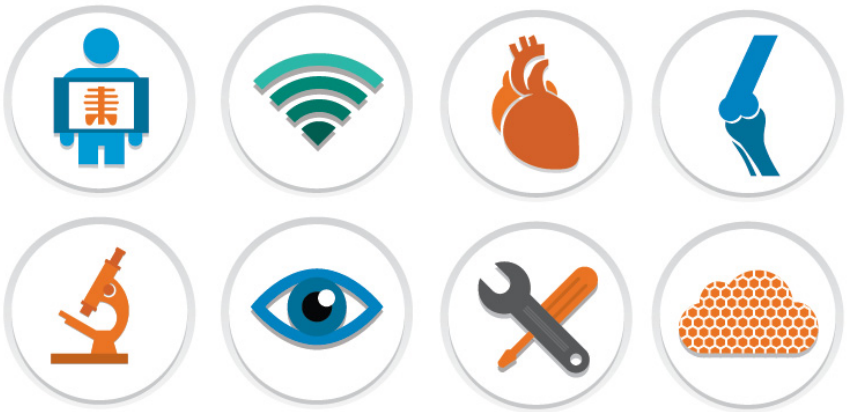

Merge DICOM Toolkit™

V. 5.10.0

RELEASE NOTES

Merge Healthcare Incorporated
900 Walnut Ridge Drive,
Hartland, WI 53029
USA

The symbols glossary is provided electronically at **http://www.merge.com/Support/Resources.aspx**.

CAUTION: U.S. federal law restricts this device to sale by, or on the order of, a physician.

Manufacturer’s Address
Merge Healthcare Incorporated
900 Walnut Ridge Drive
Hartland, WI 53029

For assistance, please contact Merge Healthcare Customer Support.

- In North America, call toll free 1-800-668-7990, then select option 2.
- International, call Merge Healthcare (in Canada) +1-905-672-7990, then select option 2.
- Email: **MDTSupport@merge.com** or **MC3Support@ca.ibm.com**

Part	Date	Revision	Description
COM-3821	October 2019	1.0	Updated bi-annually

Contents

Chapter 1 About the Application

The Merge DICOM Toolkit provides a powerful and simplified interface to DICOM. It allows you to focus on the important details of your application and the immediate needs of your end users, rather than the complex details of the DICOM standard.

WARNING: **If using the log feature to log information to a file, Personal Health Information (PHI) may be exposed. Client application and system should be aware of this risk and take necessary procedures to prevent and identify unauthorized use or access to PHI.**

This release includes the following toolkits:

Merge DICOM Toolkits	Target Development Environment
Merge DICOM Toolkit - C/C++ Toolkit V5.10.0	32-Bit Windows - Visual C++
	64-Bit Windows - Visual C++
	32-Bit Windows - Borland
	32-Bit - Linux on x86
	64-Bit - Linux on x86_64
	64-Bit - Linux on ARMv8
	32-Bit - Solaris 10 Intel - GCC Compiler
	64-Bit - Solaris 10 Intel - GCC Compiler
	32-Bit - Solaris 8 Sparc - Sun Compiler
	32-Bit - Solaris 8 Sparc - GCC Compiler
	32-Bit - MAC OS (Intel and Power PC)
	64-Bit - MAC OS (Intel)
	32-Bit Android on Armv7
	64-Bit Android on Armv8
	64-Bit iOS
Merge DICOM Toolkit - .NET/C# Toolkit V5.10.0	32-Bit Windows
	64-Bit Windows
Merge DICOM Toolkit - Java Toolkit V5.10.0	Windows, Solaris, Linux, Android, Mac OS X

This release includes the following:

- **“Enhancements” on page 6**
- **“Fixed Issues” on page 9**
- **“Known Issues” on page 11**

Chapter 2 Enhancements

NOTE: Supplements and change proposals apply to all toolkits.

This release adds support for the following DICOM supplements:

Supplement	Title
175	Second Generation Radiotherapy - C-Arm Radiations
202	Real-Time Video

This release also contains updates to the DICOM standard. It addresses the following correction proposals (CP):

CP#	Issue
1551	Resolve discrepancy in Defined Terms for ParticipantObjectIDTypeCode in ATNA messages
1552	Resolve discrepancy in defined Value Constraint for ATNA message
1766	Extend Original Attributes Sequence
1770	Add more compression information to X-Ray Radiation Dose SR
1808	Update DICOM to reflect changes in IHTSDO SNOMED CT-DICOM Subset for JUL 2018 and JAN 2019 INT Release
1835	Use TID for Quantity Definition
1839	Incorrect Ophthalmic QC Reference tag
1841	Allow compressed RGB for WSI
1842	Referenced Frame Numbers used in Acquisition Context is limited by 16 bit VR
1843	JPEG-LS Planar Configuration constraints conflict with WSI, US, Enhanced Color MR and compressed RGB images
1844	Restore group length VR definition even though retired

CP#	Issue
1845	Add description and example for ROI distance measurements with coordinates
1846	Replace DCM code for circumscribed with SNOMED codes
1847	Restrict future VRs to only upper-case letters
1848	Add concepts for relative blood flow and volume with reference regions
1849	Brain tumor segmentation codes
1850	Change old RT-style SNOMED IDs to CT-style Concept IDs
1851	Add length of encapsulated document when not even
1853	Add "All Modalities" context group
1854	Change Visual Field Test Point Normals Sequence's Type from 1C to 2C
1855	Remove duplicate Irradiation Event UID codes
1856	Unique device identification consistency and de-identification
1857	Factor out algorithm identification common to multiple observations
1858	Allow single modifier for categorical observations in TID 1500
1859	Distinguish Middle from Median
1860	Content items for de-identification with Clean Structured Content Option
1864	Add Anatomic Region Sequence to RT Structure Set
1865	Concept Codes for use of UPS in RT Treatment Sessions
1874	Modality-specific Image Library Entry Descriptors should be mutually exclusive
1875	Two-Dimensional Measurement Graph in SR has no concept for data values
1876	TID 1501 should pass ImagePurpose and WavePurpose parameters to TID 300
1877	Prohibit Uncompressed Transfer Syntax With Very Large Pixel Data
1878	Add de-identification requirements for Attributes of RT Physician's Intent and RT Segment Annotation
1879	Retire Beam Dose Specification Point
1883	Retire DCM code for Digital Mammography and replace with LOINC code
1884	Procedure reported value set should be baseline not defined

In addition to updating the toolkit to reflect changes to the DICOM standard, this release also contains the following enhancements:

NOTE: Issue numbers can be used to request additional information from your account representative.

Issue	Description
COM-3765	Added support for compression/decompression of images with photometric interpretations of YBR_FULL and PALETTE COLOR. *This enhancement applies to all Merge DICOM Toolkits.*
COM-3766	The MCfile.TransferSyntaxUid property used to throw an exception if the transfer syntax attribute is not present in the file. This behavior has been changed to return null instead. *This enhancement applies to the Merge DICOM .NET Toolkit.*
COM-3789	Support was added for Unicode paths through environment variables for the toolkit configuration files. This means that for all the files used by the toolkit (configuration, log file, temporary files, etc.), Unicode paths can now be specified through environment variables. This also includes the pseudo-environment variable MC3INIDIR, which doesn't have to be set as it's resolved internally by the toolkit to the directory where the merge.ini file resides. *This enhancement applies to all Merge DICOM Toolkits.*

Chapter 3 Fixed Issues

The following table lists the issues that have been fixed in this release.

NOTE: Issue numbers can be used to request additional information from your account representative.

Issue	Description
COM-3724	Fixed issue where a Zlib error (MC_ZLIB_ERROR) would be raised on inflating a compressed data set if received from an MCstreamDataSource. *This update applies to the Merge DICOM .NET Toolkit.*
COM-3764	Fixed issue where the range of the ISO 2022 IR 87 encoder/decoder was missing the last 6 characters in the JIS X 0208 to Unicode mapping (characters 0x7421 to 0x7426). *This update applies to all Merge DICOM Toolkits.*
COM-3781	Fixed issue where the validation functions (MC_Validate_Attribute, MC_Validate_Message, MC_Validate_File) would incorrectly return MC_INVALID_VALUE_FOR_VR when MC_INVALID_LENGTH_FOR_VR would have been appropriate. Fixed similar issue where set value functions, upon performing value validation, would incorrectly return MC_INVALID_VALUE_FOR_VR when MC_INVALID_LENGTH_FOR_VR would have been appropriate. *This update applies to the Merge DICOM C/C++ Toolkit.*
COM-3860	Fixed issue where consecutive messages were sent to the same destination AE with the same message ID in multi-threading operation. *This update applies to all Merge DICOM Toolkits.*

Issue	Description
COM-3866	Fixed issue where the MCattribute.ValueLength property would return zero for pixel data in a message that has just been duplicated. This update applies to the Merge DICOM .NET Toolkits.
COM-3878	Fixed issue where the toolkit would crash on malformed P-DATA-PF PDU, e.g. a PDU where the PDV item length is set to a very large value such as 4,294,967,289 (0xfffffff9). This update applies to all Merge DICOM Toolkits.
COM-3903	Fixed issue where structured report classes were attempting to create MCitem objects based on hard-coded names that had been discontinued (such as TEMPLATE_IDENTIFICATION_MACRO and MEASURING_UNITS). This update applies to the Merge DICOM .NET and Java Toolkits.

Chapter 4 Known Issues

The following table lists an issue that has been identified but not fixed in this release.

NOTE: Issue numbers can be used to request additional information from your account representative.

Issue #	Description	Impact	Workaround
COM-3795	The toolkit issues warning about the value multiplicity being exceeded for SOP Instance UID attribute in matching list for C FIND RQ query.	The impact is low as the toolkit issues the warnings but then goes on and sets the multiple values anyway. This defect applies to the Merge DICOM .NET Toolkit.	Not relevant.
COM-3796	The toolkit allows setting FL, FD values using MC_Set_Value_From_String, but the built-in string to double conversion functions cause rounding errors on the right most decimal position.	The value being set being infinitesimally different from the one desired, it may cause comparison failures in user code. This defect applies to the Merge DICOM C/C++ toolkit.	A straightforward workaround is to use MC_Set_Value_From_Double or MC_Set_Value_From_Float functions instead.