**

This adjustment is sufficient to ensure proper reliable engagement. Do NOT push up the C-arm potentiometer assembly tight against the pivot tube gear.

---

19. With power ON to the Gantry, verify that the rotation indicator display reads zero degrees. If not, perform the C-arm zero calibration. Refer to the C-arm Adjustment section of the on-screen CalTool.

#### **7.10.4 VTA Lead Screw Inspection and Lubrication**

Perform this procedure annually or as required. If the left front cover is off the Gantry for service, inspect the VTA lead screw.

1. Turn the system off.
2. Remove the Gantry left front cover — [Fasten the Gantry](#) on page 22.
3. Locate and inspect the VTA lead screw for loose hardware.
4. Inspect harnesses for proper dress and clearances.
5. Clean and lightly lubricate (if required) the VTA lead screw, using approximately two tablespoon of synthetic lubricant (PN 2-580-0207). Apply lubricant with brush. Ensure all metal surfaces are evenly coated.
6. Turn the system on.
7. Raise the C-arm to the top of its vertical travel, then lower the C-arm to the bottom of its vertical travel.
8. Remove any excess lubricant.
9. Replace the Gantry left front cover.







## Chapter 8 Universal Acquisition Workstation Maintenance

### 8.1 Introduction

This chapter describes maintenance information and instructions for the Universal Acquisition Workstation, including:

- Component identification
- Removing covers and panels
- Component replacement procedures
- Preventive maintenance procedures



---

**WARNING!**

**Disconnect system power before removing components!**

---



---

**Warning:**

**Always follow the safety precautions for x-ray exposures.**

---



---

**Caution:**

**Always obey Electrostatic Discharge (ESD) precautions when working with electronics and electronic components.**

---



---

**Note**

If a procedure instructs you to remove any covers or panels, do not install the covers until all required procedures are completed.

---

### 8.2 Universal Acquisition Workstation Controls and Displays



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**Note**

Hologic configures some systems to meet specific requirements. Your system configuration may not have all the options and accessories included in this manual.

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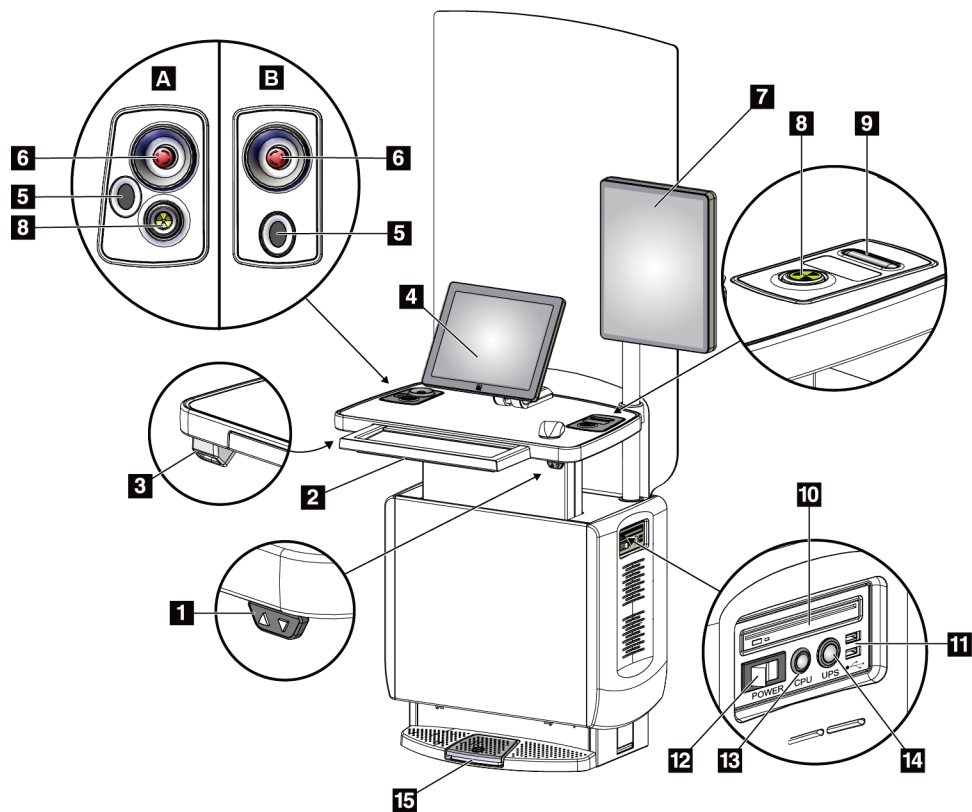


Figure 256: Universal Acquisition Workstation Controls and Displays

**Figure Legend**

- |                               |  |
|-------------------------------|--|
| 1. Height Adjustment Switch   | 10. CD/DVD Drive                                       |
| 2. Keyboard (in drawer)       | 11. USB Ports  |
| 3. Bar Code Scanner           | 12. Acquisition Workstation Power Switch               |
| 4. Control Monitor            | 13. Computer Power On/Reset Button                     |
| 5. Fingerprint Scanner*       | 14. Uninterruptible Power Supply (UPS)<br>Power Button |
| 6. Emergency Off Switch*      | 15. X-ray Footswitch                                   |
| 7. Image Display Monitor      |  |
| 8. X-ray Activation Button*   |  |
| 9. Compression Release Button |  |

\*A = series II Universal Acquisition Workstation layout;  
B = series I Universal Acquisition Workstation layout



**Note**

The controls for the Universal Acquisition Workstation installed in a mobile environment are the same as the controls for the Universal Acquisition Workstation.



## 8.3 How to Remove All Power to Universal Acquisition Workstation

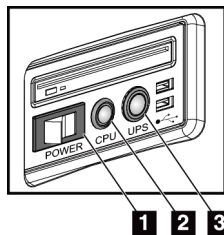


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### **WARNING!**

**Power must be removed before servicing the Acquisition Workstation.**

---



#### **Figure Legend**

1. Workstation Power Switch
2. CPU Power On/Reset Button
3. UPS (optional) Power Button

*Figure 257: Universal Acquisition Workstation power buttons*

To remove all power from the workstation (see previous figure and legend):

1. Shut down the computer including all software applications.
2. If your system includes the optional UPS, press the UPS button (item 3).
3. Power OFF the workstation power switch (item 1).
4. Unplug the workstation power cable from the AC outlet.

To restart the system:

1. Plug in the workstation power cable to the AC outlet.
2. Power ON the workstation power switch.
3. If your system includes the optional UPS, press the UPS button.
4. Wait for the green light of the CPU power on/reset button to turn on, then press the CPU power button.



## 8.4 Remove the Covers and Panels



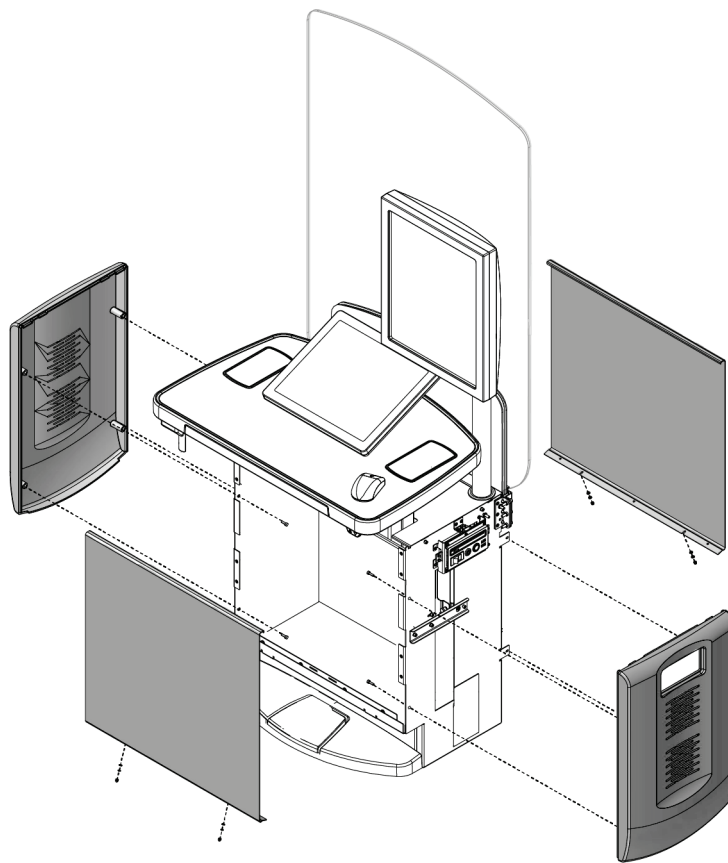
### **WARNING!**

**Power must be removed before servicing the Acquisition Workstation.**

---

See the following figures, which illustrate the removal of covers and panels. Keep in mind the following:

- To remove the side covers, first remove the front and rear covers.
- To remove the top cover, first remove the front, rear, and both side covers.
- To remove the front shroud, first remove the front cover, then remove the chassis support bracket.
- To remove the lower front panel (kick plate), first remove the front, rear, and both side covers.
- To remove the lower rear panel (kick plate), first remove the rear cover.



*Figure 258: Removing front, rear, and side covers*



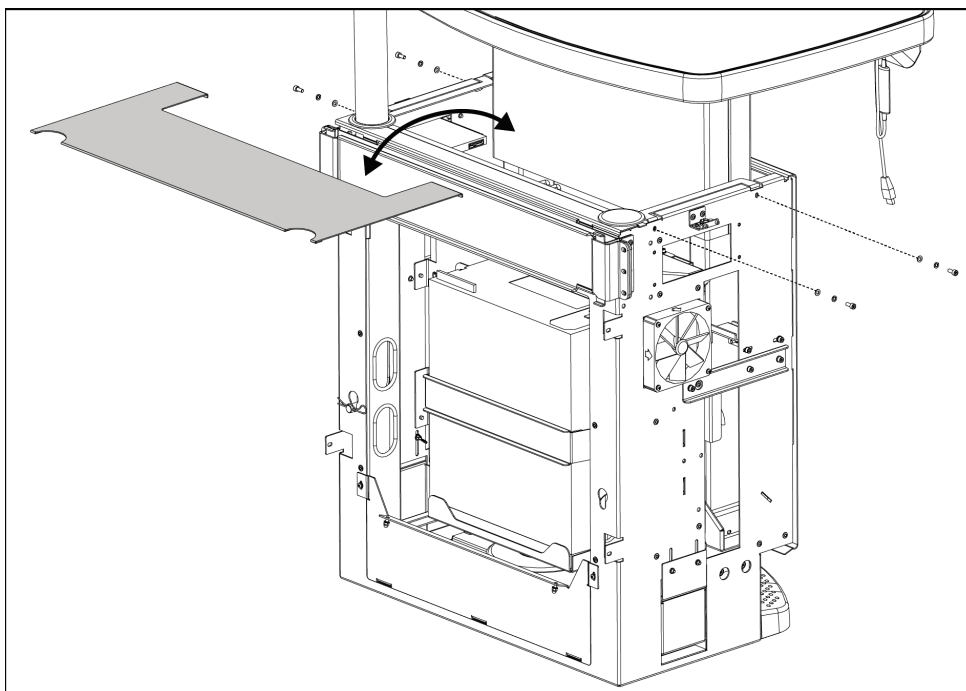


Figure 259: Removing top cover

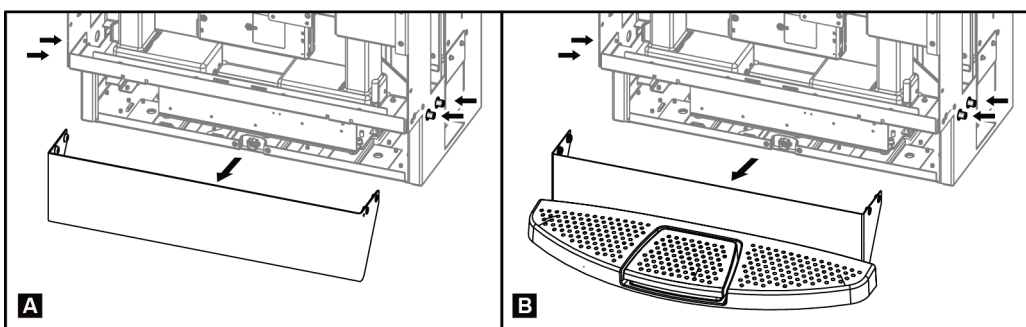
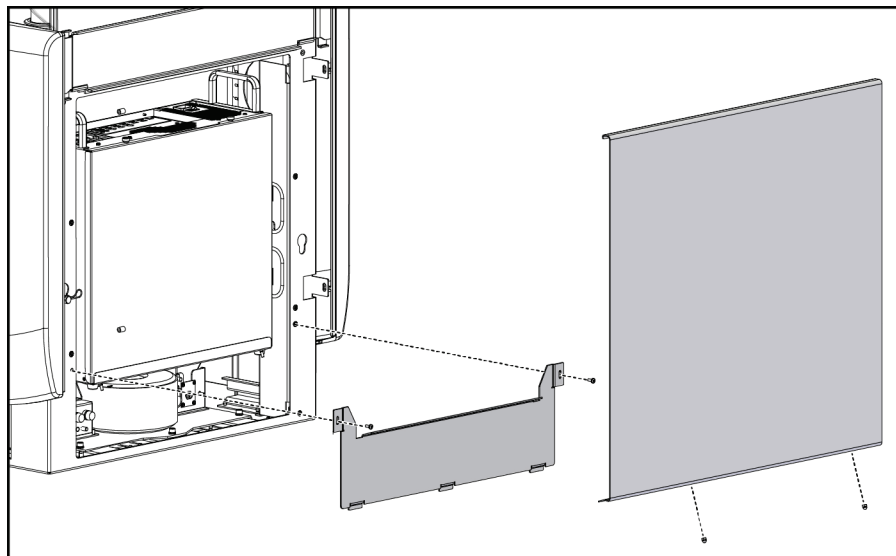
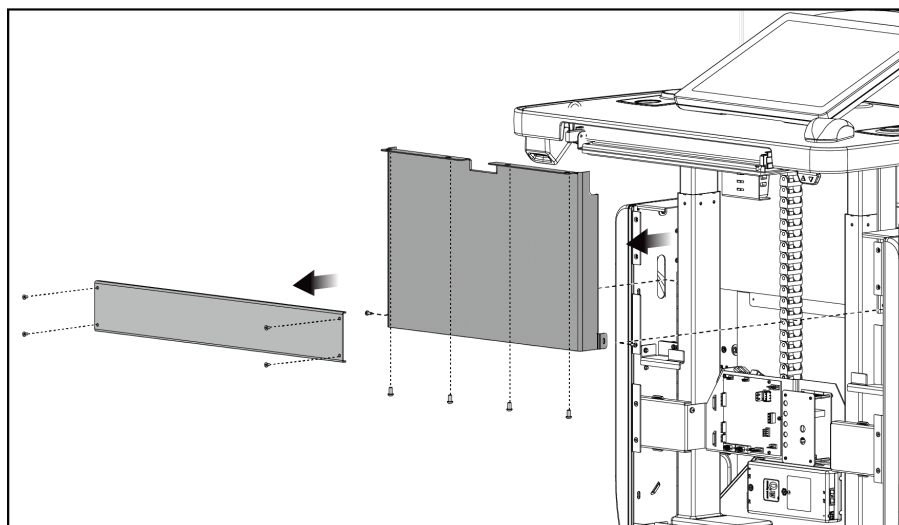


Figure 260: [A] Standard front panel kick plate [B] x-ray activation footswitch kick plate





*Figure 261: Removing rear cover (right) in order to remove lower rear panel kick plate (center)*



*Figure 262: Remove chassis support bracket (left) in order to remove front shroud (center)*



## 8.5 Replacement Procedures for the Workstation

### 8.5.1 Replace the Computer

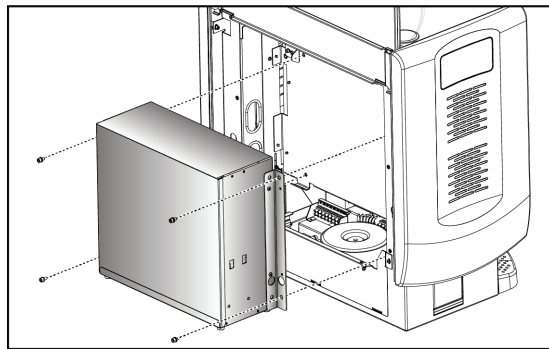
#### Back Up the Computer

Follow the on-screen procedures in System (Service) Tools under **Welcome > Troubleshooting > Backups**.

#### Replace the Computer

##### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.) You can optionally remove the lower rear panel if necessary.
3. Approach the computer from the rear of the workstation.
4. Note the orientation of the computer. The power input and other rear panel connections of the computer are on the TOP LEFT, with the rear panel connections facing UP.
5. Note all cable interconnections to and from the computer, then disconnect the cables.
6. Remove the side bracket.



*Figure 263: Removing/replacing the computer*



#### Replacement

1. Install the new computer using the side bracket as shown in the previous figure.



---

#### Note

Install the computer in the proper orientation. The power input and other connections rear panel connections of the computer **MUST** be on the TOP LEFT, with the rear panel connections facing UP.

---



---

#### Note

If your replacement kit does not include a new bracket, use the old bracket for the installation.

---

2. Reconnect all cable interconnections to and from the computer.
3. Reinstall the front, back, and side covers (and lower rear panel if previously removed).
4. Plug in and power ON the system. Verify proper system operation.

### 8.5.2 Replace the Uninterruptible Power Supply (UPS)



---

#### WARNING!

**Do NOT ship or transport a new or used UPS until you have disconnected or removed its internal battery.**

**Leaving this lead-acid battery connected or installed inside a UPS during shipment or transport presents a potential FIRE HAZARD with the risk of serious injury or death.**

**Before you ship or personally transport a UPS, make sure that you disconnect or remove its internal battery. Reconnect or reinstall the battery before installing the UPS onto the UAWS workstation.**

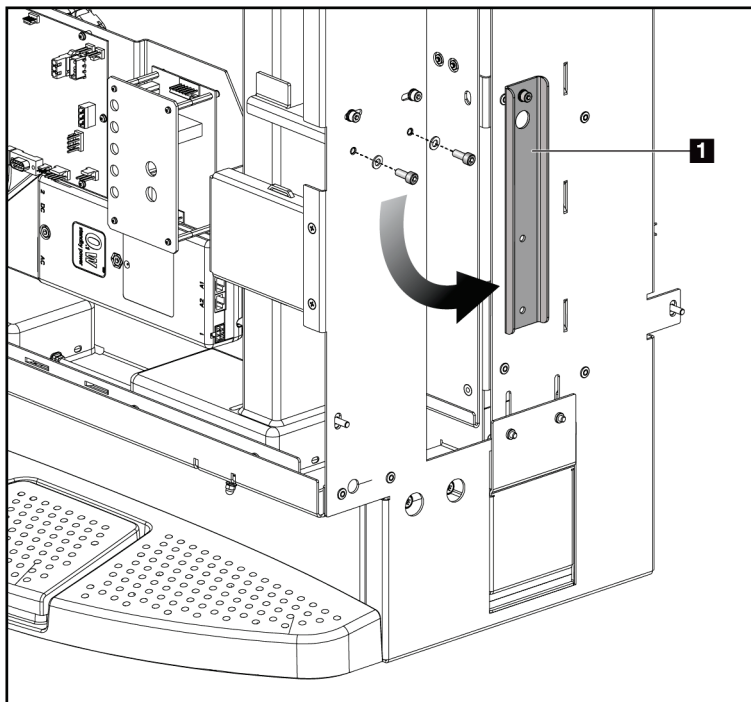
---

#### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and side covers. Remove the lower rear panel (kick plate). (Refer to [Remove the Covers and Panels](#) on page 286.)
3. From the rear of the chassis, locate and disconnect the power strip AC cord connected to the female AC outlet cord on the power distribution assembly. Unfasten any wire ties along the cable path. Make a note of the cable path.



4. On the right side of the workstation chassis, locate the right stiffener bracket (see following figure, item 1). Unfasten two of the three screws securing the bracket to the chassis and let the bracket hang by the remaining screw.

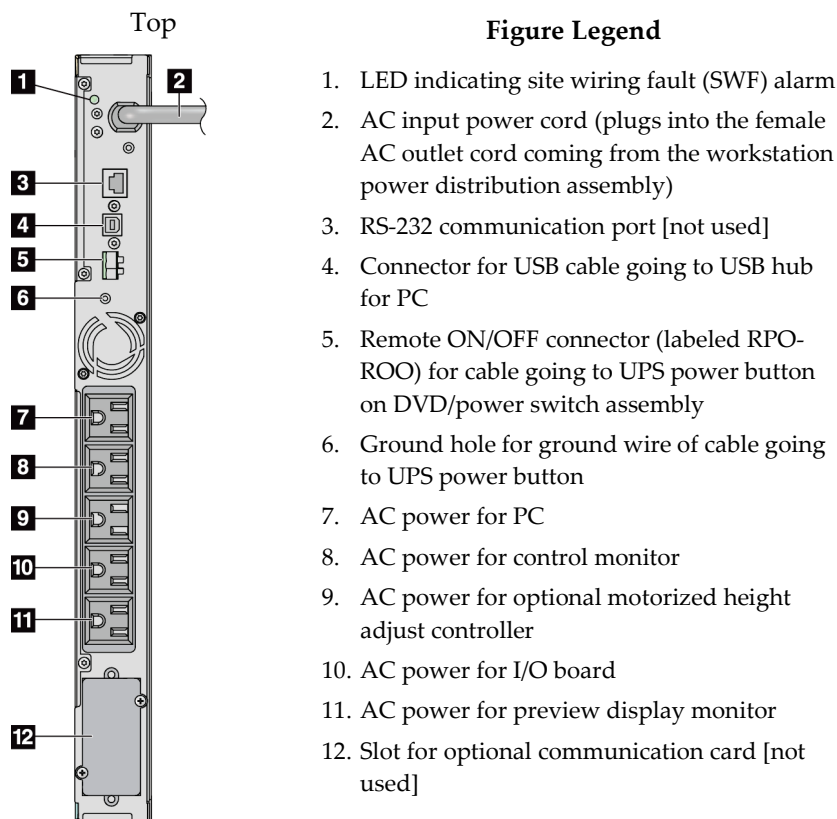


*Figure 264: Unfastening the stiffener bracket*

5. On left side of workstation, unfasten two of the three screws securing the left stiffener bracket to the chassis and let the bracket hang by the remaining screw.



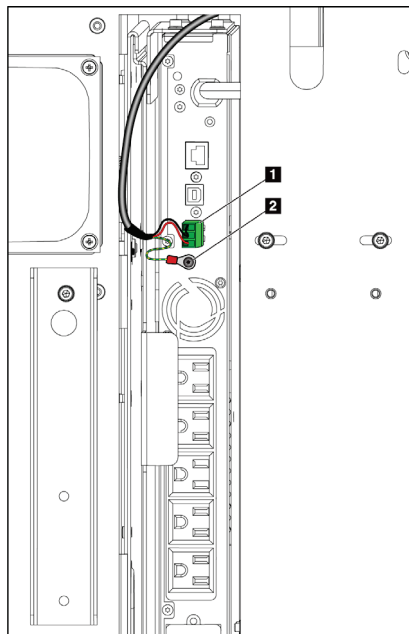
6. From the left side of the workstation (and rear of the UPS), disconnect all AC plugs from power strip. Make a note of what device each plug is for. Disconnect the USB cable. Use the following figure and legend as a guide.



*Figure 265: Connections on Rear of UPS*

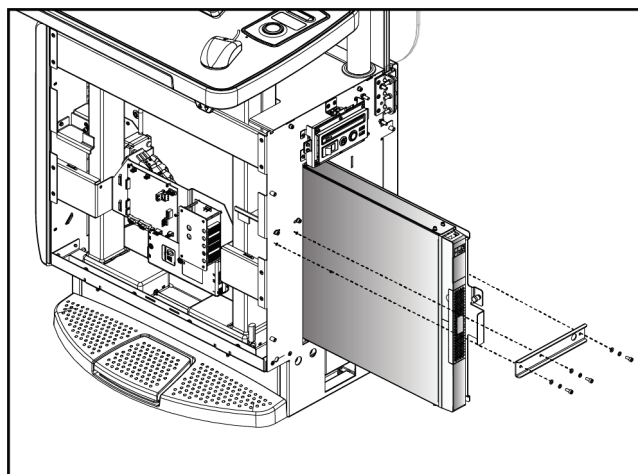


7. On the back of the UPS, disconnect the green terminal of the UPS remote power cable from RPO-ROO (item 1 in following figure). Disconnect the UPS cable ground ring from the threaded screw hole (item 2).



*Figure 266: Connections for the Remote UPS Power Cable on Rear of UPS*

8. Slide out and remove the UPS (with the UPS AC cable) from the workstation chassis.



*Figure 267: Sliding the UPS out of workstation*



#### Disconnecting, Removing, and Optionally Replacing the UPS Battery

You **MUST** disconnect the UPS battery whenever the UPS is removed for shipment back or if the battery on the UPS is being replaced.

1. Lay the UPS flat in a position where you can access the front panel.
2. Remove the middle panel of the front panel. (See the following figure, item B.)
3. Remove the left side of the front panel by pushing the PUSH button and then sliding the panel. (See the following figure, item A.)

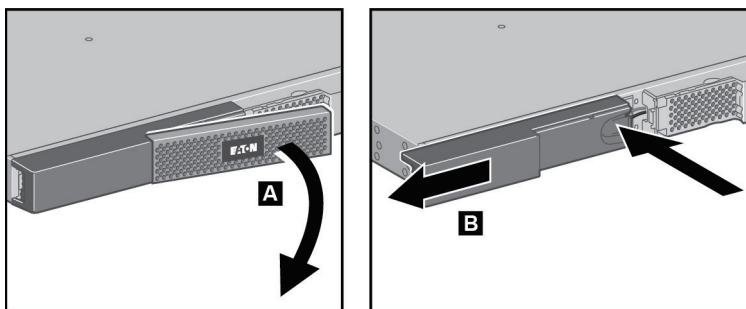


Figure 268: (A) Removing middle panel and (B) removing left-hand side of front panel

4. Disconnect the battery module by separating the two connectors. Never pull on the wires. (See the following figure.)

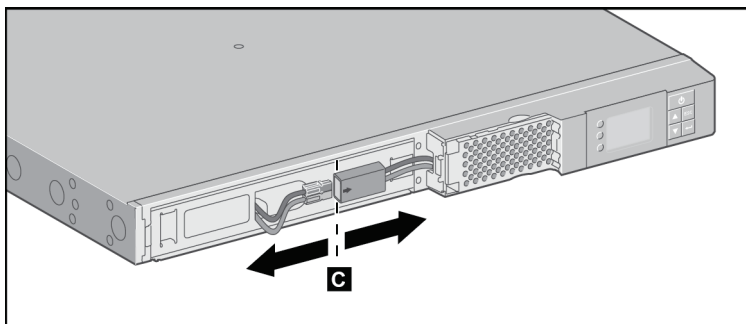
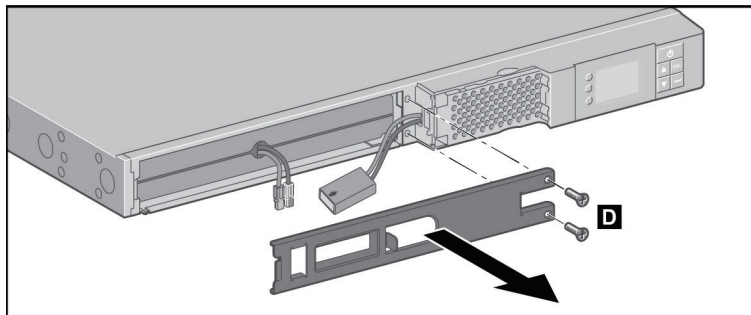


Figure 269: Disconnecting the battery module



5. Remove the metal protection cover in front of the battery (two screws). (See the following figure.)



*Figure 270: Removing the metal protection cover on battery*

6. Pull the plastic tab to move the battery block.
7. (Optional) If replacing the battery, pull out the old battery and replace with new one. Reassemble the battery module by doing the following:
  - a. Reattach the metal protection cover.
  - b. Reconnect the battery module with the two connectors.
  - c. Reattach the left side of the front panel.
  - d. Reattach the middle panel.



#### Replacement

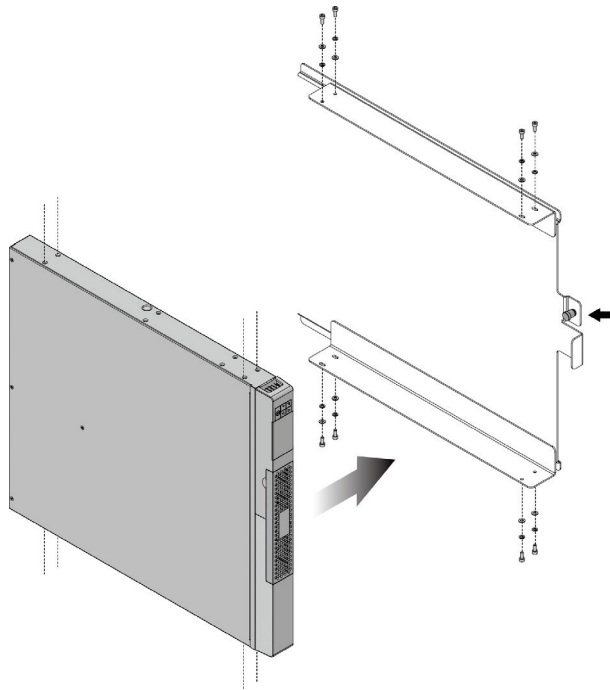
1. If for some reason the new UPS does not come pre-installed with the UPS sled bracket, remove the sled bracket from the old UPS. Mount sled bracket on new UPS. (See following figure).



#### Note

Make sure that the plunger pin locks into the chassis. (See the following figure—smaller arrow is pointing to plunger.)

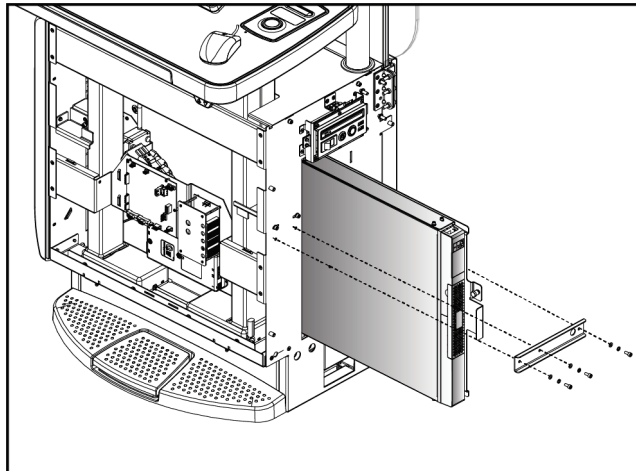
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*Figure 271: Mounting the UPS to the UPS sled bracket*



2. Install the new UPS (see following figure):
  - a. On the right side of the chassis, push the UPS AC line cord ahead of the UPS before you slide the UPS into the UPS chassis slot. Leave enough cable slack to be able to slide the UPS assembly onto the chassis slide rails without any interference or binding.
  - b. Route and connect the UPS AC cable to the female AC outlet cord coming from the workstation power distribution assembly. Use wire ties as necessary for proper cable management.
  - c. Ensure that the UPS assembly is fully seated in the proper position.
  - d. Fasten the right stiffener to the chassis with the remaining two screws.



*Figure 272: Sliding the UPS into workstation and reattaching stiffener*

3. At the rear of the UPS (see the figure [Connections for the Remote UPS Power Cable on Rear of UPS](#) on page 292):
  - a. Connect the remote UPS power cable (green terminal) into RPO-ROO.
  - b. Connect the UPS cable ground ring to the threaded screw hole using the pan head screw supplied in the kit.
  - c. Plug the USB cable (disconnected earlier) into the USB port.
  - d. Plug back in all the AC plugs from the workstation devices.
4. Fasten the left stiffener to the chassis with the remaining two screws.
5. Reinstall the front, back, side covers, and lower rear panel (kick plate) that were removed previously.
6. Plug in and power ON the system. Verify proper operation.



#### 8.5.3 Replace the Image Display Monitor

##### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. If applicable, remove the pedestal from the new monitor (refer to [Remove Pedestal from Monitor \(CMP-01531\)](#) on page 47).
3. Remove the access panel at the rear of the image display monitor (item 1 in the following two figures) and disconnect the DVI and power cables (item 3 in the following two figures).

Note the display mounting arms for the series II UAWS may look slightly different than those arms shown in the following figures, but use the same procedure.

4. Remove the preview monitor from the monitor bracket (item 2, four screws).

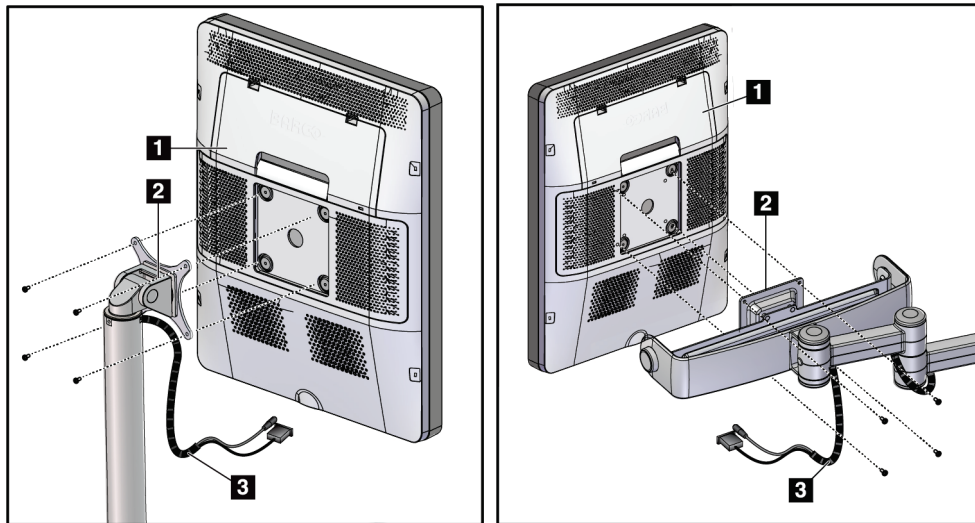


Figure 273: Removing display monitor with standard arm (left) and articulated arm (right) (series I UAWS shown)

##### Replacement

1. Remove the monitor from the packing box.
2. Attach the new monitor to the monitor bracket (four screws).
3. Remove the rear access panel from the new monitor and connect the DVI and power cables. Reattach the access panel.
4. Plug in and power ON the system. Verify proper operation of monitor.
5. Depending on your replacement model of Barco monitor, the new monitor may have advanced settings that need to be verified. Refer to [Verify Settings of Barco Image Display Monitor](#) on page 299.



### Verify Settings of Barco Image Display Monitor



**Note**

This post-installation setup verification procedure pertains only to models of Barco image display monitors that have advanced settings.

---

1. Power ON the monitor. A single LED lights up in the lower right corner of the monitor frame. (See the following figure.)
2. Wait for the LED light to go out (approximately 50 seconds after power ON).



*Figure 274: Waiting for single LED to turn OFF after power ON*

3. Touch the monitor frame (not the screen), along the bottom near its lower right corner until four LED touch keys (embedded in the frame) light up. (See the following figure.)



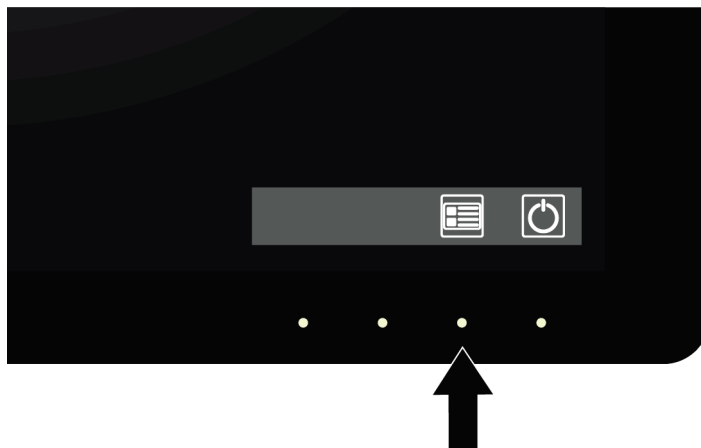
**Note**

The operator of the workstation touches these LED keys to navigate and select the various screens, menus, and settings on the monitor.

---



4. Touch the LED under the menu symbol (second from right). (See the following figure.)



*Figure 275: Touching LED under menu symbol (second from right LED) to display Main Menu*

The Main Menu is displayed. (See the following figure.)



5. Using the touch-sensitive LEDs, navigate and select **Configuration > Image Source**.

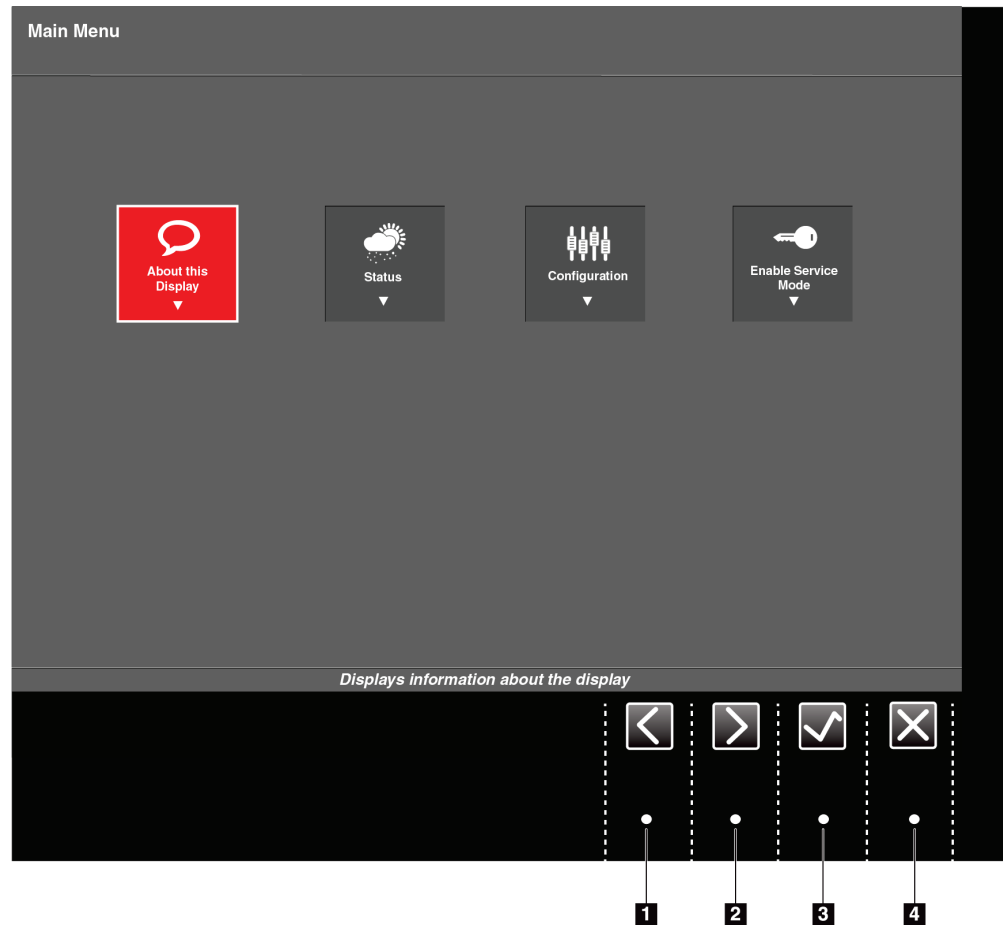


Figure 276: Configuration main menu

#### Figure Legend

1. Left key
2. Right key
3. Enter key (navigate into submenu)
4. Cancel key (exit out of submenu)

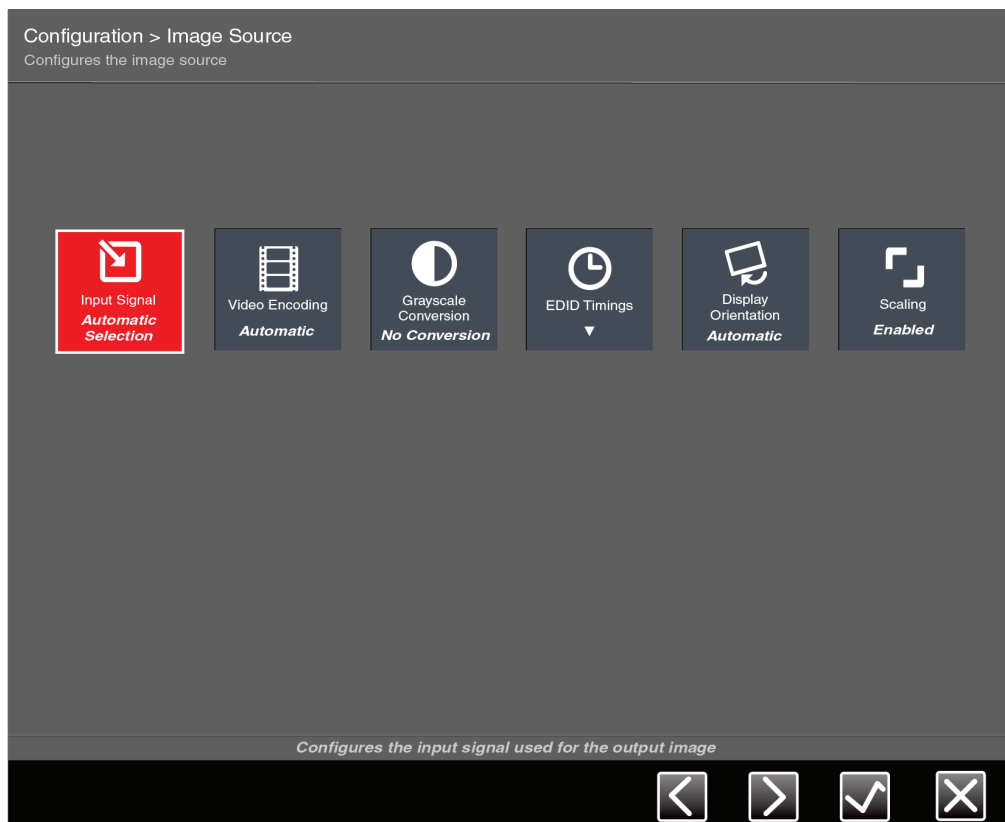


#### Note

The key icons (on-screen) are displayed above the LED keys (embedded in monitor frame). (See the previous figure.) Each icon is adapted to the function for which it is used (menu dependent).



6. Confirm all settings in the **Configuration > Image Source** screen, as shown in the following figure.

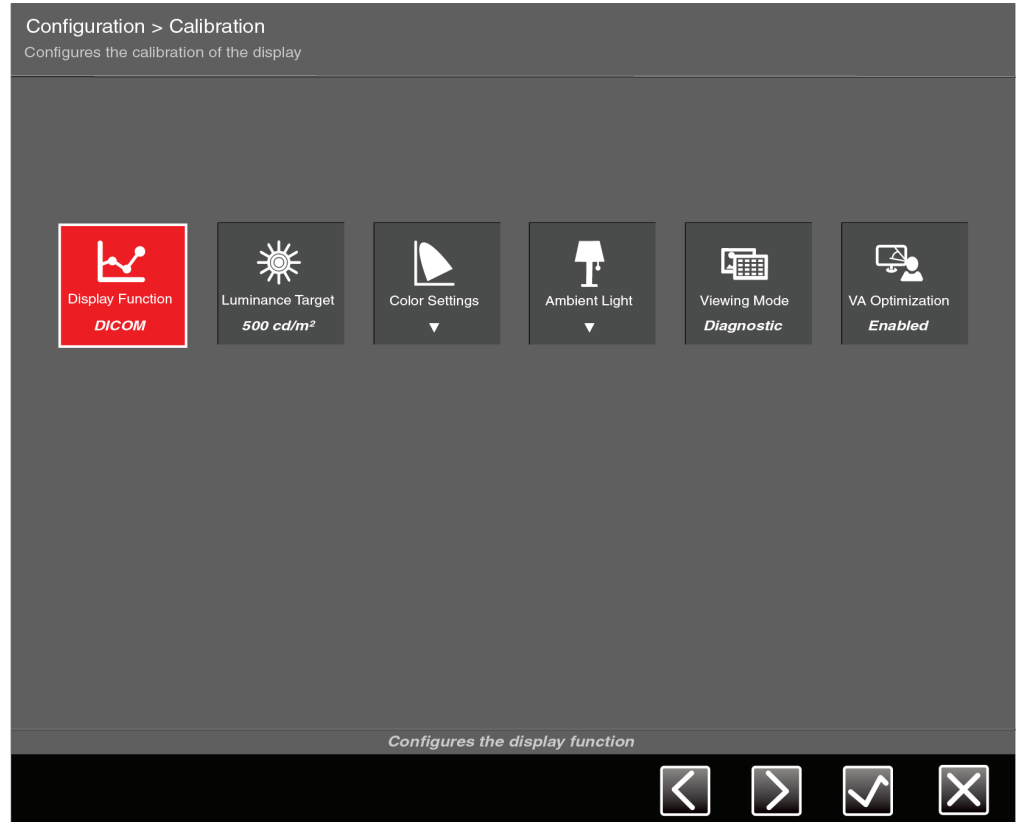


*Figure 277: Confirmation of settings in Configuration > Image Source screen*

7. Return to the main menu.
8. Navigate and select **Configuration > Calibration**.



9. Confirm all settings in the Configuration > Calibration screen, as shown in the following figure.

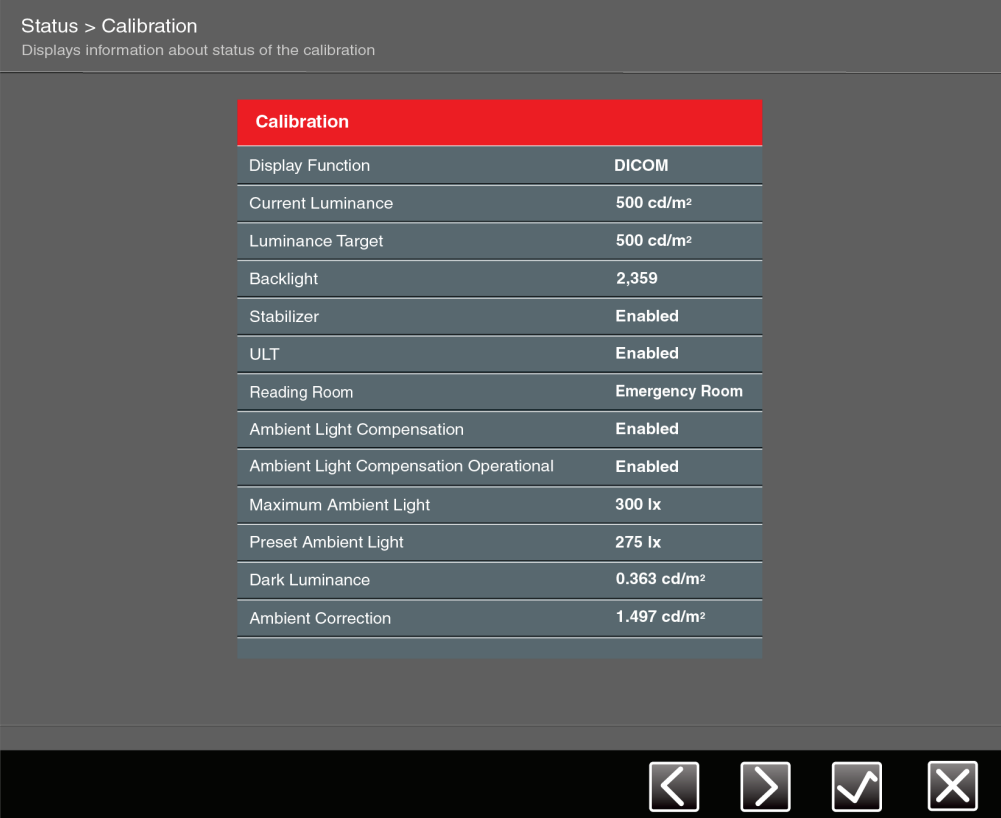


*Figure 278: Confirmation of settings in Configuration > Calibration screen.*

10. Return to the Main Menu.
11. Navigate and select **Status > Calibration**.



12. Confirm all settings in the Status > Calibration screen, as shown in the following figure.



The screenshot shows the 'Status > Calibration' screen. At the top, it says 'Status > Calibration' and 'Displays information about status of the calibration'. Below this is a table with a red header 'Calibration'. The table lists various settings and their values. At the bottom right of the screen are four navigation icons: a left arrow, a right arrow, a checkmark, and an 'X'.

Calibration	
Display Function	DICOM
Current Luminance	500 cd/m <sup>2</sup>
Luminance Target	500 cd/m <sup>2</sup>
Backlight	2,359
Stabilizer	Enabled
ULT	Enabled
Reading Room	Emergency Room
Ambient Light Compensation	Enabled
Ambient Light Compensation Operational	Enabled
Maximum Ambient Light	300 lx
Preset Ambient Light	275 lx
Dark Luminance	0.363 cd/m <sup>2</sup>
Ambient Correction	1.497 cd/m <sup>2</sup>

Figure 279: Verifying first three settings for new install, all settings for replacement install

13. In the Status > Calibration screen:
- Confirm *all* settings for a *replacement* installation, as shown in the previous figure.
  - Confirm *only* the first three settings for a *new* installation, as shown in the previous figure.

Make sure that:

- Display Function = DICOM
- Current Luminance = 500 cd/m<sup>2</sup>
- Luminance Target = 500 cd/m<sup>2</sup>



### 8.5.4 Replace Articulating Arm of Image Display Monitor

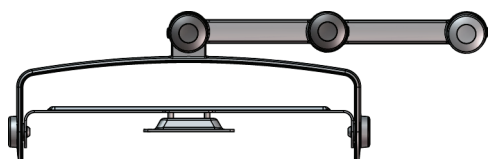


#### Note

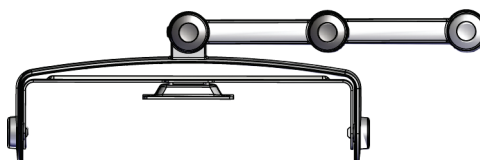
For the series I UAWS, the articulating arm is available in two mounting configurations (see the following two figures), shallow and deeper:

- The shallow monitor mounting bracket is used with the 2MP Grayscale Monitor and with the 3MP LED Display monitor.
- The deeper monitor mounting bracket is used with the 2MP Color Monitor.

Make sure you have the correct version for your monitor.



*Figure 280: Articulating arm (top view), shallow mount*



*Figure 281: Articulating arm (top view), deeper mount*



#### Removal of Articulating Arm

1. Power OFF and unplug the system.
2. Remove the articulating arm from the workstation (see the following two figures):
  - a. Remove the access panel at the rear of the image display monitor (item 1) and disconnect the DVI and power cables (item 4).
  - b. Detach the image display monitor from the monitor mount (item 2, four screws).
  - c. Loosen the three cap screws (item 5) at the top of the monitor post.
  - d. Lift and remove the articulating arm assembly from the monitor post and set it down near the workstation, but support the arm while cables are still threaded inside the post.

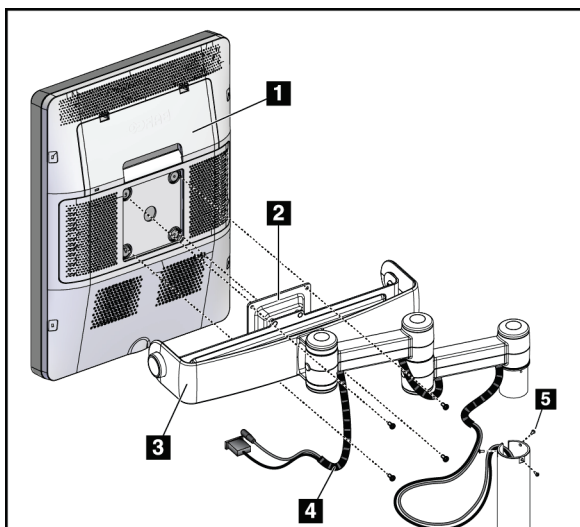


Figure 282: Removing image monitor and articulating arm (series I UAWS)

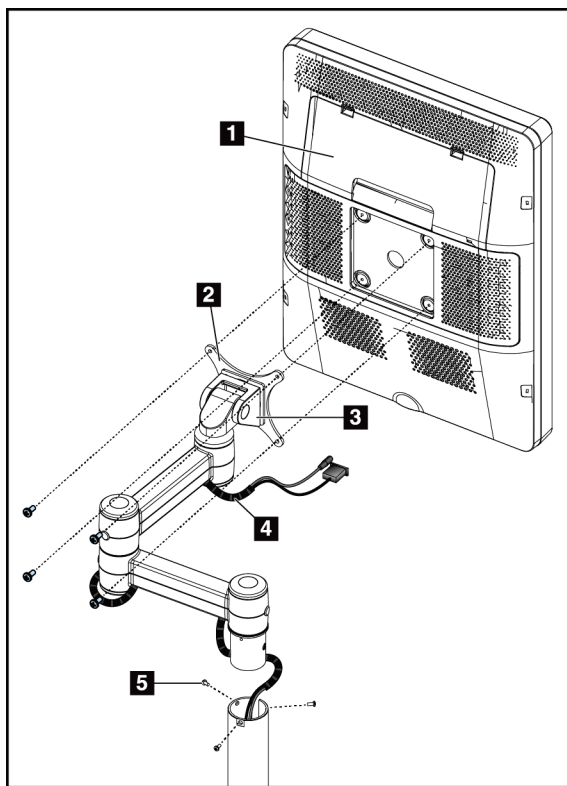


Figure 283: Removing image monitor and articulating arm (series II UAWS)



3. Remove the cables from inside the articulating arm:
  - a. From the underside of the articulating arm, remove the cable retainers that cover the cable-threading tracks under the articulating arm sections (see the following two figures).
  - b. Route the cables out of the articulating arm track. Leave the spiral tubing over those sections of cable that were not inside the arm.

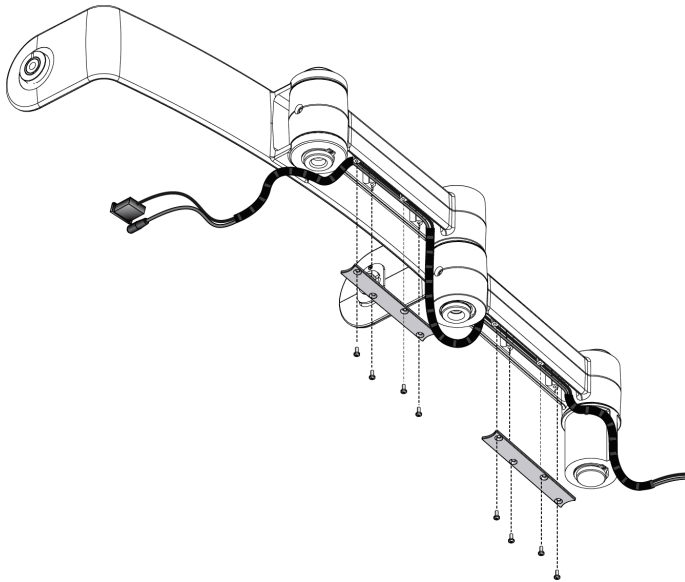


Figure 284: Removing cable retainers to access monitor cables (series I UAWS)

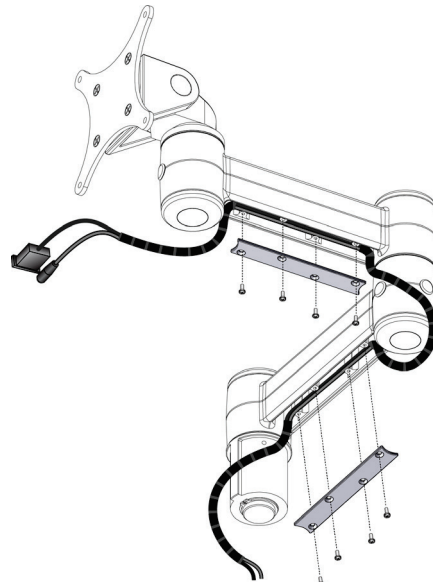


Figure 285: Removing cable retainers to access monitor cables (series II UAWS)

### Installation of Articulating Arm



#### Caution

If the original articulating arm was mounted on the left side of the post/workstation, the new articulating arm needs to be reconfigured to the left side (it is shipped for the right side by default). If reconfiguration is necessary, refer to [Change the Orientation of the Articulating Arm](#) on page 55 before installing the new articulating arm.

1. Verify that the new articulating arm is set for the proper left or right orientation (the default is right) for the customer.



2. Thread the monitor cables through the articulating arm (see the following two figures):
  - a. While holding the double articulating arm near the monitor post, thread the power and DVI cables (item 4) through the arm along the underside track of the assembly. Ensure that the spiral tubing (if supplied) is wrapped around the portions of cable that are exposed between sections of the articulating arm.
  - b. Install the cable retainers supplied with the arm install kit to the underside of the arm sections.
3. Place the new articulating arm and monitor onto the monitor post. Secure the arm to the post using the three cap screws. (See the following two figures, item 5.)
4. Install the image display monitor to the articulating arm (see the following two figures).
  - a. Attach the image display monitor to the monitor mount (item 2) using four screws supplied with the monitor install kit.
  - b. Remove the access panel at the rear of the image display monitor (item 1) and connect the DVI and power cables (item 4). Reattach the rear access panel.

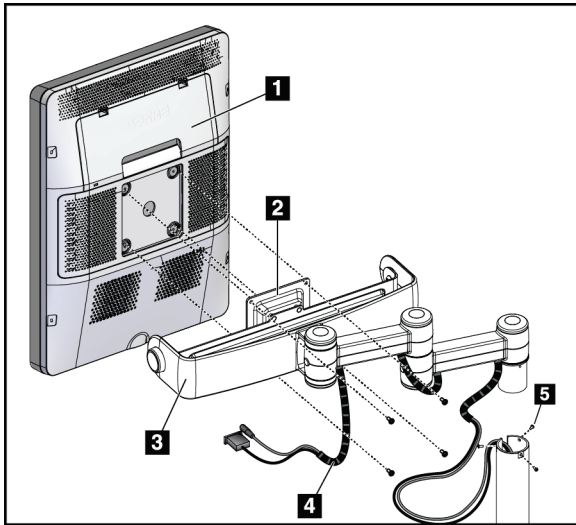


Figure 286: Routing and threading cables through articulating arm (series I UAWS)

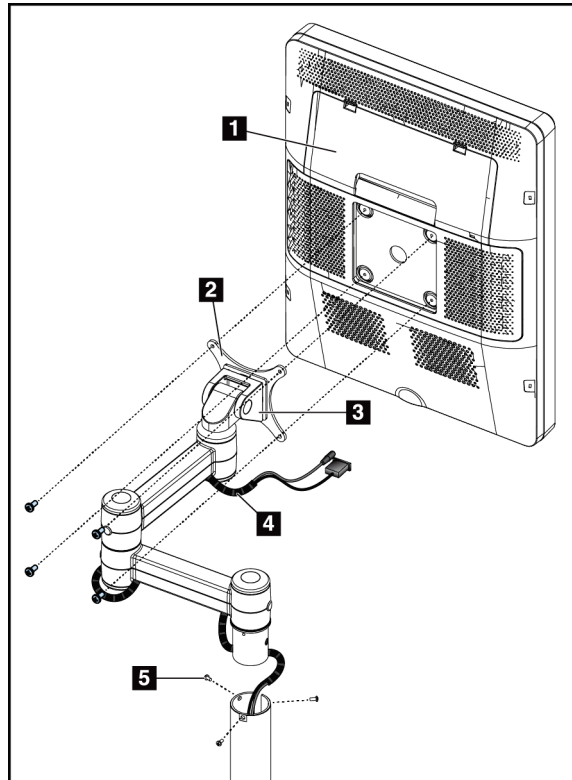


Figure 287: Routing and threading cables through articulating arm (series II UAWS)

5. Plug in and power ON the system.
6. Verify proper operation of the image monitor.



### 8.5.5 Replace Control Monitor

#### Removal

1. Power OFF and unplug the system.
2. Disconnect the VGA cable, power cable, and USB cable (if used) from the existing control monitor.
3. Remove the monitor (see the following figure, item 1) from the monitor mounting plate (item 2) by removing the four (hand-tightened) thumb nail screws (item 3).  
The two different monitor mounts (series I UAWS and series II UAWS) are shown in the following figure, item 4.

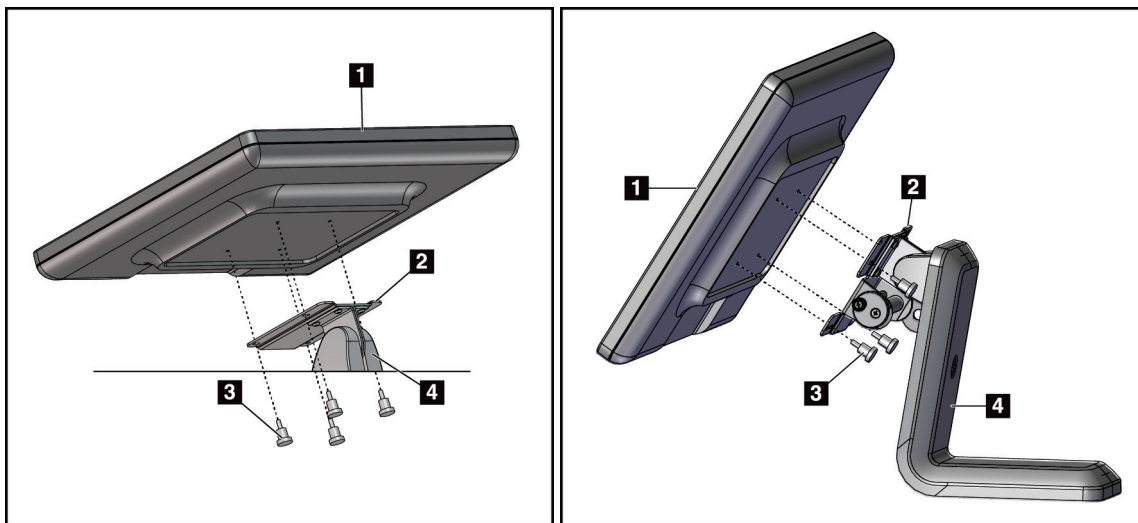


Figure 288: Monitor mount for series I UAWS (left), monitor mount for series II UAWS (right)



#### Note

For easier access to the mounting plate or cable panel on the series I UAWS monitor mount, tilt the monitor mount plate all the way back until it is resting at about a 45° angle, top-down, bottom-up. When finished, restore the mounted monitor to its proper position, top-up, bottom-down. You may have to loosen the nut on the side of the monitor pivot mount in order to tilt the monitor. If so, remember to retighten the nut after you restore the monitor to its proper position.

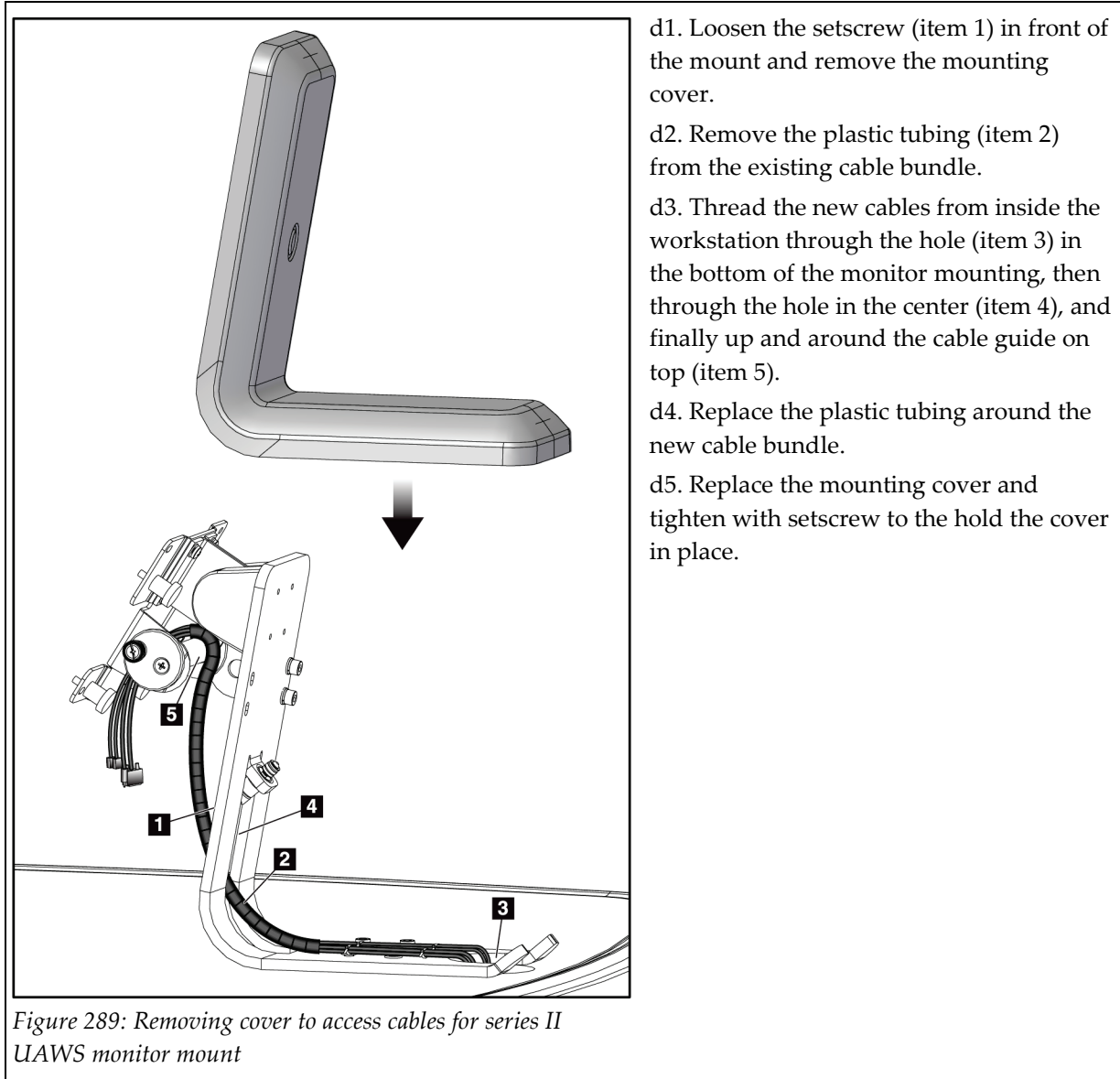


#### Replacement

1. Attach the new monitor to the mounting plate with the four hand-tightened thumbnail screws.
2. (Optional) If necessary, replace the existing VGA cable, power cable, adapter cable, and/or USB cable, as described in the following substeps. Otherwise, skip to step 3.
  - a. Remove the Universal Acquisition Workstation covers as needed.
  - b. Replace the item as necessary:
    - If you are replacing the VGA cable, disconnect it from the rear panel of the computer. Route the cable in reverse direction of its installation path, through and out of the workstation.
    - If you are replacing the power cable and/or adapter cable, disconnect it from the rear panel of the UPS. Route the cable in reverse direction of its installation path, through and out of the workstation.
    - If you are replacing the USB cable, disconnect it from the USB hub. Route the cable in reverse direction of its installation path, through and out of the workstation.
  - c. Route the new cables into and through the workstation and secure with cable ties as needed.



- d. For monitors using the series II UAWS mount, remove the mounting cover to route the cables on top of the workstation surface (see the following figure and substeps):



3. Connect the VGA cable, power cable, and USB cable (if used) to the monitor.
4. Plug in and power ON the system.
5. If the monitor is a touch screen model, calibrate the touch screen feature. (Refer to [Calibrate Touch Screen Control Monitor](#) on page 312.)



#### Calibrate Touch Screen Control Monitor

1. Calibrate the touch screen monitor by using the software utility built into the monitor drivers:
  - a. From the desktop, navigate to the Windows Control Panel.
  - b. In the Control Panel, click the **elo Touchscreen** icon.
  - c. From the General tab, select **Align**.
  - d. Follow the on-screen prompts to calibrate the monitor.
2. Verify proper operation of the monitor.

#### 8.5.6 Major Internal Components

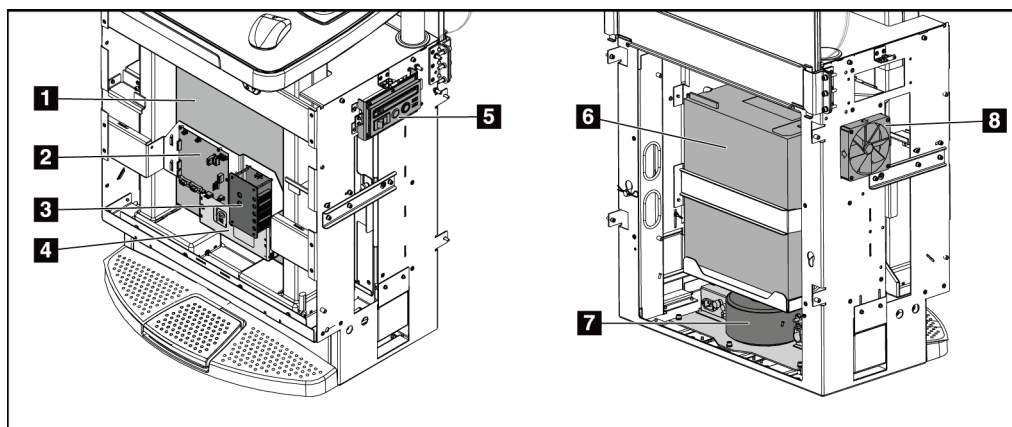


Figure 290: Universal Acquisition Workstation Major Internal Components

#### Figure Legend

1. UPS
2. AWS I/O Interface
3. DC Power Supply, Dual Output (5 V, 12 V)
4. Motorized Height Adjust Controller
5. Internal connections for CD/DVD Drive, Circuit Breaker Power On Switch, CPU Power/Reset Button, UPS (Optional) Power Button, USB Ports
6. Computer
7. Power Distribution Assembly
8. Fan



### **8.5.7 Replace the Keyboard**

#### **Removal**

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and side covers to provide access to the rear panel of the computer. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. If applicable, cut and remove the cable ties that secure the keyboard USB cable along its installation path to the rear panel of the computer.
4. Remove the existing keyboard and cable.

#### **Replacement**

1. Place the keyboard on the pull-out drawer.
2. Route and connect the USB cable of the keyboard to an available port on the rear panel of the computer. Bundle any excess length of USB cable and secure it with the cable ties provided in the kit.
3. Reinstall the front, back, and side covers.
4. Plug in and power ON the system. Verify proper operation of the keyboard.

### **8.5.8 Replace the Mouse**

#### **Removal**

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and side covers to provide access to the rear panel of the computer. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. If applicable, cut and remove the cable ties that secure the mouse USB cable along its installation path to the rear panel of the computer.
4. Remove the mouse and cable.

#### **Replacement**

1. Place mouse on the keyboard pull-out drawer.
2. Route and connect the USB cable of the new mouse to an available port on the rear panel of the computer. Bundle any excess length of USB cable and secure it with the cable ties provided in the kit.
3. Reinstall the front, back, and side covers.
4. Plug in and power ON the system. Verify proper operation of the mouse.



#### 8.5.9 Replace E-Stop, X-ray Button, and Optional Fingerprint Scanner Module

The E-Stop module on the left side of the workstation tabletop is replaced as a whole unit.

- For the series II Universal Acquisition Workstation (UAWS), the E-Stop module incorporates an x-ray button by default, and can also include the optional fingerprint scanner feature (if ordered).
  - For the series I Universal Acquisition Workstation (UAWS), the E-Stop module can also include the optional fingerprint scanner feature (if ordered).
1. Make sure that the power is OFF and the system is unplugged. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
  2. Remove the front, back, and side covers. Remove the top cover (refer to [Remove the Covers and Panels](#) on page 286).
  3. Remove the existing module (see the following figure):
    - a. Unfasten the existing module from its recess in the workstation tabletop by removing the three screws underneath. Retain the screws.
    - b. Lift the existing module from its recess.
    - c. Disconnect the cables and wires and note their locations:
      - Disconnect the wire harnesses from the E-Stop assembly.
      - Disconnect the cables from the x-ray button assembly (if equipped).

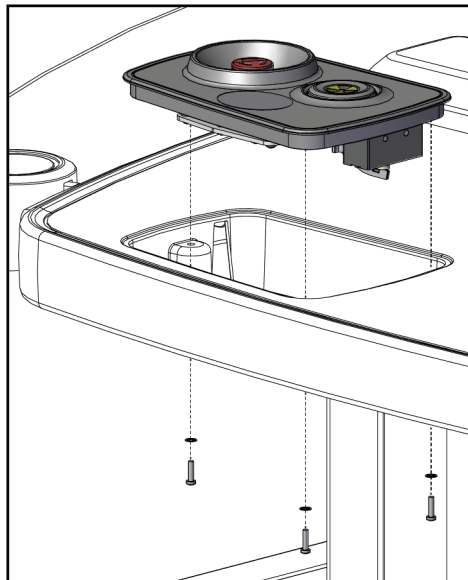


Figure 291: Removing existing E-Stop/x-ray button module (series II UAWS version shown)



4. Connect the wires and cables to the new module:
  - a. Place the new module panel in or near the recess but do not fasten it now.
  - b. Connect the wire harnesses to the E-Stop assembly.
  - c. Connect the cables to the x-ray button assembly (if equipped).
  - d. Connect the device end of the USB cable to the fingerprint scanner assembly (if equipped).

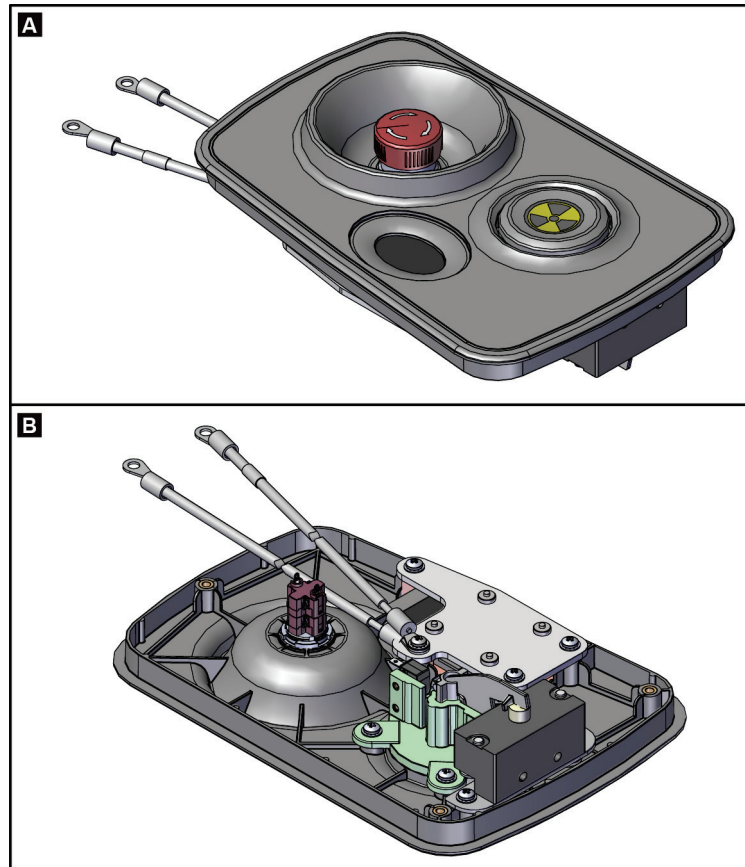


Figure 292: Topside [A] and underside [B] of replacement module (series II UAWS version shown)

5. If not equipped with a fingerprint scanner, skip to step 9; otherwise continue with step 6.
6. Install the ground wires (see the previous figure, panel B) of the fingerprint scanner assembly:



- a. Remove the wire access bracket (see the following figure, item 2) from the module recess (one screw).
- b. Remove the screw (see the following figure, item 5) near the wire access opening of the recess (item 3).
- NOTE: This screw is an outer screw that is NOT one of the eight screws that secure the tabletop mounting plate.
- c. Route the two ground wires from the fingerprint scanner assembly (see the previous figure, panel B) through the wire access opening (following figure, item 3) and out of the recess.
- d. Install the ground screw through the terminals of the ground wires, through the washer, and into the same screw hole. (Refer to previous step 3b.) (See the following figure, item 5.)



#### IMPORTANT

When installing the ground screw, make sure that you place the washer between the two ground screw terminals and the screw hole plate. The washer is essential for maintaining proper contact for the terminals of the ground wires.

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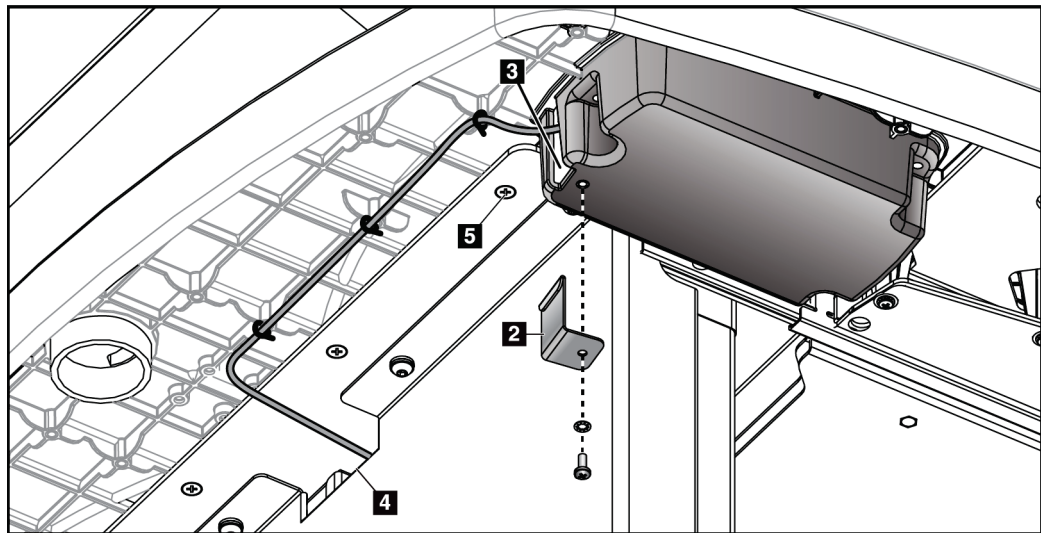
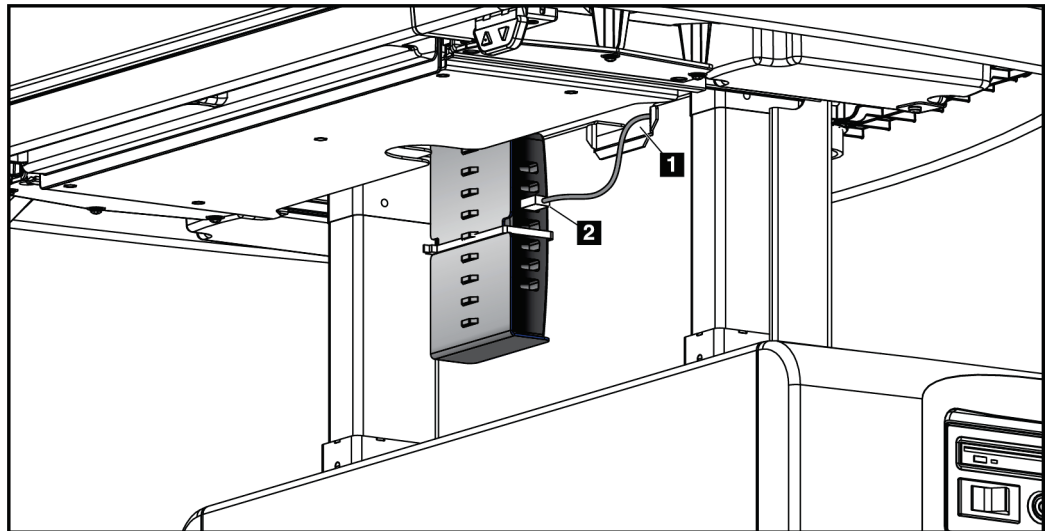


Figure 293: Routing USB cable of fingerprint scanner

7. Route the USB cable of the fingerprint scanner (if equipped) to the USB hub:
  - a. Route the hub end (flat plug) of the USB cable through the wire access opening and out of the recess. (See the previous figure, item 3.)
  - b. Route the USB cable along the underside of the tabletop, using cable ties, wire ties, or p-clips to secure the cable. (See the previous figure, between items 3 and 4.)
  - c. Continue routing the USB cable toward the wireways opening at the top center of the rear shroud. (See item 4 in the previous figure.)



8. Connect the USB cable to the USB hub:
  - a. Route the USB cable through the wireways opening (see the following figure, item 1) to the outer side of the front shroud.
  - b. Plug the USB cable into an available port on the USB hub (item 2).
  - c. Secure any excess cable slack with the cable ties provided in this installation kit and secure them to one of the slots on the USB hub bracket. (See the following figure.)



*Figure 294: Routing USB cable to USB hub*

9. Install the new E-Stop/x-ray button/fingerprint scanner module panel into its recess (three screws, see figure [Removing existing E-Stop/x-ray button module](#) on page 314).
10. If not equipped with a fingerprint scanner, skip to step 11.  
Otherwise, reattach the wire access bracket to the recess (one screw). (See item 2 in figure [Routing USB cable of fingerprint scanner](#) on page 316.)
11. Reinstall the front, back, and side covers.
12. Plug in the system and power it ON.
13. Verify proper operation of the E-Stop and X-ray switch (if equipped). Perform the functional tests as described in the *User Guide*.
14. If equipped with the fingerprint scanner, configure and test the fingerprint scanner with the operators that are using the system. (Refer to [Configure the Fingerprint Scanner](#) on page 318.)



#### Configure the Fingerprint Scanner

1. Start up the system and log in as the operator that you want to set up for fingerprint scanning.
2. On the touch screen of the user interface, go to **Admin > Manage Operators**.
3. Select the operator, then select **Edit**.
4. At the bottom of the user screen, select **Finger 1**, then select **Capture**.
5. At the prompt (see the following figure, left), place the desired finger of the operator on the fingerprint scanner.
6. Remove the finger when the Data screen indicates *Fingerprint Capture Succeeded*. (See the following figure, right.)



Figure 295: Data screen before (left) and after (right) a successful scan

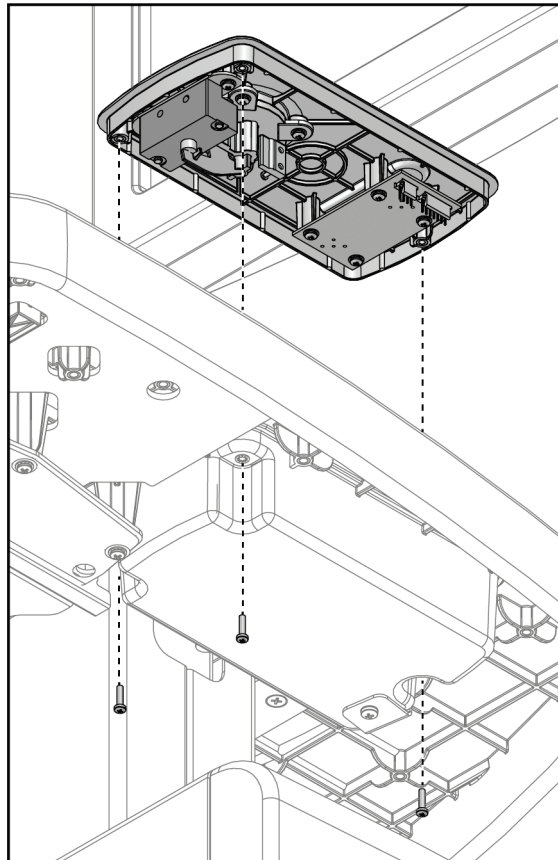
7. Repeat steps 5 and 6 until the operator obtains a total of four thorough, successful scans.
8. When you have captured four successful scans of the fingerprint, select **OK**.
9. Select **Save > OK > Back > Log Out**.
10. If necessary, repeat steps 1 to 9 to acquire another set of fingerprint images, either for the same finger or another finger. Acquiring another set is optional and is useful for the following reasons:
  - For the same finger: The operator can scan additional data for a finger (for example, for more accurate recognition under less than ideal conditions for fingerprint scanning).
  - For another finger: The operator can scan a backup fingerprint (for example, if the first finger is injured and the operator cannot use it to log in).
11. Log off the system. Advise the operator to log back on using the Fingerprint Scanner to verify proper operation.



### 8.5.10 Replace the X-ray/Compression Release Button Module

#### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Unfasten the x-ray activation button/compression release button assembly from its housing by three screws underneath the workstation table top. (See the following figure.)



*Figure 296: Removing the assembly from its housing (shows all cables already disconnected)*

3. Pry up carefully the assembly out of its housing.
4. Disconnect the cable (AEJ12) going to the x-ray activation button and jumper cable (AEJ11) to the compression release board.



#### Replacement

1. Connect cable (AEJ12) to the x-ray activation button and jumper cable (AEJ11) to the compression release board of the new assembly.
2. Reattach the assembly to its housing by three screws underneath the workstation table top.
3. Plug in and power ON the system.
4. Test the x-ray activation button and compression release button for proper operation. Perform the functional tests as described in the *User Guide*.

#### 8.5.11 Replace and Verify the Bar Code Scanner

We recommend that you configure and test the replacement bar code scanner before you actually install it in the workstation. This way, if there are any issues, you can avoid the labor to uninstall and reinstall the device from the system.

Also, we recommend that you do a final test of the bar code scanner after installation to verify nothing had changed during the hardware installation procedure.

#### Configure Bar Code Scanner Before Installation



##### Important

Configure the bar code scanner before you install it to the workstation.

---

#### Reset to Default Factory Settings

The following code erases all your settings and resets the scanner to the original factory defaults. It also disables all plugins. Use this code if you are not sure which programming options are in your scanner, or if you have changed some options and want to restore the scanner to factory default settings.

1. Power ON the system.
2. Remove the scanner from the packing box. Attach the scanner end of the USB cable (CBL-02488) to the bar code scanner (CMP-01541) and plug it into an available USB port on the side of the workstation. The scanner makes a beep sound.
3. Press the button on the scanner.
4. Scan the **Activate Custom Defaults** bar code. This step resets the scanner to the factory default settings.





### Program the Scanner

1. Program the scanner:
  - a. Press the button on the scanner.
  - b. Scan the following configuration bar code. This code gives the scanner the correct settings to work with system Capture application.



2. Activate presentation mode:
  - a. Wait 30 seconds, then press the button on the scanner.
  - b. Scan the following bar code to set Presentation Mode.

Presentation Mode uses ambient light to detect bar codes. The LEDs remain off until a bar code is presented to the scanner, then the LEDs turn on automatically to read the code.



### Verify Bar Code Scanner Before Installation



---

**Important**

Verify the bar code scanner after you have first configured it and before you physically install it.

---

The bar code scanner CMP-01541 requires Honeywell firmware (SFW-02417) to be loaded on the system as part of the scanner installation. After the firmware is loaded, a verification is performed to ensure that the scanner functions at the system level and is configured correctly with the system Capture application.



1. Install the USB Serial Driver (SFW-02417):
  - a. Install the setup file from the CD provided in the kit by right-clicking the file **setup.bat**, then selecting **Run as administrator**.

The Command Prompt window opens. Do NOT close the Command Prompt Window.
  - b. Wait until the command window closes by itself. This step takes approximately 4–10 seconds.
  - c. Restart the system.
2. Check that *3xx Area-Imaging Scanner* is installed:
  - a. Plug the programmed scanner into the computer.
  - b. Go to **Control Panel > Device Manager**.
  - c. Ensure that the Device Manager window displays **3xx Area-Imaging Scanner** under Ports (COM & LPT). (See the following figure.)
    - Note that the name following HOLOGIC (shown here as O0GJNJC) is for reference purposes only.
    - Note that the Communication Port number (shown here as COM5) is for reference purposes only. The actual COMx may vary from system to system.

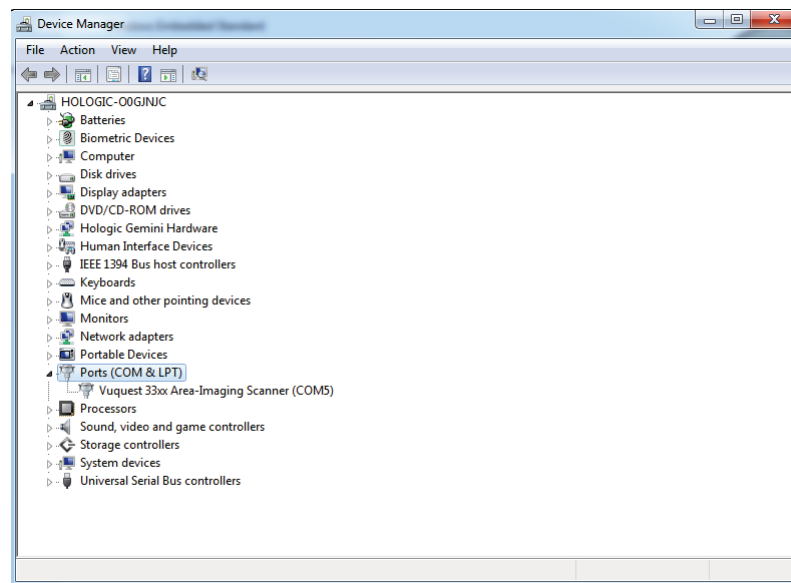


Figure 297: Verifying that 33xx Area-Imaging Scanner is installed



3. Do the following substeps to install the Linak startup fix software upgrade (SFW-02560):
  - a. If necessary, log out of the system Capture application to return to the startup screen.
  - b. Press the **CTRL** key and click **Shutdown**.
  - c. At the version level screen, press the **CTRL** key and click **Exit**. The Windows desktop is now visible.
  - d. Insert the SFW-02560 Installation disk into the CD ROM drive.
  - e. Locate **FixLinakStartup.bat** on the CD and double-click it to start the install.
  - f. A command prompt window opens, providing the status of the installation. Confirm that the installation was successful (see the following figure).

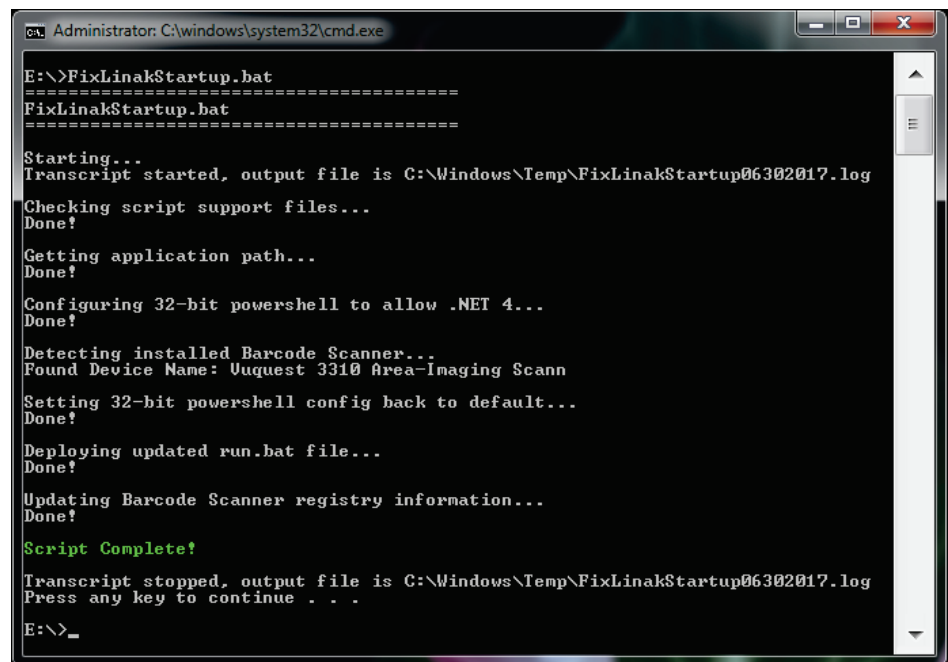


Figure 298: Fix Linak Startup software successfully installed

- g. Click the command prompt window and press any key. The command prompt window closes.
- h. Remove the SFW-02560 Installation disk from the CD ROM drive.
- i. Restart the computer.



4. Test the bar code scanner in the system Capture application.



### Caution

The testing process for the system Capture application is based on the default system setting for the interpretation of bar codes - Patient ID.

If the customer is using another setting for the interpretation of bar codes (such as Accession Number), the bar code setting in System (Service) Tools needs to be changed to Patient ID temporarily. To change this bar code setting, refer to [Configure the Bar Code Interpretation \(Optional\)](#) on page 129.

After you perform the final testing (as done in [Install and Do Final Test of Bar Code Scanner](#) on page 325), change the bar code setting back to the one used by the customer.



### Note

Disregard any Acquisition Workstation error message boxes that may occur while running this test. Click into the appropriate area of each message box to remove it from the display.

- a. In the system Capture application, log in as Service.
- b. Before scanning, confirm that you are in the **All** tab in the Select Patient screen. (See the following figure.)

Select Patient			
Patient Name			
Scheduled	In Progress	Completed	Current User
Reject	Pend	Notices	All
		QC	
Name	Patient ID	Exam	Status
Grid Line Test	10.0	Standard Screening - Conventional	Scheduled
Lost Tissue at detector Edge	11.0	Standard Screening - Conventional	Scheduled
AEC Function Performance	12.0	Standard Screening - Conventional	Scheduled
AEC Reproducibility(Combo Mode)_SNR	13.0	Standard Screening - Combo	Scheduled
System Resolution	14.0	Standard Screening - Combo	Scheduled
Final Artifact Evaluation	15.0	Standard Screening - Conventional	Scheduled
Barcode Scanner	710005	Standard Screening - Conventional	Scheduled
MAG Repo	MIS_01	Standard Screening - Conventional	Scheduled
Spare Exposures	MIS_02	Standard Screening - Conventional	Scheduled
Tomo	Tomo	Standard Screening - Conventional	Completed

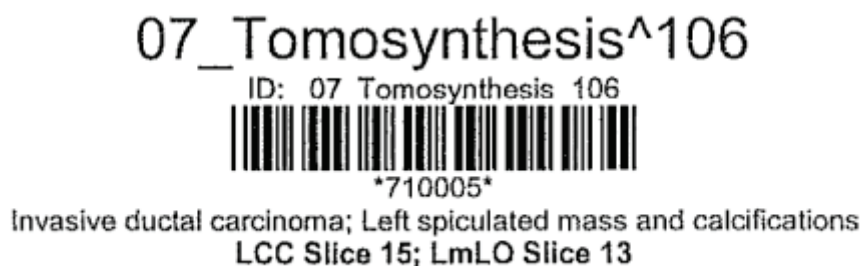
Figure 299: Testing the bar code scanner

- c. Create a new patient and name it **Tomo**.
- d. Assign the patient ID to **710005**.
- e. Select **Standard Conventional Screening As Procedure**.
- f. Select **Save**.



- g. Hold a blank page beneath the scanner and check that the scanning window is activated.
- h. Scan this bar code (see the following figure).

The Techniques screen (with patient information) is displayed.

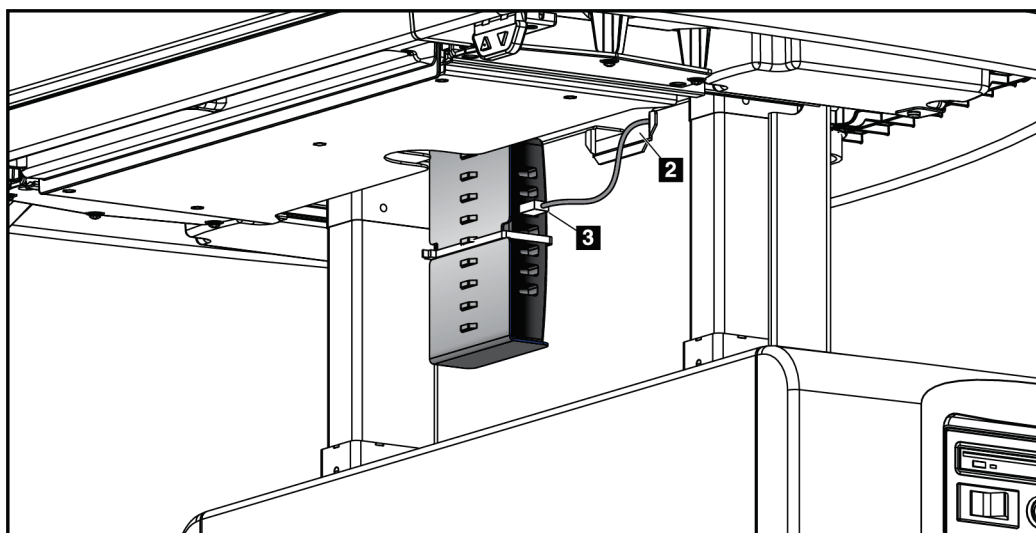


*Figure 300: Sample bar code*

### **Install and Do Final Test of Bar Code Scanner**

#### **Remove Existing Bar Code Scanner**

1. Turn power OFF and unplug system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, side, and top covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Remove the bar code scanner:
  - a. At the USB hub, disconnect the USB cable of the bar code scanner. (See the following figure, item 3.)

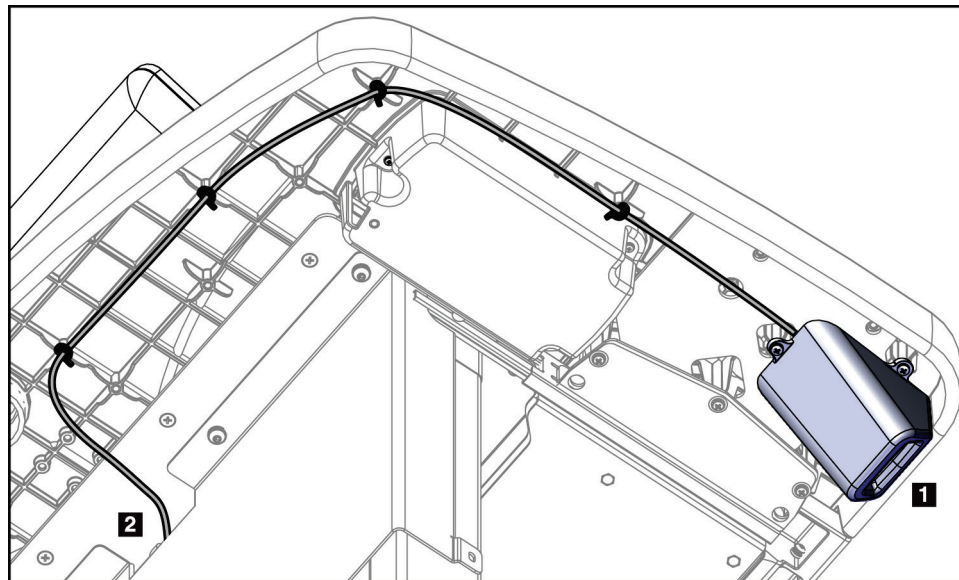


*Figure 301: Disconnecting bar code scanner USB cable from USB hub*

- b. Pull the USB cable through the access opening at the top center of the rear shroud. (See the previous figure, item 2.)



- c. Detach the USB cable from the p-clips on the underside of the workstation tabletop (see the following figure, item 2) back to the bar code scanner (item 1).

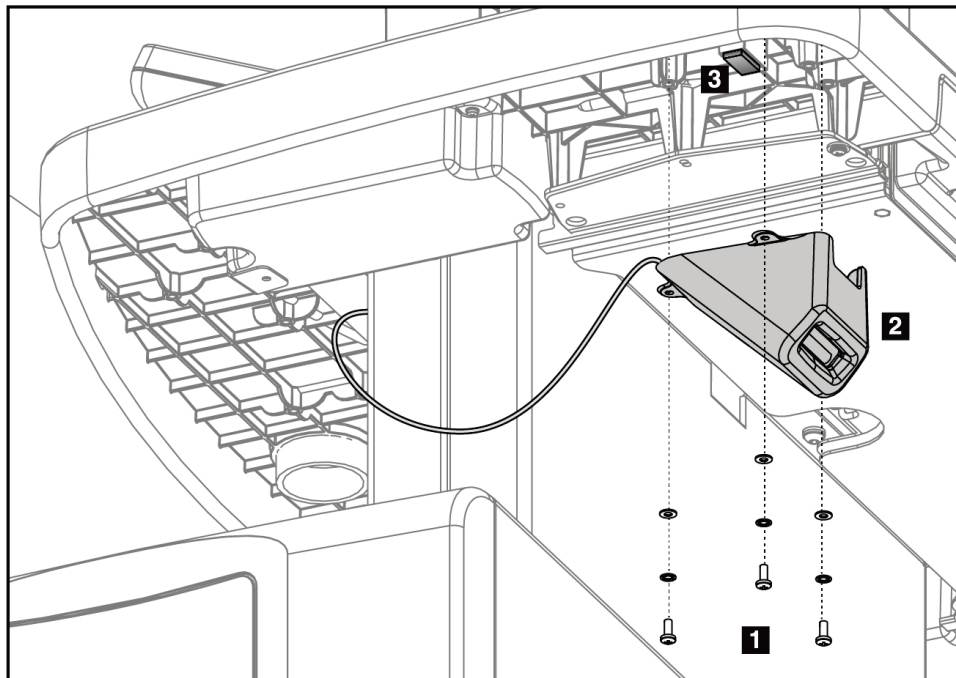


*Figure 302: Removing USB cable from access opening (2) to bar code scanner cover (1)*



- d. Remove the bar code scanner and cover (item 2 in following figure) from the underside of the tabletop (three screws, in following figure).

Make sure that the rubber stop (item 5 in following figure) is intact and still attached to the underside of the tabletop. The rubber stop holds the scanner captive when mounted. If the rubber stop is not salvageable or usable, make sure a new one is available when installing the new scanner.



*Figure 303: Removing the bar code scanner*

#### **Install New Bar Code Scanner**



##### **Important**

Install the bar code scanner only after you have tested the configuration. See the previous sections *Configure Bar Code Scanner* and *Verify Bar Code Scanner* in this document.



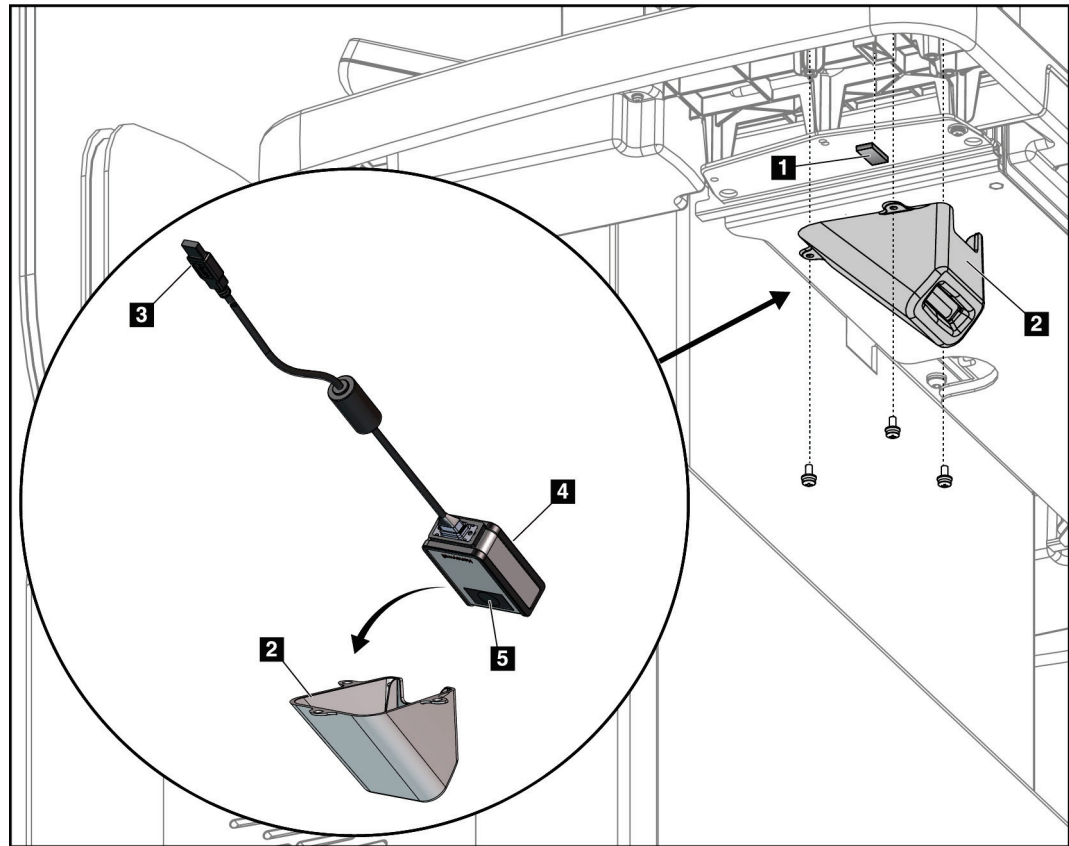


Figure 304: Installing bar code scanner and related parts

#### Figure Legend

1. Rubber Stop
  2. Scanner Cover
  3. Scanner Cable
  4. Top of Bar Code Scanner  
(Displaying Logo of Manufacturer)
  5. ON/OFF Button
1. Attach the scanner end of the USB cable (CBL-02488) to the bar code scanner (CMP-01541). (See the previous figure, items 1 and 2.)
  2. Install the rubber stop MME-02378 (see the previous figure, item 1):
    - a. Peel off the adhesive backing.
    - b. Affix the rubber stop to the molded rectangular recess under the workstation console, as shown in item 1. (The rubber stop helps to maintain a snug fit for the bar code scanner inside its cover.)
  3. Invert the orientation of the bar code scanner so that it is upside down (logo and ON/OFF button facing down).



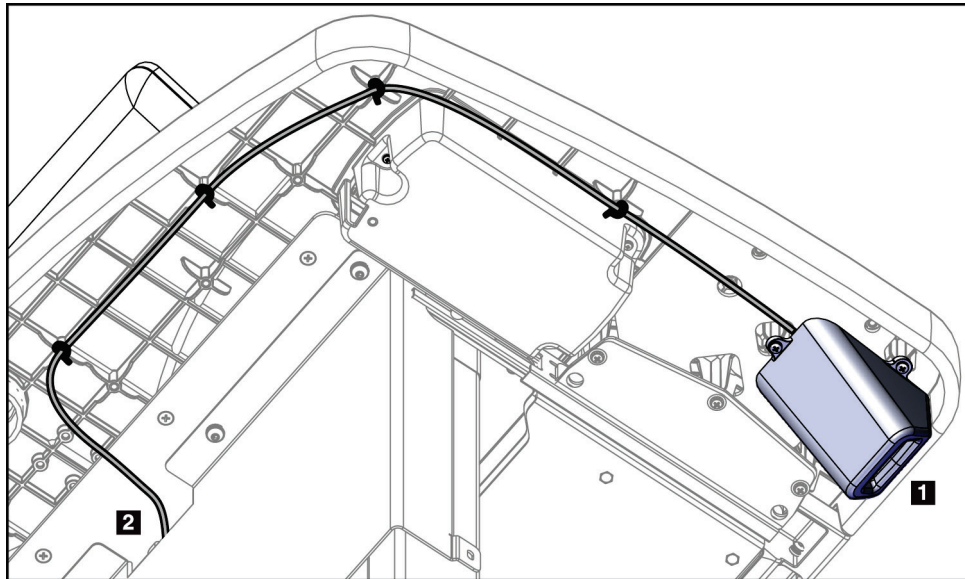
4. Fasten the scanner cover (now containing the bar code scanner) to the underside of the workstation console. See the previous figure (item 2) and the following figure (item 1).



**Caution:**

**Be careful not to damage the cable when mounting the cover. As you fasten the cover, make sure that the USB cable protrudes freely through the gap between the cover and the underside of the tabletop console.**

5. Route and connect the USB cable:
  - a. Route the USB cable along the underside of the tabletop, using the p-clips (already installed) or the wire ties provided in the kit to secure the cable. (See the following figure, between items 1 and 2.)
  - b. Continue routing the USB cable toward the top center of the rear shroud. (See item 2 in the following figure.)
  - c. Route the USB cable through the access opening (see item 2 in the following figure) at the top center of the rear shroud.



*Figure 305: Routing the USB cable*



- d. Route the USB cable out of the access opening (see item 2 in the following figure) and down the inner side of the rear shroud.
- e. Plug the USB cable into an available port on the USB hub. (See item 3 in the following figure.)
- f. Bundle any excess cable slack using a cable tie provided in the installation kit, then secure the bundle to one of the loops on the USB hub bracket.

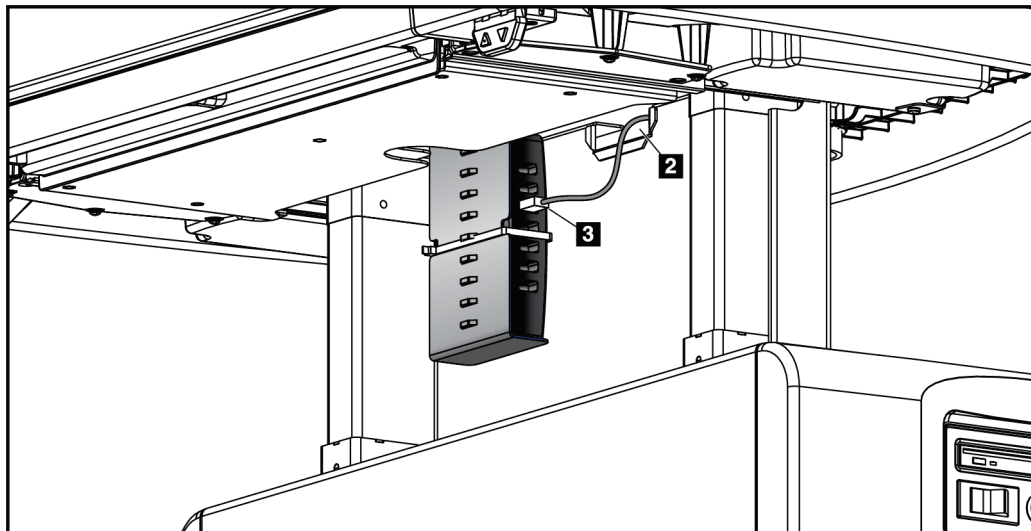


Figure 306: Routing the USB cable to the USB hub

6. Reattach components:
  - a. Reattach the front shroud.
  - b. Reattach the chassis support bracket.
  - c. Reattach the front, rear, and side covers.
7. Plug in and power ON the system.

#### Test New Bar Code Scanner

1. Test the bar code scanner in the system Capture application:



#### Caution

The testing process for the system Capture application is based on the default system setting for the interpretation of bar codes - Patient ID.

If the customer is using another setting for the interpretation of bar codes (such as Accession Number), the bar code setting in System (Service) Tools needs to be changed to "Patient ID" temporarily. To change this bar code setting, refer to [Configure the Bar Code Interpretation \(Optional\)](#) on page 129. After you perform this final testing, change the bar code setting back to the one used by the customer.





**Note**

Disregard any Acquisition Workstation error message boxes that may occur while running this test. Click into the appropriate area of each message box to remove it from the display.

- a. In the system Capture application, log in as Service.
- b. Before scanning, confirm that you are in the **All** tab in the Select Patient screen. (See the following figure.)

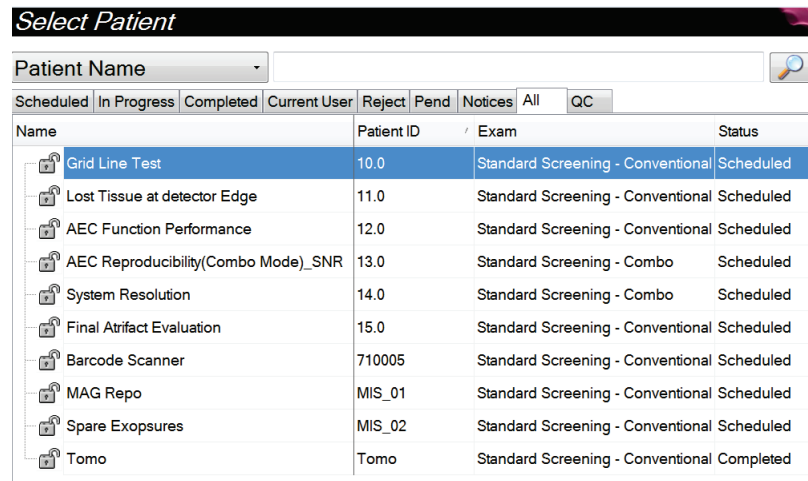


Figure 307: Testing the bar code scanner

- c. Hold a blank page beneath the scanner and check that the scanning window is activated.
- d. Scan this bar code (see the following figure).

The Techniques screen (with patient information) is displayed.

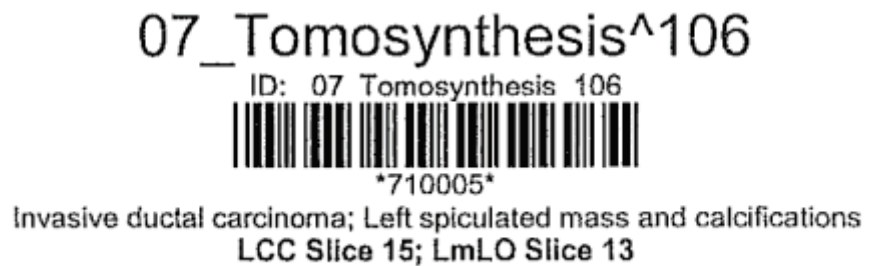


Figure 308: Sample bar code



### 8.5.12 Replace the Height Adjust Motor Controller



**Warning:**

For the following procedures, be careful not to drop the screws as you remove them. If you do, locate and retrieve the lost screws from the bottom of the machine. Not retrieving the screws may cause a shorting hazard in the power distribution assembly after system startup.

**Removal**

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, side covers, the chassis support bracket, and the front shroud. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Disconnect all cords and cables going to the controller (see following figures and legend):

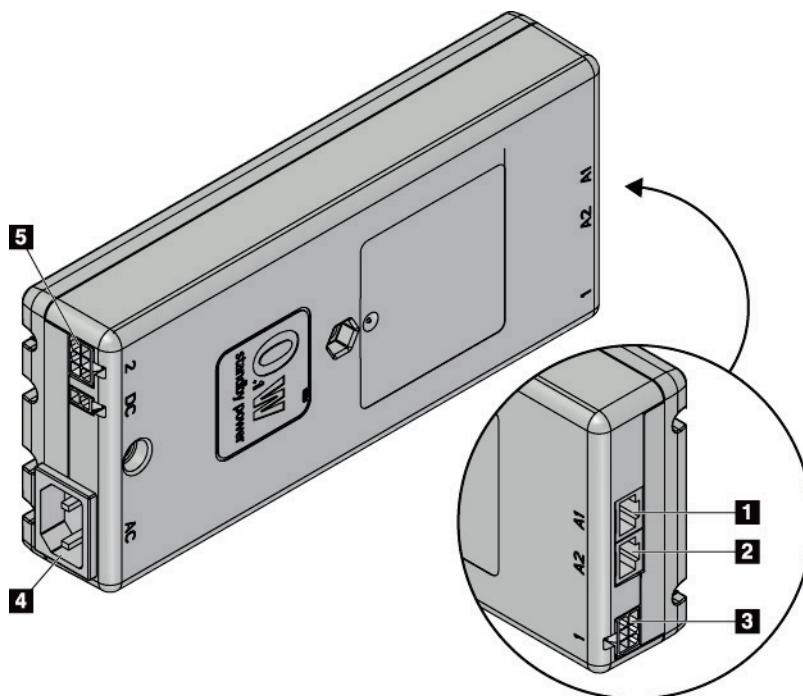
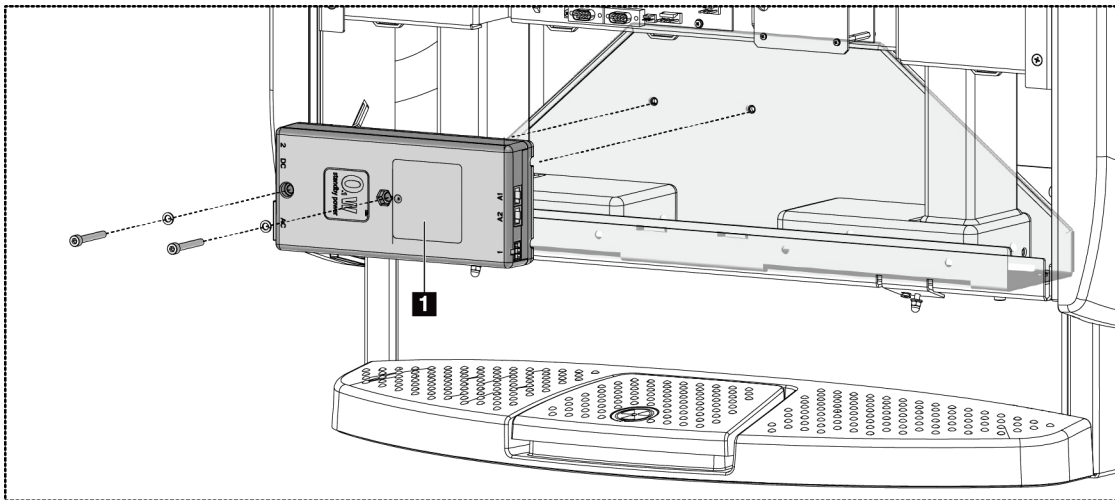


Figure 309: Connections to the motorized height adjust controller



### Figure Legend

1. Port A1: USB Signal Converter Cable (optional, may not be present)
  2. Port A2: Operator Desk Control Panel Cable
  3. Port 1: Motor 1 Controller Cable
  4. Port AC: AC input from UPS
  5. Port 2: Motor 2 Controller Cable
4. Remove the controller from the tabletop pillar mounting bracket (item 1 in following figure).



*Figure 310: Replacing the motorized height adjust controller*

### Replacement

1. Install the new controller to the mounting bracket using two screws, flat washers, and lock washers (see previous figure).
2. Reconnect all cords and cables to the controller (see figure [Connections to the Motorized Height Adjust Controller](#) on page 332):
  - a. Female AC power input (item 4)
  - b. Motor 2 controller cable (item 5)
  - c. Motor 1 controller cable (item 3)
  - d. Operator desk control panel cable at A2 (item 2)
  - e. (If originally present) Cable to USB signal converter at A1 (item 1)
3. Reattach components:
  - a. Reattach the front shroud.
  - b. Reattach the chassis support bracket.
  - c. Reattach the front, rear, and side covers.



4. Plug in and power ON the system.
5. Program/calibrate the Controller:
  - a. At the Up/Down button module of the workstation, press the **Down** button.
  - b. Lower the tabletop all the way down.
  - c. Release the **Down** button.
  - d. Depress and hold the **Down** button for about 10 seconds.
  - e. Release the **Down** button.

The tabletop of the workstation is now programmed and calibrated to move fully up and down by using the Up/Down buttons.

6. Verify proper operation of the motorized height adjust control for the tabletop.

#### 8.5.13 Replace the Signal Converter

##### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Locate the signal converter (item 1 in following figure) near the bottom front of the workstation next to the motorized height adjust controller (item 2). The signal converter consists of a rectangular device with a USB cable coming out one side and a network cable coming out the other side. It is not mounted to any structure.

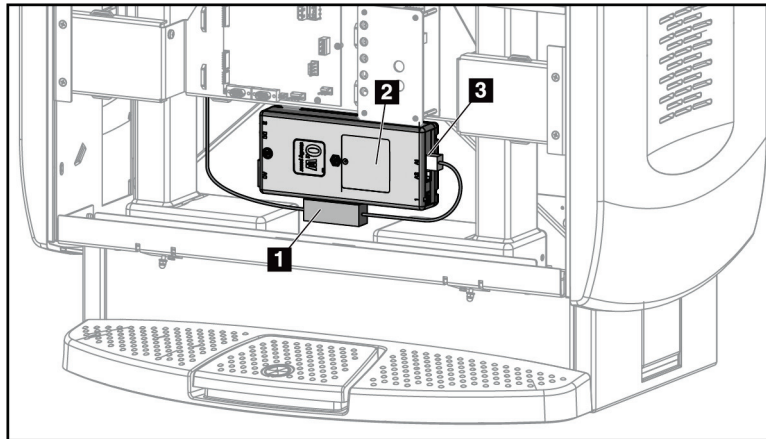


Figure 311: Location of signal converter (item 1)

4. Disconnect the network cable of the signal converter from port A1 of the motorized height adjust controller (item 3 from previous figure).
5. Disconnect the USB cable of the signal converter from the USB port on the workstation computer.
6. Remove the signal converter with its cables.



### Replacement

1. Connect the network cable into port A1 of the motorized height adjust controller (item 3 from previous figure).
2. Route the USB cable end up inside the workstation and connect it to an available port on the computer. Use cable ties to manage and bundle any slack at that end as necessary to hold the signal converter in place under the motorized height adjust controller.
3. Attach the front, back, and side covers.
4. Plug in and power ON the system. Test the motorized height adjust controller for proper operation.

#### 8.5.14 Replace the Remote X-ray Activation Switch

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the rear cover and the lower rear panel (kick plate) behind the rear cover. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. At the Gantry cable interface, disconnect the existing remote x-ray switch cable. (See the following figure.)

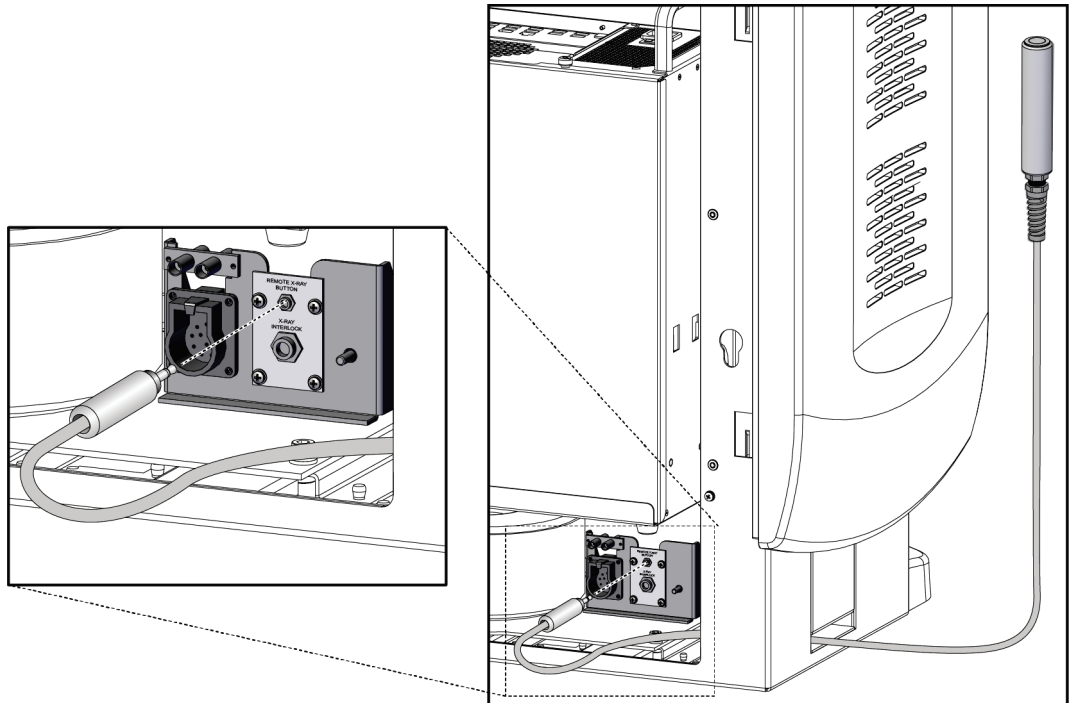


Figure 312: Removal/replacement of remote x-ray switch cable (shows left side access)



4. Pull out the remote x-ray switch cable through the access opening at the bottom left or right side of the workstation. (See the previous figure.)
5. Insert the new remote x-ray switch cable through this same access opening.
6. At the Gantry cable interface, insert the remote x-ray switch cable into the jack that is labeled *Remote X-ray Button*.
7. Place the remote x-ray switch in the desired location.
8. Reinstall the lower rear panel (kick plate) and rear cover.
9. Plug in and power ON the system. Verify proper operation of the remote x-ray switch.

#### 8.5.15 Replace the DVD Drive and Switch Assembly

##### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and right side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Remove the CD/DVD drive and switch panel assembly from the right side of the workstation chassis (four screws).

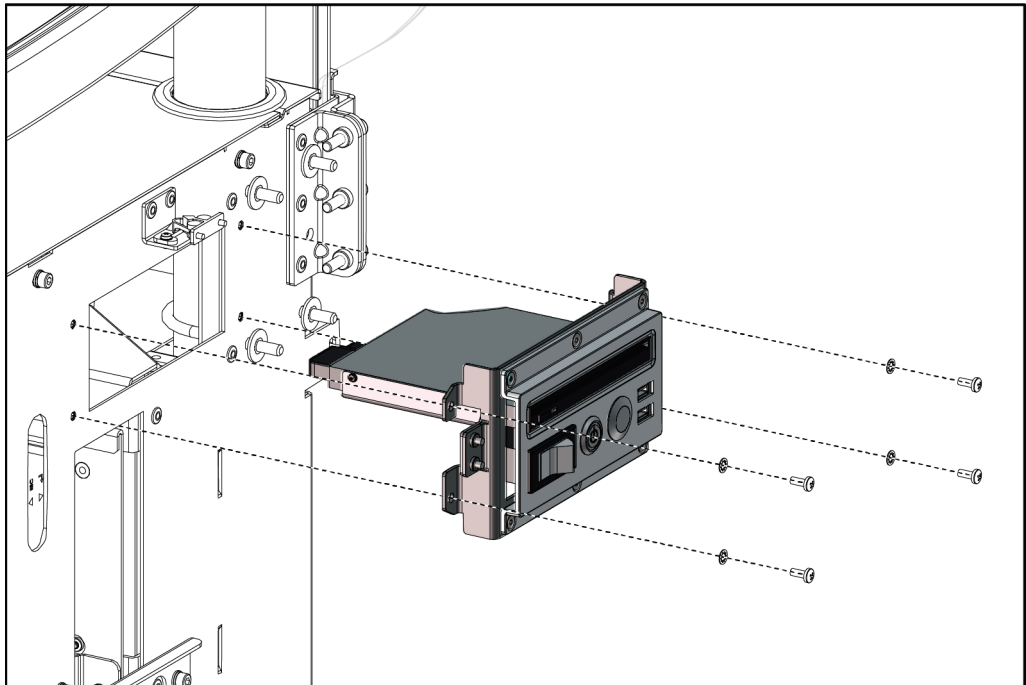
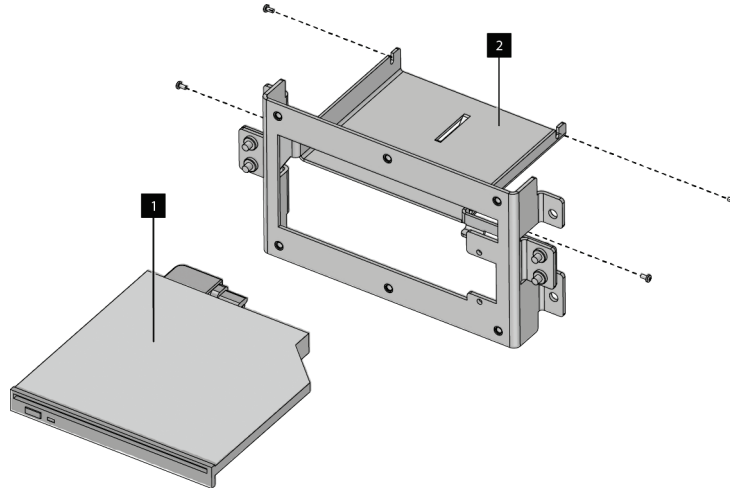


Figure 313: Removing the CD/DVD drive and switch panel assembly

4. Disconnect the cables to the CD/DVD drive, Power On/Off switch, CPU reset button, UPS reset button, and the two USB ports.



5. If necessary, remove the CD/DVD drive (item 1) from the drive mounting bracket (item 2) with four screws.



*Figure 314: Removing the CD/DVD drive from the drive mounting bracket*

### **Replacement**

1. If necessary, install the new CD/DVD drive to the drive mounting bracket.
2. Connect the cables to the CD/DVD drive, CPU reset button, UPS reset button, and Power On/Off switch.
3. Reinstall the CD/DVD drive and switch panel assembly to the chassis.
4. Reinstall the front, back, and right side covers.
5. Plug in and power ON the system. Test the CD/DVD drive and front panel switches.



#### 8.5.16 Replace the X-ray Activation Footswitch Assembly

##### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. If not done already, remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Unfasten the four screws (two at each end) of the lower front panel (kick plate) and remove the panel.) Retain the screws.

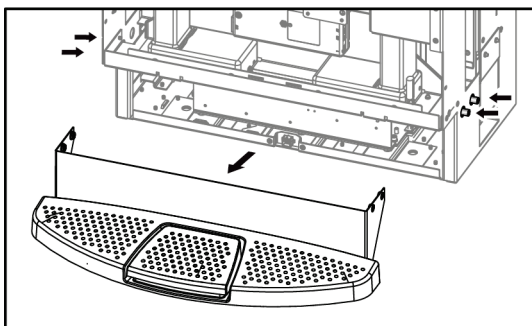


Figure 315: Removing the existing x-ray footswitch assembly

##### Replacement

1. Install the x-ray activation footswitch assembly:
  - a. Attach the new lower front panel kick plate (which is part of the x-ray activation footswitch assembly) by sliding it into place. (See the following figure.)
  - b. With the assembly now attached to the base of the workstation, secure it by tightening the same screws loosened in the previous step.

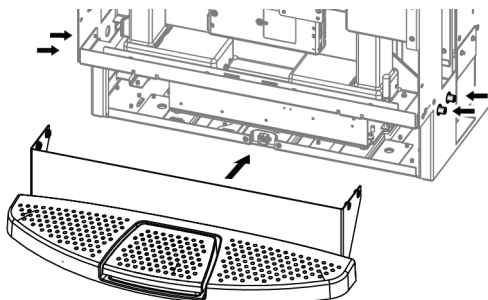


Figure 316: Installing x-ray footswitch assembly (which includes new lower front panel kick plate)





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**Note**

The wiring connection is made via bulkhead connectors between the footswitch and the workstation with no separate cabling/harnesses used.

See the previous figure. The center arrow points to where the footswitch connector connects with the workstation mating connector.

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**Tip**

If there is not enough space to slide the x-ray footswitch assembly into place, loosen the Universal Acquisition Workstation mounting bolts from the floor. If necessary, tilt the front of the workstation up slightly to slide the x-ray footswitch assembly into place.

---

2. Verify that the footswitch is installed and connected properly:
  - a. On the I/O Interface Board, locate JP5. (See the following figure.)
  - b. Using a digital multimeter (DMM), measure resistance between JP5 Pin-2 and JP5 Pin-4 on the I/O Interface Board.
  - c. If the footswitch is installed and connected properly:
    - When the footswitch is depressed, your resistance measurement indicates a closed connection.
    - When the footswitch is NOT depressed, your resistance measurement indicates an open connection.



3. Set the jumpers for the proper footswitch operation (parallel or series) that the customer requires. (Refer to the following figure and legend.)

#### Figure Legend

**A - For parallel operation** (the operator uses *either* the footswitch *or* the x-ray button on the tabletop to activate an x-ray image):

- Put jumpers on pins 1-2 and 3-4. (See the adjacent figure, item A.)

**B - For series operation** (the operator uses *both* the footswitch *and* the x-ray button on the tabletop to activate an x-ray image):

- Verify (or put) jumpers on pins 5-6 and 2-3. (See the adjacent figure, item B.)

#### NOTE:

- Parallel operation is the default setting for all shipped UAWS systems.
- Series operation is the default setting for AWS.

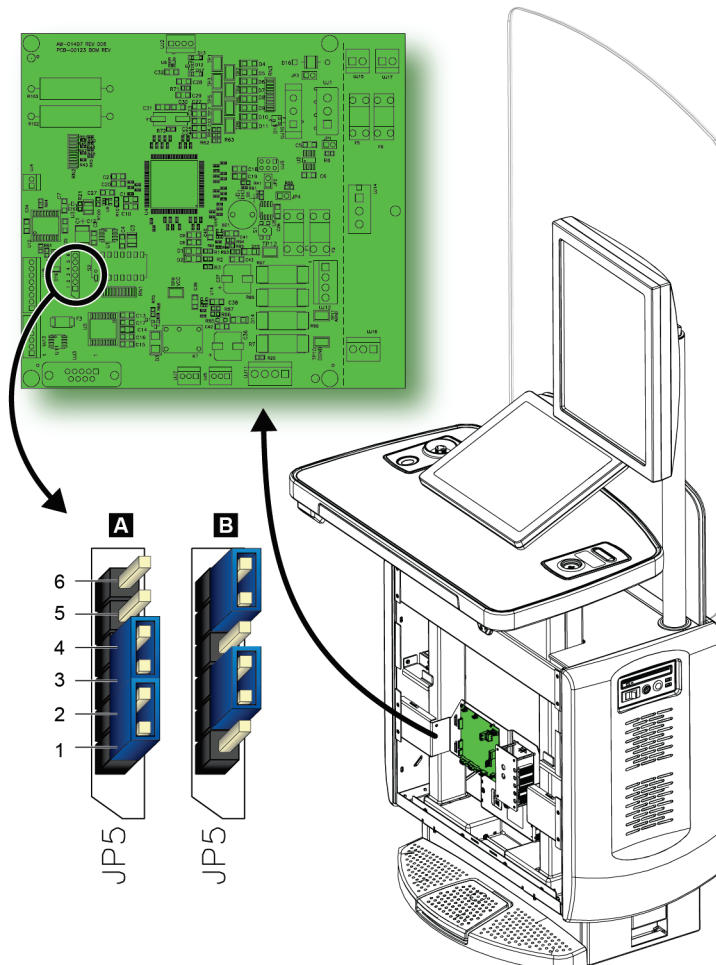


Figure 317: Setting the jumpers on the UAWS I/O Board

4. Reinstall the side, rear, and front covers.
5. Plug in and power ON the system.
6. Verify proper operation of the x-ray activation footswitch and the x-ray activation button on the tabletop.



### 8.5.17 Replace the Radiation Shield



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**Warning:**

Use gloves and eye protection when handling the X-ray Shield.

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**Warning:**

Do not handle or position the Radiation Shield alone. Two people are required to handle and position the tempered glass shield to minimize stress to the shield.

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**Caution:**

The X-Ray Shield is made of tempered glass and is fragile. Use extreme care when handling and installing the shield. When installing, the shield must be precisely positioned and must not be flexed in any direction.

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**Caution:**

Inspect the X-ray Shield before and after installation. Small imperfections embedded in the glass are acceptable. Do not install the shield if cracks or chips are visible.

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**Caution:**

Use care when cleaning the X-ray Shield to avoid excessive force and movement of the shield.

---



#### Replacement of Taller Radiation Shield

1. On the back of the workstation, loosen the workstation shield bracket (item F in the following figure, three screws on each side) enough to free up the shield (item C) and related spacers/plates.
2. Carefully remove the shield (item C). Two people are required for this action.
3. Place into position the new shield between the front reinforcement plate (item D) and the back reinforcement plate (item B).

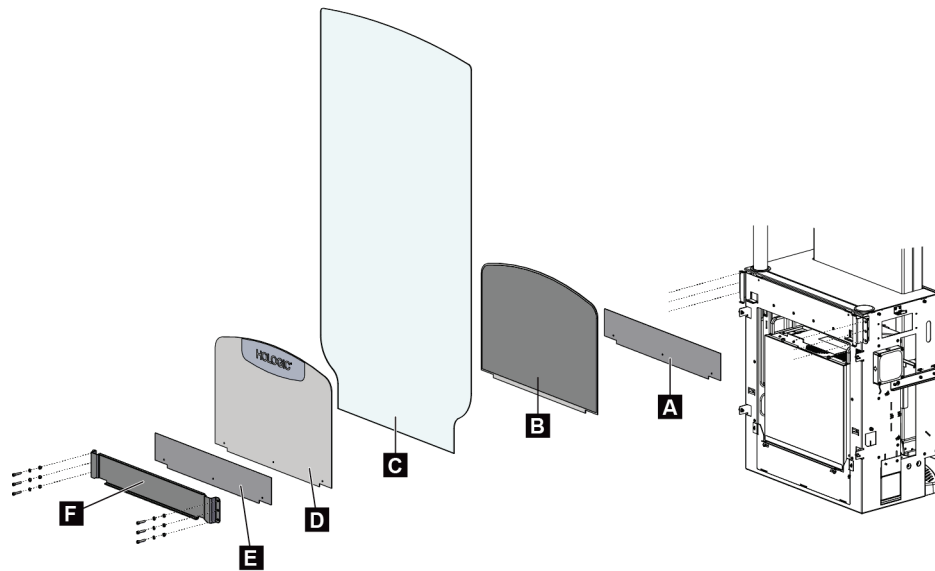


Figure 318: Radiation shield replacement (taller shield)

4. Hand tightening the screws in the shield bracket (item F in previous figure) in the order shown in the following figure (A through F). After hand tightening screws, tighten 1/4 turn or enough to flatten the lock washer.

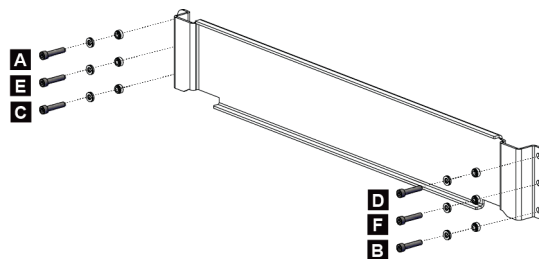
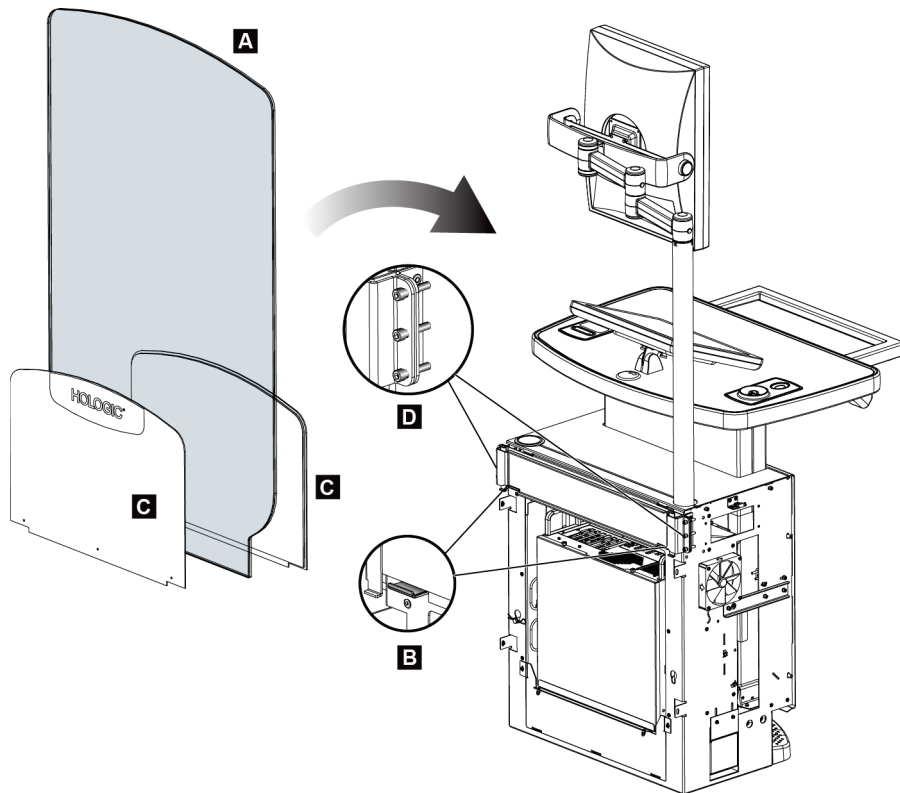


Figure 319: Shield bracket screw fastening



### Replacement of Original Radiation Shield

(Refer to the following figure.)



*Figure 320: Radiation shield replacement (original shield)*

1. Loosen screws (item D) on both sides of metal bracket.
2. Carefully remove the shield reinforcement plates (item C) on either side of the radiation shield (item A).
3. Carefully lift and remove the radiation shield (item A) from the shield supports behind the right and left slots (item B) of the metal bracket.
4. Lift the new radiation shield (item A) carefully and place it on the shield supports behind the right and left slots (item B) of the metal bracket.
5. Place the shield reinforcement plates (item C) on either side of the radiation shield (item A) and tighten screws (item D) on both sides of metal bracket.



#### 8.5.18 Replace the AWS I/O Interface Assembly



##### Warning:

For the following procedures, be careful not to drop the screws as you remove them. If you do, locate and retrieve the lost screws from the bottom of the machine. Not retrieving the screws may cause a shorting hazard in the power distribution assembly after system startup.

---

##### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. From the front of the machine, locate the I/O interface board (item 1).

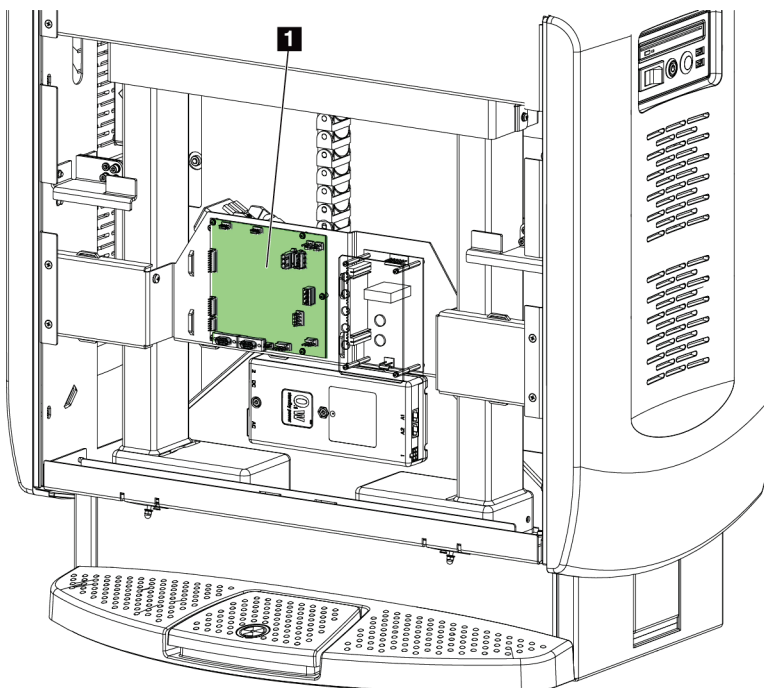


Figure 321: AWS I/O interface board



4. Disconnect all cables from the interface board (see following figure).

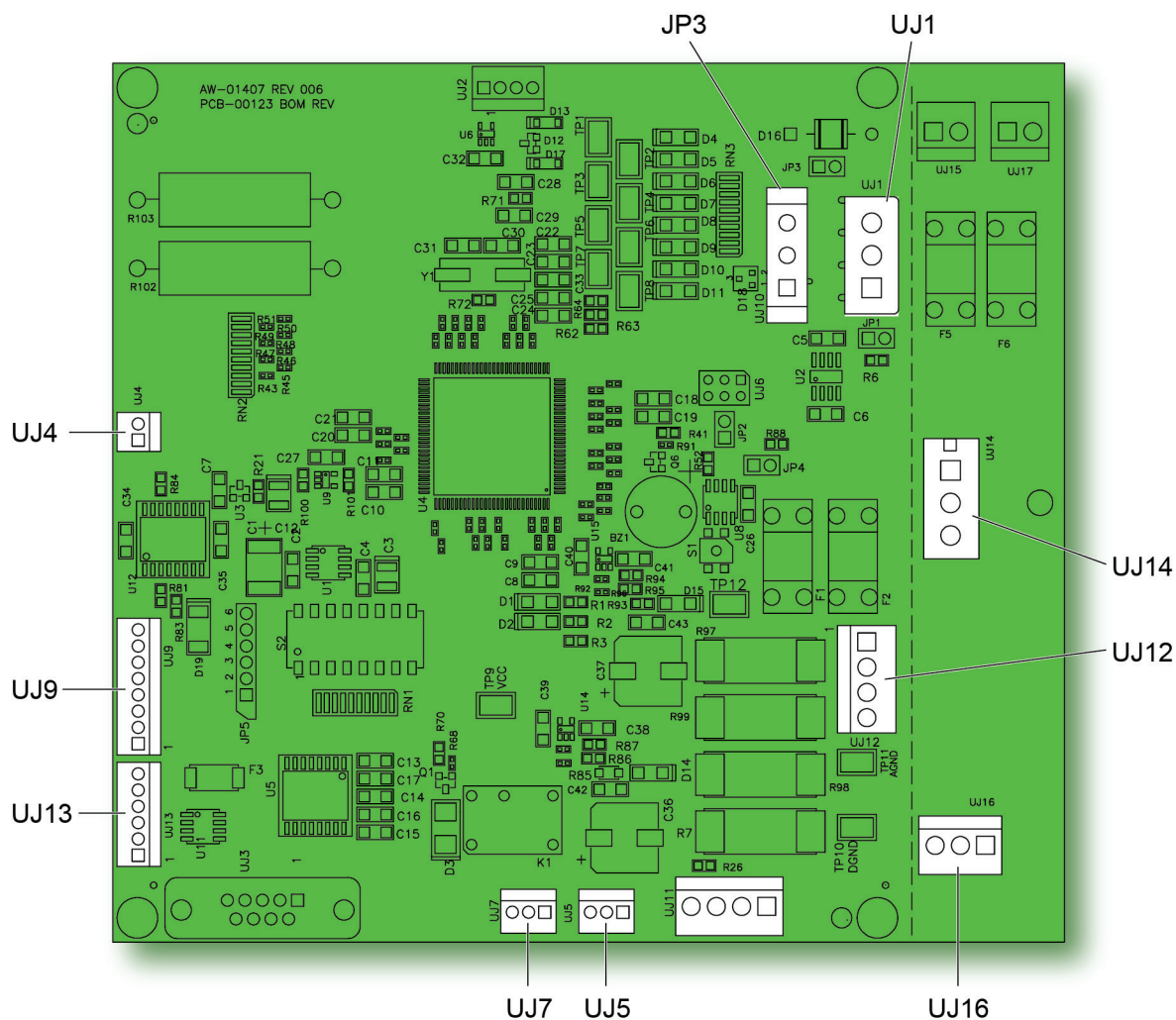
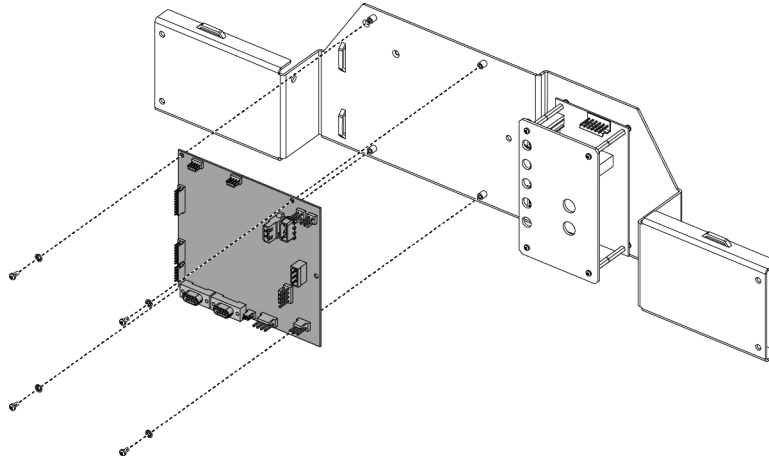


Figure 322: Connections on AWS I/O interface board



5. Remove the interface board from the control board mounting bracket (four screws).



*Figure 323: Removing AWS I/O interface board*

6. Make a note of all jumper positions on the existing interface board.

#### **Replacement**

1. Check the jumpers on new board (and change if necessary) to match the same jumper positions on the old board.
2. Install the new interface board to the control board mounting bracket (see the previous figure).
3. Reconnect all cables to the interface board.
4. Reinstall the front, back, and side covers.
5. Plug in and power ON the system. Verify proper system operation.



### 8.5.19 Replace the Low Voltage DC Power Supply



**Warning:**

For the following procedures, be careful not to drop the screws as you remove them. If you do, locate and retrieve the lost screws from the bottom of the machine. Not retrieving the screws may cause a shorting hazard in the power distribution assembly after system startup.

**Removal**

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285).
2. Remove the front, back, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. From the front of the machine, locate the powers supply (item 1).

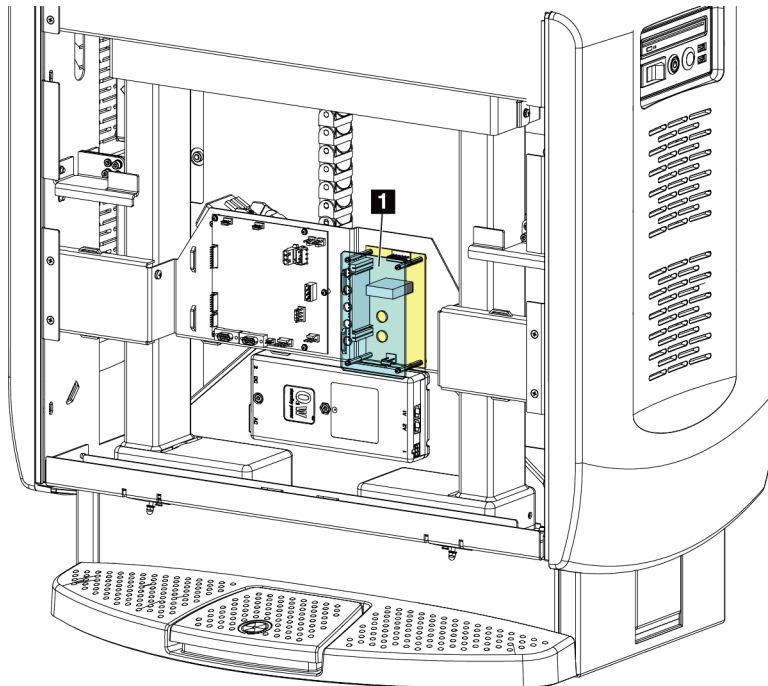


Figure 324: DC Power supply (dual output)



4. Disconnect from the power supply the AC input harness (at JP1, item 4, and at CN1, item 5) and the DC output harness (at CN2, item 7) as shown on following figure.

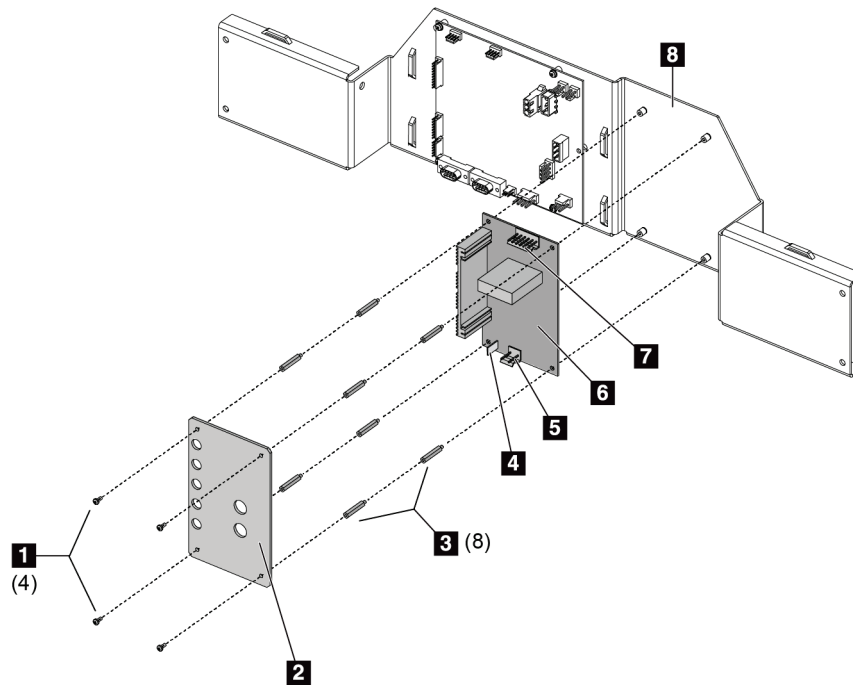


Figure 325: Removal/Disconnection of the power supply

5. Remove the power supply shield (item 2) with four screws (item 1) as shown on previous figure.
6. Remove the stand-off posts (item 3) from the power supply (item 6) as shown on previous figure. If possible, try to keep each pair of stand-offs (one on top of the other) as one item when removing.
7. Remove the power supply (item 6) from the control board mounting bracket (item 8) as shown on previous figure.

#### Replacement

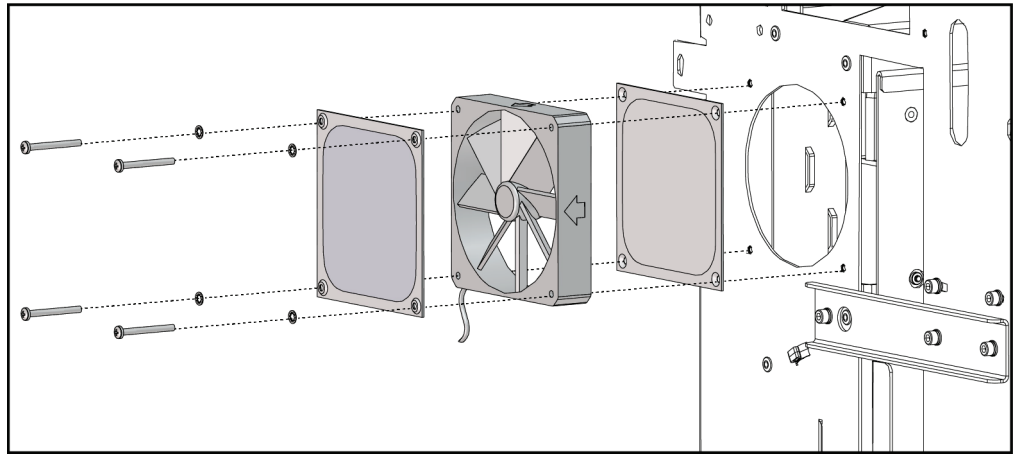
1. Attach the power supply to the control board mounting bracket (see the previous figure) using the stand-off posts.
2. Attach the power supply shield to the stand-offs on the power supply.
3. Connect the AC input harness (at CN1 and JP1) and the DC output harness (at CN2) on the power supply.
4. Reinstall the front, back, and side covers.
5. Plug in and power ON the system. Verify proper system operation.



### 8.5.20 Replace the Fan

#### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and left side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Unfasten fan from chassis (see following figure, four screws) and remove front and back screens on fan.



*Figure 326: Removal/disassembly of fan*

4. Disconnect power cable to fan and remove fan.

#### Replacement

1. Connect power cable to fan.
2. Assemble screens on front and back of fan and attach fan to chassis (four screws).
3. Reinstall the front, back, and left side covers.
4. Plug in and power ON the system. Verify proper system operation.



#### 8.5.21 Replace the Power Distribution Assembly

##### Removal

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, and side covers. Remove the lower front panel (kick plate) and lower rear panel (kick plate). (Refer to [Remove the Covers and Panels](#) on page 286.)
3. Note all cable connections and their locations to the power distribution assembly, then disconnect:
  - UPS AC power cable from AC extension outlet on power assembly.
  - AC power cord from AC input terminal block (on the left side if viewing from the rear of the workstation). (See following figure, item 2.)
  - blue and brown wires going to AC input terminal block (see following figure, item 1)

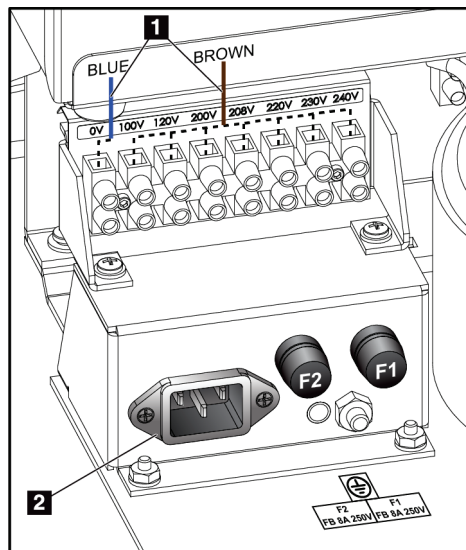
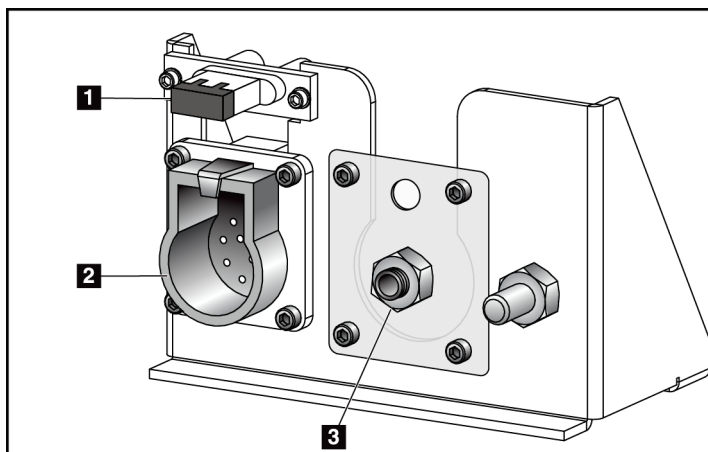


Figure 327: AC input power terminal block on left side of power distribution assembly

- Cables going to the Gantry cable interface (on the right side if viewing from the rear of the workstation). (See the following figure.) The cable interface acts merely as a mounting plate for the Gantry cables and does not interact directly with the power distribution assembly.
  - Unplug the Gantry fiber optic cable pair from the front of interface and remove the mounting plate (two screws) with the rear cables still attached as one unit.
  - Unplug the Gantry interconnect cable from the front of interface and remove the mounting plate (four screws) with the rear cables still attached as one unit.



- Unplug the remote x-ray activation button cable from the front of interface (if used) and remove the mounting plate (four screws) with the rear cables still attached as one unit.

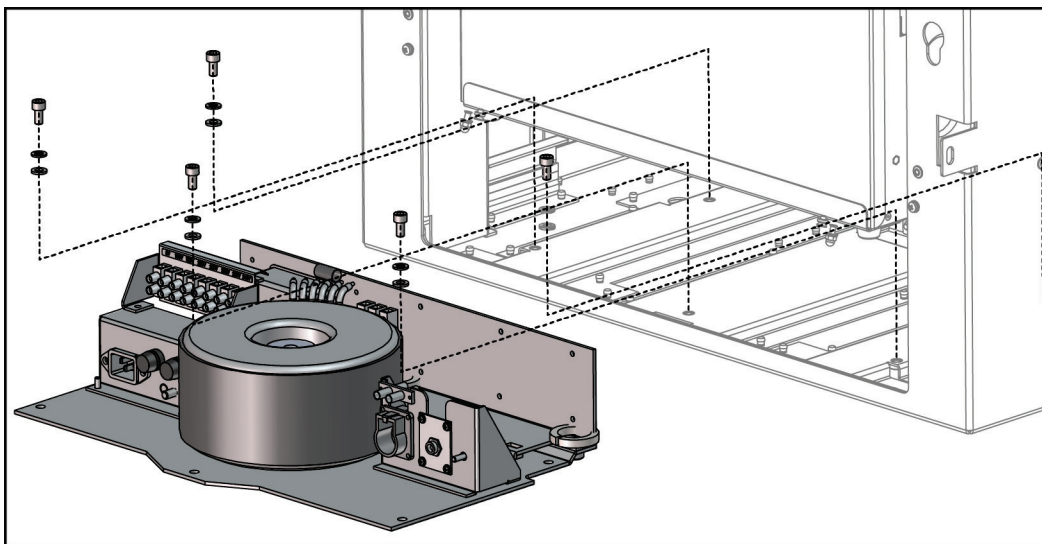


**Figure Legend**

1. Gantry fiber optic cable (pair)
2. Interconnect cable to Gantry
3. Remote x-ray activation button jack

*Figure 328: Gantry cable interface on right side of power distribution assembly*

4. Unfasten the power distribution assembly (five mounting bolts) from the base of the workstation and slide it out the rear of the chassis. (See the following figure.)



*Figure 329: Unfastening mounting bolts and sliding power distribution assembly out of rear of chassis*



#### Replacement

1. Slide the assembly into place at the base of the workstation chassis and fasten using five screws and washers.
2. Reconnect all the cables/harnesses to the assembly (see step 3 in previous procedure), including those cables and hardware removed at the Gantry cable interface. Use wire ties as necessary for proper cable management.
3. Attach workstation AC input cord (not plugged in to AC outlet yet) to the left terminal block of the power assembly.
4. Reinstall the lower front panel (kick plate), lower rear panel, front, back, and side covers.
5. Plug in and power ON the system. Verify proper system operation.

## 8.6 Relocating Assemblies to Opposite Side of Workstation

### 8.6.1 Relocate the Image Display Monitor

You can change the location of the image display monitor post and monitor to the opposite side of the workstation tabletop.



#### Note

When the steps relocating the image display mounting arms are the same between the series I UAWS and series II UAWS, only the series I UAWS figures are shown to streamline the layout. Where there are differences between the series I and series II UAWS mounting procedures, figures (and steps) for the series II UAWS are also included.

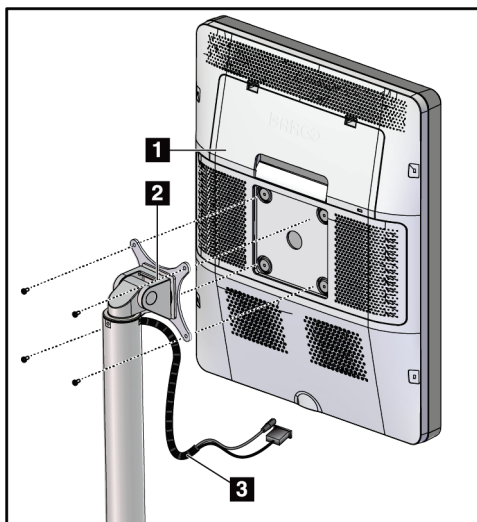
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#### Remove Display Monitor and Arm

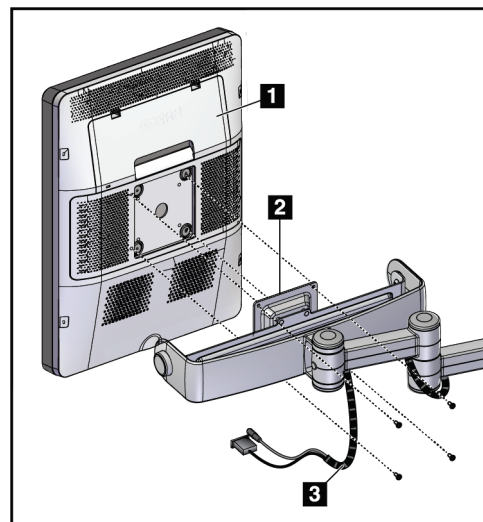
1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the front, back, side, and top covers. (Refer to [Remove the Covers and Panels](#) on page 286.)



3. Remove the access panel on the rear of the monitor (item 1 in the following two figures) and disconnect the DVI and power cables (item 3).
4. Remove the monitor from the monitor bracket (item 2 in the following two figures).



*Figure 330: Removing display monitor from a standard arm (series I UAWS)*



*Figure 331: Removing display monitor from an articulating arm (right orientation, series I UAWS)*



5. Loosen three cap screws (item 5 in figure [Routing preview monitor cables through articulating arm](#) on page 362) from the monitor post and then:
  - *Standard Arm (series I UAWS)* - Remove the mounting arm from the post.
  - *Standard Arm (series II UAWS), Articulating Arm (series I and series II UAWS)* - Support the arm while cables are still threaded inside arm and remove arm from post. From the underside of the articulating arm, unfasten the cable retainers (see the following two figures). Remove the DVI cable and power cable out of the articulating arm assembly. Leave the spiral tubing over those sections of cable that were not inside the arm.

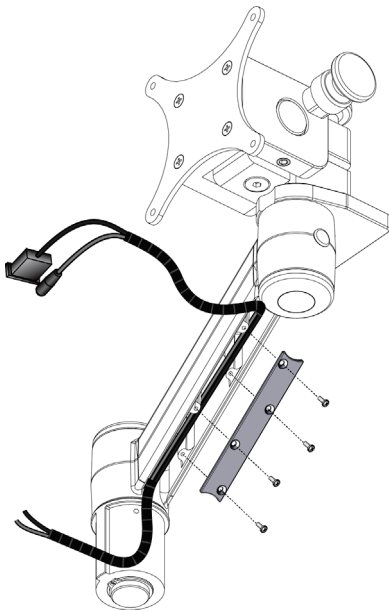


Figure 332: Removing cable retainers from underside of standard arm (series II UAWS shown)

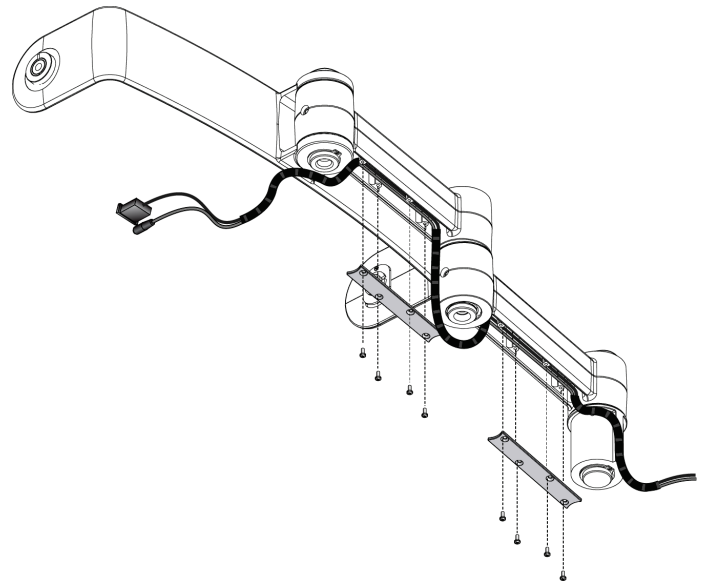
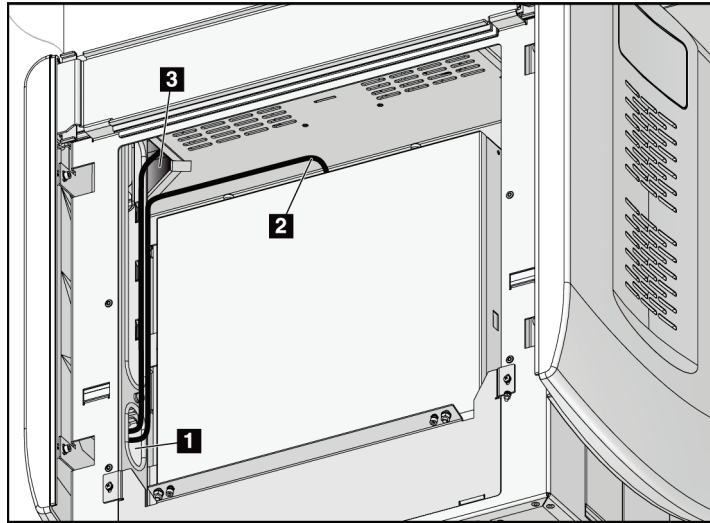


Figure 333: Removing cable retainers from underside of articulating arm (series I UAWS shown)



6. Inside the workstation:
  - a. Disconnect the DVI cable from the computer. (See the following figure, item 2.)
  - b. Disconnect monitor power cable (item 3) from power supply on platform above the computer.



*Figure 334: Routing of DVI and power cables for display monitor (right side post mounting)*

7. Unfasten wire ties from DVI and monitor power cables. Gather up slack for both cables and insert into monitor post through access opening (item 1 in previous figure).

### **Relocate the Display Monitor Post**

Move monitor post to the appropriate side (left or right) of the workstation, based on the type of workstation.



#### Series I UAWS

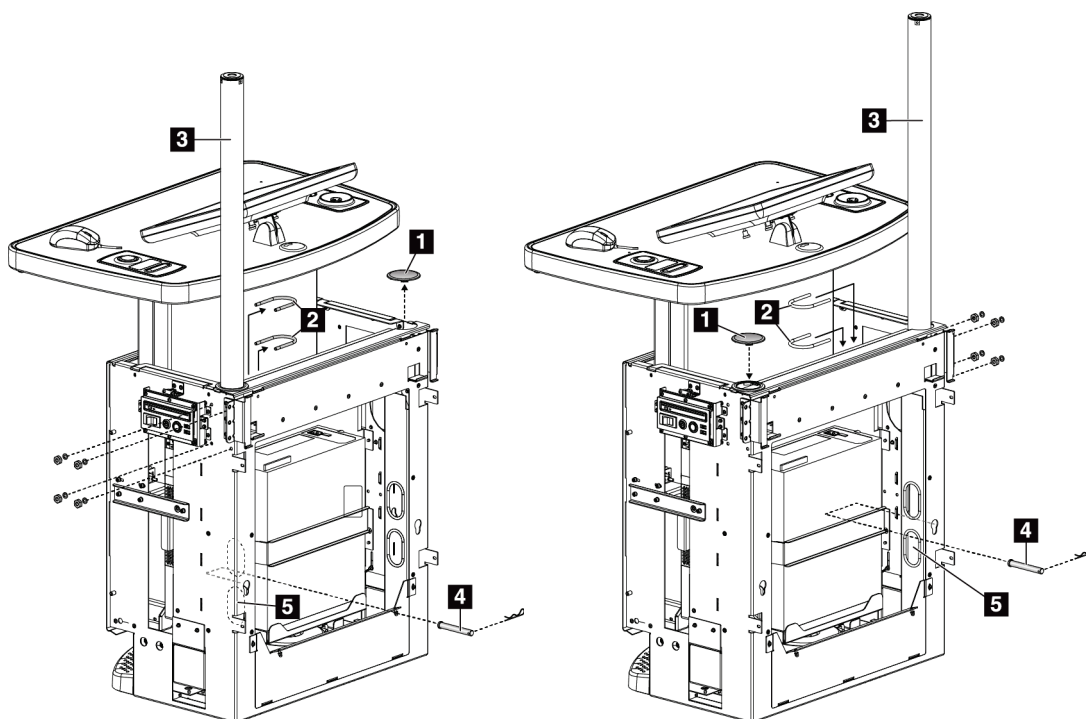
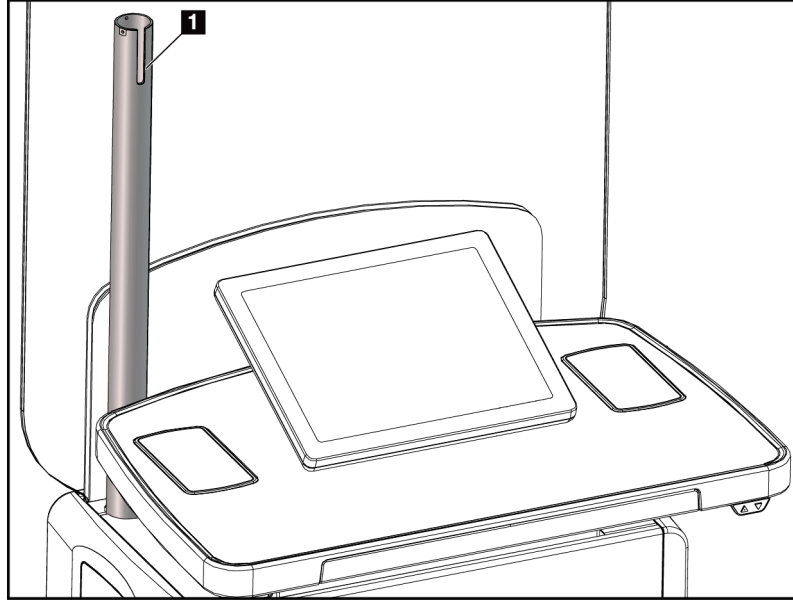


Figure 335: Installing the image display monitor post on either side of workstation (series I UAWS)

1. Remove cap (item 1) from top cover on the side you are installing.
2. For monitor posts having the standard arm, remove the pin bolt (item 4).
3. Loosen the two U-bolts (item 2, using four screws) located near the top of the monitor post shaft.
4. Slide the monitor post (item 3) out with cables inside and move to other side of workstation.
5. Slide post down the shaft on the other side of workstation.
  - *Standard Arm* - Slide shaft and align slot in post with pin bolt hole in chassis. Insert pin bolt (item 4) to hold shaft in place.
  - *Articulating Arm* - Slide shaft until it can go no further.



6. Rotate the monitor post so the notch on top (see following figure, item 1) is facing the operator side of the workstation.

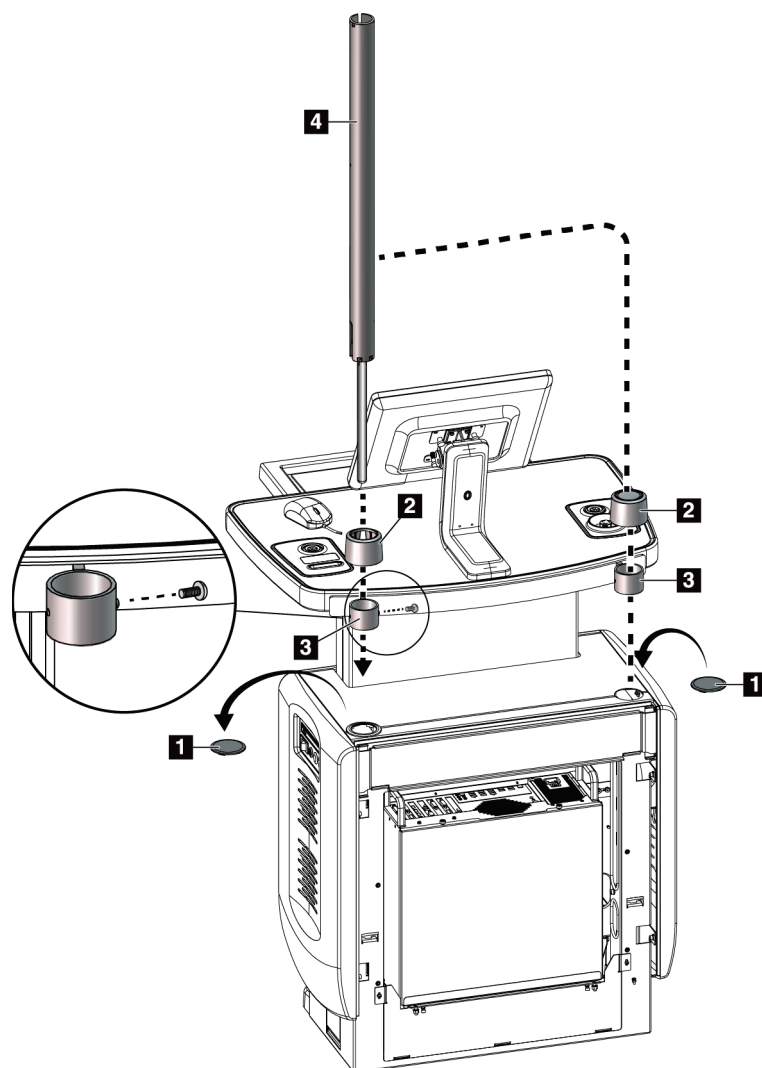


*Figure 336: Notch on monitor post facing the operator (left side post mounting)*

7. Tighten the two U-bolts to secure the monitor post.



Series II UAWS

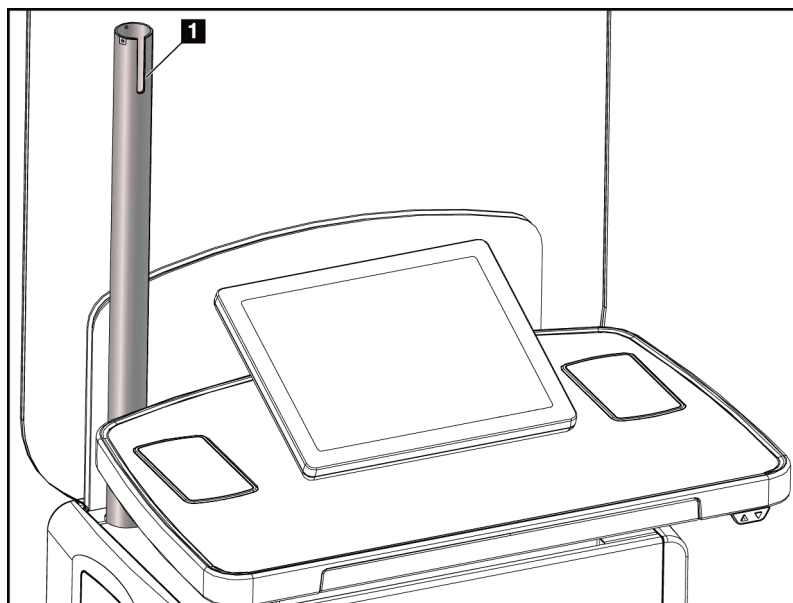


*Figure 337: Switching monitor post from right to left side of workstation (series II UAWS)*

1. Remove the cap (item 1 in previous figure) from the top cover on the side you are installing.
2. Remove the top collar (item 2 in previous figure); it is held on only by force.
3. Slide the monitor post (item 4 in previous figure) out and insert it into the other side of the workstation.
4. Rotate the monitor post so the notch on top (item 1 in following figure) is facing the operator side of the workstation.
5. Tighten the setscrew in the inner collar (item 3 in previous figure) to hold the post in position.
6. Replace the top collar (item 2 in previous figure).



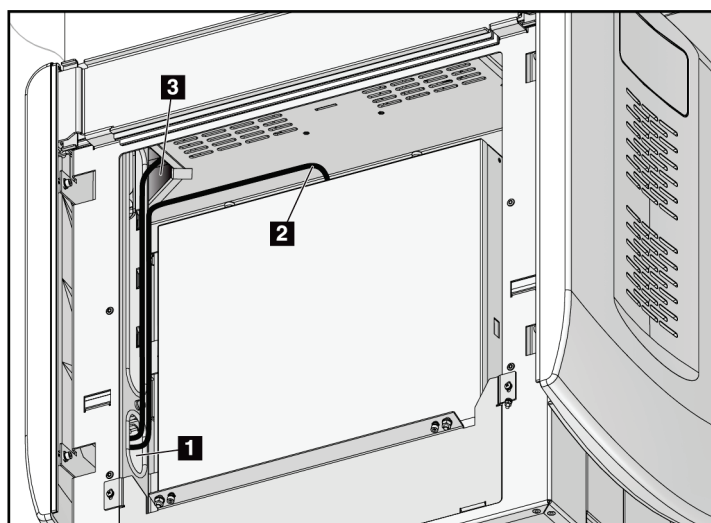
7. Place the cap (item 1 in previous figure) on the top cover on the side you moved the post from.



*Figure 338: Notch on monitor post facing operator (left side post mounting)*

### **Route Cables and Reinstall Display Monitor and Arm**

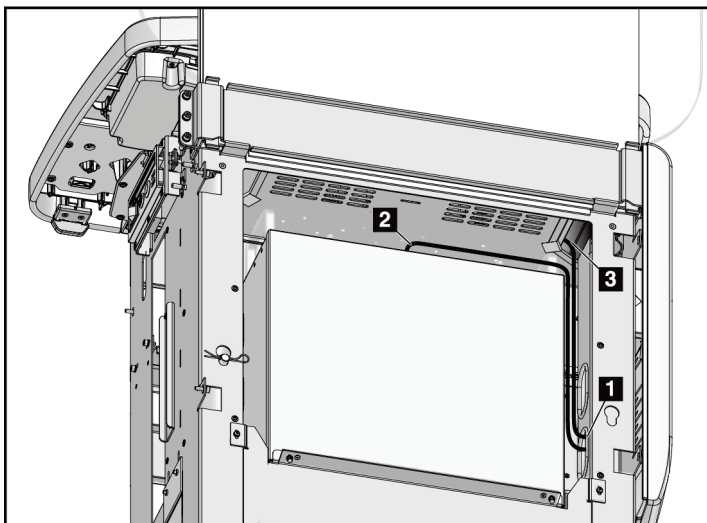
1. Untie the power and DVI cables that you bundled up previously and pull them out of the access opening of the monitor post (item 1 in following figure).



*Figure 339: Routing of DVI and power cables for display monitor (right side post mounting)*



2. Route the DVI cable up the inside of the workstation and over the rear panel of the computer. (See the following figure, item 2 that shows left side routing.) Connect to proper video output on computer rear panel. Use wire ties a necessary for proper cable management.



*Figure 340: Routing of DVI and power cables for image display monitor (left side post mounting)*

3. Route the monitor power cable up the inside of the workstation and through the access opening to the platform above the computer. (See the previous figure, item 3 that shows the left side access opening.) Connect monitor power cable to power supply on platform above the computer. Use wire ties a necessary for proper cable management.



4. The next step depends on the type of mounting arm:
- *Standard Arm (series I UAWS)* - follow the substeps next to the figure.

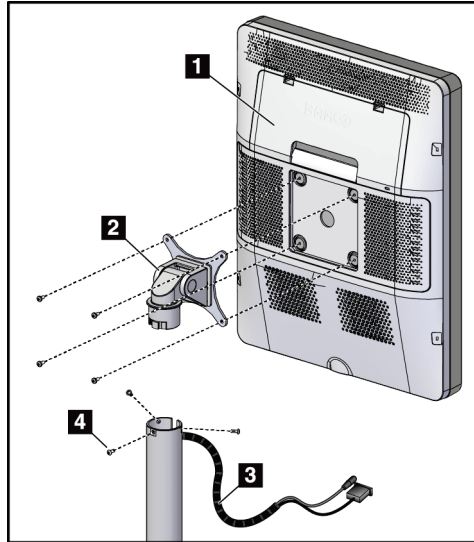


Figure 341: Connecting display monitor to a standard arm (series I UAWS shown)

- a. Thread the DVI and power cables up and out through the notch on top of the monitor post.
- b. Align the protrusion of the arm to the groove in the monitor post and insert the arm into the post. Secure the arm to the post using the three cap screws (item 4).
- d. Attach the image display monitor to the monitor bracket (item 2, four screws).
- e. Remove the access panel on the rear of the monitor (item 1) and connect the DVI and power cables (item 3). Reattach access panel.



- *Standard Arm (series II UAWS), Articulating Arm (series I and series II UAWS)* - follow the substeps next to the figure.

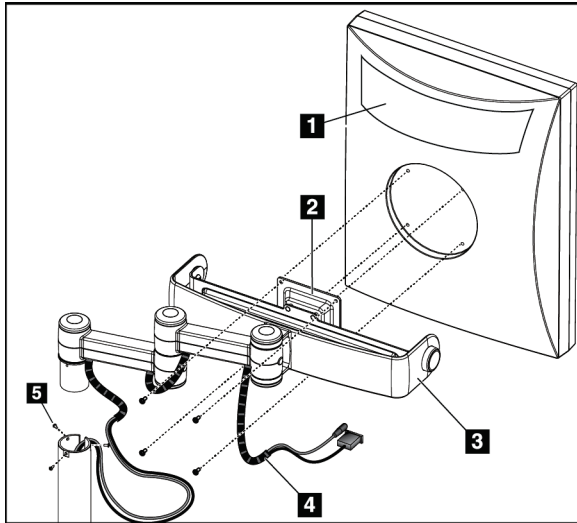


Figure 342: Routing preview monitor cables through articulating arm, left side mounting (series I UAWS shown)

- a. If you are moving the monitor post from the left side to the right side, refer to [Change the Orientation of the Articulating Arm](#) on page 55, then continue with substep "b."
- b. Thread the DVI and power cables up and out through the notch on top of the monitor post (item 5).
- c. Align the protrusion of the arm to the groove in the monitor post and insert the arm into the post. Secure the arm to the monitor post using three cap screws (item 5.)
- d. Thread the power and DVI cables through the arm tracks. For those sections of cable that are not inside the arm (such as the gap between the arm sections), ensure that the spiral tubing is outside the arm track. Fasten the cable retainers under the new arm.
- e. Attach the image display monitor to the mounting plate (item 2) on the new arm (four screws).
- f. Remove the access panel on the rear of the monitor (item 1) and connect the DVI and power cables (item 4). Reattach access panel.

5. Install the top, front, back, side, and top covers.
6. Plug in and power ON the system. Verify proper operation of the image display monitor.

#### 8.6.2 Relocate Bar Code Scanner and/or Motorized Height Adjust Buttons - UAWS

You can change the location of the bar code scanner and/or motorized height adjust control panel to the opposite side of the workstation tabletop.



##### Note

If you are moving a bar code scanner, make sure that you have a new rubber stop or can salvage/reuse the old rubber stop from the original install. The rubber stop holds the scanner captive when mounted underneath the workstation tabletop.



1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Remove the bar code scanner (if installed).
  - a. Remove the cable (item 2, see following figure) for the bar code scanner (item 1) by detaching it from the p-clips on the underside of the workstation tabletop.

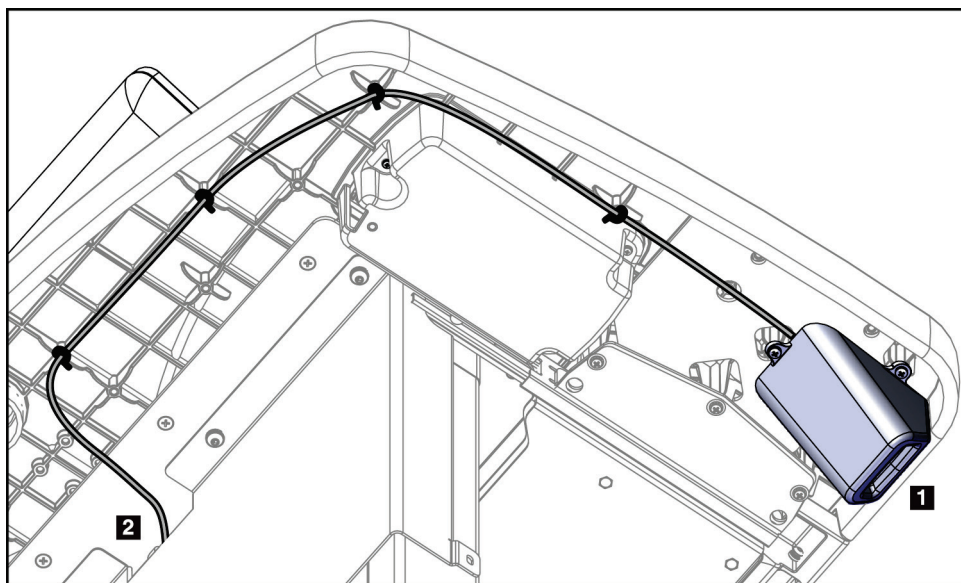
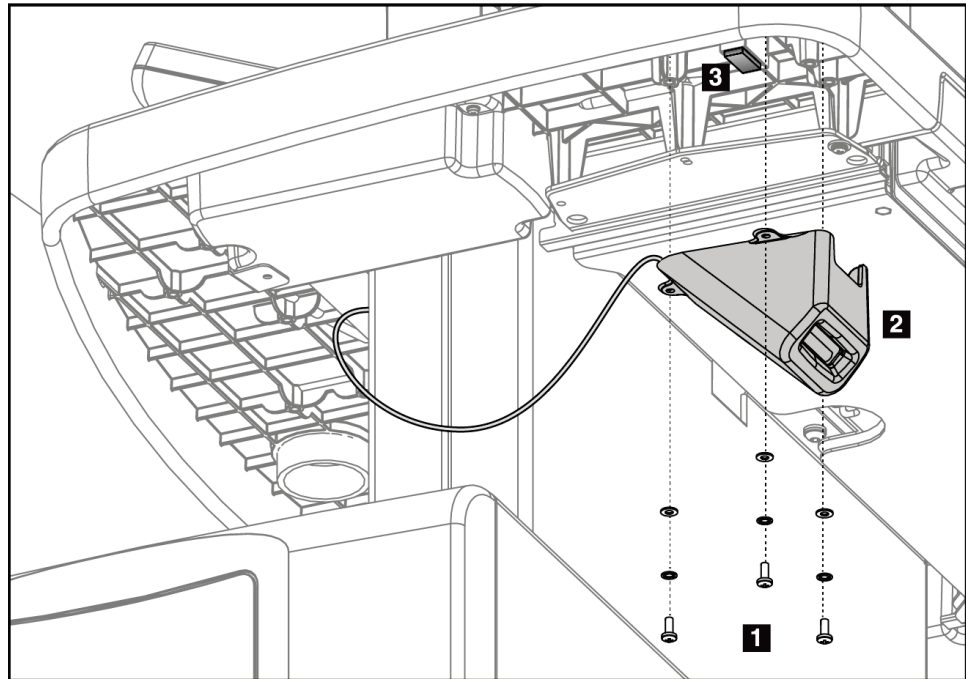


Figure 343: Bar code scanner and cabling (shown on left side of workstation)



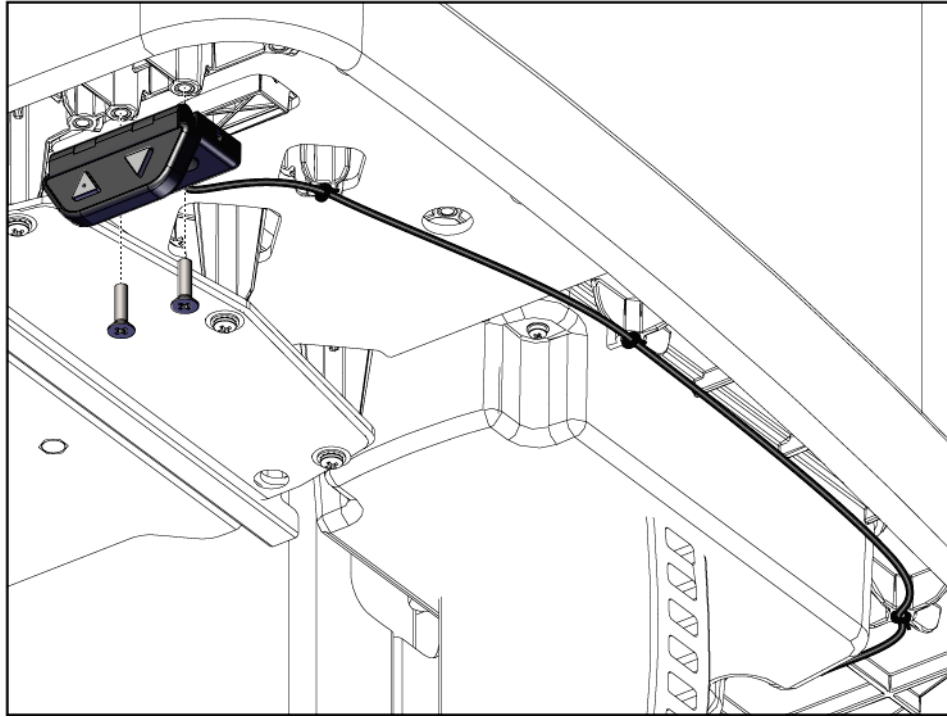
- b. Remove the bar code scanner assembly from the underside of the tabletop (three screws, item 1 in following figure). If you do not have a new rubber stop (item 3), try to salvage the old rubber stop. The rubber stop holds the scanner captive when mounted underneath the workstation tabletop.



*Figure 344: Removing/replacing the bar code scanner*



3. Remove the height adjust control panel (if installed). (See following figure.)



*Figure 345: Replacing the height adjust control panel and routing the cable*

- a. Unfasten the control panel from the underside of the workstation tabletop (two hex screws).
- b. Remove the cable for the module by detaching it from the p-clips on the underside of the workstation tabletop.
4. Reroute each assembly with its cable to the opposite sides of the workstation tabletop using the p-clips or wire ties as necessary.
5. Install the bar code scanner:
  - a. Insert the rubber stop into the rectangular cavity under the tabletop where you are installing the bar code scanner. The rubber stop helps hold the scanner captive when mounted underneath the workstation tabletop.
  - b. Fasten the assembly to the underside of the tabletop (three screws).
6. Fasten the desk control panel button module to the underside of the workstation tabletop using two hex screws (see previous figure).
7. Plug in and power ON the system.
8. Verify the proper operation of the bar code scanner and/or height adjust control panel.



#### 8.6.3 Relocate E-Stop/Fingerprint Scanner and X-ray Act./Compression Rel. Buttons (Series I UAWS only)

On the series I Universal Acquisition Workstation (UAWS), you can change the location of the E-Stop/fingerprint scanner assembly and the x-ray activation button/compression release button assembly to the opposite side of the workstation tabletop.



##### Note

You cannot swap the positions of the E-Stop/fingerprint scanner assembly and the x-ray activation button/compression release button assembly on a series II UAWS because they are manufactured as a "mirror-imaged" assemblies. Each assembly can only be installed in its respective left or right side of the workstation surface.

---

1. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
2. Unfasten the E-Stop/fingerprint scanner assembly and the x-ray activation button/compression release button assemblies from respective their housings by removing the three screws underneath the workstation tabletop. (See the following figures.)

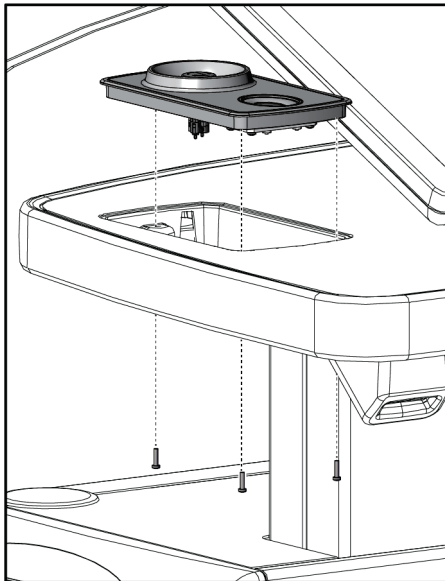


Figure 346: Removing the E-Stop/fingerprint assembly (series I UAWS)

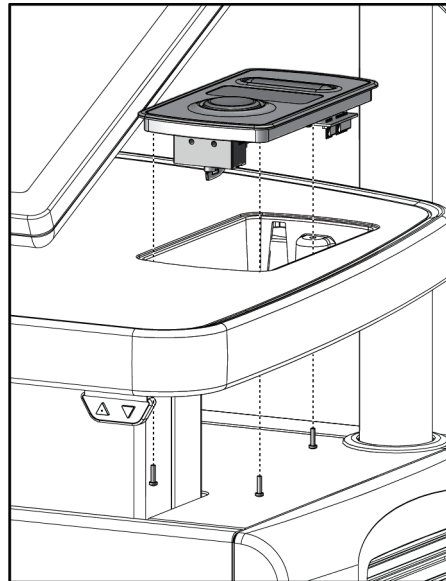
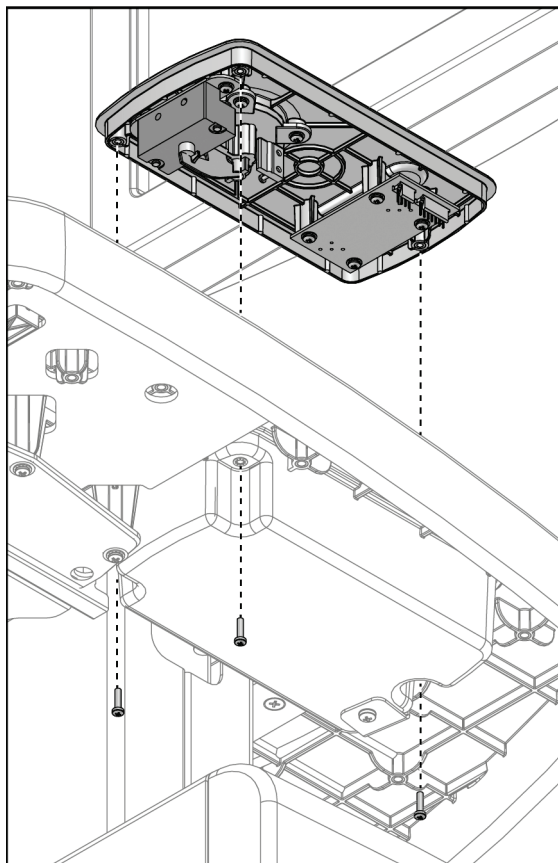


Figure 347: Removing the x-ray activation button/compression release button assembly (series I UAWS)





*Figure 348: Underside of an assembly housing*

3. Pry up carefully each assembly out of its housing.
4. Disconnect the cables for each assembly:
  - For the E-Stop/fingerprint scanner assembly, disconnect the "y" junction cable from E-Stop wire harness and disconnect the cable going to the fingerprint scanner.
  - For the x-ray activation button/compression release button assembly, disconnect the cable (AEJ12) going to the x-ray activation button.
5. Move each assembly to the opposite side of the workstation tabletop.



6. Remove the wire harness bracket (one screw, see the following figure, item 2) that covers the cable access opening (item 3) in each assembly housing. Remove the cables through the access opening.

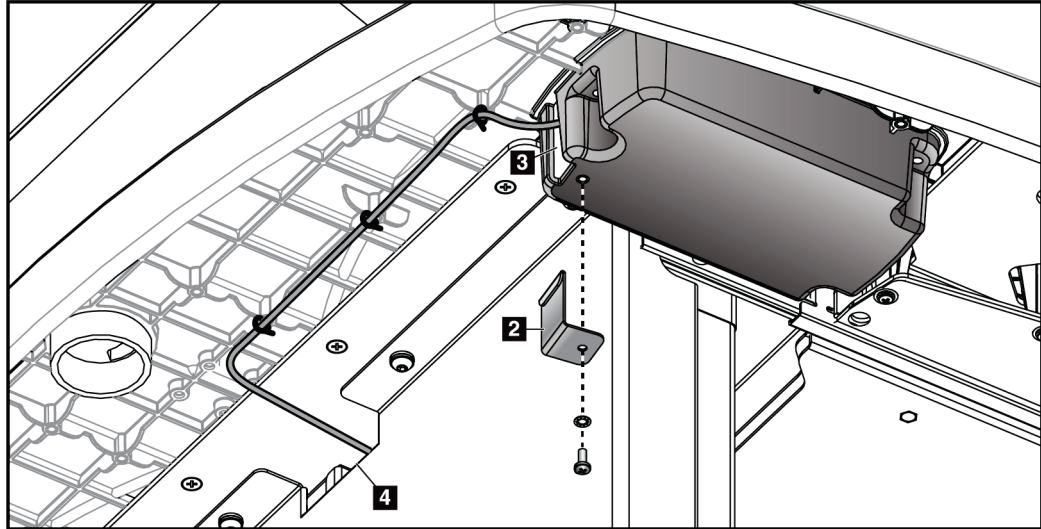


Figure 349: Routing/Removing cables of assembly housing under the workstation tabletop

7. Unclip the existing cables for each assembly under the workstation tabletop (see previous figure) and reroute to the other side. Use new wire ties as necessary.
8. Route the cables through the access opening in each new assembly housing. Tighten the wire harness bracket (one screw, see the previous figure, item 2) that covers the cable access opening (item 3).
9. Connect the cables for each assembly:
  - For the E-Stop/fingerprint scanner assembly, connect the "y" junction cable from E-Stop wire harness and connect the cable going to the fingerprint scanner.
  - For the x-ray activation button/compression release button assembly, connect the cable (AEJ12) going to the x-ray activation button.
10. Reattach each assembly to its housing (three screws).
11. Plug in and power ON the system.
12. Verify the proper operation of the E-Stop, fingerprint scanner (if equipped), x-ray activation button, and compression release button. Perform the functional tests as described in the *User Guide*.



#### 8.6.4 Relocate DVD Drive/Switch Panel Assembly

You can change the location of the DVD Drive/Switch Panel Assembly to the opposite side of the workstation if necessary or per customer request.

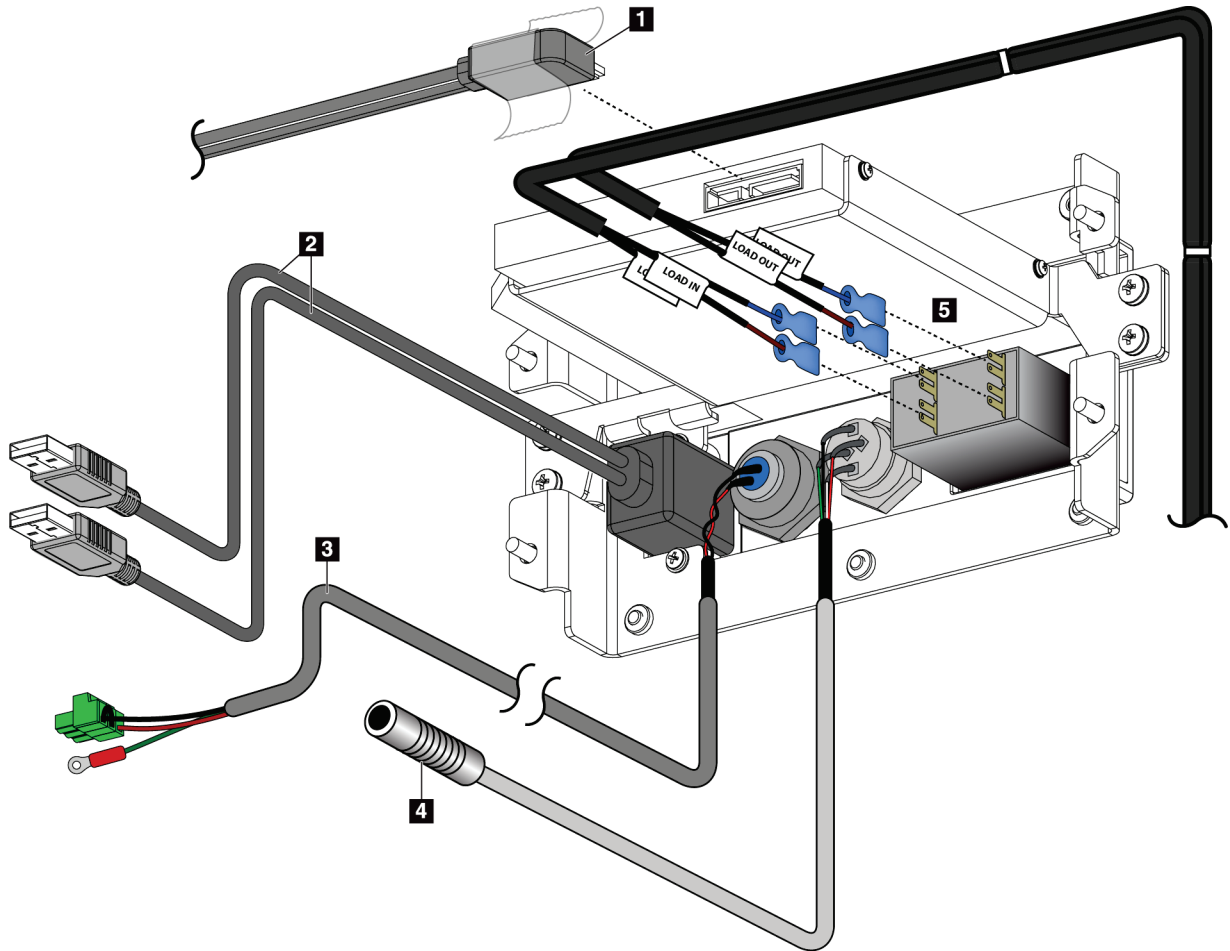


Figure 350: Rear view of cable connections to/from DVD Drive/Switch Panel Assembly

##### Figure Legend

1. DVD Drive cable
2. USB Ports cables
3. Uninterruptible Power Supply (UPS) Power Button cable
4. CPU Power/Reset Button cable
5. UAWS Power ON/OFF Circuit Breaker cable



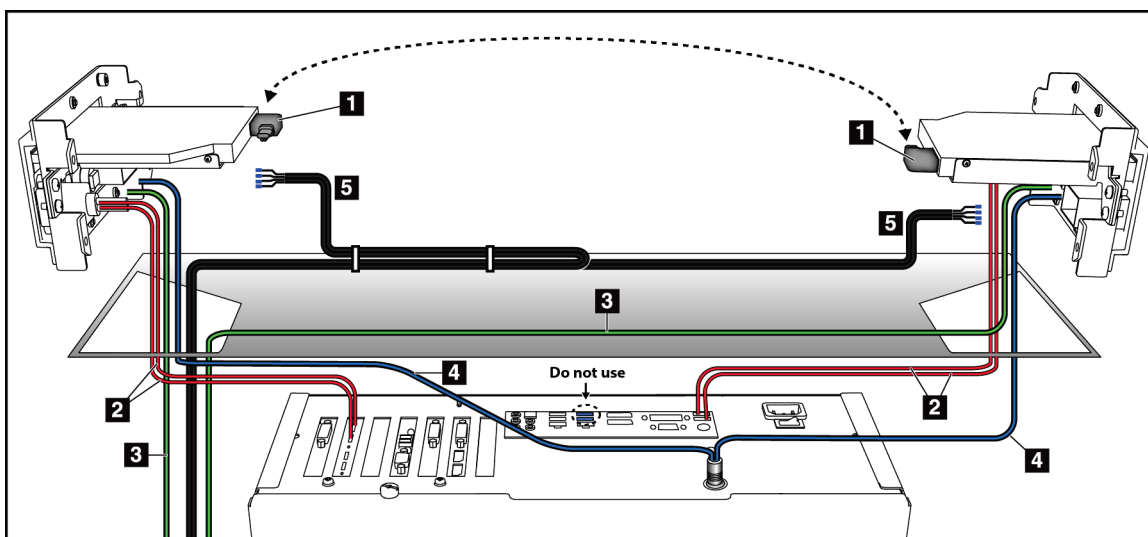


Figure 351: Cable connections for relocation of DVD/Switch Panel Assembly to opposite side

#### Figure Legend

1. DVD Drive cable
2. USB Ports cables
3. Uninterruptible Power Supply (UPS) Power Button cable
4. CPU Power/Reset Button cable

5. UAWS Power ON/OFF Circuit Breaker cable

NOTE: "Do not use" any of the USB 3.0 ports (colored blue) on rear panel of computer.



## Overview of Relocation Procedure

The following steps provide a high level overview of the procedure for relocate the DVD Drive/Switch Panel Assembly to the opposite side of the workstation. For more details, refer to the tables at the end of this section.



---

### Note

Before you disconnect the cables and reroute them to the opposite side, note how each cable has been routed or bundled and where the wire ties are installed. Use the current cable management arrangement as a guide to rerouting the cables to the opposite side. In most cases, your new rearrangement of cable routing and wire ties will mirror the old arrangement.

---

To relocate the DVD Drive/Switch Panel Assembly to the opposite side of the workstation:

1. Raise the height of the tabletop (to the extent permitted by this system's configuration) to provide easier access to the rear of the DVD/Switch Panel Assembly.
2. Power OFF and unplug the system. (Refer to [How to Remove All Power to Universal Acquisition Workstation](#) on page 285.)
3. Remove the front, back, top, and side covers. (Refer to [Remove the Covers and Panels](#) on page 286.)
4. Remove the DVD Drive/Switch Panel Assembly from its present location on the frame/chassis as follows:
  - a. Disconnect the cable(s) from each component of the assembly:
    - For the DVD Drive and the Power ON/OFF Circuit Breaker Switch connections, make the disconnections at the assembly end of each cable. (See the previous two figures in this section, items 1 and 5.)
    - For the CPU Power/Reset Button, optional UPS Power Button, and two USB ports, we recommend that you make the disconnections at the routing endpoint of each cable. (See the previous two figures in this section, items 4, 3, and 2.)
    - Refer to the table at the end of this section for more information about disconnecting, rerouting, and reconnecting each cable of the assembly.
  - b. Cut and remove wire ties as necessary along the routing paths of the cables/harnesses to ensure there is enough slack to re-route the cables to the opposite side of the workstation.
  - c. Remove the assembly (keeping it attached to its Mounting Bracket) from its present location on the frame/chassis (four Mounting Bracket screws).
5. Relocate the assembly to the opposite side. (See previous figure.)
6. Reroute the cables. (See previous figure.)



7. Re-install the assembly (with Mounting Bracket) to the opposite side of the frame/chassis:
  - a. Reconnect the cable(s) to each component of the assembly:
    - For the DVD Drive and the Power ON/OFF Circuit Breaker Switch, reconnect at the assembly end of each cable. (See the previous two figures in this section, items 1 and 5.)
    - For the CPU Power/Reset Button, optional UPS Power Button, and two USB ports, reconnect at the endpoint of each cable. (See the previous two figures in this section, items 4, 3, and 2.)
    - Refer to the following table in this section for more information about disconnecting, rerouting, and reconnecting each cable of the assembly.
  - b. Use new wire ties as necessary to take up any loose slack along the routing paths in the cables/harnesses to the opposite side of the workstation.
  - c. Install the DVD Drive/Switch Panel Assembly (attached to its Mounting Bracket) to its new location on the opposite side of the frame/chassis (four Mounting Bracket screws).
8. Swap the side covers so that the DVD/Switch Panel Assembly cut-out is on the side cover where the assembly is now installed.
9. Reinstall the top, front, back, and side covers.
10. Plug in and power ON the system. Test the DVD Drive/Switch Panel Assembly switches/buttons/ports for proper operation.



### Details of Relocation Procedure by Specific Component

<i>Table 8: Relocate the DVD Drive</i>		
<b>Disconnect</b>	<b>Remove/Reroute/Relocate</b>	<b>Reconnect</b>
<ul style="list-style-type: none"> <li>Remove piece of tape (2-580-1118) affixed to connector plug at rear of DVD drive assembly. Save tape for reuse. (See previous two figures, item 1.)</li> <li>Disconnect connector plug from socket at rear of DVD drive assembly. (See previous figure, item 1.)</li> </ul>	<ul style="list-style-type: none"> <li>Remove DVD Drive/Switch Panel assembly (keep attached to mounting bracket) by pulling outward (not inward) from cut-out in frame/chassis.</li> <li>Relocate assembly to opposite side.</li> <li>Reroute connector plug with its cables across chassis platform to opposite side.</li> <li>Remove/replace wire ties as needed, as you reroute cables.</li> </ul>	<ul style="list-style-type: none"> <li>Plug connector into socket of DVD drive.</li> <li>Re-affix tape (2-580-1118) to help secure plug.</li> </ul>
<p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>During relocation, if you need to unplug and relocate flat black/red cable from its endpoint (on rear panel of computer), reconnect to an available USB port.</li> <li>Do NOT use either of two USB 3.0 ports, which are easily recognized by their blue color.</li> <li>There is sufficient slack to reroute this component to opposite side without needing to make substantial modifications.</li> <li><b>TIP:</b> When disconnecting/reconnecting this cable from its component on the DVD Drive/Switch Panel Assembly, you may find it easier to temporarily pull assembly partially forward and outward from its opening in cut-out of frame/chassis. There is sufficient slack to reroute this component to opposite side without needing to make substantial modifications.</li> </ul>		



*Table 9: Relocate the UAWS Power ON/OFF Circuit Breaker Switch*

Disconnect	Remove/Reroute/Relocate	Reconnect
Remove four-prong connector from terminal block at rear of assembly. (See first figure in this section, item 5.)	Remove wire ties that secure wire harness to chassis platform about midway across.	Plug four-prong connector into socket.
<p><b>NOTES:</b></p> <ul style="list-style-type: none"> <li>• Cables for this component are encased in and routed through wire harness.</li> <li>• Wire harness length is about twice that of chassis platform, so is folded in half and secured midway with two wire ties about an inch or two apart. (See previous figure, item 5.)</li> <li>• Plenty of slack to reroute to opposite side.</li> <li>• Insert pair of cable plugs labeled LOAD IN into leftmost vertical pair of prongs on rear side of switch. (See first figure in this section, item 5.)</li> <li>• Insert pair of cable plugs labeled LOAD OUT into rightmost vertical pair of prongs on rear side of switch. (See first figure in this section, item 5.)</li> <li>• Regarding color of wires—in horizontal pairs—keep blue with blue, brown with brown. For example: <ul style="list-style-type: none"> <li>• Blue and blue on two upper prongs (horizontal pair), brown and brown on two lower prongs (horizontal pair). (As shown in first figure in this section, item 5).</li> <li>- OR -</li> <li>• Brown and brown on two upper prongs, blue and blue on two lower prongs. (Not shown.)</li> </ul> </li> <li>• <b>TIP:</b> When disconnecting/reconnecting this cable from its component on the DVD Drive/Switch Panel Assembly, you may find it easier if you temporarily pull assembly partially outward from its opening in cut-out of frame/chassis.</li> </ul>		



*Table 10: Relocate the UAWS Computer Remote Power/ Reset Button*

<b>Disconnect</b>	<b>Remove/Reroute/Relocate</b>	<b>Reconnect</b>
Disconnect LEMO® connector plug from its socket on rear panel of computer.	Allow cable to remain attached to assembly as you relocate assembly to opposite side.	Plug LEMO® connector plug into its socket on rear panel of computer.
<b>NOTES</b> <ul style="list-style-type: none"> <li>• CPU button cannot be easily or quickly removed from rear of assembly.</li> <li>• Make disconnection at endpoint of CPU remote power cable. (See item 4 in previous figure.) That is, at round socket for LEMO® connector plug. Socket is located on rear panel of computer.</li> <li>• Computer remote power/reset cable cannot be disconnected at DVD Drive / Switch Panel Assembly. Must be disconnected at cable endpoint (item 4 in previous figure) at rear panel of computer.</li> <li>• There is sufficient slack to reroute to opposite side without modifications.</li> </ul>		



Table 11: Relocate the UPS Remote Power Button

Disconnect	Remove/Reroute/Relocate	Reconnect
<ul style="list-style-type: none"><li>• Disconnect UPS cable and ground ring at endpoint of routing path at rear panel of UPS. (See following figure in this table.)</li><li>• Socket for green connector and screw for ground ring of UPS remote power cable are located at RPO-ROO on rear panel of UPS. (See items 1 and 2 in following figure in this table.)</li></ul>	<ul style="list-style-type: none"><li>• At publication time of this manual, workstation manufacturing process routes UPS cable across platform in frame/chassis, to ease routing of cable to opposite side. Older units have UPS cable routed down shaft and through access openings, so you must pull cable up through its routing path to/from rear panel of UPS.</li><li>• Allow cable and ground ring to remain attached to assembly as you relocate assembly to opposite side.</li></ul>	<ul style="list-style-type: none"><li>• Route cable back to rear panel of UPS.</li><li>• Connect UPS cable and attach ground ring to rear panel of UPS.</li></ul>

**NOTES:**

- UPS remote power cable splits at its endpoint into terminal connector and ground ring, which connect to rear panel of UPS.
- UPS remote power cable cannot be disconnected at DVD Drive/Switch Panel Assembly. (See first figure in this section, item 3.) Must be disconnected at cable endpoint, at rear panel of UPS. (See following figure in this table.)
- For older units, as you disconnect cable from UPS and retract it up to frame/chassis platform, make note of cable routing path and cable management (wire ties). You will need this information when reinstalling cable.
- It may be necessary for you to temporarily pull UPS out to gain sufficient access to its rear panel in order to make disconnections.

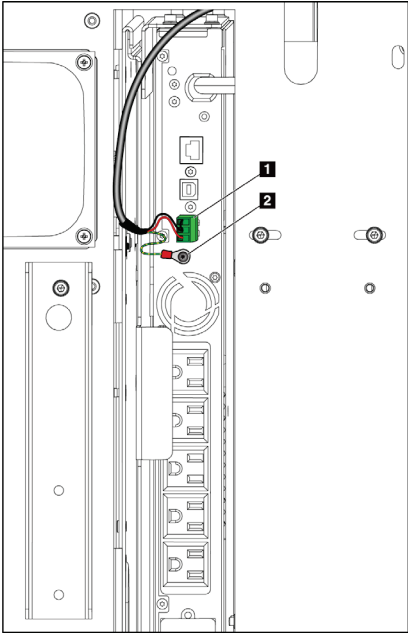


Figure 352: Connections for Remote UPS Power Cable on rear of UPS



<i>Table 12: Relocate the USB Port</i>		
<b>Disconnect</b>	<b>Remove/Reroute/Relocate</b>	<b>Reconnect</b>
Disconnect both cables from their USB ports on rear panel of computer.	Allow cables to remain attached to assembly as you relocate assembly to opposite side.	<ul style="list-style-type: none"> <li>Reconnect to unused pair of USB ports on rear panel of computer so that both USB cables reach DVD Drive/Switch Panel Assembly's new location on opposite side.</li> <li>Do NOT use either of two USB 3.0 ports (colored blue).</li> </ul>
<p><b>NOTES:</b></p> <p>For workstations equipped with upgrade (larger) computer:</p> <ul style="list-style-type: none"> <li>Both USB port cables on DVD Drive/Switch Panel Assembly are too short to reach assembly's new location on opposite side of workstation.</li> <li>Therefore, disconnect both cables from their original two USB ports on rear panel of computer. Reconnect both cables to two other USB ports that are closer to relocated assembly.</li> </ul> <p>For workstations equipped with standard (smaller) computer:</p> <ul style="list-style-type: none"> <li>We recommend that you disconnect both cables from their original two USB ports on rear panel of computer. Reconnect both cables to two other USB ports that are closer to relocated assembly.</li> </ul>		

## 8.7 Workstation Preventive Maintenance

### 8.7.1 Universal Acquisition Workstation Preventive Maintenance Checklist

Use the following table for a workstation preventive maintenance checklist. The tools and materials required for workstation preventive maintenance include:

- Standard hand tools
- Lint free cloths
- CRT wipes
- Small vacuum cleaner
- Brush

For preventive maintenance procedures on the *entire* system, refer to [Preventive Maintenance Schedule](#) on page 193.





### Note

- The following preventive maintenance checklist is for guidance only - it is not a representation of the approved Preventive Maintenance document for the system located in Agile.
- Refer to the appropriate sections of the Service Manual as necessary.

Table 13: Preventive Maintenance Checklist for Universal Acquisition Workstation

	Maintenance Task Description	Recommended Frequency	
		Semi-Annually	Annually
1	Review with customer any concerns or unreported issues before starting the PM.	x	x
2	Inspect all outer cosmetics, panels, desk top, foot switch, monitor column and mounting for damage or wear, electrical connections for security.		x
3	Remove all covers, and check x-ray shield integrity and ensure that mounting hardware is secure (non-Mobile only).	x	x
4	Check the console tabletop up/down drive mechanism and controls for proper operation and ensure that movement is smooth with no interference.	x	x
5	Perform all functional tests and component checks for proper operation of workstation. Ensure that monitors, controls, and all features are performing to factory specifications after reassembly.	x	
6	Ensure that cooling fans and internal components are free of debris and dust. Clean as necessary to ensure proper operation.	x	
7	Clean panel interiors as necessary and inspect for any mounting hardware that is damaged or missing. Correct as necessary and reinstall all panels.	x	
8	Visually inspect reassembled console for cosmetics; clean and align panels after service if necessary.	x	
9	Perform a full functional check of the monitors and controls of the workstation and insure all features and controls are performing to factory specification after reassembly.	x	x



### **8.7.2 Clean the Preview Display and Touchscreen Display**

Avoid touching the display area.

Always use care when cleaning the outer surface of the display area. Always use a clean, soft, lint-free cloth. Microfiber cloths, are highly recommended.

- Never spray or pour a liquid directly onto the display area.
- Never apply excessive pressure to the display area.
- Never use detergents with fluorides, ammonia, alcohol, or abrasives.
- Never use bleach.
- Never use steel wool, or cloth woven with metal.
- Never use a sponge with abrasives.

To clean the display:

Clean the display using a sponge, cleaning cloth, or soft tissue, lightly moistened with a recognized cleaning product for medical equipment. Read and follow all label instructions on the cleaning product. In case of doubt about a screen cleaning product, use plain water.

Do NOT use the following products:

- Alcohol/solvents at higher concentration > 5%
- Strong alkalis lye, strong solvents
- Acid
- Detergents with fluoride
- Detergents with ammonia
- Detergents with abrasives
- Steel wool
- Sponge with abrasives
- Steel blades
- Cloth with steel thread







# Appendix A Specifications

## A.1 Product Measurements

### A.1.1 Tubestand (Gantry with C-Arm)

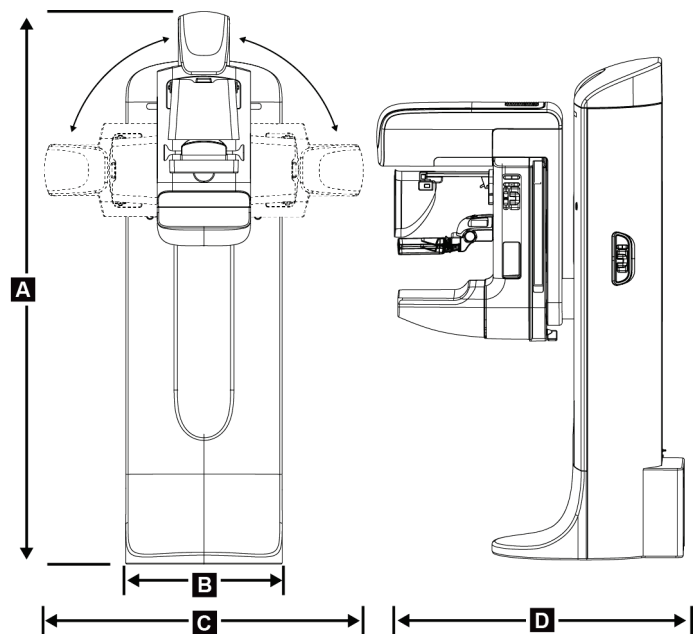


Figure 353: Tubestand (Gantry with C-arm) Measurements

A.	Height	223 cm (87.8 inches)
B.	Width	66 cm (26 inches)
C.	Width	173 cm (68 inches)
D.	Depth	138 cm (54.25 inches)
	Weight	Maximum of 400 kg (882 pounds)



A.1.2 Acquisition Workstations

Universal Acquisition Workstation

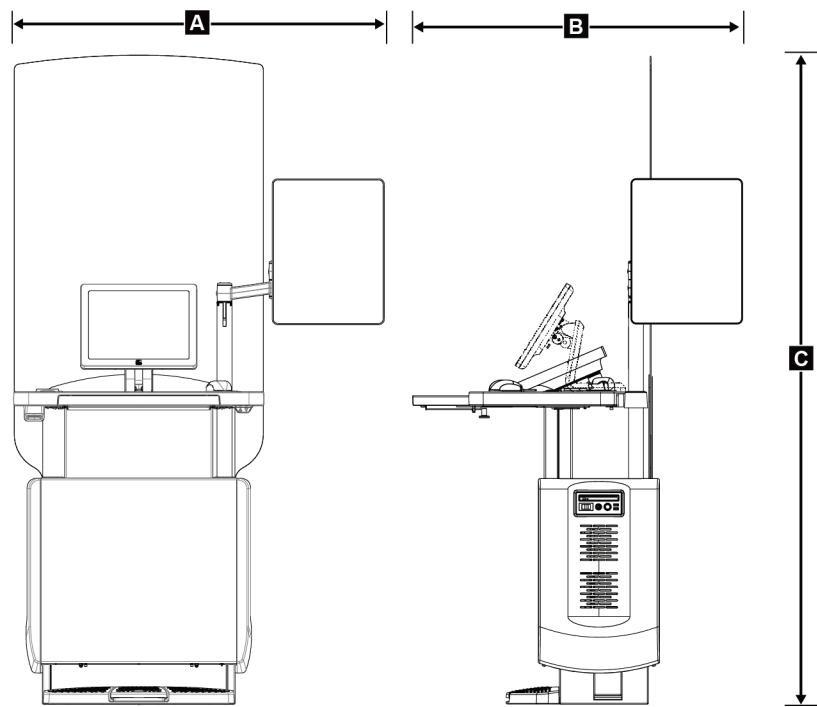


Figure 354: Universal Acquisition Workstation Measurements

A.	Width (maximum) with optional articulated display arm extended	136 cm (53.4 inches) - series I UAWS
		128 cm (50.3 inches) - series II UAWS
	Width (maximum) with standard display arm	94.0 cm (36.9 inches) - series I UAWS
		107 cm (42.0 inches) - series II UAWS
B.	Depth (maximum) with keyboard tray extended and optional articulated display monitor arm	122 cm (48.4 inches) - series I UAWS, rotated to the side
		115 cm (45.1 inches) - series II UAWS, rotated to the side
	Depth (maximum) with keyboard tray extended and standard display arm	83.6 cm (32.9 inches) - series I and II UAWS
C.	Height (nominal)	219 cm (86.1 inches) after August 2017
		204 cm (80.3 inches) before September 2017
	Weight (maximum)	209 kg (460 pounds)



Acquisition Workstation for Mobile Use

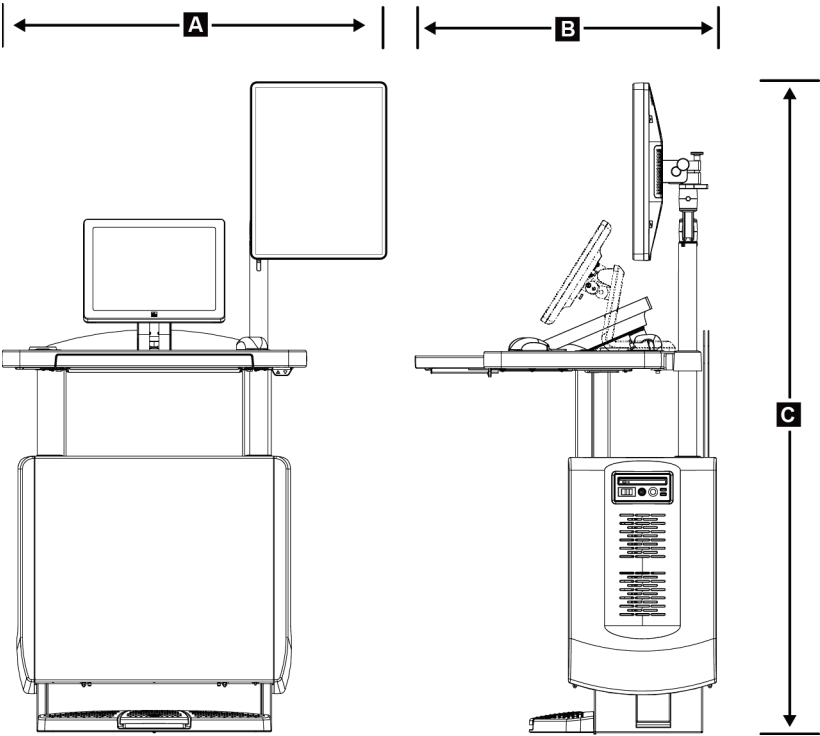


Figure 355: Mobile Universal Acquisition Workstation Measurements

A.	Width (maximum) with mobile display arm	100 cm (39.5 inches) - series I UAWS
		107 cm (42.0 inches) - series II UAWS
B.	Depth (maximum) with keyboard tray extended	85 cm (33.5 inches)
C.	Height (maximum)	180 cm (71 inches)
	Weight (maximum)	179 kg (395 pounds)

A.2 Operation and Storage Environment

A.2.1 General Conditions for Operation

Temperature Range	20 °C (68 °F) to 30 °C (86 °F)
Relative Humidity Range	20% to 80% without condensing moisture



### A.2.2 Storage Environment

#### Gantry

<i>Temperature Range</i>	<i>–10 °C (14 °F) to 40 °C (104 °F)</i>
<i>Relative Humidity Range</i>	<i>10% to 90% without condensing moisture</i>

*(Put in a package for storage in a building.)*

#### X-ray Detector

<i>Temperature Range</i>	<i>10 °C (50 °F) to 30 °C (86°F) indefinitely</i> <i>10 °C (50 °F) to 35°C (95 °F) for a maximum of 12 hours</i>
<i>Maximum rate of temperature change</i>	<i>Less than 10 °C (50 °F) per hour</i>
<i>Relative Humidity Range</i>	<i>10% to 80% without condensing moisture</i>

*(Put in a package for storage in a building.)*

#### Acquisition Workstation

<i>Temperature Range</i>	<i>–10 °C (14 °F) to 40 °C (104 °F)</i>
<i>Relative Humidity Range</i>	<i>10% to 90% without condensing moisture</i>

*(Put in a package for storage in a building.)*

### A.3 Radiation Shield

<i>Radiation Shield Lead (Pb) equivalent</i>	<i>0.5 mm lead for x ray energy to 35 kV</i>
--	--

### A.4 Electrical Input

#### A.4.1 Tubestand

<i>Mains Voltage</i>	<i>200/208/220/230/ 240 VAC ±10%</i>
<i>Mains Impedance</i>	<i>Maximum line impedance not to exceed 0.20 ohms for 208/220/230/240 VAC, 0.16 ohms for 200 VAC</i>
<i>Mains Frequency</i>	<i>50/60 Hz ±5%</i>
<i>Average Current over 24 Hours</i>	<i>&lt; 5 A</i>
<i>Peak Line Current</i>	<i>4 A (65 A maximum for ≤ 5 seconds)</i>



## A.4.2 Acquisition Workstation

<i>Mains Voltage</i>	100/120/200/208/220/230/240 VAC $\pm 10\%$
<i>Mains Frequency</i>	50/60 Hz $\pm 5\%$
<i>Power Consumption</i>	< 1000 watts
<i>Duty Cycle (Standard Acquisition Workstation)</i>	10% ~ 6 minutes per hour or 2 minutes on, 18 minutes off
<i>Overcurrent Protection</i>	8A

## A.5 Tubestand Technical Information

### A.5.1 C-Arm

<i>Rotation Range</i>	<p><i>Conventional Mammography:</i></p> $+195^{\circ} +3^{\circ}/-0.5^{\circ}$ to $0^{\circ} \pm 0.5^{\circ}$ to $-155^{\circ} +0.5^{\circ}/-3^{\circ}$
	<p><i>Tomosynthesis option:</i></p> $+180^{\circ} \pm 0.5^{\circ}$ to $0^{\circ} \pm 0.5^{\circ}$ to $-140^{\circ} \pm 0.5^{\circ}$
<i>Absolute Angular Position</i>	accurate to $\pm 0.5^{\circ}$
<i>Rotation Acceleration</i>	$18^{\circ}/s^2 +18/-9\%$
<i>Rotation Deceleration</i>	$18^{\circ}/s^2 +18/-9\%$
<i>Rotational Positioning Angular Velocity</i>	$18^{\circ}/s \pm 25\%$



#### Note

The angular velocity is the average of the velocity of the tube arm rotating clockwise between  $0^{\circ}$  and  $90^{\circ}$  or rotating counterclockwise between  $90^{\circ}$  and  $0^{\circ}$ . The angular velocity does not include the time to accelerate from zero velocity and decelerate to zero velocity.

<i>Source-to-Image Distance (SID)</i>	$70.0\text{ cm} \pm 1.0\text{ cm}$ (27.6 inches $\pm 0.4$ inches) (Focus position deviation is $\pm 5\text{ mm}$ )
<i>Patient Support (non-magnification)</i>	
<i>Vertical Position Lower Limit</i>	$70.5\text{ cm} +5.1/-0\text{ cm}$ (27.75 inches $+2.0/-0$ inches)
<i>Vertical Position Upper Limit</i>	$141\text{ cm} +0/-17.8\text{ cm}$ (55.5 inches $+0/-7.0$ inches)



**A.5.2 Compression**

<i>Manual Compression Force</i>	<i>Maximum of 300 N (67.4 pounds)</i>
<i>Motorized Compression</i>	<i>Functions in three operating modes: Pre-compression, Full-Range, Dual Compression. User selectable through software.</i>
<i>Pre-Compression Force</i>	<i>15 pounds to 30 pounds (67 to 134 N), motorized</i>
<i>Full Range Compression Force</i>	<i>20 pounds to 40 pounds (89 to 178 N), motorized</i>
<i>Dual Mode Compression</i>	<i>Provides Pre-Compression force upon first activation of compression switch; then, if switch is activated within 2 seconds, the force is increased incrementally for each additional switch activation, up to the user selected full compression force.</i>
<i>Compression Controls</i>	<i>Up/Down controls on both sides of C-arm and on 2-position footswitch (Motorized). Handwheel on both sides of Compression Device (Manual).</i>
<i>Compression Release</i>	<i>Manual Motorized Release controlled by push-buttons on both sides of the C-arm.</i>
<i>Automatic Compression Release</i>	<i>User selectable automatic release mode raises Compression Device upon exposure termination.</i>
<i>Down Motion Variable Speed</i>	<i>4.2 cm/s <math>\pm</math>15% (1.66 inches/s <math>\pm</math>15%)</i>
<i>Compression Force Display</i>	<i>Two LCDs on the Compression Device show the compression force through the range of 18 N to 300 N in 1 N increments (4 pounds to 67 pounds in 1 pound increments).</i>
<i>Compression Force Display Accuracy</i>	<i><math>\pm</math>20 N (<math>\pm</math>4.5 pounds)</i>
<i>Compression Thickness Display</i>	<i>Two LCDs on the Compression Device measure compression thickness in 0.1 cm increments. The display is visible from both sides of the patient.</i>
<i>Compression Thickness Accuracy</i>	<i><math>\pm</math>0.5 cm (<math>\pm</math>0.2 inches) for thicknesses between 0.5 cm and 15 cm (5.9 inches)</i>
<i>Breast Tomosynthesis Compression Thickness</i>	<i>Standard resolution tomosynthesis Maximum: 24 cm (restricted by compression device geometry)  High resolution tomosynthesis Maximum: 15 cm (restricted by DICOM limitations)</i>
<i>Compression Paddles</i>	<i>Compression Paddles are transparent. The paddles are composed of polycarbonate resin or the equivalent. With compression applied, paddle deflection from a plane parallel to the patient support surface shall be less than or equal to 1.0 cm.</i>



### A.5.3 X-ray Tube

<i>Focal Spot</i>	<i>Large (0.3 mm) Nominal</i> <i>Small (0.1 mm) Nominal</i>
<i>Tube Voltage</i>	<i>20 kV to 49 kV</i>
<i>Anode Material</i>	<i>Tungsten</i>
<i>X-Ray Window</i>	<i>Beryllium 0.63 mm</i>
<i>Tube leakage test conditions</i>	<i>49 kVp, 2.0 mA</i>

### A.5.4 X-ray Beam Filtration and Output

<i>Filtration</i>	<i>Five-position filter wheel:</i> <i>Position 1: Rhodium, 0.050 mm ±10%</i> <i>Position 2: Aluminum, 0.70 mm (nominal) (Tomosynthesis option)</i> <i>Position 3: Silver, 0.050 mm ±10%</i> <i>Position 4: Copper, 0.3mm</i> <i>Position 5: Lead (provided for servicing)</i>
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#### kV/mA Range

Table 14: Maximum mA Setting as a Function of kV

<b>kV</b>	<b>LFS mA</b>	<b>SFS mA</b>
20	100	30
21	110	30
22	110	30
23	120	30
24	130	30
25	130	40
26	140	40
27	150	40
28	160	40
29	160	40
30	170	50
31	180	50



Table 14: Maximum mA Setting as a Function of kV

kV	LFS mA	SFS mA
32	190	50
33	200	50
34	200	50
35	200	50
36	190	50
37	180	50
38	180	50
39	180	50
40	170	
41	170	
42	160	
43	160	
44	150	
45	150	
46	150	
47	140	
48	140	
49	140	

*mAs Steps (Table 1, default)*

4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 25, 30, 32.5, 35, 37.5, 40, 42.5, 45, 47.5, 50, 52.5, 55, 57.5, 60, 62.5, 65, 67.5, 70, 75, 80, 85, 90, 95, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500

### Attenuation of Carbon Fiber

*Image Receptor*

< 0.3 mm Al

*Magnification Platform*

< 0.3 mm Al



### A.5.5 X-ray Collimation

<i>Collimation Fields</i>	<i>7.0 cm x 8.5 cm</i>
	<i>10 cm x 10 cm</i>
	<i>15 cm x 15 cm</i>
	<i>18 cm x 24 cm</i>
	<i>18 cm x 29 cm (Tomosynthesis option)</i>
	<i>24 cm x 29 cm</i>

### A.5.6 Light Field Indication

<i>Light Field to X Ray Congruency</i>	<i>Within 2% of SID</i>
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### A.5.7 X-ray Generator

<i>Type</i>	<i>Constant Potential High Frequency Inverter</i>
<i>Rating</i>	<i>7.0 kW, maximum (isowatt), 200 mA at 35 kV</i>
<i>Electrical Power Capacity</i>	<i>9.0 kW maximum</i>
<i>kV Range</i>	<i>20 kV to 49 kV in 1 kV increments</i>
<i>kV accuracy</i>	<i>±2%, over range 20-49 kVp</i>
<i>mAs Range</i>	<i>3.0 mAs to 500 mAs in Manual Mode mAs (8 mAs minimum in AEC Mode)</i>
<i>mAs Accuracy</i>	<i>±(10% + 0.2 mAs)</i>
<i>mA Range</i>	<i>10 mA to 200 mA, Large Focal Spot</i>
	<i>10 mA to 50 mA, Small Focal Spot</i>



### A.6 Imaging System Technical Information

#### A.6.1 Image Receptor

<i>Fluid Ingress</i>	<i>No fluid from accidental spillage on the Image Receptor may seep inside.</i>
<i>Deflection</i>	<i>Does not exceed 1.0 mm at maximum compression.</i>
<i>Active Imaging Area</i>	<i>Not less than 23.3 cm by 28.5 cm (9.2 inches x 11.2 inches)</i>
<i>DQE Conventional Mammography</i>	<i>Not less than 50% at 0.2 lp/mm</i>
	<i>Not less than 15% at the Nyquist limit</i>
<i>DQE (Tomosynthesis option)</i>	<i>Not less than 30% at 0.2 lp/mm</i>
	<i>Not less than 15% at the Nyquist limit</i>
<i>Dynamic Range and Linearity</i>	<i>Detector Subsystem response is linear with linearity of 0.999 over a dynamic range of 400:1 in x-ray exposure.</i>
<i>Uniformity</i>	<i>Detector Subsystem can correct pixel-to-pixel gain variations.</i> <i>For conventional mammography procedures, the uniformity of flat field image response of the detector shall be no greater than 2% after gain calibration is applied over an exposure range of 0.5 mR to 200 mR.</i>



## Appendix B System Messages and Alert Messages

### B.1 Error Recovery and Troubleshooting

Most faults and alert messages are cleared without result to your workflow. Follow the instructions on the screen or fix the condition then clear the status from the Taskbar. Some conditions require a system restart or indicate that more action is necessary (for example, to call Hologic Technical Support). This appendix describes the message categories and your actions to return the system to normal operation. If errors repeat, contact Hologic Technical Support.

### B.2 Types of Messages

#### B.2.1 Fault Levels

Each Message has a particular set of the following characteristics:

- Aborts an exposure in progress (yes/no)
- Prevents an exposure from starting (yes/no)
- Displays a message to the user on the Acquisition Workstation (yes/no)
- May be reset by the user (yes/no)
- May be reset automatically by the system (yes/no)

#### Displayed Messages

All displayed messages will be shown in the user's selected language.

Any message which aborts an exposure or prevents an exposure from starting will always display a message directing the user's actions required to proceed.

#### Additional Message Information

Technical information about the message is available in the log file.

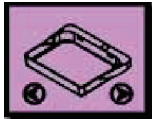
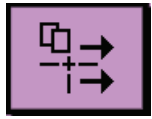





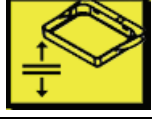


Some messages always show as a critical fault (a system restart is necessary). These messages result from a condition which prevents an exposure, and which cannot be reset by the user or the system.



## B.2.2 System Messages









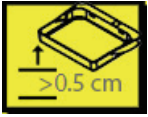
When the following system messages show, do the step shown in the User Action column to clear the message and allow the next exposure.

*Table 15: System Messages*

Icon	Message	User Action
	Paddle is moving	No action needed.
	Sending notice	No action needed.
	Invalid use of Magnification Stand	You selected a tomographic view with the Magnification Stand installed. Select a non-tomographic view. (Tomosynthesis option)
	Face shield is not secured	Fully extend or fully retract the Face Shield. (Tomosynthesis option)
	Invalid use of compression paddle	Remove the Magnification Stand or install the Magnification Paddle.
	Paddle position does not match selected view	Shift the Paddle to the correct location for the selected view.
	Compression is less than 4.5 cm during calibration	Move the Compression Paddle higher than 4.5 cm to complete the calibration procedure.
	FAST compression is engaged	Disengage FAST compression and install a paddle designated for this mode.
	License is missing	A license is necessary to use this feature or function. (This message is for your information only. There are no user actions.)
	Invalid detector calibration	Install the Magnification Stand for Small Focal Spot calibration. Remove the Magnification Stand to do Large Focal Spot calibration.



*Table 15: System Messages*

Icon	Message	User Action
	Invalid geometry calibration	Repeat the geometry calibration before you try to take an exposure. (Tomosynthesis option)
	Configuration file is missing	Applies to Service Personnel.
	Waiting for Detector	No action needed.
	System in Test Mode	Applies to Service Personnel.
	Tube needs to be manually positioned (move to 0 degrees)	Rotate the C-arm to 0 degrees.
	Tube needs to be manually positioned (move to -15 degrees)	Rotate the C-arm to -15 degrees.
	Tube needs to be manually positioned (move to 15 degrees)	Rotate the C-arm to +15 degrees.
	The Emergency Stop switch has been engaged.	Turn the Emergency Off switch one-quarter turn to reset the switch.
	Compression too low for tomo reconstructions.	Move the Compression Paddle higher than 0.5 cm to take tomography exposures.



B.3    UPS Messages



**Note**  
The User Guide for the UPS is supplied with the system. Refer to the *UPS User Guide* for complete instructions.

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The LCD in the UPS shows the power status.

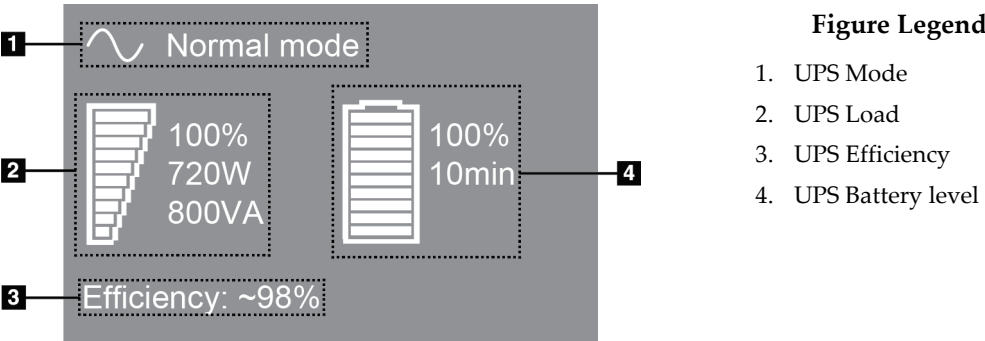


Figure 356: UPS LCD Display

If the UPS battery expires, the Mode icon changes as shown. Contact your service representative to replace the battery.





## Appendix C Field Replaceable Units

### C.1 Universal Acquisition Workstation Visual Reference for FRUs

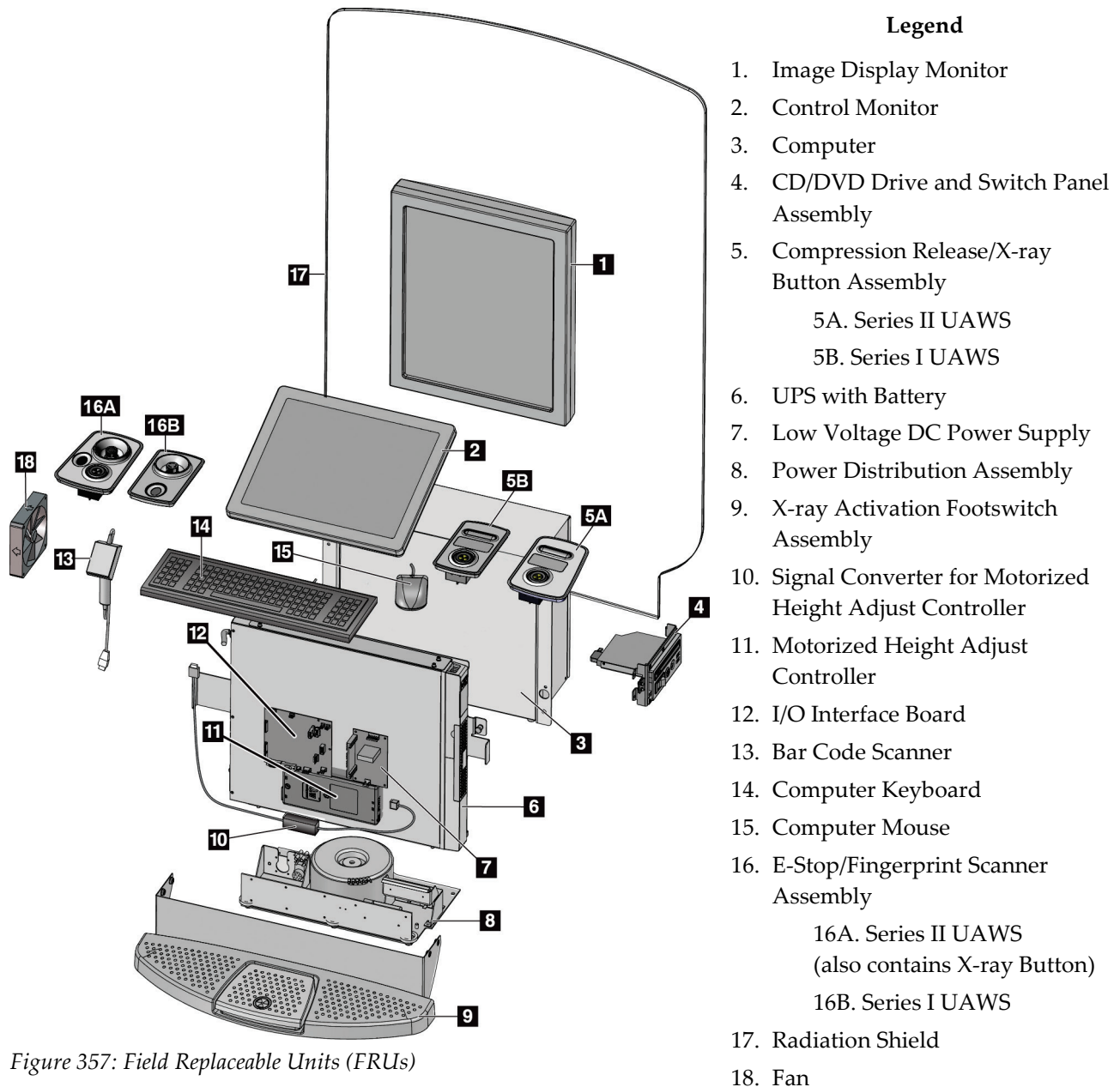


Figure 357: Field Replaceable Units (FRUs)



### C.2 Replacement Parts List for Field Replaceable Units (FRUs)

The Parts Lists are located in the tables below.

The replacement parts lists are divided into four parts:

- **Part Number:** This is the order number for the Field Replaceable Unit/part. The Hologic Service Department requires this number when placing an order.
- **Description:** Identifies the Field Replaceable Unit/part by name.
- **Refer To:** Identifies the Chapter and Section in this manual to go to for installation or remove and replace procedures for that Field Replaceable Unit/part.
- **Comments:** Contains additional information. Also identifies components which make up the Field Replaceable Unit. If any of these components fail, replace the Field Replaceable Unit.

Table 16: Gantry Power Distribution Functions Parts List

Part Number	Description	Refer To	Comments
ASY-01612	Power Distribution Drawer	<a href="#">Power Distribution Drawer</a> on page 261	
ASY-01546	Fixed Power Distribution Assembly	<a href="#">Power Distribution Drawer</a> on page 261	At rear of Power Distribution Drawer
ASY-01711	Capacitor and Bridge Assembly	<a href="#">Capacitor and Bridge Assembly</a> on page 263	To right of Isolation Transformer
ASY-02522	Detector Isolation Transformer 120VAC Assembly	<a href="#">Detector Isolation Transformer</a> on page 262	To left of Isolation Transformer
ASY-02507	Power Supply Switching Assembly	<a href="#">24 V Power Supply and External User Indicator Board</a> on page 263	To left of Isolation Transformer
1-700-0107	Emergency Off Switch	<a href="#">Emergency Off Switch</a> on page 260	
CKB-00030	Circuit Breaker	<a href="#">Circuit Breaker</a> on page 259	
PCB-00070	Power Distribution Board Assembly	<a href="#">Power Distribution Drawer</a> on page 261	In Power Distribution Drawer
PCB-00044	Gantry Control Board Assembly	<a href="#">Power Distribution Drawer</a> on page 261	
PCB-00166	Rail Indicator Board Assembly	<a href="#">Capacitor and Bridge Assembly</a> on page 263	On Capacitor and Bridge Assembly



Table 17: System Control and X-ray Functions Parts List

Part Number	Description	Refer To	Comments
OSC-00007	X-ray Tube, Varian M-113T	<a href="#">X-ray Tube Maintenance</a> on page 238	Varian M-113T
PCB-00061	Tubehead Microprocessor Board	<a href="#">Tubehead Microprocessor Board</a> on page 245	
ASY-01381	Tube Arm Fan Bracket Assembly	<a href="#">Tubehead Cooling Fan</a> on page 257	
ASY-01273 ASY-05340	HV Multiplier Drawer Assembly	<a href="#">Remove the HV Multiplier Drawer</a> on page 236	
PCB-00179	High Voltage Adjust Board Assembly	<a href="#">Peak Tube Potential</a> on page 205	Located in the Inverter Drawer for ASY-01272. (Note: The HV Adj. function is integral to PCB-00797 located in the Inverter Drawer for ASY-05788).
ASY-01272 ASY-05788	Inverter Drawer	<a href="#">Remove the HV Inverter Drawer</a> on page 236	
1-003-0289	Filament Protect Board	<a href="#">Filament Protect Board</a> on page 246	
ASY-01309	Collimator Assembly	<a href="#">Beam Limiting Assembly</a> on page 232	
ASY-01307	Beam Limiting Assembly	<a href="#">Beam Limiting Assembly</a> on page 232	
PCB-00117	Filter Wheel Board	<a href="#">Beam Limiting Assembly</a> on page 232	



Table 18: C-Arm Functions Parts List

Part Number	Description	Refer To
PCB-00092	C-Arm Switch Board	<a href="#">C-Arm Switch Boards</a> on page 247
PCB-00393 (replaces PCB-00134)	Mag Sense Board	<a href="#">Mag Sense Board</a> on page 249
PCB-00086	C-Arm Angle Display Board	<a href="#">C-Arm Angle Display Board</a> on page 245
PCB-00155	VTA Drive Board	<a href="#">VTA Drive Board</a> on page 253
PCB-00154	VTA Control Board	<a href="#">VTA Control Board</a> on page 253
PCB-00064	C-Arm Board	<a href="#">C-Arm Board</a> on page 249
ASY-10323	Gantry C-Arm Switch Assembly, Right Hand	<a href="#">Gantry C-Arm Switch Assemblies</a> on page 247
ASY-10324	Gantry C-Arm Switch Assembly, Left Hand	<a href="#">Gantry C-Arm Switch Assemblies</a> on page 247
PCB-00095	Compression Device Interface Board	<a href="#">Compression Device Interface Board</a> on page 250
PCB-00150	Grid Interface Board	<a href="#">Grid Interface Board</a> on page 249
PCB-00152	Grid Transition Board	<a href="#">Grid Transition Board</a> on page 249
PCB-00197	C-Arm Transition Board	<a href="#">C-Arm Transition Board</a> on page 247
PCB-01647 (replaces PCB-00116)	RFID Interface Board	<a href="#">RFID (Radio Frequency Identification) Board</a> on page 251
PCB-00186	Paddle Position Sensor Board	<a href="#">Paddle Position Sensor Board</a> on page 250
PCB-00163	Power Filter Board	<a href="#">VTA Power Filter Board</a> on page 253
PCB-00136	C-Arm Zero Position Sense Board	<a href="#">Zero Position Board</a> on page 254
ASY-01503	C-Arm Rotation Switch	<a href="#">C-Arm Rotation Limit Switch</a> on page 254



Table 18: C-Arm Functions Parts List

1-195-3058	C-Arm Rotation Potentiometer	<a href="#">C-Arm Rotation Potentiometer</a> on page 255
ASY-01216	C-Arm Rotation Drive Motor/Gear Box	<a href="#">C-Arm Rotation Drive Motor and Gear Box</a> on page 264
1-195-3058	Compression Thickness Potentiometer	<a href="#">Compression Thickness Potentiometer</a> on page 271
RES-00015	Tomo Potentiometer (Tomosynthesis option)	<a href="#">Tomo Angle Potentiometer (Tomosynthesis Option)</a> on page 255
ASY-01588	Compression Device Clutch	<a href="#">Compression Device Drive Assembly</a> on page 269
ASY-01589	Compression Device Brake Assembly	<a href="#">Compression Motor and Brake</a> on page 272
ASY-01589	Compression Motor/Brake Assembly	<a href="#">Remove the Compression Motor and Brake Assembly</a> on page 273
MME-00400	Timing Belt	<a href="#">Compression Timing Belt</a> on page 274
ASY-10312	Grid Device (Linear)	<a href="#">Replace the Grid Assembly</a> on page 235
ASY-04242	Grid Device (HTC)	<a href="#">Replace the Grid Assembly</a> on page 235
PRD-04420	Image Receptor (Linear Grid)	<a href="#">Remove the Breast Platform and Image Receptor</a> on page 234
PRD-00455	Image Receptor (HTC Grid)	<a href="#">Remove the Breast Platform and Image Receptor</a> on page 234



Table 19: Universal Acquisition Workstation Parts List

Part Number	Description	Refer To	Comments
ASY-07468	UPS, Universal AWS, Assembly	<a href="#">Replace the Uninterruptible Power Supply (UPS)</a> on page 290	
CMP-01503 (replaces CMP-01065)	AWS Computer, WIN7, with GTX1070	<a href="#">Replace the Computer</a> on page 289	
ASY-01947	AWS Power Distribution Assembly	<a href="#">Replace the Power Distribution Assembly</a> on page 350	
PWR-00066	Low Voltage DC Power Supply, Dual Output 5V,5.5A/12V,2.8A	<a href="#">Replace the Low Voltage DC Power Supply</a> on page 347	
PCB-00123	AWS I/O Interface Assembly	<a href="#">Replace the AWS I/O Interface Assembly</a> on page 344	
ASY-07463	X-Ray Activation Footswitch Assembly	<a href="#">Replace the X-ray Activation Footswitch Assembly</a> on page 338	
ASY-10667	CD/DVD Drive and Switch Panel Assembly	<a href="#">Replace the DVD Drive and Switch Assembly</a> on page 336	
ASY-10648	X-Ray Switch and Compression Release Assembly	<a href="#">Replace the X-ray/Compression Release Button Module</a> on page 319	
ASY-10831	E-STOP and Fingerprint Scanner Assembly	<a href="#">Replace E-Stop, X-ray Button, and Optional Fingerprint Scanner Module</a> on page 314	
CMP-01261	Height Adjust Controller, Programmed for Travel 0-200MM, 120V 220-240VAC	<a href="#">Replace the Height Adjust Motor Controller</a> on page 332	



Table 19: Universal Acquisition Workstation Parts List

Part Number	Description	Refer To	Comments
CMP-01259	Control Monitor, 17" Flat Panel Color TFT LCD Touchscreen with LED Backlight	<a href="#">Replace Control Monitor</a> on page 309	
CMP-00447	Keyboard, Spill Safe, USB & PS/2 104 Key	<a href="#">Replace the Keyboard</a> on page 313	
CMP-00819	Mouse, USB & PS/2 3 Button Optical w/Scroll Wheel w/cord 6FT	<a href="#">Replace the Mouse</a> on page 313	
CMP-01307	Converter, Signal	<a href="#">Replace the Signal Converter</a> on page 334	
CMP-01541	Barcode Scanner, Universal Acquisition	<a href="#">Replace and Verify the Barcode Scanner</a> on page 320	
CMP-01531 (BARCO MDNC-3421)	Monitor, 21.3" 3MP 2048X1538 Barco NIO Color, TFT AM Color LCD IPS, LED Backlights, DVID Dual Link, DisplayPort	<a href="#">Replace the Image Display Monitor</a> on page 298	
FAB-12469	Shield, Universal AWS	<a href="#">Replace the Radiation Shield</a> on page 341	
FAN-00084	Fan	<a href="#">Replace the Fan</a> on page 349	



Table 20: Miscellaneous Gantry Parts List

Part Number	Description	Refer To	Comments
PCB-00174	Gantry Service Port Board	<a href="#">Gantry Service Port Board</a> on page 252	
PCB-00271 (replaces PCB-00165)	Face Shield Sense Board	<a href="#">Face Shield Sense Board</a> on page 254	
PCB-00124	External User Indicator Board	<a href="#">24 V Power Supply and External User Indicator Board</a> on page 263	On ASY-02507 bracket to left of isolation transformer.
PWR-00049	24 V Power Supply	<a href="#">24 V Power Supply and External User Indicator Board</a> on page 263	
ASY-02385	Standard Crosshair	User Guide	
ASY-02258	Magnification Crosshair	User Guide	
ASY-02202	Magnification Stand	User Guide	

Table 21: System Paddle Parts List

Part Number	Description
ASY-01945	24 cm x 29 cm Screening Paddle
ASY-01946	18 cm x 24 cm Screening Paddle
ASY-01950	Spot Contact Paddle
ASY-01940	Small Breast Paddle
ASY-01986	7.5 cm Spot Contact Paddle
ASY-01993	Localization Rectangular Opening Paddle
ASY-01994	10 cm Localization Perforated Paddle
ASY-02028	15 cm Contact Paddle
ASY-02036	15 cm Localization Rectangular Opening Paddle
ASY-02037	15 cm Localization Perforated Paddle
ASY-05469	15 cm LG Ultrasound Paddle
ASY-11738	SmartCurve 2 Paddle, 24 cm x 29 cm
ASY-11739	SmartCurve 2 Paddle, 18 cm x 24 cm
ASY-13532	Mini SmartCurve Paddle, 18 cm x 8 cm



*Table 22: System Cables Parts List*

<b>Part Number</b>	<b>Description</b>	<b>Max. Length</b>
CBL-00326	Network Cable Assembly	10 feet
CBL-00465	Fiber Optic Cable	43 feet
CBL-02722 (replaces CBL-00585)	Workstation/Gantry Interconnect Cable (with ground strap)	40 feet
CBL-02349	Network Cable Assembly	25 feet
1-040-0719	Ground Cable Assy	40 feet
1-040-0777	Power Cable Assy	25 feet
1-056-0046	International Power Cord	10 feet
1-056-0047	Domestic Power Cord	10 feet







## Appendix D Use of Mobile System

### D.1 General Information

This appendix describes the system installed in a mobile environment.

### D.2 Conditions for Safety and Other Precautions

An acceptable, stable, clean VAC power source is required to make sure that the system meets all its performance specifications. Where available, shore power correctly supplied to the system provides the best performance. If a mobile power generator is used, you must keep the specifications for input power during all load conditions.



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**Warning:**

**The radiation shield is not approved for mobile use and is not provided. The coach manufacturer must provide adequate shielding.**

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**Caution:**

When shore power is unavailable, mobile power sources that provide equivalent performance may be employed. (Refer to [Specifications for Mobile Use](#) on page 406.) Proper system function and performance can only be ensured if continuous true sinusoidal VAC power is supplied per the system power input specifications and loading characteristics. Intermittently, the power source must provide 65 Amps at 208 VAC for a minimum of 5 seconds, and 4 Amps maximum continuous otherwise. This load must be supported once every 30 seconds. In the event of shore or mobile power service interruption, the UPS must be capable of providing the operational power described above for a minimum of 4 minutes. Acquisition Workstation and Gantry power must be fed on separate dedicated circuits. The use of an uninterruptible power supply with active line conditioner is recommended on each power circuit. Accordingly, all ancillary mobile coach power should be distributed by other circuits. The electrical installation must be verified to meet system power input specifications and IEC 60601-1 safety requirements after initial installation and upon each relocation of the mobile coach.

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**Caution:**

The temperature and humidity inside the vehicle must be maintained at all times. Do not allow environmental conditions to exceed stated specifications when the unit is not in use.

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**Caution:**  
Voltages cannot change by more than  $\pm 10\%$  when the x-ray unit or other equipment (for example, heating or air conditioning) is operated.

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**Caution**  
To avoid image artifacts from occurring:

- Care should be exercised not to locate or park the mobile coach near sources of high power (such as power transmission lines and outdoor transformers).
- Make sure that any mobile power generator, uninterruptible power system (UPS), or voltage stabilizer is at least 3 meters (10 feet) from the closest point of the image detector travel.

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### D.3 Specifications for Mobile Use

The following system specifications are for mobile use only. For all other specifications, refer to the section [Specifications](#) on page 381.

#### D.3.1 Shock and Vibration Limits

<i>Vibration Limit</i>	<i>Maximum of 0.30 G (2 Hz to 200 Hz), measured at the point where the system mounts to the coach.</i>
<i>Shock Limit</i>	<i>Maximum of 1.0 G (1/2 sine pulse), measured at the point where the system mounts to the coach. An “air ride” coach suspension is recommended.</i>

#### D.3.2 Coach Environment

##### Operation Environment

<i>Temperature Range</i>	<i>20 °C (68 °F) to 30 °C (86 °F)</i>
<i>Relative Humidity Range</i>	<i>20% to 80% without condensing moisture</i>

##### Non-operating/Transit Environment

<i>Temperature Range</i>	<i>10 °C (50 °F) to 35 °C (95 °F) for a maximum of 12 hours</i> <i>10 °C (50 °F) to 30 °C (86 °F) indefinitely</i>
<i>Maximum Rate of Temperature Change</i>	<i>&lt;10 °C/hr.</i>
<i>Relative Humidity Range</i>	<i>10% to 80% without condensing moisture</i>



## D.4 Electrical Input

### D.4.1 Gantry

<i>Mains Voltage</i>	200/209/220/230/ 240 VAC $\pm 10\%$
<i>Mains Impedance</i>	Maximum line impedance not to exceed 0.20 ohms for 208/220/230/240 VAC, 0.16 ohms for 200 VAC
<i>Mains Frequency</i>	50/60 Hz $\pm 5\%$
<i>Average Current over 24 Hours</i>	< 5 A
<i>Peak Line Current</i>	4 A (65 A maximum for 3 seconds)

### D.4.2 Acquisition Workstation

<i>Mains Voltage</i>	100/120/200/ 208/220/230/ 240 VAC $\pm 10\%$
<i>Mains Frequency</i>	50/60 Hz $\pm 5\%$
<i>Power Consumption</i>	< 1000 watts

### D.4.3 Coach UPS Recommendations

- Dedicated UPS for only the Gantry and Acquisition Workstation
- Dual Conversion UPS (Uninterruptible Power Supply and Power Conditioner)
- Single Phase
- Hardwired (Multi) Input 208/220/230/240
- Hardwired (Multi) Output 120/208/240
- IGBT Technology (refer to note below)
- Output Current >55Amps @ 240 VAC
- Internal Isolation Transformer (separate module not preferred)
- Power Factor Correction Technology Input Power Factor >.95 / Output Power Factor  $\geq .85$
- Output Voltage Regulation not to exceed  $\pm 3\%$  (1% typical)
- Minimum Battery Back-up time at Full charge  $\geq 7$  minutes



#### Note

If the UPS does not use IGBT Technology the UPS specification must be for a minimum 2X the systems kW rating.

Placement of the UPS relative to the detector must be a minimum of 3.05 meters (10 feet) line-of-sight.



## D.5 Changes to the Installation Procedures

This section discusses changes to the *Service Manual* for the mobile installation procedures.

### Universal Acquisition Workstation-Changes

None are required for mobile. However, you have the option of mounting the following items on either side of the workstation based on customer preference or site conditions:

- preview display (refer to [Relocate the Image Display Monitor](#) on page 352)
- bar code scanner (refer to [Relocate Bar Code Scanner and/or Motorized Height Adjust Buttons - UAWS](#) on page 362)
- motorized height adjust control panel (refer to [Relocate Bar Code Scanner and/or Motorized Height Adjust Buttons - UAWS](#) on page 362)
- E-Stop/fingerprint scanner assembly (refer to [Relocate E-Stop/Fingerprint Scanner and X-ray Act./Compression Rel. Buttons \(Series I UAWS only\)](#) on page 366)
- compression release button/x-ray activation button assembly (refer to [Relocate E-Stop/Fingerprint Scanner and X-ray Act./Compression Rel. Buttons \(Series I UAWS only\)](#) on page 366)
- CD/DVD drive and power switch assembly (refer to [Relocate DVD Drive/Switch Panel Assembly](#) on page 369)

### Gantry Changes

- set the vertical height upper limit (refer to [Gantry Vertical Height Upper Limit Adjust](#) on page 409)
- install the mobile brake kit (refer to [Install Brake Kit for Gantry Mobile](#) on page 410)
- add extra support (if necessary) for the Gantry (refer to [Gantry Support](#) on page 408)

## D.5.1 Gantry Install Changes

### Gantry Support

This section adds a procedure to the Gantry Installation section in the Service Manual.

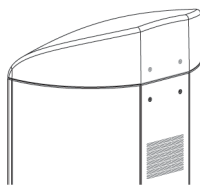


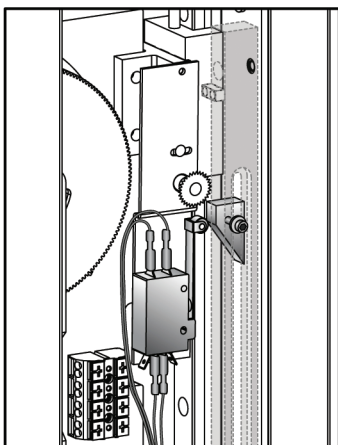
Figure 358: Additional Gantry support mounting holes

If additional support is needed, two holes that have threads are provided at the top rear of the Gantry. (These holes are 3/8 x 1/2 inch deep.) Use this option with the four standard base mounting holes.

Refer also to [Center of Gravity Reference - Mobile](#) on page 436.



### Gantry Vertical Height Upper Limit Adjust



*Figure 359: Vertical height adjustment components in Gantry*

The C-arm upper travel can be adjusted for ceiling limits.

1. Move the Gantry tube head to approximately 1 inch from the ceiling.
2. Open the VTA Vertical Height Limits Menu from the Calibration Tool.
3. Click **Next**. This action resets the vertical height limits to their original values.
4. Adjust the limit switch ramp until the ramp actuates the switch, (this action stops the Gantry).
5. Reverse the switch until the switch releases 1/4-inch higher, and lock the ramp in this position.
6. Press the Advanced button from the Advanced Form to turn the Gantry on.
7. Click **Next** (sets the upper limit).
8. Follow the instructions in the Calibration Tool to set the lower limit.
9. Click **Next** (sets the lower limit).
10. Verify the upper and lower mechanical switch settings.



#### Install Brake Kit for Gantry Mobile



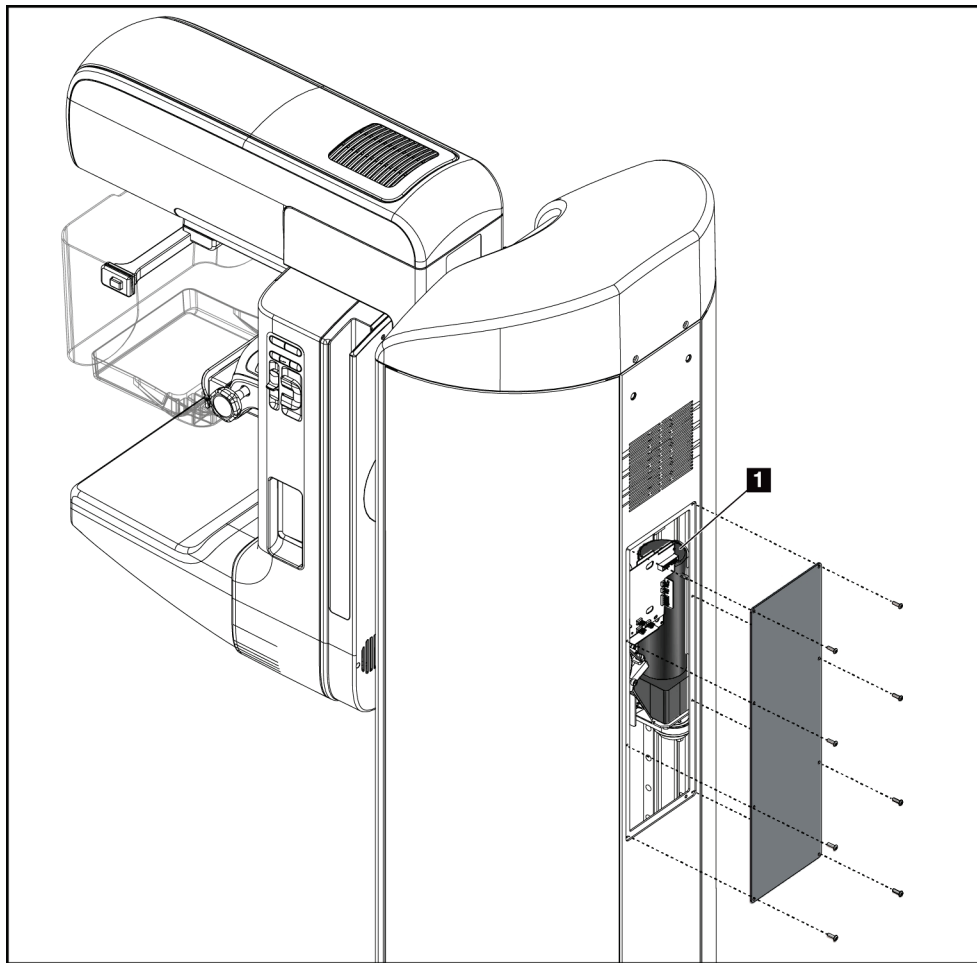
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#### **WARNING!**

**Ensure that system power is Off and the Gantry circuit breaker is in the Off position.**

---

1. Power DOWN the system.
2. Remove the eight screws holding the rear cover to the Gantry (see following figure) and remove cover to expose the lift motor (item 1).



*Figure 360: Removing rear cover of Gantry to expose the lift motor (item 1)*

3. Locate the lift motor (item 1 from previous figure). Secure the nut supplied with the kit over the motor shaft:



- a. Place the nut (item 1 on following figure) over the shaft and make sure that the slotted part of the nut is on top and the set screw is on the bottom.
- b. Align the set screw (item 2) to the flat on the motor shaft (item 3).
- c. Use a 0.015" shim (item 4) to set the gap between the nut and motor housing, then tighten the two set screws on the nut with 1/16" Allen wrench. Remove the shim.

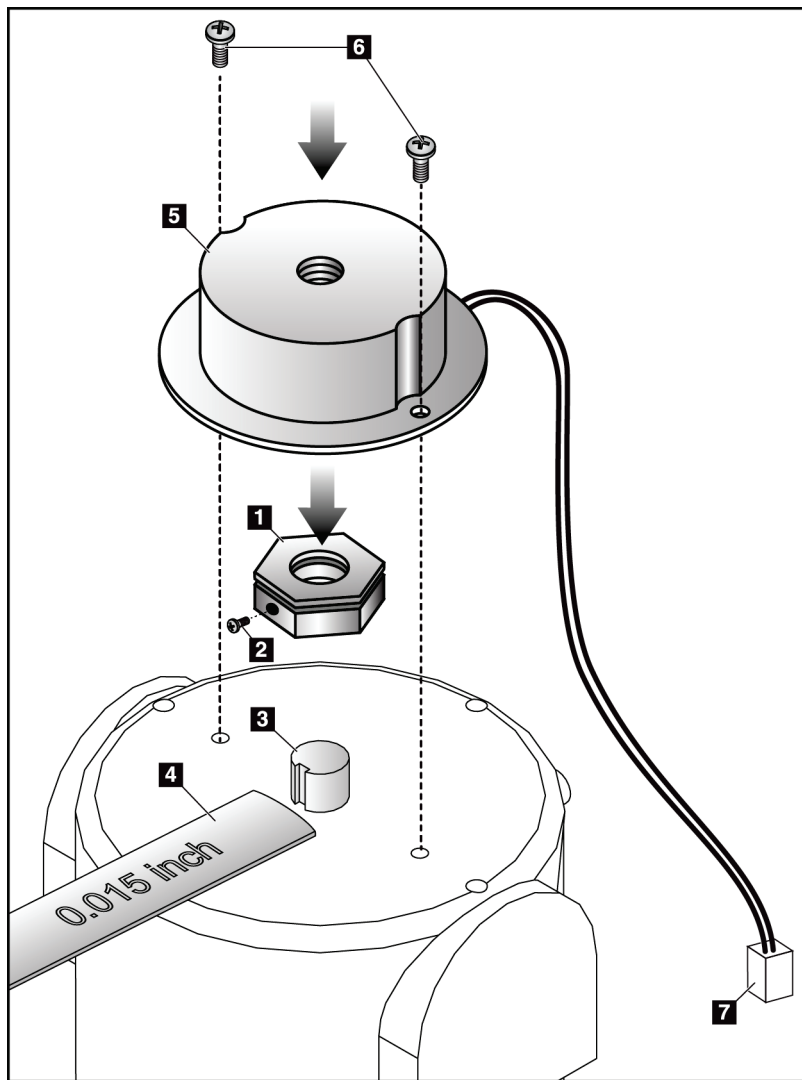


Figure 361: Securing brake assembly to motor and motor shaft

4. Center the 24 VDC Power Off Brake assembly (item 5 on previous figure) over the nut on the motor shaft. Secure with two screws (item 6).



5. Route the brake cable (item 7 on previous figure) to the VTA Control board and plug the connector into WCJ15 (see following figure). Make a service loop in the brake cable and secure it to the nearby gray wire harness with a cable tie.

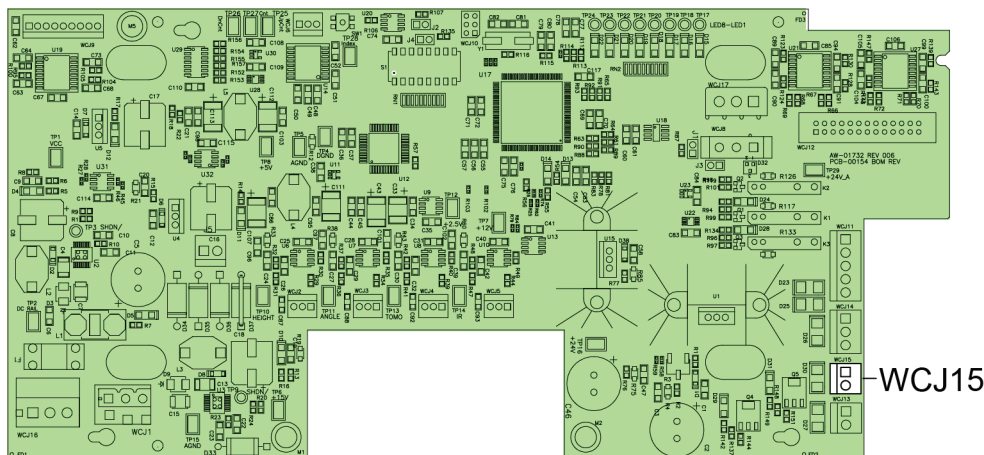


Figure 362: WCJ15 on VTA board for brake cable

6. Reinstall rear cover to Gantry.
7. Power up the system and verify proper operation.

## D.6 Changes to the Maintenance Procedures

This section discusses changes to the *Service Manual* for the mobile maintenance procedures.

### Mobile Universal Acquisition Workstation-Changes

- None required.

### Gantry Changes

- replace the VTA motor brake (refer to [Replace the VTA Motor Brake \(Mobile\)](#) on page 412)

### D.6.1 Replace the VTA Motor Brake (Mobile)

This section adds a new procedure to the Gantry Maintenance section.

1. Remove the upper rear Gantry panel.
2. Lift the VTA Motor Assembly to expose the top of the Vertical Drive Motor.
3. Remove the brake cable from the VTA circuit board.
4. Remove the two screws on the top of the brake.
5. Remove the brake.



6. To replace the coupler (if necessary), loosen the two hex screws on the coupler, and remove the coupler from the motor shaft. Energize the brake to line up the mounting holes.

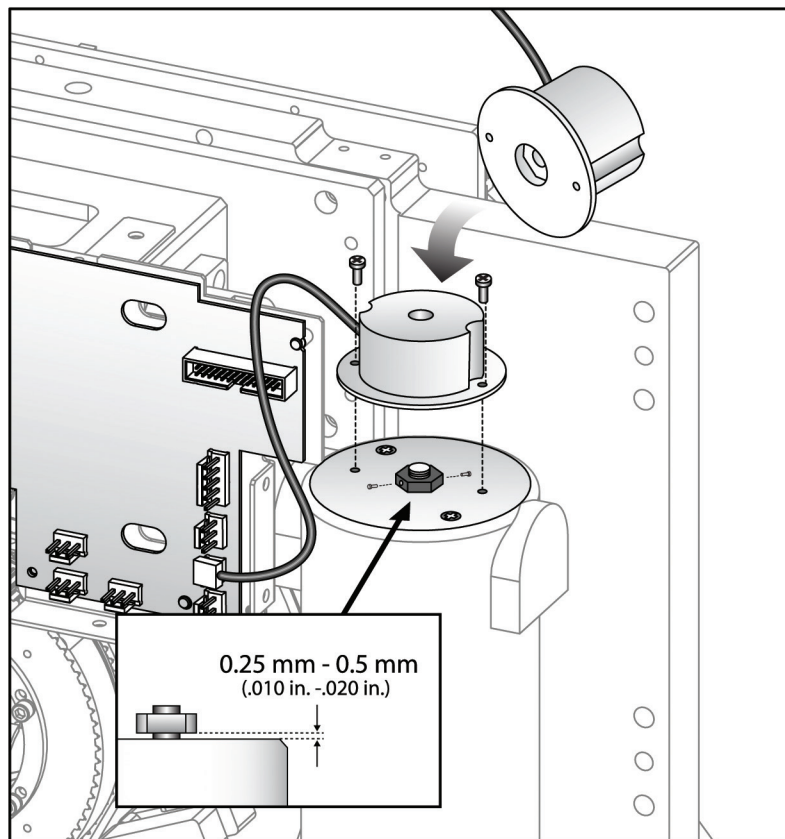


Figure 363: VTA Motor Brake



**Note**

The coupler should be set above the motor housing as shown in the drawing detail.

## D.7 Prepare the System for Travel

Before travel, perform these steps:

1. Rotate the C-arm to 0 degrees (CC position).
2. Lower the C-arm to its lowest position.
3. Turn off the system through the user interface.
4. Place the mouse in the keyboard tray.



5. Lock the keyboard tray (see the following figures):
  - a. Close the tray.
  - b. Find the lock knob under the tray.

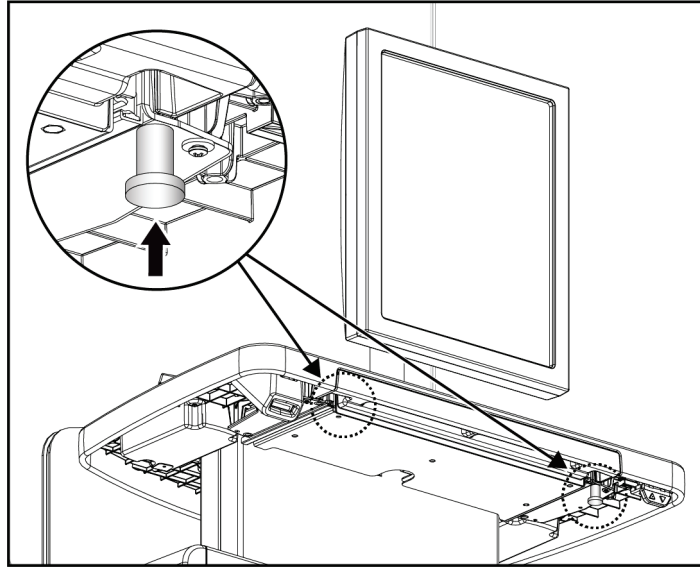


Figure 364: Keyboard Tray Lock Knob (Right or Left Side)

- c. Turn the lock knob 90° until the knob fits into the lock. Position A in the following figure shows the locked position.

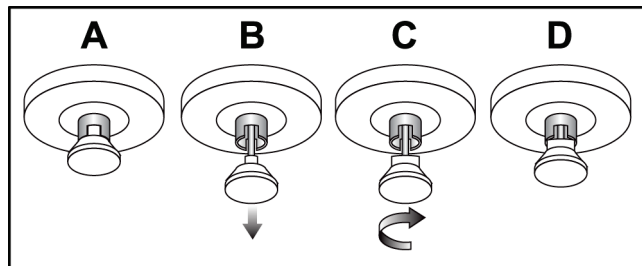


Figure 365: Tray Lock Release from Locked (A) to Unlocked (D)



6. Lock the swivel monitor using the knobs provided (see the following figure).

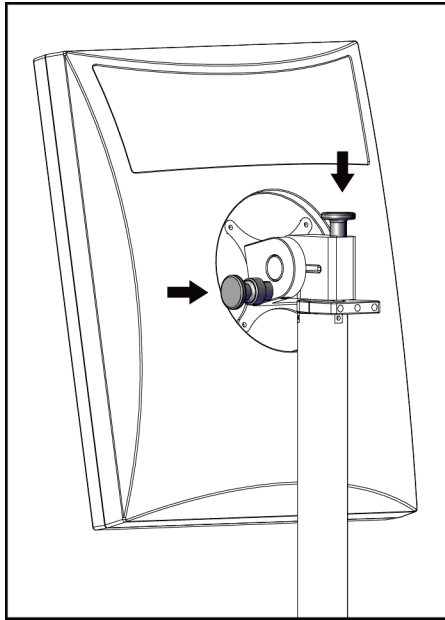


Figure 366: Swivel Monitor Lock Knobs on the Mobile Universal Acquisition Workstation (series I)

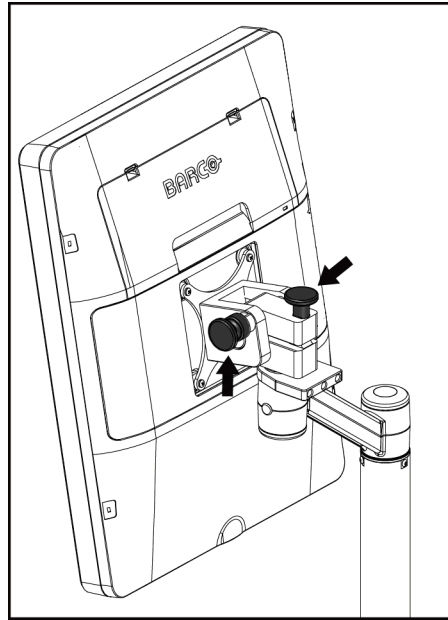


Figure 367: Swivel Monitor Lock Knobs on the Mobile Universal Acquisition Workstation (series II)

7. Lower the work surface to the minimum height.
8. Remove all system accessories.
9. Put all accessories in a safe storage area.

### D.8 Prepare the System for Use

1. Unlock the keyboard tray:
  - a. Find the lock knob under the tray.
  - b. Pull the knob down.
  - c. Turn the knob 90°. This position keeps the latch open. Position D (in the following figure) shows the unlocked position.

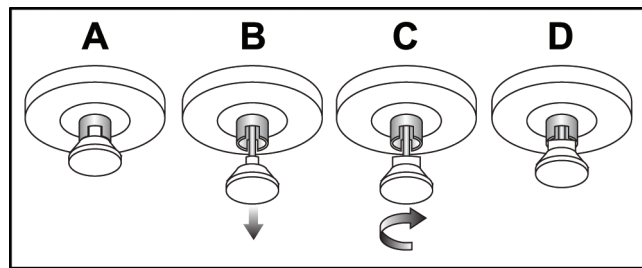


Figure 368: Tray Lock Release from Locked (A) to Unlocked (D)



2. Pull the tray out, if needed.
3. If using the mobile Universal Acquisition Workstation, unlock the swivel monitor (see the following figure).

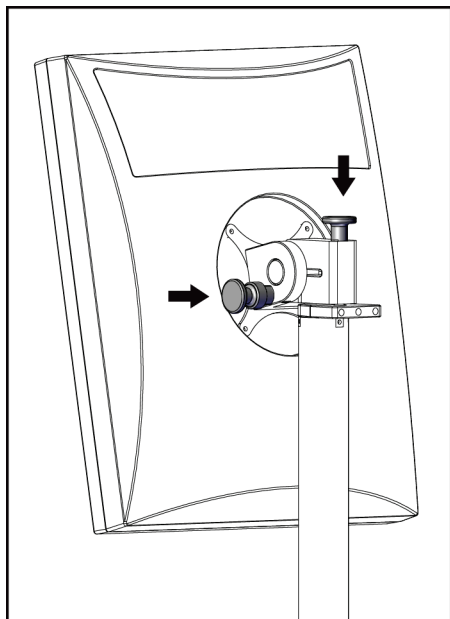


Figure 369: Swivel Monitor Lock Knobs on the Mobile Universal Acquisition Workstation (series I)

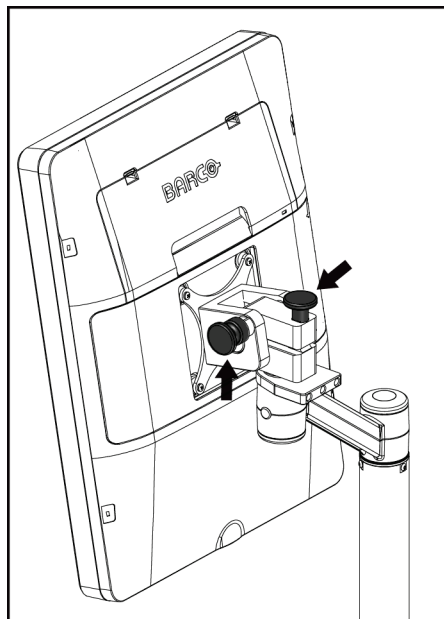


Figure 370: Swivel Monitor Lock Knobs on the Mobile Universal Acquisition Workstation (series II)

## D.9 Test the System after Travel

### D.9.1 System Controls and Functional Tests

Perform the Controls and Functional Tests. Refer to the *User Guide*.

- Compression Up/Down
- Compression Release
- C-arm Rotation
- C-arm Up/down
- Collimator Override
- Light Field Lamp
- Shifting Paddle System
- Emergency Off Switches

## D.10 Quality Control Tests

Refer to your quality control manual for quality system checks.



## Appendix E Technical References

### E.1 System Overview

#### E.1.1 Gantry Subsystem

The Gantry subsystem consists of an x-ray source, a digital x-ray image detector, mechanisms for positioning and compressing the patient, mechanisms for rotating the C-arm, and mechanisms for rotating the tube head to obtain tomosynthesis (Tomosynthesis option) projection images. The following sections describe each Gantry subsystem in more detail.

#### E.1.2 X-ray Source

The x-ray source consists of a high-voltage generator, a rotating-anode x-ray tube, and an x-ray filter mechanism. The generator supplies high voltage to the x-ray tube, and is capable of the fast rise times and quick cycle times needed for tomosynthesis imaging. Filters can be selected from three materials to optimize x-ray beam quality for breast thickness and composition, and for the type of exam being performed, conventional or tomosynthesis. The x-ray filter materials for conventional imaging are rhodium and silver. An aluminum filter is added for use in tomosynthesis. The system uses a filter wheel to house the filters.

#### E.1.3 Digital X-ray Image Detector

The digital x-ray image detector is based on technology identical to that in the Selenia digital x-ray image detector and incorporates the dielectric structure.

The x-ray image detector is responsible for capturing and digitizing x-ray images, correcting the images for known detector defects and non-uniformities, and presenting digitized images to the host Acquisition Workstation.

The interface between the detector and host Acquisition Workstation on the system was redesigned to support a higher data rate over an error-correcting fiber optic link. The host board in the Acquisition Workstation has sufficient memory to buffer a full combination image (conventional plus maximum size tomosynthesis projection set).

#### E.1.4 Positioning and Compression

The system gives the technologist the capability to position and compress the patient for all standard mammography procedures. Positioning and compression are performed identically for conventional and tomosynthesis imaging. The C-arm can be rotated to allow positioning for all standard views, and both conventional and tomosynthesis imaging can be performed at any C-arm rotation angle.

Compression paddles are available to cover all standard mammography examinations. Paddles on the system that are smaller than 24 cm x 29 cm shift center, left, and right automatically to match the selected view.



#### **E.1.5 Tube Head Rotation (Tomosynthesis Option)**

Capturing tomosynthesis projection images is achieved by rotating the tube head through a maximum specified angle about the stationary, compressed breast while the x-ray tube emits a controlled sequence of short, evenly spaced x-ray pulses. The tube head motion is actuated by a DC servo motor while the tube head angle is measured by a rotary sensor. The tube head rotation is controlled by a servo feedback loop from the sensor to achieve precise, smooth, reproducible rotary motion during the tomosynthesis sweep.

Tube head rotation is uncoupled from C-arm rotation so that tomosynthesis sweeps can be carried out at any C-arm angle.

#### **E.1.6 Acquisition Workstation Subsystem**

The Acquisition Workstation enables the technologist to enter patient demographic data automatically or manually, set up examination procedures for each patient, set up operating parameters and techniques for studies, initiate exposures, review x-ray images for quality control purposes, and transmit and store images to connected peripherals. The Acquisition Workstation performs image processing on captured images to optimize them for soft copy and hardcopy display. The Acquisition Workstation carries out the filtered back projection operation to reconstruct the tomosynthesis projections into tomosynthesis image slices.

### **E.2 Principles of Operation**

The system uses digital imaging technology to acquire and store x-ray images of the breast. The system acquires conventional mammography images in an identical fashion as the Selenia product. The system also captures tomosynthesis (Tomosynthesis option) images by rotating the tube head about the stationary breast and capturing x-ray projection images at several angles relative to the breast. Image capture during a tomosynthesis sweep is the same as during a conventional image, but the individual x-ray exposures during the tomosynthesis sweep are shorter and occur more rapidly. The projection images are mathematically reconstructed to generate three-dimensional breast images that enhance the radiologist's ability to discern pathology and structures within the breast.

#### **E.2.1 Conventional Image Acquisition**

Conventional imaging on the system is identical to imaging performed on the Selenia system.

During the x-ray exposure, the image acquisition system uses the direct conversion of x-ray energy into charge to produce a digital x-ray image. X rays of a selected energy are generated by a rotating-anode tungsten tube and are filtered by selectable x-ray filters, rhodium, and silver. The x rays penetrate the breast, pass through a carbon-fiber breast tray, and then through an anti-scatter grid.



The digital x-ray imaging detector converts the absorbed energy to charge in an x-ray photoconductive layer. The photoconductor is biased with an electric field supplied by a high-voltage power supply. The converted charge is collected with spatial resolution by a two-dimensional array of pixels. Each pixel consists of a charge-storage capacitor and a TFT (thin-film transistor) switch. The gates of the TFTs are connected together in rows, with each gate being connected to the output of a digital driver. The sources of the TFTs are connected in columns, with each column being connected to the input of a low-noise charge amplifier. Following the x-ray exposure, the gate lines are turned on sequentially and the charge from the storage capacitors are read out through the low-noise charge amplifiers.

The outputs of the low-noise amplifiers are filtered, further amplified, and digitized. Parallelism is used in the readout and digitization electronics to increase panel readout speed. The digitized signal is transmitted over a serial optical link from the detector to a PCI card installed in a host computer where the image is buffered in PCI card memory. Image data on the PCI card is transferred to host computer memory by DMA where it can be stored, viewed, or otherwise manipulated.

### E.2.2 Tomosynthesis Image Acquisition (Tomosynthesis Option)

The process used in the system for Tomosynthesis imaging is identical to that used for conventional imaging described above, except that the tube head is moved at a constant angular velocity about the stationary breast and a number of short, low-dose exposures are performed during the sweep.

The Tomosynthesis images are made by first acquiring projection images and then performing reconstruction. For each standard view, for example RCC, a series of projection images are acquired. Once the images are acquired the projections are reconstructed into a series of images spanning the entire breast thickness.

The following figures explain the acquisition geometry graphically. During acquisition the x-ray tube moves over an arc, acquiring projection images. Following the acquisition, these are reconstructed into cross-sectional slices parallel to the breast platform, labeled as 'Reconstructed planes' in the following figure.

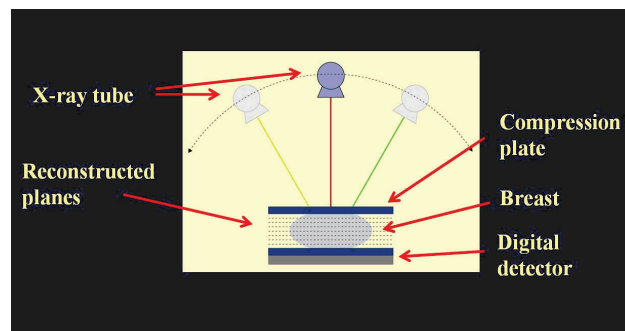


Figure 371: Tube Movement During Projection Image Acquisition



The acquisition geometry is shown again for an MLO view—see the figure [Acquisition Geometrical View](#) on page 420. During acquisition, the x-ray tube moves, acquiring projection images. Each projection image is a low dose mammogram, viewing the breast from the differing angles.

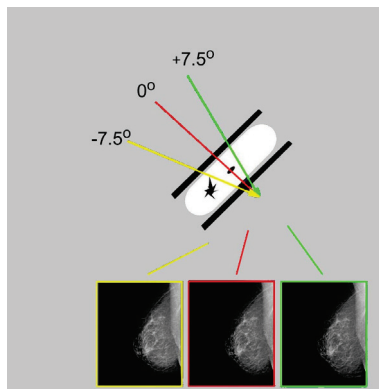


Figure 372: Acquisition Geometrical View

#### E.2.3 Image Correction

The system performs several operations on acquired images to optimize image quality. The system performs identical image-correction processes as the Selenia system.

First, a dark image frame (no x-ray exposure) is subtracted from the exposure image frame pixel by pixel. This step removes any common-mode noise from the image. Common-mode noise is noise that does not change with signal level, such as offset differences between charge amplifiers.

Next, defective pixels are corrected. Defective pixels are cataloged at the time of manufacture of the detector and are updated periodically during preventive maintenance performed by Hologic. A pixel is defective if its digital value differs by more than a specified amount from the average of its neighbors. If a pixel is in the defective pixel map, its digital value is replaced by a weighted average of its nearest neighbors at this stage of the imaging process. To ensure the quality of x-ray images, there are limits imposed on the number and density of defective pixels allowed in a detector. With the exception of the maximum number of allowable pixel clusters, the defective pixel specification for the system is the same as the specification for the Selenia system. These pixel clusters have eight or fewer defective pixels, and are smaller in area than the smallest microcalcification detectable on a mammogram.

Finally, system gain variations are corrected. Gain variations are noise sources that change in proportion to x ray signal level. The largest source of gain variation is the chip-to-chip differences in gain between charge amplifiers. A gain map is created during system calibration that represents the response of the detector to a flat field. At the time of imaging, the acquired image is effectively mathematically divided pixel-by-pixel by the values in the gain map. Creation of the gain map is a function that is carried out during production and periodically by the system user.



### E.2.4 Image Processing and Reconstruction

Once image corrections have been applied, all conventional and Tomosynthesis are processed to improve their appearance. Two forms of images processing are used, multilevel contrast enhancement (MCE) and peripheral contrast enhancement (PCE).

The MCE image processing performs the following steps on the image. The breast image area is determined using a breast boundary detection algorithm. The breast image is logarithmically converted to enhance contrast in the area of the uniformly compressed breast. A multilevel contrast enhancement method is then applied to smooth the image. An adaptive unsharp mask image processing technique is applied to enhance image contrast. Finally, the processed data set is passed through a sigmoid data conversion process and the bit depth is adjusted to meet the requirements of the display device. PCE image processing applies a small amount of dynamic range compression to the digital values in a breast image so that the skin line can be visualized simultaneously with dense breast tissue when the image is viewed on a soft copy display or film.

In the case of tomosynthesis imaging, once the projection images are captured and corrected, the Acquisition Workstation processes and reconstructs them using a filtered back projection algorithm to obtain slice images. Both the processed projection images and the reconstructed slices are retained.

The following figure shows the reconstructed image geometry. The reconstructed slices are slices at different heights in the breast, and parallel to the breast platform. The number of reconstructed slices varies with the compressed breast size; the thicker the compressed breast, the more reconstructed slices. These reconstructed slices are the images that are viewed by the radiologist.

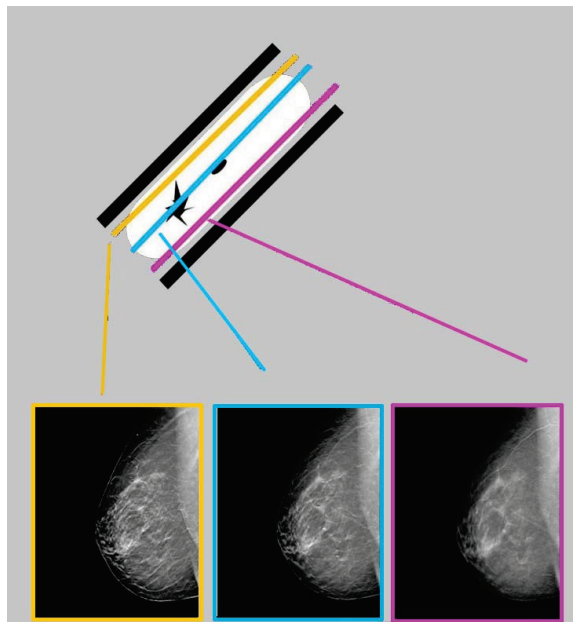


Figure 373: Reconstructed Image Geometry



### E.3 Leakage Radiation

All important x ray safety features meet 21 CFR, Chapter I, 1020.31, IEC 60601-1-3, and IEC 60601-2-45.

Typical values of x ray leakage shown are at a distance of 1 meter from the tube focal spot, at maximum kVp, and adjusted for a maximum in use duty cycle of 0.027.

Duty cycle comes from a maximum throughput of 12 patients per hour x 4 exposures, or 48 exposures per hour with a maximum exposure time of 2 seconds.

$48 \times 2 = 96$  exposure seconds per hour, or  $96 \text{ exposure seconds} / 3600 \text{ seconds per hour} = 0.027$ .

The meter measures x ray leakage in units of mR/Hour.

The meter reading is multiplied by the duty cycle to get the correct leakage value ( $N \times 0.027$ ) and this is compared with the maximum allowed criteria 90 mR/Hour.

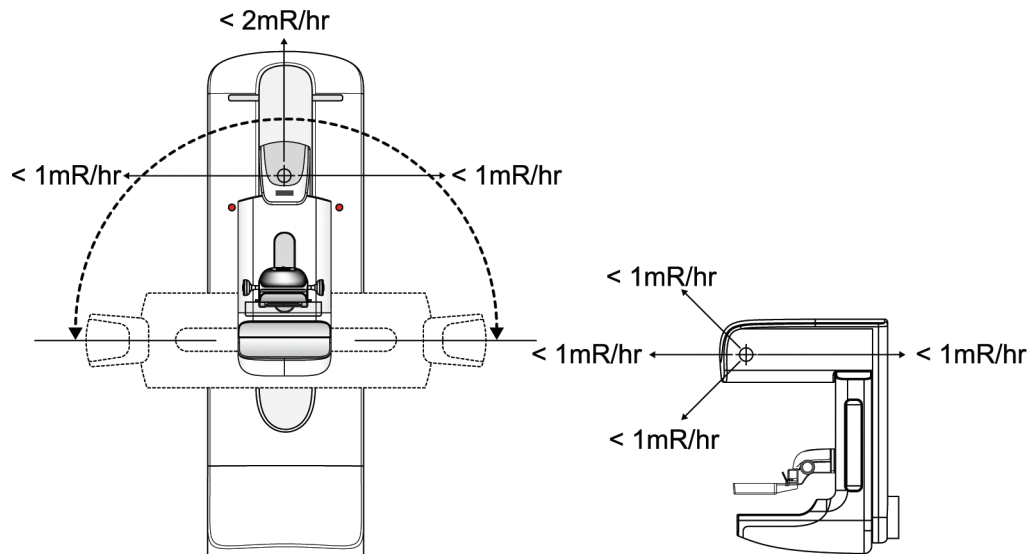


Figure 374: Leakage Radiation



## E.4 Electromagnetic Compatibility

This section provides information about the electromagnetic compatibility of the system per IEC 60601-1-2.

Table 23: Electronic Emissions

Electromagnetic Emissions		
The system is intended for use in the electromagnetic environment specified below. The customer or the user of the system should assure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	Meets Class A Compliance.  The system is suitable for use in all establishments other than domestic, and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	



Table 24: Electromagnetic Immunity Part 1

<b>Electromagnetic Immunity – Part 1</b>			
The system is intended for use in the electromagnetic environment specified below. The customer or the user of the system should assure that it is used in such an environment.			
<b>Immunity Test</b>	<b>IEC 60601 Test Level</b>	<b>Compliance Level</b>	<b>Electromagnetic Environment - Guidance</b>
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV Contact ±8 kV Air	±6 kV Contact ±8 kV Air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/ burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s) ±2 kV line(s) to earth	±1 kV line(s) to line(s) ±2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% Ut (>95 % dip in Ut) for 0,5 cycle  40% Ut (60 % dip in Ut) for 5 cycles  70% Ut (30 % dip in Ut) for 25 cycles  <5% Ut (>95 % dip in Ut) for 5 s	<5% Ut (>95 % dip in Ut) for 0,5 cycle  40% Ut (60 % dip in Ut) for 5 cycles  70% Ut (30 % dip in Ut) for 25 cycles  <5% Ut (>95 % dip in Ut) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the system requires continued operation during power mains interruptions, it is recommended that the system be powered from an uninterruptible power supply or battery.
Power Frequency (50/60Hz) Magnetic Field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE Ut is the a.c. mains voltage prior to application of the test level.			



Table 25: Electromagnetic Immunity Part 2


The system is intended for use in the electromagnetic environment specified below. The customer or the user of the system should assure that it is used in such an environment.			
Immunity Test	EN/IEC 60601 Test Level	Compliance Level	Electromagnetic Environment - Guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80MHz	[V1] = 3 V	<p>Portable and mobile RF communications equipment should be used no closer to any part of the system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance:</b></p> $d = \left[ \frac{3,5}{V_1} \right] \sqrt{P}$ $d = \left[ \frac{3,5}{E_1} \right] \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = \left[ \frac{7}{E_1} \right] \sqrt{P} \quad 800 \text{ MHz to } 2,5 \text{ GHz}$ <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) and <math>d</math> is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey<sup>a</sup>, should be less than the compliance level in each frequency range<sup>b</sup>.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	[E1] = 3 V/m	
<p>NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p><sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the system is used exceeds the applicable RF compliance level above, the system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the system.</p> <p><sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			



Table 26: Separation Distances for RF Equipment

Recommended Separation Distances for Portable and Mobile RF Communications Equipment and the system			
The system is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the system as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = [\frac{3,5}{V_1}] \sqrt{P}$	80 MHz to 800 MHz $d = [\frac{3,5}{E_1}] \sqrt{P}$	800 MHz to 2.5 GHz $d = [\frac{7}{E_1}] \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.7	3.7	7.38
100	11.7	11.7	23.3
For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			



## E.5 List of Test Points

Use the following test point tables as an aid in troubleshooting the system.

*Table 27: Gantry Control Board Test Points*

Test Point	Voltage/Signal
TP2	+32Vdc
TP3	GND
TP5	+3.3Vdc
TP6	+5Vdc
TP4	Temp.

*Table 28: X-ray Tube Arm (Tubehead) Control Board Test Points*

Test Point	Voltage/Signal
TP15	+32Vdc
TP16	GND
TP21	+3.3Vdc
TP17	+5Vdc
TP34	+1.8Vdc

*Table 29: C-Arm Control Board Test Points*

Test Point	Voltage/Signal
TP10	+32Vdc
TP14	GND
TP9	+5Vdc
TP12	+12Vdc



*Table 30: Compression Device Interface  
Board Test Points*

Test Point	Voltage/Signal
TP3	+32Vdc
TP4	GND
TP6	+5Vdc
TP7	+15Vdc
TP1	Comp. Force
TP2	Comp. Thick.

*Table 31: Grid Interface Board Test  
Points*

Test Point	Voltage/Signal
TP26	+32V
TP30	GND
TP27	+3.3Vdc
TP25	+5Vdc
TP31	+15Vdc

*Table 32: VTA Control Board Test Points*

Test Point	Voltage/Signal
TP4	GND
TP1	+5Vdc
TP8	+5Vdc
TP7	+12Vdc
TP6	+15Vdc
TP29	+24Vdc
TP12	+2.5V ref
TP10	C-Arm Height
TP11	C-Arm Angle
TP13	Tomo Angle (Tomosynthesis option)



Table 33: Power Distribution Board Test Points

Test Point	Voltage/Signal	Test Point	Voltage/Signal
TP29	+5Vdc	TP1	+2.5Vdc ref
TP17	+15Vdc	TP2	+90Vdc
TP22	On Latch	TP3	+90V ref
TP23	On Hold	TP4	+32Vdc
TP24	On	TP5	+32Vdc
TP18	Comp. Up	TP6	20Vac_A
TP19	Comp.Dn	TP7	20Vac_B
TP20	Arm Up	TP25	120Vac_A
TP21	Arm Dn	TP26	120Vac_B

## E.6 LED Indicators

Use the following LED Indicator tables as an aid for troubleshooting the system. Covers must be removed to view LED Indicators.

Table 34: Gantry Control Board LEDs

LED	LED "ON" Indication
D26	+3.3Vdc
D3	+5Vdc

Table 35: Tubehead Control Board LEDs

LED	LED "ON" Indication
D30	+1.8Vdc
D24	+3.3Vdc
D23	+5Vdc
D27	+15Vdc
D33	+24Vdc
D11	+32Vdc



*Table 36: Compression Device Interface**Board LEDs*

LED	LED "ON" Indication
D13	+5Vdc
D16	+15Vdc
D14	+32Vdc

*Table 37: C-Arm Control Board LEDs*

LED	LED "ON" Indication
D13	+5Vdc
D16	+12Vdc
D4	+5Vdc
D12	+5Vdc
D11	+12Vdc

*Table 38: VTA Control Board LEDs*

LED	LED "ON" Indication
D4	+5Vdc
D12	+5Vdc
D11	+12Vdc
D10	+15Vdc
D5	+32Vdc
D24	C-Arm Lock
D28	Tomo Lock (Tomosynthesis option)

*Table 39: Power Distribution Board LEDs*

LED	LED "ON" Indication
D32	+5Vdc
D30	+15Vdc
D31	+24Vdc
D6	Trip Coil Fail



## E.7 List of Fuses

These fuses are located on the Gantry, in the individual boards in the Gantry, and in the Acquisition Workstation.

Table 40: Fuses

Description	Fuse	Rating	Circuit	Part No.
<b>Gantry Fuse Panel</b>				
Rear Fuse Panel	F14	FB 30A 600V	600 VDC Rail	1-070-1119
	F10, F11	SB 3A 250V	Sec 120 VAC	1-070-1076
	F8, F9	SB 12A 250V	Sec 65 VAC	1-070-1327
	F6, F7	SB 10A 250V	Sec 24 VAC	1-070-1275
	F4, F5	SB 10A 250V	Sec 24 VAC	1-070-1275
	F12, F13	SB 1.5A 250V 3AG	Line (PRI)	1-070-1263
	F15	40A 600V	Sec 380 VAC	CKB-00027
	F16	40A 600V	Sec 380 VAC	CKB-00027
<b>Gantry Board Fuses</b>				
PCB-00061	F2	1.5A SB 2AG	X-ray Tube Arm (Tubehead) Microprocessor Board	1-070-1245
PCB-00070	F2	10A SB 250V 3AG	Power Distribution Board	1-070-1275
	F3	10A SB 250V 3AG		1-070-1275
	F4	0.125A 250V 2AG		1-070-1220
PCB-00123	F1	3A SB 2AG	Acquisition Workstation Interface Board	1-070-1248
	F2	2A SB 2AG		1-070-1246
	F5	3A SB 2AG		1-070-1248
	F6	3A SB 2AG		1-070-1248
PCB-00150	F1	1.5A SB 2AG	Grid Interface Board	1-070-1245
PCB-00154	F1	4A SB 2AG	VTA Control Board	1-070-1250
PCB-00197	F1	3A SB 2AG	C-Arm Transition Board	1-070-1248
	F3	3A SB 2AG		1-070-1248



Table 40: Fuses

Description	Fuse	Rating	Circuit	Part No.
PCB-00110	F1	FB 25A 600V	HV Inverter Drawer	1-070-1118
	F2	FB 8A 600V	HV Inverter Drawer - Rotor	1-070-1112
PCB-00158	F1	0.1A 600V Fast Acting Cartridge	Fast Bleed - Capacitor and Bridge Assembly	CKB-00025
<b>Acquisition Workstation Fuses</b>				
	F1	8A 250V Fast Blo 3AG 1/4X1-1/4	AWS Power Distribution	CKB-00031
	F2	8A 250V Fast Blo 3AG 1/4X1-1/4		

## E.8 Jumper Configuration

Table 41: Jumper Configuration

PCB Assembly	Jumpers Installed	Jumpers not Installed
PCB-00044	J2 (1 and 2), J6	JP1, JP2, JP3, JP4
PCB-00061	JP2	JP1, JP3, JP4
PCB-00064	JP1	
PCB-00070	J3, J4	J1, J5
PCB-00095	J1, J2	
PCB-00123	JP2	JP1, JP3
PCB-00150	JP3	JP1, JP2
PCB-00154	J2	J1, J3
PCB-00197		JP1, JP2



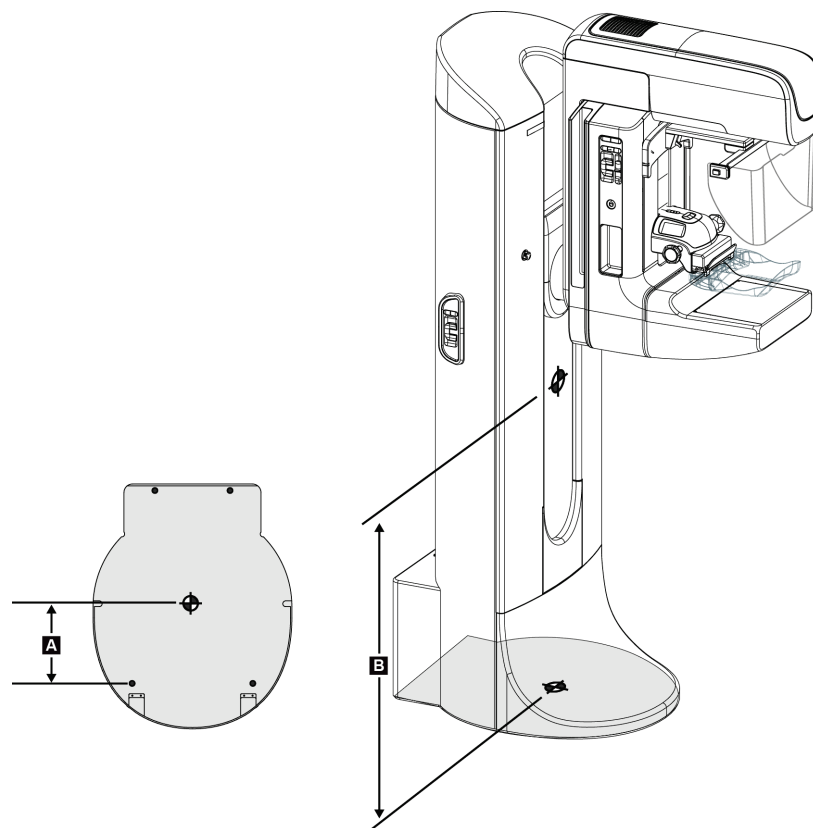
## E.9 LED Status

Table 42: LED Status

PCB Assembly	Run LED		Fault LED	
	CPU	CPLD	CPU	CPLD
PCB-00044	D1	n/a	n/a	n/a
PCB-00061	D2	n/a	D1	D29
PCB-00064	D2	n/a	D1	n/a
PCB-00070	D2	n/a	D1	n/a
PCB-00095	D2	n/a	D1	n/a
PCB-00123	D2	n/a	D1	n/a
PCB-00150	D21	D10	D20	D3
PCB-00154	D14	n/a	D13	n/a



## E.10 Center of Gravity Reference



*Figure 375: Gantry Center-of-Gravity Reference*

- A. 31.8 cm (12.5 inches)
- B. 95.5 cm (37.6 inches)



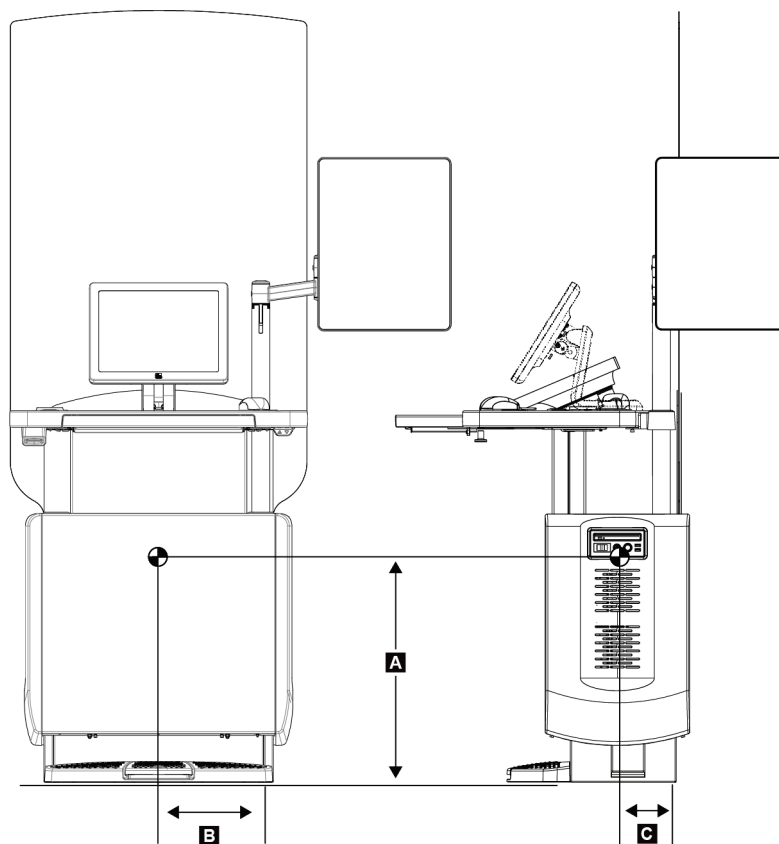
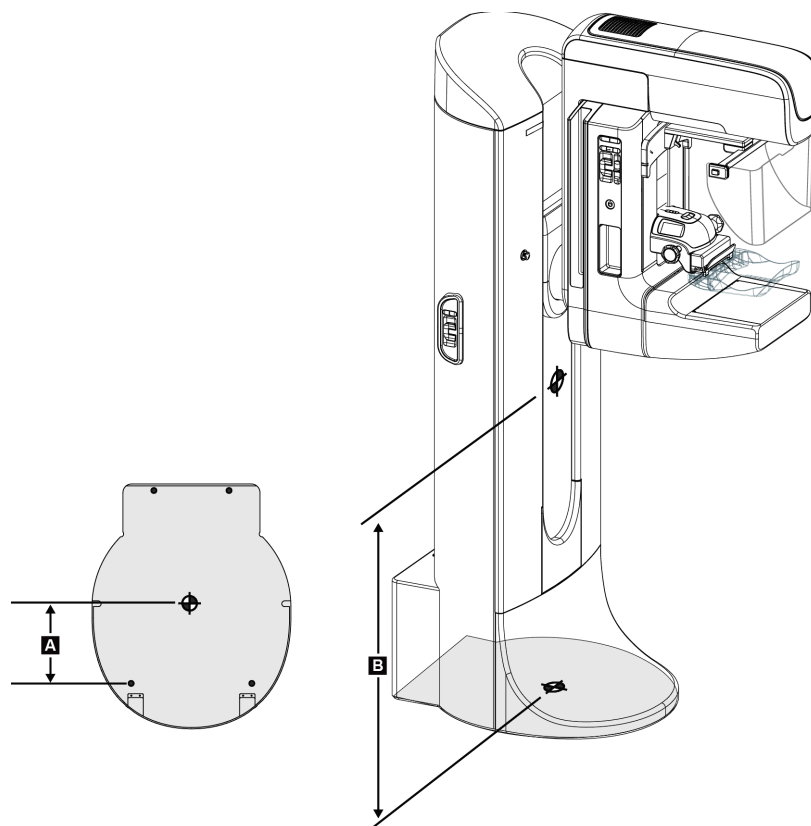


Figure 376: Universal Acquisition Workstation Center-of-Gravity Reference

- A. 61.7 cm (24.3 inches)
- B. 29.0 cm (11.4 inches)
- C. 14.2 cm (5.6 inches)



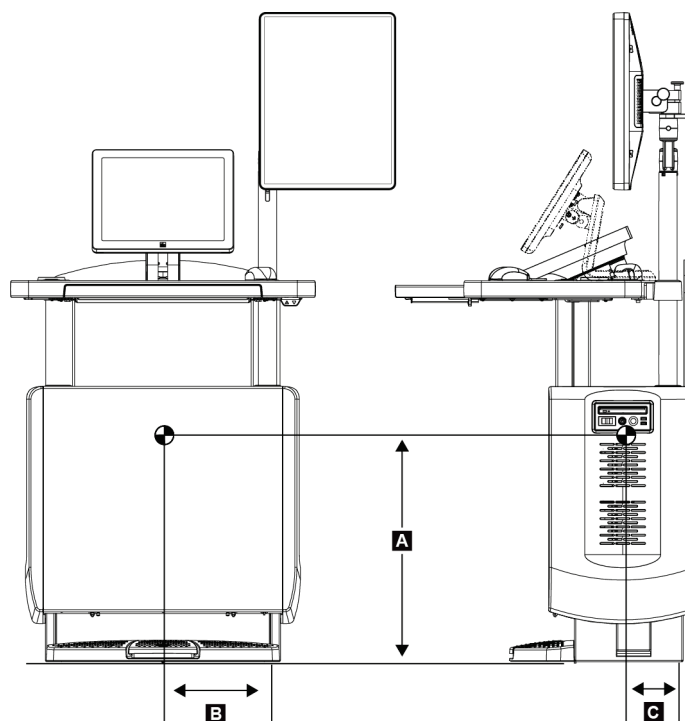
## E.11 Center of Gravity Reference - Mobile



*Figure 377: Gantry Center-of-Gravity Reference*

- A. 31.8 cm (12.5 inches)
- B. 95.5 cm (37.6 inches)





*Figure 378: Mobile Universal Acquisition Workstation Center-of-Gravity Reference*

- A. 61.7 cm (24.3 inches)
- B. 29.0 cm (11.4 inches)
- C. 14.2 cm (5.6 inches)







## Appendix F Checklists and Forms

Make copies of these checklists and forms for your use during installation and maintenance.

### **F.1 Installation and Preventive Maintenance Checklist**

The following checklist forms represent the individual pages taken from the Dimensions System Maintenance Report PDF form (CSD-0042-F15).


To access the latest electronic version of this PDF form:

1. From the Hologic intranet (myhologic.com), go to **More Links > BigTinCan - Hub**.
2. Navigate to **Content > Dimensions (Service) > Reference Material**.
3. Locate and open **CSD-0042-F15 PM Form**.



## 3Dimensions System Service Manual

### Appendix F: Checklists and Forms

<b>3Dimensions™ Selenia® Dimensions® Maintenance Report</b>			
<input type="checkbox"/> Installation Report		<input type="checkbox"/> Preventative Maintenance Report	
Customer Name <input type="text"/>		Room Identification <input type="text"/>	
Date of Service <small>MM/DD/YYYY</small> <input type="text"/>	System SN <input type="text"/>	System Software Version <input type="text"/>	Detector SN <input type="text"/>
Contact Name <input type="text"/>		Street Address <input type="text"/>	
Email <input type="text"/>	<input type="text"/>		
City <input type="text"/>	State <input type="text"/>	Zip Code <input type="text"/>	
Engineer/Title <input type="text"/>		Case # <input type="text"/>	
<b>System Check</b>		<b>Functional Check</b>	
<input type="checkbox"/> System Cleaning	<input type="checkbox"/> CalTool Verification	<input type="checkbox"/> Half Value Layer	
<input type="checkbox"/> System Lubrication	<input type="checkbox"/> Line Voltage	<input type="checkbox"/> AEC Performance	
<input type="checkbox"/> System Integrity	<input type="checkbox"/> X-ray Tube Voltage	<input type="checkbox"/> QAS	
	<input type="checkbox"/> Generator mA	<input type="checkbox"/> Target Dose	
	<input type="checkbox"/> Filaments	<input type="checkbox"/> Image Quality	
	<input type="checkbox"/> X-ray Tube Current		
<b>Installation</b>	<b>Preventative Maintenance</b>	<b>Preventative Maintenance Period</b>	
<input type="checkbox"/> Complete	<input type="checkbox"/> Complete	<input type="checkbox"/> Semiannual	
		<input type="checkbox"/> Annual	



**Test Equipment**

Digital Multimeter

Model #  Serial #  Cal. Date   
MM/DD/YYYY

Oscilloscope

Model #  Serial #  Cal. Date   
MM/DD/YYYY

Compression Gauge

Model #  Serial #  Cal. Date   
MM/DD/YYYY

Radiation Measurement

Model #  Serial #  Cal. Date   
MM/DD/YYYY

High Voltage Tank / Probe

Model #  Serial #  Cal. Date   
MM/DD/YYYY

**Installed Licenses**☐ Advanced Connectivity (Ref only)☐ Biopsy☐ I-View CE2D☐ SmartCurve (Ref only)☐ C-View 1 (Ref only)☐ C-View Natural Look (Ref only)☐ Intelligent 2D (Ref only)☐ Intelligent 2D Map☐ Diagnostic☐ 3Dimensions (Ref only)☐ Clarity HD☐ Lateral Arm☐ Master (Ref only)☐ Notices (Ref only)☐ 30 Projections (Ref only)☐ System (Ref only)☐ Tomo☐ Tomo Biopsy**Other Features**☐ Mobile Unit☐ 2D Custom Dose☐ 3D Custom Dose



#### Hardware Installation

##### Gantry

- |  |  |
|--|--|
| <input type="checkbox"/> Fasten the Gantry in Position                               | <input type="checkbox"/> Install Gantry Footswitch             |
| <input type="checkbox"/> Remove the Grid Assembly Shipping Bracket                   | <input type="checkbox"/> Verify Read Out Sequence for Detector |
| <input type="checkbox"/> Configure Transformer Tap                                   | <input type="checkbox"/> Install Gantry Compliance Label       |
| <input type="checkbox"/> Install the Detector  |  |
| <input type="checkbox"/> Install Remote X-ray On/Power On Lamp Connection (Optional) |  |

##### Acquisition Workstation

- ☐ Fasten the Acquisition Workstation in Position Install
- ☐ Control Monitor (UAWS only)
- ☐ Install X-ray Footswitch (UAWS only)
- ☐ Install the Image Display Monitor
- ☐ Install the Radiation Shield
- ☐ Install the Acquisition Workstation Network Cable

##### Mobile Gantry

- ☐ Install Gantry Brake Kit
- ☐ Set Vertical Height Limit
- ☐ Mobile Mounting Requirements Reviewed with the Customer

##### Mobile Acquisition Workstation

- ☐ Install Mobile Mounting Arm for Image Display
- ☐ Review Radiation Shield Requirements

- ☐ Hardware Installation Complete



### Line Voltage Verification

Gantry Tap Configuration

Record Gantry Idle Line Voltage

Record Gantry Input Line Voltage with 28kV ~3 Second Exposure

Results

☐

Voltage Verification Pass

The Measured Voltages are Within +/- 10% of Tap Configuration

☐

Verify AWS Tapped Correctly

Pick one of these.

240VAC

230VAC

220VAC

208VAC

200VAC

120VAC - Demo Use Only



#### System Check

##### System Cleaning

- ☐ Clean AWS Glass
- ☐ Vacuum AWS Interior
- ☐ Vacuum Computer Fans
- ☐ Vacuum AWS Intake Vents
- ☐ Vacuum Gantry Generator Exhaust Vents
- ☐ Replace Detector Filters (ASY-07829)
- ☐ Clean Image and Control Monitors
- ☐ Clean Trackball

##### System Lubrication

- ☐ Inspect and Lubricate VTA Assembly (PN 2-580-0207)
- ☐ Clean and Lubricate Collimator Assembly (PN 2-580-0216)
- ☐ Clean and Reapply X-ray Tube Grease (Dow Corning Silicone 540-0108)
- ☐ C-arm Tomo Gear Rotational Assembly (Lubricate Rotational Gear only PN 2-580-0207)

#### Customer Concerns

- ☐ Customer Concerns Were Resolved



**System Integrity**

- ☐ Inspect Wiring for Safety and Integrity
- ☐ Inspect AWS X-Ray Shield for Damage and Integrity
- ☐ Inspect High Voltage Cable Connections at the Resistor Pack (2) and Multiplier Drawer
- ☐ Check Function of Safety Interlocks, Switches and Limit Switches
- ☐ Verify VTA Bolts are Tight and Have Not Come Loose Over Time
- ☐ Verify Gantry and AWS Mounting Bolts are Installed Properly
- ☐ Verify Grid Configuration (Dip Switch Settings Match Grid Rev and Detector)
- ☐ Verify Console Up/Down and Smooth Operation (If Equipped)
- ☐ Verify UPS Performance Status/Batteries
- ☐ Inspect All Paddles for Cracking
- ☐ Verify C-arm and Tomo Arm Functionality
- ☐ Inspect Vertical Height Configuration (Mobile and Low Ceiling)
- ☐ Verify C-arm Function, Up, Down, Clockwise, Counter-clockwise Rotation
- ☐ Verify C-arm Zero Angle
- ☐ Verify Tomo Zero
- ☐ Verify C-arm Rotational Brake (Biopsy)
- ☐ Verify Accessory Installation and Operation (Face Shield, Crosshairs, Paddles, Mag Stand)
- ☐ Verify Compression Function, Up, Down, Release
- ☐ Verify Collimator Lamp Operation and Override (If Equipped)
- ☐ Verify Compression Force Accuracy
- ☐ Verify Compression Thickness Accuracy
- ☐ Verify Paddle Offset Height Offset Calibration on All Paddles
- ☐ Verify Paddle Shifting
- ☐ Verify FAST Paddle Springs are Not Soft
- ☐ Verify FAST Paddle Compression Thickness

**CalTool Verification**

- ☐ X-Ray LFS Field Alignment
- ☐ X-Ray SFS Field Alignment
- ☐ Light Field Alignment



#### X-ray Tube Voltage

Measured Voltage	Min - Max
20kV <input type="text"/>	19.20 - 20.80
25kV <input type="text"/>	24.00 - 26.00
30kV <input type="text"/>	28.80 - 31.20
35kV <input type="text"/>	33.60 - 36.40
39kV <input type="text"/>	37.44 - 40.56

All Values Must Be Within 4% of the Requested Configuration Value.

☐ X-ray Tube Voltage Verification Pass

#### Generator mA and Exposure Count

Generator mA Value

Must Be 100mA +/-0.5mA

☐ Generator mA Pass

Generator Exposure Count

#### Filament Calibration

☐ Large Focal Spot Filament Calibration Complete

☐ Small Focal Spot Filament Calibration Complete



**X-ray Tube Current**

Large Focal Spot LFS

Enter mAs - Range 8 - 12

**10mAs**

25kV

30kV

35kV

**100mAs**

Enter mAs - Range 96-104

25kV

30kV

35kV

39kV

42kV

**200mAs**

Enter mAs - Range 196-204

30kV

35kV

39kV

42kV

☐

LFS X-ray Tube Current Verification Pass

Small Focal Spot SFS

Enter mAs - Range 8 - 12

**10mAs**

20kV

25kV

30kV

35kV

39kV

**40mAs**

Enter mAs - Range 38.4 - 41.6

25kV

30kV

35kV

39kV

☐

SFS X-ray Tube Current Verification Pass



### HVL Verification

Use CalTool HVL Spot Check Task

#### Rh(28kV)

Measured mR

Measured HVL

Tube Output

HVL in File

TO in File

#### Al(29kV)

Measured mR

Measured HVL

Tube Output

HVL in File

TO in File

#### Ag(28kV)

Measured mR

Measured HVL

Tube Output

HVL in File

TO in File

#### Cu(42kV)

Measured mR

Measured HVL

Tube Output

HVL in File

TO in File

Measured Value Must Be Within 5% of File Value to Pass.

☐ HVL Verification Pass



**Image Quality Verification**
☐ Gain Calibration Completed
**Traditional ACR Phantom**

	Fibers	Specks	Masses	Pass
2D Requirements	5 Fibers	4 Groups	4 Masses	3.5 Masses are acceptable per 1999 ACR QC
Measured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3D Requirements	4 Fibers	3 Groups	3 Masses	
Measured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**ACR 2016 Phantom**

	Fibers	Specks	Masses	Pass
2D Requirements	≥2.0	≥3.0	≥2.0	
Measured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Rh Filter LFS No Artifacts

☐ Ag Filter SFS No Artifacts

☐ Rh Filter SFS No Artifacts

☐ Al Filter (3D) No Artifacts

☐ Ag Filter LFS No Artifacts

☐ Cu Filter (CEDM) No Artifacts

☐ Image Quality Verification Pass

☐ SNR as Measured

☐ CNR as Measured

☐ Customer Baseline CNR

☐ Baseline CNR Deviation



### Target Dose Verification mGy

Imaging Mode	Target	Measured	kV	mAs	EI	
Conv 2D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Tomo	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Combo 2D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Combo 3D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Tomo HD	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Combo HD 2D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Combo HD 3D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
CEDM	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
CEDM Combo 2D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
CEDM Combo 3D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Custom Note
Custom 2D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Custom 3D	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Phantom Used for Dose Verification

☐ ACR

☐ PMMA

☐ Dose Verification Pass +/- 0.1 mGy



### AEC Performance Use CalTool AEC (or EUREF) Scaling Verification Task

Thick	Filter	kV	mAs	Dose	mAs Mult	El Result	Low	High	Result
2cm	Rh	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4cm	Rh	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6cm	Rh	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8cm	Ag	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4cm Mag	Rh	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2cm	Al	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4cm	Al	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6cm	Al	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8cm	Al	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

☐ AEC Performance Pass

### Affirm Upright Performance

#### QAS Verification

Stereo Target	Tomo Target	Lateral Arm Left	Lateral Arm Right
X 30 <input type="text"/>	X 30 <input type="text"/>	X-30 <input type="text"/>	X 30 <input type="text"/>
Y 40 <input type="text"/>	Y 40 <input type="text"/>	Y 40 <input type="text"/>	Y 40 <input type="text"/>
Z 50 <input type="text"/>	Z 50 <input type="text"/>	Z 77 <input type="text"/>	Z 77 <input type="text"/>

☐ QAS Verification Pass

All Measured Values are +/-1.0mm of Target



#### Computer Settings (Installation Only)

- ☐ Configure Windows Time Zone and Date
- ☐ Configure Network Settings
- ☐ Configure Computer Host Name
- ☐ Configure/Verify/Email Hologic Connect Settings (Optional)
  
- ☐ Computer Setting Complete

#### Application Settings (Installation Only)

- ☐ Enable AWM (optional)
- ☐ Configure Institution, Address, Station Name and Locale
- ☐ Configure Serial Number in System Settings
- ☐ Verify Reclaimer System Settings (Factory Default No Storage Commit)
- ☐ Verify Reclaimer User Settings (Factory Default No Storage Commit)
- ☐ Verify / Install Licenses
- ☐ Configure Generated 2D settings (Optional)
  - ☐ Synthesized2D for CAD (Optional)
  - ☐ Auto Mapping (Intelligent2D only)
- ☐ Set System AE Title in Connectivity (Global)
- ☐ Verify Reorient Tomo, Generated 2D and Projection Pixel Data Settings
- ☐ Verify the Use Extended DICOM Image Type Parameter in Connectivity (Global) is Enabled  
for SecurView 10.x and Disabled for SecurView < 10.x
- ☐ Configure Procedure RIS Codes (When Available)
  
- ☐ Application Settings Complete



**Interface Configuration (Installation Only)**

- ☐ Install Modality Worklist Interface(s) (as Needed)
- ☐ Install Archive/Router Devices
- ☐ Install Workstation Devices (as Needed)
- ☐ Install CAD Devices (as Needed)
- ☐ Install Printer Devices (as Needed)
- ☐ Install Query/Retrieve Interfaces (as Needed)
- ☐ Set/Verify Retrieve Address for Query/Retrieve Devices (as Needed)
- ☐ Configure Installed Devices' Info, IP Address, AE Title and Port Data
- ☐ Verify/Install Optional Image Types for Store Devices
- ☐ Verify/Modify Transfer Syntaxes for Store Devices
- ☐ Verify/Install Marker Burn-in Settings for Store Devices
- ☐ Verify/Configure Film Sizes for Printer Devices (as Needed)
- ☐ Configure Output Groups
- ☐ Install/Configure Optional Features As Needed (i.e. Dose Reporting, BPO, MPPS)
- ☐ Restart System
  
- ☐ Interface Configuration Complete



#### Interface Tests (Installation Only)

- ☐ Verify MWL Query Results
- ☐ Verify MWL RIS Code Mapping Is Set Correctly
- ☐ Verify Images Are Stored On PACS (Verify Selected DICOM Support Types Are Being Stored/Selected as Applicable)
- ☐ Verify Images Can Be Viewed and Oriented Correctly on PACS
- ☐ Verify Images Can Be Retrieved from PACS (Verify All Selected Support Types Can Be Retrieved/Viewed)
- ☐ Verify Images Can Be Sent to Workstations (Optional)
- ☐ Verify Images Are Sent to CAD and Displayed on SecurView (Optional)
- ☐ Verify Generated 2D RAW Is Sent to CAD (Optional)
- ☐ Verify Images Are Sent to DICOM Printer (Optional)
- ☐ Verify Correct TOMO Format Is Sent to PACS and Workstation (3D System)
- ☐ Verify Images Annotated on SecurView Arrive at Dimensions (Optional)
- ☐ Verify Export Settings for Removable Media
- ☐ Verify Paper Printer If Needed for QC Report, Rejected Images, Etc. (Optional)
- ☐ Verify Notices Are Operational (Optional)
- ☐ Reorient Pixel Data (Check That It Is Selected Active)
- ☐ Verify Barcode Reader Operation (If Equipped)
  
- ☐ Interface Tests Complete



**Final Tasks**

- ☐ Verify 2D Image Processing, SHARP Is Default
- ☐ Equipment Placement/Fastening
- ☐ Connection of Modules/Cable Management
- ☐ Ship Back Detector Packaging and Dolly (Installation)
- ☐ Clean System Exterior
- ☐ Check and Store All Accessories
- ☐ Discuss Installation of Paddle Racks with Customer (Installation)
- ☐ Perform System Backup Including Node Calibrations
- ☐ Complete Installation Report (Installation)
- ☐ Complete FDA 2579 Form (Installation)
- ☐ Final Tasks Complete

Attach This PDF file to the Hologic Installation Form via the Attachment Box  
at the Bottom of the Web Page.

**Comments**



### F.2 Compliance Forms

#### F.2.1 Tube Current/Exposure Time Product Forms

##### LARGE FOCAL SPOT

Tube Current Exposure Time Product Expected Results – Large Focal Spot					
mA Setting	mAs Setting	kVp Setting	mAs Reading	Minimum Permitted mAs	Maximum Permitted mAs
50	10	25		8	12
100	100	35		96	104
160	200	42		196	204

##### SMALL FOCAL SPOT

Tube Current Exposure Time Product Expected Results – Small Focal Spot					
mA Setting	mAs Setting	kVp Setting	mAs Reading	Minimum Permitted mAs	Maximum Permitted mAs
20	10	22		8.0	12.0
40	40	39		38.4	41.6

#### F.2.2 Peak Tube Potential Form

##### LARGE FOCAL-SPOT:

kVp	mA Setting	mAs Setting	Tube Voltage (kV)	Minimum Permitted kV	Maximum Permitted kV
20	100	100		19.20	20.80
25	130	120		24.00	26.00
30	170	200		28.80	31.20
35	200	200		33.60	36.40
39	170	200		37.44	40.56



### F.2.3 X-ray Field Size Determination Forms

Collimation / FS / Shift	Measurement Location	Specification (cm)	Actual (cm)
24x29/Large/Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
18x24/Large/Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
15x15 / Large / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
10x10 / Large / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
7x8.5 / Large / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
18x24 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
15x15 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	



Collimation / FS / Shift	Measurement Location	Specification (cm)	Actual (cm)
10x10 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	
7x8.5 / Small / Center	Back Edge	Visually Inspect	
	Left Edge	Visually Inspect	
	Right Edge	Visually Inspect	
	Front Edge	Visually Inspect	

### F.2.4 Alignment of Visually Defined X-ray Fields Form

Collimation / Focal Spot	18 x 29cm / LARGE	18 x 24cm / LARGE	24 x 29cm / LARGE	Max. Dev.
Front Edge (chest wall)				The sum of the Front plus the Rear edge disregarding the sign must be less than or equal to 10mm.
Rear Edge				
Sum of Front plus Rear disregarding the sign				
Left Edge				The sum of the Left plus the Right edge disregarding the sign must be less than or equal to 10mm.
Right Edge				
Sum of Left plus Right				

### F.2.5 Beam Quality Half Value Layer Form

Beam Quality Half Value Layer – Expected Results				
Target / Filter Combination	W / Rh	W / Ag	W / Rh	W / Ag
Filter Position	1	3	1	3
Nominal kVP Setting	30	30	35	39
mA setting	100	100	100	100
Time or mAs setting	80	80	80	80
Added Thickness of Aluminum	Exposure Measurements (mR)			
0.0mm				
0.4mm				
0.7mm				
	Expected			
	0.4 < HVL < 0.7	0.4 < HVL < 0.7	0.5 < HVL < 0.8	0.58 < HVL < 0.88
Calculated HVL				



### F.2.6 Linearity Form

Large Focal Spot Linearity Expected Test Results						
mAs Setting	mAs	Meter Reading mR	Quotient mR / mAs	Difference [ABS] (Previous Quotient - This Quotient)	Sum (Previous Quotient + This Quotient)	Difference / Sum
10						
12						
16						
20						
32.5						
50						
100						
200						
320						
400						

Small Focal Spot Linearity Expected Test Results						
mAs Setting	mAs	Meter Reading mR	Quotient mR / mAs	Difference [ABS] (Previous Quotient - This Quotient)	Sum (Previous Quotient + This Quotient)	Difference / Sum
10						
12						
16						
20						
32.5						
45						
50						
80						
100						



### F.2.7 Reproducibility Form

	Meter Reading mR	$\frac{(mR - \text{Mean } mR)^2}{9}$	Test Results:
1			<b>Standard Deviation</b> ((Sum of Quotients))
2			
3			
4			
5			
6			<b>Coefficient of Variation</b> (Std.Dev./Mean mR)
7			
8			
9			
10			
	Sum (mR readings)	Mean mR (Sum/10)	Sum of Quotients



# Glossary of Terms

## AE

Application Entity

## BTO

Hologic's abbreviation for the DICOM Breast Tomosynthesis Image SOP Class, for interoperable exchange of tomosynthesis reconstructed slices

## CAD

Computer Assisted Detection and Diagnosis

## CC

Cranio-caudal (mammography view)

## Conventional Mammography

Single projection x-ray images of views for screening and diagnostic purposes

## ESD

(Electrostatic Discharge) - the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown. When working with sensitive electrical components, precautions should be made to avoid ESD.

## FDA

Food and Drug Administration (in the United States)

## Gantry

A part of the Selenia Dimensions and 3Dimensions systems that has the Detector, Generator and X-ray Source, Positioning/Compression, Power Distribution, and Accessories Subsystems

## Grid

An element within the Digital Image Receptor that reduces scatter radiation during the exposure

## Image Receptor

Assembly of the x-ray detector, x-ray scatter reduction grid, and carbon fiber cover

## IP

(Internet Protocol) - connectivity guidelines and regulations that govern computer networks

## JSS

(Job Scheduler Services) - settings in System (Service) Tools that affect how jobs are printed, stored, and retrieved

## MLO

Medio Lateral Oblique (mammography view)

## MPPS

Modality Performed Procedure Step

## MWL

Modality Worklist

## Node

A start or stop for a CAN message (more than one node can exist within a subsystem)

## Notice

Annotations and comments per image communicated between Diagnostic Review Workstations, Technologist Workstations, and Acquisition Workstations

## NPT

Non-Patient Test (Service Mode only)

## PCI

Peripheral Component Interconnect

## QR

Query/Retrieve

## SCO

Hologic's abbreviation for the proprietary use of the DICOM Secondary Capture Image SOP Class to store tomosynthesis projection images and reconstructed slices



#### **UDI**

(Unique Device Identifier) - identification (usually a number) that distinguishes a part of the machine from the rest of the system for tracking purposes as mandated by the FDA in 2016

#### **USB**

Universal Serial Bus



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