

Manufacturer Disclosure Statement for Medical Device Security -- MDS2

Hologic, Inc. Advanced Workflow Manager (AWM) 1.11 RD-04058 Rev 001 18-Dec-2020

| Question ID | Question | See note | IEC TR 80001-2-2:2012 | NIST SP 800-53 Rev. 4 | ISO 27002:2013 |
|-------------|---|--|-----------------------|-----------------------|----------------|
| DOC-1 | Manufacturer Name | Hologic, Inc. | — | | |
| DOC-2 | Device Description | Advanced Workflow Manager Advanced Workflow Manager | — | | |
| DOC-3 | Device Model | (AWM) 1.11 | — | | |
| DOC-4 | Document ID | RD-04058 Rev 001 | — | | |
| DOC-5 | Manufacturer Contact Information | Chris Fischer Chris.Fischer@Hologic.com | — | | |
| DOC-6 | Intended use of device in network-connected environment: | Workflow manager for Dimensions & 3Dimensions. | — | | |
| DOC-7 | Document Release Date | 12/18/2020 | — | | |
| DOC-8 | Coordinated Vulnerability Disclosure: Does the manufacturer have a vulnerability disclosure program for this device? | No | — | | |
| DOC-9 | ISAO: Is the manufacturer part of an Information Sharing and Analysis Organization? | No | — | | |
| DOC-10 | Diagram: Is a network or data flow diagram available that indicates connections to other system components or expected external resources? | Yes, available upon request. | — | | |
| DOC-11 | SaMD: Is the device Software as a Medical Device (i.e. software-only, no hardware)? | No | — | | |
| DOC-11.1 | Does the SaMD contain an operating system? | N/A | — | | |
| DOC-11.2 | Does the SaMD rely on an owner/operator provided operating system? | N/A | — | | |
| DOC-11.3 | Is the SaMD hosted by the manufacturer? | N/A | — | | |
| DOC-11.4 | Is the SaMD hosted by the customer? | N/A | — | | |
| | | Yes, No, N/A, or See Notes | Note # | | |
| | MANAGEMENT OF PERSONALLY IDENTIFIABLE INFORMATION | | | | |
| MPII-1 | Can this device display, transmit, store, or modify personally identifiable information (e.g. electronic Protected Health Information (ePHI))? | Yes | Note 1 | AR-2 | A.15.1.4 |
| MPII-2 | Does the device maintain personally identifiable information? | Yes | — | AR-2 | A.15.1.4 |
| MPII-2.1 | Does the device maintain personally identifiable information temporarily in volatile memory (i.e., until cleared by power-off or reset)? | Yes | — | AR-2 | A.15.1.4 |
| MPII-2.2 | Does the device store personally identifiable information persistently on internal media? | Yes | — | | |
| MPII-2.3 | Is personally identifiable information preserved in the device's non-volatile memory until explicitly erased? | Yes | Note 2 | | |
| MPII-2.4 | Does the device store personally identifiable information in a database? | Yes | Note 3 | | |
| MPII-2.5 | Does the device allow configuration to automatically delete local personally identifiable information after it is stored to a long term solution? | Yes | Note 2 | AR-2 | A.15.1.4 |

| | | | | | |
|-----------------------------------|--|-----|--------|------|----------|
| MPII-2.6 | Does the device import/export personally identifiable information with other systems (e.g., a wearable monitoring device might export personally identifiable information to a server)? | Yes | — | AR-2 | A.15.1.4 |
| MPII-2.7 | Does the device maintain personally identifiable information when powered off, or during power service interruptions? | Yes | — | AR-2 | A.15.1.4 |
| MPII-2.8 | Does the device allow the internal media to be removed by a service technician (e.g., for separate destruction or customer retention)? | Yes | — | | |
| MPII-2.9 | Does the device allow personally identifiable information records be stored in a separate location from the device's operating system (i.e. secondary internal drive, alternate drive partition, or remote storage location)? | No | — | AR-2 | A.15.1.4 |
| MPII-3 | Does the device have mechanisms used for the transmitting, importing/exporting of personally identifiable information? | Yes | — | AR-2 | A.15.1.4 |
| MPII-3.1 | Does the device display personally identifiable information (e.g., video display, etc.)? | No | Note 8 | AR-2 | A.15.1.4 |
| MPII-3.2 | Does the device generate hardcopy reports or images containing personally identifiable information? | No | Note 8 | AR-2 | A.15.1.4 |
| MPII-3.3 | Does the device retrieve personally identifiable information from or record personally identifiable information to removable media (e.g., removable-HDD, USB memory, DVD-R/RW, CD-R/RW, tape, CF/SD card, memory stick, etc.)? | No | Note 8 | AR-2 | A.15.1.4 |
| MPII-3.4 | Does the device transmit/receive or import/export personally identifiable information via dedicated cable connection (e.g., RS-232, RS-423, USB, FireWire, etc.)? | No | — | AR-2 | A.15.1.4 |
| MPII-3.5 | Does the device transmit/receive personally identifiable information via a wired network connection (e.g., RJ45, fiber optic, etc.)? | Yes | Note 6 | AR-2 | A.15.1.4 |
| MPII-3.6 | Does the device transmit/receive personally identifiable information via a wireless network connection (e.g., WiFi, Bluetooth, NFC, infrared, cellular, etc.)? | No | — | AR-2 | A.15.1.4 |
| MPII-3.7 | Does the device transmit/receive personally identifiable information over an external network (e.g., Internet)? | No | — | AR-2 | A.15.1.4 |
| MPII-3.8 | Does the device import personally identifiable information via scanning a document? | No | — | | |
| MPII-3.9 | Does the device transmit/receive personally identifiable information via a proprietary protocol? | No | — | | |
| MPII-3.10 | Does the device use any other mechanism to transmit, import or export personally identifiable information? | No | — | AR-2 | A.15.1.4 |
| Management of Private Data notes: | | | | AR-2 | A.15.1.4 |

AUTOMATIC LOGOFF (ALOF)
The device's ability to prevent access and misuse by unauthorized users if device is left idle for a period of time.

| | | | | | | |
|--------|---|-----|--------|-------------------|-------|--------------------|
| ALOF-1 | Can the device be configured to force reauthorization of logged-in user(s) after a predetermined length of inactivity (e.g., auto-logout, session lock, password protected screen saver)? | Yes | Note 7 | Section 5.1, ALOF | AC-12 | None |
| ALOF-2 | Is the length of inactivity time before auto-logout/screen lock user or administrator configurable? | Yes | Note 7 | Section 5.1, ALOF | AC-11 | A.11.2.8, A.11.2.9 |

AUDIT CONTROLS (AUDT)

IEC TR 80001-2-2:2012

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ISO 27002:2013

The ability to reliably audit activity on the device.

| | | | | | | |
|------------|--|-----|-------------------------|-------------------|------|---|
| AUDT-1 | Can the medical device create additional audit logs or reports beyond standard operating system logs? | Yes | — | Section 5.2, AUDT | AU-1 | A.5.1.1, A.5.1.2, A.6.1.1, A.12.1.1, A.18.1.1, A.18.2.2 |
| AUDT-1.1 | Does the audit log record a USER ID? | Yes | — | | | |
| AUDT-1.2 | Does other personally identifiable information exist in the audit trail? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2 | Are events recorded in an audit log? If yes, indicate which of the following events are recorded in the audit log: | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.1 | Successful login/logout attempts? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.2 | Unsuccessful login/logout attempts? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.3 | Modification of user privileges? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.4 | Creation/modification/deletion of users? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.5 | Presentation of clinical or PII data (e.g. display, print)? | N/A | Note 8 | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.6 | Creation/modification/deletion of data? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.7 | Import/export of data from removable media (e.g. USB drive, external hard drive, DVD)? | N/A | Note 8 | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.8 | Receipt/transmission of data or commands over a network or point-to-point connection? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.8.1 | Remote or on-site support? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.8.2 | Application Programming Interface (API) and similar activity? | N/A | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.9 | Emergency access? | N/A | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.10 | Other events (e.g., software updates)? | Yes | Note 9 | Section 5.2, AUDT | AU-2 | None |
| AUDT-2.11 | Is the audit capability documented in more detail? | No | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-3 | Can the owner/operator define or select which events are recorded in the audit log? | No | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-4 | Is a list of data attributes that are captured in the audit log for an event available? | Yes | Available upon request. | Section 5.2, AUDT | AU-2 | None |
| AUDT-4.1 | Does the audit log record date/time? | Yes | Note 10 | Section 5.2, AUDT | AU-2 | None |
| AUDT-4.1.1 | Can date and time be synchronized by Network Time Protocol (NTP) or equivalent time source? | Yes | Note 11 | Section 5.2, AUDT | AU-2 | None |
| AUDT-5 | Can audit log content be exported? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-5.1 | Via physical media? | Yes | — | | | |
| AUDT-5.2 | Via IHE Audit Trail and Node Authentication (ATNA) profile to SIEM? | No | — | | | |
| AUDT-5.3 | Via Other communications (e.g., external service device, mobile applications)? | Yes | Note 12 | | | |
| AUDT-5.4 | Are audit logs encrypted in transit or on storage media? | Yes | Note 13 | | | |
| AUDT-6 | Can audit logs be monitored/reviewed by owner/operator? | Yes | — | | | |
| AUDT-7 | Are audit logs protected from modification? | Yes | — | Section 5.2, AUDT | AU-2 | None |
| AUDT-7.1 | Are audit logs protected from access? | Yes | — | | | |
| AUDT-8 | Can audit logs be analyzed by the device? | No | — | Section 5.2, AUDT | AU-2 | None |

AUTHORIZATION (AUTH)

The ability of the device to determine the authorization of users.

IEC TR 80001-2-2:2012

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| | | | |
|----------|---|-----------|------------------|
| AUTH-1 | Does the device prevent access to unauthorized users through user login requirements or other mechanism? | Yes | Note 14 |
| AUTH-1.1 | Can the device be configured to use federated credentials management of users for authorization (e.g., LDAP, OAuth)? | Yes | Active Directory |
| AUTH-1.2 | Can the customer push group policies to the device (e.g., Active Directory)? | See Notes | Note 15 |
| AUTH-1.3 | Are any special groups, organizational units, or group policies required? | Yes | Note 16 |
| AUTH-2 | Can users be assigned different privilege levels based on 'role' (e.g., user, administrator, and/or service, etc.)? | Yes | — |
| AUTH-3 | Can the device owner/operator grant themselves unrestricted administrative privileges (e.g., access operating system or application via local root or administrator account)? | Yes | — |
| AUTH-4 | Does the device authorize or control all API access requests? | N/A | — |
| AUTH-5 | Does the device run in a restricted access mode, or 'kiosk mode', by default? | N/A | Note 8 |

Section 5.3, AUTH

IA-2

A.9.2.1

Section 5.3, AUTH

IA-2

A.9.2.1

Section 5.3, AUTH

IA-2

A.9.2.1

Section 5.3, AUTH

IA-2

A.9.2.1

Section 5.3, AUTH

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A.9.2.1

Section 5.3, AUTH

IA-2

A.9.2.1

Section 5.3, AUTH

IA-2

A.9.2.1

CYBER SECURITY PRODUCT UPGRADES (CSUP)

The ability of on-site service staff, remote service staff, or authorized customer staff to install/upgrade device's security patches.

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|----------|---|-----------|---------|--|--|--|
| CSUP-1 | Does the device contain any software or firmware which may require security updates during its operational life, either from the device manufacturer or from a third-party manufacturer of the software/firmware? If no, answer "N/A" to questions in this section. | Yes | — | | | |
| CSUP-2 | Does the device contain an Operating System? If yes, complete 2.1-2.4. | Yes | — | | | |
| CSUP-2.1 | Does the device documentation provide instructions for owner/operator installation of patches or software updates? | Yes | Note 17 | | | |
| CSUP-2.2 | Does the device require vendor or vendor-authorized service to install patches or software updates? | No | — | | | |
| CSUP-2.3 | Does the device have the capability to receive remote installation of patches or software updates? | Yes | — | | | |
| CSUP-2.4 | Does the medical device manufacturer allow security updates from any third-party manufacturers (e.g., Microsoft) to be installed without approval from the manufacturer? | See Notes | Note 17 | | | |
| CSUP-3 | Does the device contain Drivers and Firmware? If yes, complete 3.1-3.4. | Yes | — | | | |
| CSUP-3.1 | Does the device documentation provide instructions for owner/operator installation of patches or software updates? | No | — | | | |

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|----------|---|-----------|---------|--|--|--|
| CSUP-3.2 | Does the device require vendor or vendor-authorized service to install patches or software updates? | Yes | — | | | |
| CSUP-3.3 | Does the device have the capability to receive remote installation of patches or software updates? | Yes | — | | | |
| CSUP-3.4 | Does the medical device manufacturer allow security updates from any third-party manufacturers (e.g., Microsoft) to be installed without approval from the manufacturer? | No | — | | | |
| CSUP-4 | Does the device contain Anti-Malware Software? If yes, complete 4.1-4.4. | Yes | Note 18 | | | |
| CSUP-4.1 | Does the device documentation provide instructions for owner/operator installation of patches or software updates? | Yes | Note 18 | | | |
| CSUP-4.2 | Does the device require vendor or vendor-authorized service to install patches or software updates? | See Notes | Note 18 | | | |
| CSUP-4.3 | Does the device have the capability to receive remote installation of patches or software updates? | Yes | Note 18 | | | |
| CSUP-4.4 | Does the medical device manufacturer allow security updates from any third-party manufacturers (e.g., Microsoft) to be installed without approval from the manufacturer? | See Notes | Note 18 | | | |
| CSUP-5 | Does the device contain Non-Operating System commercial off-the-shelf components? If yes, complete 5.1-5.4. | Yes | — | | | |
| CSUP-5.1 | Does the device documentation provide instructions for owner/operator installation of patches or software updates? | No | — | | | |
| CSUP-5.2 | Does the device require vendor or vendor-authorized service to install patches or software updates? | Yes | — | | | |
| CSUP-5.3 | Does the device have the capability to receive remote installation of patches or software updates? | Yes | — | | | |
| CSUP-5.4 | Does the medical device manufacturer allow security updates from any third-party manufacturers (e.g., Microsoft) to be installed without approval from the manufacturer? | No | — | | | |
| CSUP-6 | Does the device contain other software components (e.g., asset management software, license management)? If yes, please provide details or reference in notes and complete 6.1-6.4. | No | — | | | |
| CSUP-6.1 | Does the device documentation provide instructions for owner/operator installation of patches or software updates? | N/A | — | | | |
| CSUP-6.2 | Does the device require vendor or vendor-authorized service to install patches or software updates? | N/A | — | | | |
| CSUP-6.3 | Does the device have the capability to receive remote installation of patches or software updates? | N/A | — | | | |
| CSUP-6.4 | Does the medical device manufacturer allow security updates from any third-party manufacturers (e.g., Microsoft) to be installed without approval from the manufacturer? | N/A | — | | | |
| CSUP-7 | Does the manufacturer notify the customer when updates are approved for installation? | Yes | Note 19 | | | |

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|-----------|--|-----|---------|--|--|--|
| CSUP-8 | Does the device perform automatic installation of software updates? | No | — | | | |
| CSUP-9 | Does the manufacturer have an approved list of third-party software that can be installed on the device? | Yes | Note 18 | | | |
| CSUP-10 | Can the owner/operator install manufacturer-approved third-party software on the device themselves? | Yes | Note 18 | | | |
| CSUP-10.1 | Does the system have mechanism in place to prevent installation of unapproved software? | No | — | | | |
| CSUP-11 | Does the manufacturer have a process in place to assess device vulnerabilities and updates? | Yes | Note 20 | | | |
| CSUP-11.1 | Does the manufacturer provide customers with review and approval status of updates? | Yes | Note 19 | | | |
| CSUP-11.2 | Is there an update review cycle for the device? | Yes | Note 21 | | | |

HEALTH DATA DE-IDENTIFICATION (DIDT)

IEC TR 80001-2-2:2012

NIST SP 800-53 Rev. 4

ISO 27002:2013

The ability of the device to directly remove information that allows identification of a person.

| | | | | | | |
|----------|---|-----|--------|-------------------|------|-----------|
| DIDT-1 | Does the device provide an integral capability to de-identify personally identifiable information? | N/A | Note 8 | Section 5.6, DIDT | None | ISO 27038 |
| DIDT-1.1 | Does the device support de-identification profiles that comply with the DICOM standard for de-identification? | N/A | Note 8 | Section 5.6, DIDT | None | ISO 27038 |

DATA BACKUP AND DISASTER RECOVERY (DTBK)

IEC TR 80001-2-2:2012

NIST SP 800-53 Rev. 4

ISO 27002:2013

The ability to recover after damage or destruction of device data, hardware, software, or site configuration information.

| | | | | | | |
|--------|--|-----|---------|-------------------|------|----------|
| DTBK-1 | Does the device maintain long term primary storage of personally identifiable information / patient information (e.g. PACS)? | No | — | | | |
| DTBK-2 | Does the device have a “factory reset” function to restore the original device settings as provided by the manufacturer? | Yes | — | Section 5.7, DTBK | CP-9 | A.12.3.1 |
| DTBK-3 | Does the device have an integral data backup capability to removable media? | Yes | Note 22 | Section 5.7, DTBK | CP-9 | A.12.3.1 |
| DTBK-4 | Does the device have an integral data backup capability to remote storage? | Yes | Note 22 | | | |
| DTBK-5 | Does the device have a backup capability for system configuration information, patch restoration, and software restoration? | Yes | Note 22 | | | |
| DTBK-6 | Does the device provide the capability to check the integrity and authenticity of a backup? | No | — | Section 5.7, DTBK | CP-9 | A.12.3.1 |

EMERGENCY ACCESS (EMRG)

IEC TR 80001-2-2:2012

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The ability of the device user to access personally identifiable information in case of a medical emergency situation that requires immediate access to stored personally identifiable information.

EMRG-1 Does the device incorporate an emergency access (i.e. "break-glass") feature? No

Section 5.8, EMRG

SI-17

None

HEALTH DATA INTEGRITY AND AUTHENTICITY (IGAU)

IEC TR 80001-2-2:2012

NIST SP 800-53 Rev. 4

ISO 27002:2013

How the device ensures that the stored data on the device has not been altered or destroyed in a non-authorized manner and is from the originator.

IGAU-1 Does the device provide data integrity checking mechanisms of stored health data (e.g., hash or digital signature)? No

Section 5.9, IGAU

SC-28

A.18.1.3

IGAU-2 Does the device provide error/failure protection and recovery mechanisms for stored health data (e.g., RAID-5)? Yes Note 4

Section 5.9, IGAU

SC-28

A.18.1.3

MALWARE DETECTION/PROTECTION (MLDP)

IEC TR 80001-2-2:2012

NIST SP 800-53 Rev. 4

ISO 27002:2013

The ability of the device to effectively prevent, detect and remove malicious software (malware).

MLDP-1 Is the device capable of hosting executable software? Yes

Section 5.10, MLDP

MLDP-2 Does the device support the use of anti-malware software (or other anti-malware mechanism)? Provide details or reference in notes. Yes Note 18

Section 5.10, MLDP

SI-3

A.12.2.1

MLDP-2.1 Does the device include anti-malware software by default? Yes Note 18

Section 5.10, MLDP

CM-5

A.9.2.3, A.9.4.5, A.12.1.2, A.12.1.4, A.12.5.1

MLDP-2.2 Does the device have anti-malware software available as an option? Yes Note 18

Section 5.10, MLDP

AU-6

A.12.4.1, A.16.1.2, A.16.1.4

MLDP-2.3 Does the device documentation allow the owner/operator to install or update anti-malware software? Yes Note 18

Section 5.10, MLDP

CP-10

A.17.1.2

MLDP-2.4 Can the device owner/operator independently (re-)configure anti-malware settings? Yes Note 23

Section 5.10, MLDP

AU-2

None

MLDP-2.5 Does notification of malware detection occur in the device user interface? Yes Note 24

MLDP-2.6 Can only manufacturer-authorized persons repair systems when malware has been detected? Yes

MLDP-2.7 Are malware notifications written to a log? Yes Note 25

MLDP-2.8 Are there any restrictions on anti-malware (e.g., purchase, installation, configuration, scheduling)? Yes Note 23

MLDP-3 If the answer to MLDP-2 is NO, and anti-malware cannot be installed on the device, are other compensating controls in place or available? N/A

Section 5.10, MLDP

SI-2

A.12.6.1, A.14.2.2, A.14.2.3, A.16.1.3

MLDP-4 Does the device employ application whitelisting that restricts the software and services that are permitted to be run on the device? No

Section 5.10, MLDP

SI-3

A.12.2.1

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|--|--|------------------|-------------------------|------------------------------|------------------------------|--|
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| MLDP-5 | Does the device employ a host-based intrusion detection/prevention system? | No | — | Section 5.10, MLDP | SI-4 | None |
| MLDP-5.1 | Can the host-based intrusion detection/prevention system be configured by the customer? | N/A | — | Section 5.10, MLDP | CM-7 | A.12.5.1 |
| MLDP-5.2 | Can a host-based intrusion detection/prevention system be installed by the customer? | No | — | Section 5.10, MLDP | | |
| NODE AUTHENTICATION (NAUT) <i>The ability of the device to authenticate communication partners/nodes.</i> | | | | IEC TR 80001-2-2:2012 | NIST SP 800-53 Rev. 4 | ISO 27002:2013 |
| NAUT-1 | Does the device provide/support any means of node authentication that assures both the sender and the recipient of data are known to each other and are authorized to receive transferred information (e.g. Web APIs, SMTP, SNMP)? | Yes | | Section 5.11, NAUT | SC-23 | None |
| NAUT-2 | Are network access control mechanisms supported (E.g., does the device have an internal firewall, or use a network connection white list)? | Yes | Note 26 | Section 5.11, NAUT | SC-7 | A.13.1.1, A.13.1.3, A.13.2.1, A.14.1.3 |
| NAUT-2.1 | Is the firewall ruleset documented and available for review? | Yes | Available upon request. | | | |
| NAUT-3 | Does the device use certificate-based network connection authentication? | No | | | | |
| CONNECTIVITY CAPABILITIES (CONN) <i>All network and removable media connections must be considered in determining appropriate security controls. This section lists connectivity capabilities that may be present on the device.</i> | | | | IEC TR 80001-2-2:2012 | NIST SP 800-53 Rev. 4 | ISO 27002:2013 |
| CONN-1 | Does the device have hardware connectivity capabilities? | Yes | — | | | |
| CONN-1.1 | Does the device support wireless connections? | No | — | | | |
| CONN-1.1.1 | Does the device support Wi-Fi? | No | — | | | |
| CONN-1.1.2 | Does the device support Bluetooth? | No | — | | | |
| CONN-1.1.3 | Does the device support other wireless network connectivity (e.g. LTE, Zigbee, proprietary)? | No | — | | | |
| CONN-1.1.4 | Does the device support other wireless connections (e.g., custom RF controls, wireless detectors)? | No | — | | | |
| CONN-1.2 | Does the device support physical connections? | Yes | — | | | |
| CONN-1.2.1 | Does the device have available RJ45 Ethernet ports? | Yes | — | | | |
| CONN-1.2.2 | Does the device have available USB ports? | Yes | — | | | |
| CONN-1.2.3 | Does the device require, use, or support removable memory devices? | Yes | Note 5 | | | |
| CONN-1.2.4 | Does the device support other physical connectivity? | No | | | | |
| CONN-2 | Does the manufacturer provide a list of network ports and protocols that are used or may be used on the device? | Yes | Available upon request. | | | |
| CONN-3 | Can the device communicate with other systems within the customer environment? | Yes | — | | | |

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| CONN-4 | Can the device communicate with other systems external to the customer environment (e.g., a service host)? | Yes | — |
| CONN-5 | Does the device make or receive API calls? | No | — |
| CONN-6 | Does the device require an internet connection for its intended use? | No | — |
| CONN-7 | Does the device support Transport Layer Security (TLS)? | Yes | Note 27 |
| CONN-7.1 | Is TLS configurable? | Yes | Note 27 |
| CONN-8 | Does the device provide operator control functionality from a separate device (e.g., telemedicine)? | No | |

PERSON AUTHENTICATION (PAUT)

The ability to configure the device to authenticate users.

| | | | |
|-----------|--|-----|------------------|
| PAUT-1 | Does the device support and enforce unique IDs and passwords for all users and roles (including service accounts)? | Yes | Note 28 |
| PAUT-1.1 | Does the device enforce authentication of unique IDs and passwords for all users and roles (including service accounts)? | Yes | Note 28 |
| PAUT-2 | Is the device configurable to authenticate users through an external authentication service (e.g., MS Active Directory, NDS, LDAP, OAuth, etc.)? | Yes | Active Directory |
| PAUT-3 | Is the device configurable to lock out a user after a certain number of unsuccessful logon attempts? Are all default accounts (e.g., technician service accounts, administrator accounts) listed in the documentation? | Yes | Note 29 |
| PAUT-4 | Can all passwords be changed? | No | — |
| PAUT-5 | Can all passwords be changed? | Yes | — |
| PAUT-6 | Is the device configurable to enforce creation of user account passwords that meet established (organization specific) complexity rules? Does the device support account passwords that expire periodically? | Yes | Note 30 |
| PAUT-7 | Does the device support multi-factor authentication? | Yes | Note 31 |
| PAUT-8 | Does the device support multi-factor authentication? | No | — |
| PAUT-9 | Does the device support single sign-on (SSO)? | Yes | Active Directory |
| PAUT-10 | Can user accounts be disabled/locked on the device? | Yes | — |
| PAUT-11 | Does the device support biometric controls? Does the device support physical tokens (e.g. badge access)? | No | — |
| PAUT-12 | Does the device support group authentication (e.g. hospital teams)? | No | — |
| PAUT-13 | Does the application or device store or manage authentication credentials? | Yes | — |
| PAUT-14 | Does the application or device store or manage authentication credentials? | Yes | Note 32 |
| PAUT-14.1 | Are credentials stored using a secure method? | Yes | Note 32 |

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| | | |
|--|--------------|---|
| Section 5.12, PAUT | IA-2 | A.9.2.1 |
| Section 5.12, PAUT | IA-2 | A.9.2.1 |
| Section 5.12, PAUT | IA-5 | A.9.2.1 |
| Section 5.12, PAUT | IA-2 | A.9.2.1 |
| Section 5.12, PAUT Section 5.12, PAUT | SA-4(5) | A.14.1.1, A.14.2.7, A.14.2.9, A.15.1.2 |
| Section 5.12, PAUT | IA-2 | A.9.2.1 |
| Section 5.12, PAUT | IA-2 | A.9.2.1 |
| Section 5.12, PAUT Section 5.12, PAUT | IA-2 IA-2 | A.9.2.1 A.9.2.1 |

PHYSICAL LOCKS (PLOK)

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Physical locks can prevent unauthorized users with physical access to the device from compromising the integrity and confidentiality of personally identifiable information stored on the device or on removable media

| | | | | | | |
|--------|--|-----|---|--------------------|----------|------------------------------|
| PLOK-1 | Is the device software only? If yes, answer "N/A" to remaining questions in this section. | No | — | Section 5.13, PLOK | PE- 3(4) | A.11.1.1, A.11.1.2, A.11.1.3 |
| PLOK-2 | Are all device components maintaining personally identifiable information (other than removable media) physically secure (i.e., cannot remove without tools)? | Yes | — | Section 5.13, PLOK | PE- 3(4) | A.11.1.1, A.11.1.2, A.11.1.3 |
| PLOK-3 | Are all device components maintaining personally identifiable information (other than removable media) physically secured behind an individually keyed locking device? | No | — | Section 5.13, PLOK | PE- 3(4) | A.11.1.1, A.11.1.2, A.11.1.3 |
| PLOK-4 | Does the device have an option for the customer to attach a physical lock to restrict access to removable media? | No | — | Section 5.13, PLOK | PE- 3(4) | A.11.1.1, A.11.1.2, A.11.1.3 |

ROADMAP FOR THIRD PARTY COMPONENTS IN DEVICE LIFE CYCLE (RDMP)

IEC TR 80001-2-2:2012 NIST SP 800-53 Rev. 4 ISO 27002:2013

Manufacturer's plans for security support of third-party components within the device's life cycle.

| | | | | | | |
|--------|--|-----|---|--------------------|------|------------------|
| RDMP-1 | Was a secure software development process, such as ISO/IEC 27034 or IEC 62304, followed during product development? | Yes | — | Section 5.14, RDMP | CM-2 | None |
| RDMP-2 | Does the manufacturer evaluate third-party applications and software components included in the device for secure development practices? | Yes | — | Section 5.14, RDMP | CM-8 | A.8.1.1, A.8.1.2 |
| RDMP-3 | Does the manufacturer maintain a web page or other source of information on software support dates and updates? | Yes | — | Section 5.14, RDMP | CM-8 | A.8.1.1, A.8.1.2 |
| RDMP-4 | Does the manufacturer have a plan for managing third-party component end-of-life? | Yes | — | Section 5.14, RDMP | CM-8 | A.8.1.1, A.8.1.2 |

SOFTWARE BILL OF MATERIALS (SBOM)

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A Software Bill of Material (SBOM) lists all the software components that are incorporated into the device being described for the purpose of operational security planning by the healthcare delivery organization. This section supports controls in the RDMP section.

| | | | | | | |
|----------|--|-----|--------------------------------------|--|--|--|
| SBOM-1 | Is the SBOM for this product available? | Yes | See SBOM sheet within this document. | | | |
| SBOM-2 | Does the SBOM follow a standard or common method in describing software components? | No | | | | |
| SBOM-2.1 | Are the software components identified? | Yes | — | | | |
| SBOM-2.2 | Are the developers/manufacturers of the software components identified? | Yes | — | | | |
| SBOM-2.3 | Are the major version numbers of the software components identified? | Yes | — | | | |
| SBOM-2.4 | Are any additional descriptive elements identified? | Yes | — | | | |
| SBOM-3 | Does the device include a command or process method available to generate a list of software components installed on the device? | No | — | | | |
| SBOM-4 | Is there an update process for the SBOM? | Yes | Note 33 | | | |

SYSTEM AND APPLICATION HARDENING (SAHD)

The device's inherent resistance to cyber attacks and malware.

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| | Is the device hardened in accordance with any industry standards? | Yes | DISA STIG | Section 5.15, SAHD | CM-7 | A.12.5.1* |
|----------|--|-----------|-----------|--------------------|---------------|---|
| SAHD-1 | Has the device received any cybersecurity certifications? | No | — | Section 5.15, SAHD | AC-17(2)/IA-3 | A.6.2.1, A.6.2.2, A.13.1.1, A.13.2.1, A.14.1.2/None |
| SAHD-2 | Does the device employ any mechanisms for software integrity checking? | Yes | — | | SA-12(10) | A.14.2.7, A.15.1.1, A.15.1.2, A.15.1.3 |
| SAHD-3 | Does the device employ any mechanism (e.g., release-specific hash key, checksums, digital signature, etc.) to ensure the installed software is manufacturer-authorized? | Yes | Note 34 | | | |
| SAHD-3.1 | Does the device employ any mechanism (e.g., release-specific hash key, checksums, digital signature, etc.) to ensure the software updates are the manufacturer-authorized updates? | Yes | Note 35 | Section 5.15, SAHD | CM-8 | A.8.1.1, A.8.1.2 |
| SAHD-3.2 | Can the owner/operator perform software integrity checks (i.e., verify that the system has not been modified or tampered with)? | Yes | Note 34 | Section 5.15, SAHD | AC-3 | A.6.2.2, A.9.1.2, A.9.4.1, A.9.4.4, A.9.4.5, A.13.1.1, A.14.1.2, A.14.1.3, A.18.1.3 |
| SAHD-4 | Is the system configurable to allow the implementation of file-level, patient level, or other types of access controls? | Yes | Note 36 | Section 5.15, SAHD | CM-7 | A.12.5.1* |
| SAHD-5 | Does the device provide role-based access controls? | Yes | Note 36 | Section 5.15, SAHD | CM-7 | A.12.5.1* |
| SAHD-5.1 | Are any system or user accounts restricted or disabled by the manufacturer at system delivery? | Yes | Note 37 | Section 5.15, SAHD | CM-8 | A.8.1.1, A.8.1.2 |
| SAHD-6 | Are any system or user accounts configurable by the end user after initial configuration? | Yes | | Section 5.15, SAHD | CM-7 | A.12.5.1* |
| SAHD-6.1 | Does this include restricting certain system or user accounts, such as service technicians, to least privileged access? | See Notes | Note 38 | Section 5.15, SAHD | CM-7 | A.12.5.1* |
| SAHD-6.2 | Are all shared resources (e.g., file shares) which are not required for the intended use of the device disabled? | Yes | — | Section 5.15, SAHD | CM-7 | A.12.5.1* |
| SAHD-7 | Are all communication ports and protocols that are not required for the intended use of the device disabled? | Yes | — | Section 5.15, SAHD | SA-18 | None |
| SAHD-8 | Are all services (e.g., telnet, file transfer protocol [FTP], internet information server [IIS], etc.), which are not required for the intended use of the device deleted/disabled? | Yes | — | Section 5.15, SAHD | CM-6 | None |
| SAHD-9 | Are all applications (COTS applications as well as OS-included applications, e.g., MS Internet Explorer, etc.) which are not required for the intended use of the device deleted/disabled? | Yes | — | Section 5.15, SAHD | SI-2 | A.12.6.1, A.14.2.2, A.14.2.3, A.16.1.3 |
| SAHD-10 | Can the device prohibit boot from uncontrolled or removable media (i.e., a source other than an internal drive or memory component)? | Yes | Note 39 | | | |
| SAHD-11 | Can unauthorized software or hardware be installed on the device without the use of physical tools? | See Notes | Note 40 | | | |
| SAHD-12 | Does the product documentation include information on operational network security scanning by users? | No | — | | | |
| SAHD-13 | | | | | | |

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| | | | |
|-----------|--|-----------|------------------------------------|
| SAHD-14 | Can the device be hardened beyond the default provided state? | See Notes | Note 41 |
| SAHD-14.1 | Are instructions available from vendor for increased hardening? | Yes | Available upon request/discussion. |
| SHAD-15 | Can the system prevent access to BIOS or other bootloaders during boot? | Yes | Note 39 |
| SAHD-16 | Have additional hardening methods not included in 2.3.19 been used to harden the device? | No | — |

SECURITY GUIDANCE (SGUD)

Availability of security guidance for operator and administrator of the device and manufacturer sales and service.

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| | | | |
|----------|---|-----|-------------------------|
| SGUD-1 | Does the device include security documentation for the owner/operator? | Yes | Note 42 |
| SGUD-2 | Does the device have the capability, and provide instructions, for the permanent deletion of data from the device or media? | Yes | Note 43 |
| SGUD-3 | Are all access accounts documented? | Yes | Available upon request. |
| SGUD-3.1 | Can the owner/operator manage password control for all accounts? | Yes | — |
| SGUD-4 | Does the product include documentation on recommended compensating controls for the device? | Yes | Note 18 |

Section 5.16, SGUD

AT-2/PL-2

A.7.2.2, A.12.2.1/A.14.1.1

Section 5.16, SGUD

MP-6

A.8.2.3, A.8.3.1, A.8.3.2, A.11.2.7

Section 5.16, SGUD

AC-6,IA-2

A.9.1.2, A.9.2.3, A.9.4.4, A.9.4.5/A.9.2.1

HEALTH DATA STORAGE CONFIDENTIALITY (STCF)

The ability of the device to ensure unauthorized access does not compromise the integrity and confidentiality of personally identifiable information stored on the device or removable media.

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| | | | |
|----------|---|-----|---------|
| STCF-1 | Can the device encrypt data at rest? | Yes | — |
| STCF-1.1 | Is all data encrypted or otherwise protected? | Yes | Note 44 |
| STCF-1.2 | Is the data encryption capability configured by default? | Yes | — |
| STCF-1.3 | Are instructions available to the customer to configure encryption? | N/A | — |
| STCF-2 | Can the encryption keys be changed or configured? | Yes | Note 45 |
| STCF-3 | Is the data stored in a database located on the device? | Yes | — |
| STCF-4 | Is the data stored in a database external to the device? | No | — |

Section 5.17, STCF

SC-28

A.8.2.3

Section 5.17, STCF

SC-28

A.8.2.3

TRANSMISSION CONFIDENTIALITY (TXCF)

The ability of the device to ensure the confidentiality of transmitted personally identifiable information.

Can personally identifiable information be transmitted only via a point-to-point dedicated cable?

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| | | | |
|--------|--|-----------|---------|
| TXCF-1 | Can personally identifiable information be transmitted only via a point-to-point dedicated cable? | Yes | — |
| TXCF-2 | Is personally identifiable information encrypted prior to transmission via a network or removable media? | See Notes | Note 46 |

Section 5.18, TXCF

CM-7

A.12.5.1

Section 5.18, TXCF

CM-7

A.12.5.1

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| | | | |
|----------|---|-----------|---------|
| TXCF-2.1 | If data is not encrypted by default, can the customer configure encryption options? | Yes | Note 46 |
| TXCF-3 | Is personally identifiable information transmission restricted to a fixed list of network destinations? | Yes | — |
| TXCF-4 | Are connections limited to authenticated systems? | See Notes | Note 46 |
| TXCF-5 | Are secure transmission methods supported/implemented (DICOM, HL7, IEEE 11073)? | See Notes | Note 46 |

TRANSMISSION INTEGRITY (TXIG)

The ability of the device to ensure the integrity of transmitted data.

Does the device support any mechanism (e.g., digital signatures) intended to ensure data is not modified during transmission?
 Does the device include multiple sub-components connected by external cables?

| | | | |
|--------|---|-----------|---------|
| TXIG-1 | Does the device support any mechanism (e.g., digital signatures) intended to ensure data is not modified during transmission? | See Notes | Note 46 |
| TXIG-2 | Does the device include multiple sub-components connected by external cables? | No | — |

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Section 5.18, TXCF CM-7 A.12.5.1
 Section 5.18, TXCF CM-7 A.12.5.1

A.8.2.3, A.13.1.1, A.13.2.1, A.13.2.3, A.14.1.2, A.14.1.3

| REMOTE SERVICE (RMOT) | | | | IEC TR 80001-2-2:2012 | NIST SP 800-53 Rev. 4 | ISO 27002:2013 |
|-----------------------|--|-----|---------|-----------------------|-----------------------|--|
| | <i>Remote service refers to all kinds of device maintenance activities performed by a service person via network or other remote connection.</i> | | | | | |
| RMOT-1 | Does the device permit remote service connections for device analysis or repair? | Yes | — | | AC-17 | A.6.2.1, A.6.2.2, A.13.1.1, A.13.2.1, A.14.1.2 |
| RMOT-1.1 | Does the device allow the owner/operator to initiate remote service sessions for device analysis or repair? | No | — | | | |
| RMOT-1.2 | Is there an indicator for an enabled and active remote session? | No | — | | | |
| RMOT-1.3 | Can patient data be accessed or viewed from the device during the remote session? | Yes | — | | AC-17 | A.6.2.1, A.6.2.2, A.13.1.1, A.13.2.1, A.14.1.2 |
| RMOT-2 | Does the device permit or use remote service connections for predictive maintenance data? | Yes | — | | | |
| RMOT-3 | Does the device have any other remotely accessible functionality (e.g. software updates, remote training)? | Yes | Note 47 | | | |

OTHER SECURITY CONSIDERATIONS (OTHR)

NONE

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Notes:

Note 1 Device contains a limited amount of ePHI to identify images - typically a name, date of birth, patient ID, and accession number.

Note 2 Patient procedures may be deleted by privileged users on demand and/or automatically by product application reclaimer. Reclaimer times and thresholds configurable.

Note 3 Database encrypted with Microsoft Always Encrypted technology.

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Note 4 Product system uses RAID-5 storage.
USB ports present and enabled on the product device. Typically only used during service and maintenance for installations or retrieving pertinent files for troubleshooting.

Note 5 Typically an RJ45 Ethernet connection.

Note 6 Windows configured to lock the system automatically after 15 minutes. Idle timeout configurable via security policy.

Note 7 Product does not contain the Dimensions AWS user interface allowing limited display of PII. Limited to Service Tools configuration site and Windows tools. Mostly designed as a headless server for the Dimensions cluster.

Note 8 Software installation and updates are logged.

Note 9 Log date/time stamp based on current Windows date/time for the system.

Note 10 Windows can be configured with an NTP server.

Note 11 Can be exported and downloaded by remote or local service users via the product Service Tools web application.

Note 12 Audit and application log files encrypted. Application log files also have PHI one-way hashed.

Note 13 User login with password leveraging Windows accounts.

Note 14 It's strongly recommended to limit policy changes pushed to the device to User related policies only, such as password complexity requirements, forcing passwords to expire, etc. There are certain policy changes that, if pushed, could negatively impact the product application.

Note 15 Strongly recommend configuring the product in its own Organizational Unit and limiting policy changes pushed to the system.

Note 16 See product support website for list of validated security patches. Validation of latest security patches performed at regular intervals for the product. We strongly encourage only applying patches or software updates that have been validated by Hologic.

Note 17 Microsoft Windows Defender enabled by default. Option available to install validated CoTS antimalware products. See product support website for list of validated antimalware software solutions and installation guidance. Malware definitions can be updated by customer at will. Hologic suggests keeping antimalware software version at the same major version as what was validated.

Note 18 Validated security patches for the product are posted to the product support website at regular intervals.

Note 19 Vulnerability assessments, leveraging industry standard tools, and Windows security patch validation occur at regular intervals.

Note 20 Validated security patches for the product are posted to the product support website at regular intervals.

Note 21 Vulnerability assessments, leveraging industry standard tools, and Windows security patch validation occur at regular intervals.

Note 22 Validated security patches for the product are posted to the product support website at regular intervals.

Note 23 Vulnerability assessments, leveraging industry standard tools, and Windows security patch validation occur at regular intervals.

Note 24 Validated security patches for the product are posted to the product support website at regular intervals.

Note 25 Vulnerability assessments, leveraging industry standard tools, and Windows security patch validation occur at regular intervals.

Note 26 Validated security patches for the product are posted to the product support website at regular intervals.

Note 27 Vulnerability assessments, leveraging industry standard tools, and Windows security patch validation occur at regular intervals.

Note 28 Validated security patches for the product are posted to the product support website at regular intervals.

Note 29 Vulnerability assessments, leveraging industry standard tools, and Windows security patch validation occur at regular intervals.

Note 30 Validated security patches for the product are posted to the product support website at regular intervals.

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Note 21 Hologic strives to evaluate and test Windows security updates for the product as they're released (typically monthly).

Note 22 Software databases and configurations are automatically backed up at regular intervals. Patient studies should be stored to long term storage.

Note 23 See antimalware software installation guide on product support website for required scan exemptions and configurations.

Note 24 Notification can occur directly on the device. However, being a server product, there's limited interaction with users for them to see those alerts. CoTS antimalware products often provide a manager that allows for email alerts and notifications to the appropriate personnel.

Note 25 Windows Defender and approved CoTS antimalware software typically have a history feature and/or log. Windows Firewall enabled and configured to allow product application network traffic. Patient data only sent to cluster devices and configured DICOM devices.

Note 27 Hologic Connect leverages an encrypted TLS tunnel for remote Service connectivity. TLS can, optionally, be configured for the product Service Tools configuration web application. External network traffic can also be blocked for Service Tools.

Note 28 Customer may configure TLS at the network layer. Use of unique product accounts is the decision of the customer. Generic or default accounts can be removed.

Note 29 Enabled by default, locking the user for 15 minutes after 3 failed logon attempts. Configurable by customer.

Note 30 Configured by default to require complex passwords, by Microsoft standards, with a minimum length of 8 characters. Configurable by customer.

Note 31 Passwords not configured to automatically expire by default. Configurable by customer.

Note 32 Product leverages Windows Operating System for user authentication. Credentials not stored in application databases. Credentials stored/managed securely via Operating System.

Note 33 SBOM reviewed and updated as required during product update cycles.

Note 34 Application libraries leverage .NET code signing. A command line utility can also be executed, on demand, to check product application integrity.

Note 35 Software update install packages include integrity checks for all packaged files. Integrity check automatically performed during installations.

Note 36 Product utilizes role-based privileges. Default users can be removed. Windows Administrator and Guest account renamed.

Note 37 Windows Guest account disabled.

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Note 38 Service users require admin privileges for many of their responsibilities. Customer may customize those privileges or disable service accounts to restrict access, but should communicate these changes to their service representative. Implementing service user restrictions requires customers to provide access as needed for servicing the product.

Note 39 Can be configured, not restricted by default. If configured, communicate change to service representative.

Note 40 Hardware installation would require tools, software would require OS authentication.

Note 41 Hologic has hardened the product against DISA STIG guidelines and vulnerability assessments. Additional hardening or concerns may be discussed with Hologic. Implementing additional hardening changes may negatively impact the product.

Note 42 Security documentation available on product support website.

Note 43 Patient studies directly stored on the AWM can be removed via a privileged user on a cluster Dimensions system. For permanent deletion of all sensitive data, contact support.

Note 44 Sensitive PII stored to disk and/or the product databases are encrypted with AES 256. PII stored to application logs are both encrypted and one-way hashed.

Note 45 Changes to encryption keys should be done at time of installation and can be modified upon request.

Note 46 Patient studies are transferred between Dimensions and AWM cluster devices using WCF with Windows authentication and AES 256 encryption. WCF communication is also signed for integrity check. Communication with other cluster devices leverages standard DICOM. Customer may optionally implement TLS encryption at their network level.

Note 47 Remote configuration of product via Service Tools web application. Ability to push approved software changes over Hologic Connect.

Software Bill of Materials (SBOM)

| Component Name | Developer | Version(s) | Product Use |
|-------------------------------------|--------------------------------|---|---|
| Windows Server Standard | Microsoft | 2016 | Operating System |
| SQL Server 2017 Express | Microsoft | 2019 14.0.3238.1 | Product application database software. |
| .NET Framework | Microsoft | 3.5 4.7.2 | Product application support libraries. |
| .NET Core | Microsoft | 2.1.15 | Product configuration web application. |
| Internet Information Services (IIS) | Microsoft | 10.0.14393.0 10.0.17763.1 | Product configuration web application. |
| Internet Explorer 11 | Microsoft | 11.2395.14393.0 11.678.17763.0 | Microsoft Edge not available for product OS. |
| Visual C++ Redistributable | Microsoft | 9.0.21022 9.0.30729.17 9.0.30729.6161 10.0.40219.325 11.0.61030 12.0.21005 12.0.40664 | Product application support libraries. |
| PowerChute Business Edition | Schneider Electric | 14.22.27821 | UPS Software. Typically only installed when UPS option ordered. |
| Dell OpenManage Software | Dell | 9.5.0.301 9.1.0 | Dell system management software. |
| Cygwin | Open Source | 9.3.0 | Hologic Connect |
| OpenSSH | Open Source | 2.8.0 | Hologic Connect |
| TightVNC | GlavSoft | 7.5p1 | Hologic Connect |
| DCF | Laurel Bridge Software | 2.8.8.0 | Configured for localhost connection only. |
| IronPython | Open Source | 3.4.32.65 | Dicom Communication |
| Nant | Open Source | 2.7.5 | Hologic Connect |
| CodeSmith | Eric J. Smith | 0.91.4312.0 | Application setup/unsetup |
| ExcelML Writer | Carlos Ag | 2.6.0.117 | Development Tool |
| Dev Express | Developer Express Inc. | 1.0.0.6 | Development Tool |
| Nunit | Nunit Software | 7.2.11.0 | Development Tool |
| Nsubstitute | Open Source (Nsubstitute Team) | 3.4.1.0 | Development Tool |
| Xceed Wpf Toolkit | Xceed Software Inc. | 1.4.3.0 | Development Tool |
| Json.NET | Newtonsoft | 3.6.0.0 | Development Tool |
| | | 12.0.3.23909 | Development Tool |

Additional Notes

Some of the software components listed above are covered by Hologic's program to regularly validate latest released security patches. See the product support website for the latest validated patches available or contact support for assistance.

Note 1