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X-Scribe

DATA EXCHANGE INTERFACES

ADMINISTRATOR MANUAL

Manufactured by Mortara Instrument, Inc., Milwaukee, Wisconsin U.S.A.

CE

CAUTION: *Federal law restricts this device to sale by or on the order of a physician.*

Applies to X-Scribe V3.30 and HX-Gate V1.10

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d) Accident; a disaster affecting the Product/s;

e) Alterations and/or modifications to the Product/s not authorized by Mortara;

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USER SAFETY INFORMATION

Warning: Means there is the possibility of personal injury to you or others.

Caution: Means there is the possibility of damage to the device.

Note: Provides information to further assist in the use of the device.

Warning(s)

- Reference X-Scribe™ user manual for warnings relating to the stress exercise system.
- Possible malfunction risks could be associated when installing 3rd party software. Mortara Instrument, Inc. cannot verify the compatibility of all possible hardware/software combinations.
- Data exchange interfaces are used to exchange data with 3rd party ECG management systems. It is not possible to assure complete compatibility with all possible 3rd party ECG management systems and configurations. It is recommended to contact the 3rd party vendor to ensure device has been verified as compatible with a particular installation of their system.

Caution(s)

- Reference X-Scribe user manual for cautions relating to the stress exercise system.

Note(s)

- Reference X-Scribe user manual for notes relating to the stress exercise system.

EQUIPMENT SYMBOLS

Symbol Delineation

Attention, consult accompanying documents

Do not dispose as unsorted municipal waste. Per European Union Directive 2002/96, requires separate handling for waste disposal according to national requirements

Indicates compliance to applicable European Union directives

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INTRODUCTION

SECTION 1

Purpose

The X-Scribe stress system offers several ways to exchange information with 3rd party ECG management systems. This manual covers the technical aspects of installing and configuring the various interface options.

- Stress report as PDF file
- Stress report as TIFF file
- Stress report statistics as Mortara XML file
- Stress report statistics as Alternate XML file
- Stress report statistics sent in HL7 message
- Stress report as PDF encapsulated in HL7 message
- Stress report as DICOM®-encapsulated PDF storage
- Stress orders as DICOM Modality Worklist (MWL) request
- Stress orders received in HL7 messages
- Stress orders receives as XML files
- Stress report DICOM storage commitment
- Stress study status reported as DICOM Modality Performed Procedure Step (MPPS)

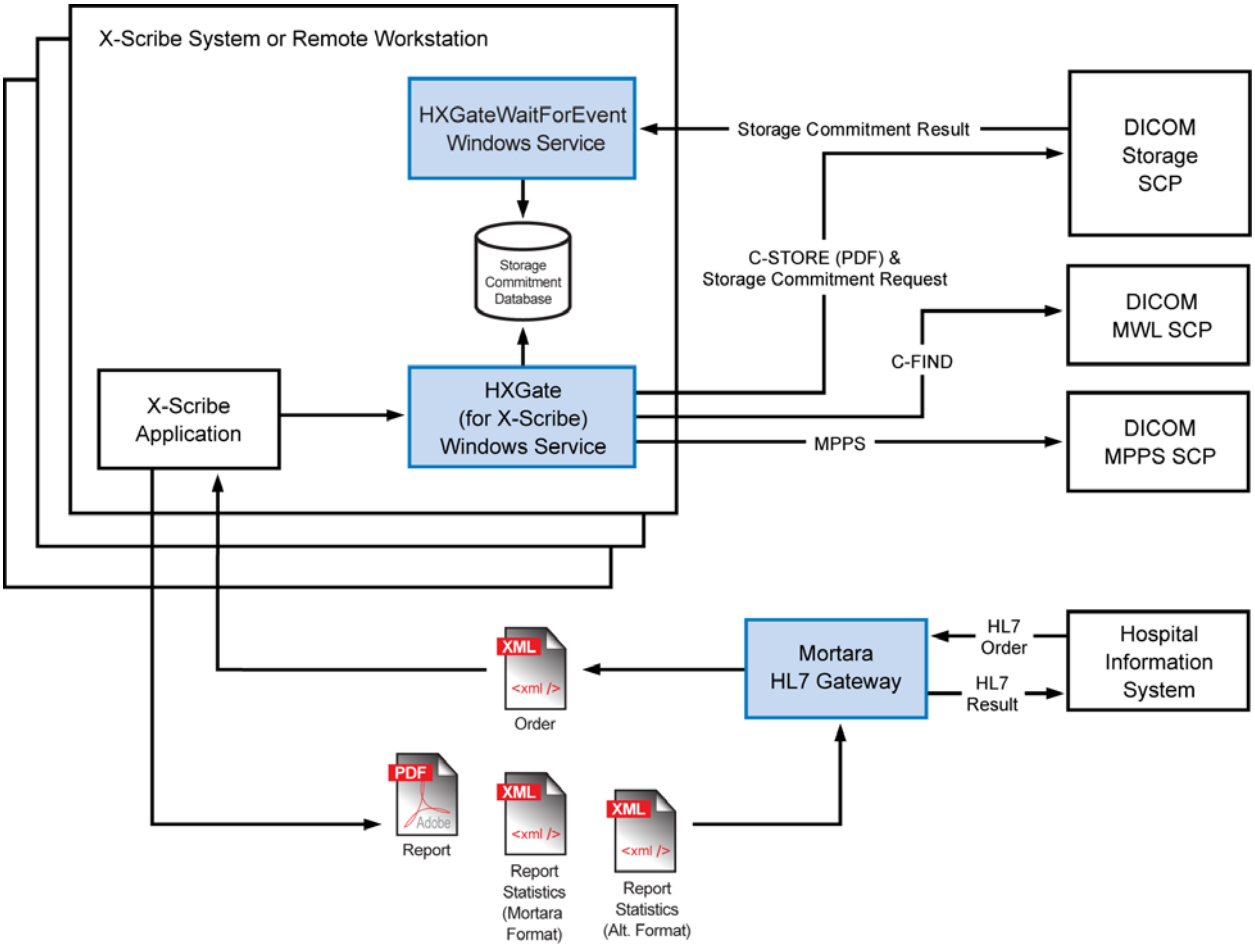
> ***NOTE**: This manual may contain screen shots. Any screen shots are provided for reference only and are not intended to convey actual operating techniques. Consult the actual screen in the host language for specific wording.*

Architecture

Figure 1-1 shows the overall architecture of the X-Scribe data exchange interfaces. X-Scribe can be configured to export PDF, TIFF, and XML files into folders monitored by other systems for import. The exported files can also be used by Mortara's HL7 Gateway for generating HL7 results messages. The Microsoft® Windows™ service "HXGate for X-Scribe" is used to generate DICOM messages; the Windows service "HXGateWaitForEvent" listens for confirmations from DICOM storage commitment requests.

The HL7 Gateway is centralized per enterprise and typically runs on its own server; however, the Windows' HXGate and HXGateWaitForEvent services are installed on each X-Scribe system.

Figure 1-1


X-Scribe System or Remote Workstation
HXGateWaitForEvent Windows Service
Storage Commitment Result
DICOM Storage SCP
Storage Commitment Database
C-STORE (PDF) & Storage Commitment Request
DICOM MWL SCP
C-FIND
X-Scribe Application
HXGate (for X-Scribe) Windows Service
MPPS
DICOM MPPS SCP
XML
<xml />
Order
Mortara HL7 Gateway
HL7 Order
HL7 Result
Hospital Information System
PDF
Adobe
Report
XML
<xml />
Report Statistics (Mortara Format)
XML
<xml />
Report Statistics (Alt. Format)

HL7

HL7 implementations vary widely between products, versions, and installations. As such, Mortara offers its HL7 Gateway which includes a commercial HL7 messaging broker that is configured for each installation. Mortara representatives work directly with the site's IT representatives to configure and test the interface.

The HL7 Gateway uses the Mortara XML files to generate results messages. These messages can include discrete data found in the XML file as well as the displayable PDF or TIFF report.

DICOM

HXGate is used to communicate with 3rd party systems that use the DICOM protocol. It supports Modality Worklist (MWL) queries, PDF storage, storage commitment, and Modality Performed Procedure Step (MPPS) status messages.

DICOM Storage Events

DICOM-encapsulated PDF messages are sent whenever a report is exported from the archive, or when the report is saved and "Export on Save" option is enabled. If Storage Commitment is enabled, a commitment request will be sent at the same time.

DICOM MPPS Events

Events in X-Scribe cause MPPS messages to be sent if MPPS is enabled in HXGate:

- An "In Progress" message is sent when a procedure is started. X-Scribe considers the procedure started when a new exam is selected and the "OK" button is clicked after entering the patient demographics.
- A "Discontinued" message is sent when a procedure is stopped before entering into the exercise phase. X-Scribe considers the procedure discontinued when the "Abort" button is clicked before "Start Exercise" is selected.
- A "Completed" message is sent when a procedure is completed. X-Scribe considers a procedure completed when the "End" button is clicked in the recovery phase.

CONFIGURATION OF INTERFACES

X-Scribe can export several kinds of files. The file types and locations are configured in the Miscellaneous tab of the User Profile Settings.

Option	Description
Export Directory	The full path where the files will be exported. The default is C:\XS2\REPORTS.
Request Directory	The full path where order XML files are placed. The default is C:\XS2\Requests.
Sub Directories	Check if exported files should be placed into a separate sub directory per test. The sub directories will have the following format: X<PatientID>[<ExamDate><ExamTime>]<FirstName>_<MI>_<LastName>.
Export On Save	Check if files should be automatically exported when the report is saved.
Export Formats	**Description**
PDF	Check if a PDF of the report should be exported.
Mortara XML	Check if Mortara XML should be exported.
Alternate XML	Check is Alternate XML should be exported.
TIFF	Check if a TIFF of the report should be exported.
HL7	Check if orders will be coming from an HL7 interface or from another external source of XML-format orders. If unchecked, the clinician can pre-enter demographics and orders using the X-Scribe interface.
DICOM	Check if a DICOM interface is being used.

Filenames

Configure filename formats in the "XS2.ini" file. The file is located in the folder "C:\Mortara Instrument Inc\XScribeII\System". Add a line specifying "`ExportFileNameFormat=`" in the `[Behavior]` section. An appropriate file extension will be added automatically, e.g., .xml or .pdf. **EXAMPLE**:

```
[Behavior]
ExportFileNameFormat=<PatientID>[<TestDateTime>]<PatientFirstName>_<PatientLastName>
```

The following variables can be used to specify the filename format:

Variable	Description
<PatientID>	Patient's ID.
<PatientLastName>	Patient's last name.
<PatientFirstName>	Patient's first name.
<PatientMiddleName>	Patient's middle name.
<PatientSex>	Patient's gender: M = male F = female U = Unknown
<TestDateTime>	Start date/time of the test in HL7 yyyyMMddHHmmss format.
<TestDate>	Start date of the recording in HL7 yyyyMMdd format.
<ReportDateTime>	The current (local) date/time when the report is exported, in HL7 yyyyMMddHHmmss format.
<ReportDate>	The current (local) date when the report is exported, in HL7 yyyyMMdd format.
<PatientDOB>	Patient's date of birth, in HL7 yyyyMMdd format.

X-Scribe will not replace incompatible characters used as part of the filename format. For example, if the Patient ID field is used and it contains a / (slash), the resulting filename will be incompatible with the Windows file system and the file export will fail.

X-Scribe overwrites files with the same name. If exported files will remain in the destination folder, verify the filename formats include variables to ensure each filename is unique. For example, use <TestDateTime> so multiple tests for the same patient are named uniquely. Or, if each revision (export) of the same test will be kept, use <ReportDateTime> so each revision is named uniquely.

XML Orders

When X-Scribe is configured for HL7 mode, orders in XML files can be dropped into its *Request Directory* from the Mortara HL7 Gateway, or from other systems that drop the XML files directly. The XML files must be in the format described in Appendix B. Filenames do not matter; however, filenames starting with the reserved words "Dicom" and "Request" will be ignored. File extensions must be .xml. Orders in the Request Directory can be seen when X-Scribe displays the Worklist.

X-Scribe will delete the corresponding XML file when the exam is completed. If the exam is aborted before entering the exercise phase, the XML file will remain in the directory. If an order is canceled before it is used, the corresponding XML file must be removed by the source system generating the XML files. The source system is also responsible for replacing XML files with updated versions whenever an order is updated (e.g., patient demographics change).

Configuration of HL7

HL7 implementations vary widely between products, versions, and installations. As such, Mortara offers its Mortara HL7 Gateway which includes a commercial HL7 messaging broker that is configured for each installation. Mortara representatives work directly with the site's IT representatives to configure and test the interface.

If HL7 order messages will be received, check the HL7 option in the Miscellaneous tab of the User Profile Settings.

Configuration of DICOM

HXGate is used to communicate with 3rd party systems that use the DICOM protocol. All DICOM communications settings and Modality Worklist (MWL) filters are configured by running HXConfig.exe. This configuration utility is found in the HXGate folder where the service was installed, typically at:

`C:\Mortara Instrument Inc\HXGate\HXConfig.exe`.

The left side of the configuration table shows settings for the four DICOM services: C-STORE, C-FIND/MWL, MPPS, and Storage Commitment. It is assumed that C-STORE and Storage Commitment SCPs share the same host and port.

Setting	Description
C-STORE	
Host	The network name or TCP/IP address of the Storage SCP server. This is the same SCP for Storage Commitment requests.
Port	The TCP/IP port number used by the Storage SCP.
AE Title	Application Entity Title of the Storage SCP.
Retry (days)	When the Storage SCP is unavailable, the number of days to continue trying to reach the Storage SCP before giving up.

Setting	Description
New Series Instance UID	Check if each version of a report should be stored in a new DICOM Series. If unchecked, each version is stored in the same Series.
MWL (Modality Worklist)	
Host	The network name or TCP/IP address of the MWL SCP server.
Port	The TCP/IP port number used by the MWL SCP.
AE Title	Application Entity Title of the MWL SCP.
MPPS (Modality Performed Procedure Step)	
Enable MPPS	Check to enable MPPS messages.
Host	The network name or TCP/IP address of the MPPS SCP server.
Port	The TCP/IP port number used by the MPPS SCP.
AE Title	Application Entity Title of the MPPS SCP.
Storage Commitment	
Enable Storage Commitment	Check to enable Storage Commitment messages. Messages will be sent to the C-STORE SCP after report is stored.
Receive Event Port	TCP/IP port where HXGateWaitForEvent Windows service listens for results messages.
Wait For Response (days)	Number of days to wait for a result message before giving up.

Station Settings		Description
SCU AE Title		The SCU AE Title used by HXGate in all DICOM transactions.
Institution Name	(0008,0080)	This is the name of the institution and/or department where the Holter exam was performed. This will be stored in the DICOM object.
Station Name	(0008,1010)	DICOM Station Name assigned to this X-Scribe system. This will be stored in the DICOM object.
Modality	(0008,0060)	Typically “ECG”.
Scheduled Station Name	(0040,0010)	
Scheduled Procedure Step Location	(0040,0011)	
Current Patient Location	(0038,0300)	
Requested Procedure Location	(0040,1005)	
Scheduled Procedure Step ID	(0040,0009)	
Requested Procedure ID	(0040,1001)	
Accession Number	(0008,0050)	
Scheduled Station AE Title	(0040,0002)	
User Tag		This can be used to define one additional DICOM tag for filtering the MWL.
User Tag Value		
Requested Procedure Description List	(0032,1060)	List of procedure descriptions accepted. These values are not sent to the MWL SCP for filtering, but are used by HXGate to filter the results from the MWL SCP.
Use Institution	(0008,0080)	When checked, the Institution Name will be used to filter the Modality Worklist query.

INSTALLATION

Installation of HXGate includes installation of the HXGate and HXGateWaitForEvent Windows services. This is necessary to support DICOM. HXGate must be installed on every X-Scribe stress system and Review Station when DICOM is used. If PDF and XML file export, or HL7 will be used without DICOM, HXGate is not necessary.

Install HXGate

1. Install X-Scribe first. If X-Scribe is not installed, do not install HXGate.
2. Insert the "HXGate for X-Scribe" installation CD.
3. If the installer does not automatically launch, use Windows Explorer to view the files on the CD and launch **HXGate (X-Scribe).msi**
4. Follow the prompts to complete the installation.
5. When possible, keep the default folder: C:\Mortara Instrument Inc\HXGate\
6. Reboot Windows after installation is complete.

In X-Scribe, check the DICOM box in the Miscellaneous tab under User Profiles in Settings.

Open Ports in Firewall

If the system where HXGate was installed has firewall software, it must be configured to allow connections to the computer on the TCP/IP port it listens on. The default port for HXGateWaitForEvent is 104, but it can be changed in the HXGate configuration dialog.

TROUBLESHOOTING

Log Files

HXGate creates a log file for each day of the month. Log files are kept for one month and are overwritten on the same day of the next month. The log files are saved in the "logfiles" folder where HXGate is installed, typically C:\Mortara Instrument Inc\HXGate\LogFiles. Examine the log files when troubleshooting communication problems.

HXGate uses a DICOM library from Merge and has its own log. Modify the file C:\Mortara Instrument Inc\HXGate\bin\Merge.ini to turn logging on. Remove the comment symbol, #, in front of the last lines of the file to turn on the various levels of logging. There are comments in the file to indicate what is logged at each level. Messages will be logged into the file C:\Mortara Instrument Inc\HXGate\bin\merge.log. When changes are made to the merge.ini file, the HXGate service must be restarted for the changes to take effect.

The Merge library uses an environment variable called MERGE_INI. If there is some question where Merge is looking for its ini and DLL files, check this variable. If it is not set, Merge will use a default search path (e.g., current working folder, system32, etc.).

DICOM Echo

A DICOM Echo should be performed whenever you need to test the connection to the DICOM SCPs. Open a cmd window, or use Windows Explorer and go to the HXGate installation folder (default is C:\Mortara Instrument Inc\HXGate). There are 3 BAT files starting with "Echo", one each for CSTORE, MPPS, and MWL. Execute the appropriate file. A command window will display the result of the DICOM Echo.

MORTARA STRESS REPORT XML

XSD file name: **XScribeOutput3_30.xsd**
File location: on the X-Scribe installation CD, in the **misc** folder.

***NOTE**: When ST levels are reported in millimeters, the gain is assumed to be 10 mm/mV.*

XML Description

XML Tag	Description
/StressTest	
./Manufacturer	Name of manufacturer of the system that produced the report. Always "Mortara Instrument, Inc."
./Version	Name and version of the system that produced the report.
./PDF_Path	Full path and filename of the exported report in PDF format.
./TIFF_Path	Full path and filename of the exported report in TIFF format.
/StressTest/PatientDemographics	
./LastName/Value	Patient's last name.
./LastName/Label	
./FirstName/Value	Patient's first name.
./FirstName/Label	
./MiddleName/Value	Patient's middle name.
./MiddleName/Label	
./ID/Value	Patient's primary medical record number.
./ID/Label	
./SecondaryID/Value	Patient's alternate ID. Site-specific use.
./SecondaryID/Label	
./DOB/Value	Patient's date of birth in format displayed to the user.
./DOB/Label	
./DobEx/Value	Patient's date of birth in XML format, yyyy-MM-dd.
./DobEx/Label	
./Age/Value	Patient's age at time of exam.
./Age/Units	Always **years**.
./Age/Label	
./TargetHR/Value	Target heart rate to be reached in this exam.
./TargetHR/Units	Always **BPM** (beats per minute).
./TargetHR/Label	
./Gender/Value	Patient's gender. Values can be: • **Male** • **Female** • **Unknown**
./Gender/Label	

XML Tag	Description
./Race/Value	Patient's race, free text or selected from the customizable pick list configured in **RaceList.txt**. Factory default choices in English are: • Caucasian • Afro American • Black • Asian • Hispanic • Indian • Other
./Race/Label	
./Height/Value	Patient's height at time of exam.
./Height/Units	• **in** = inches • **cm** = centimeters
./Height/Label	
./Weight/Value	Patient's weight at time of exam.
./Weight/Units	• **lbs** = pounds • **kg** = kilograms
./Weight/Label	
./Address/Value	Patient's home address. House number and street.
./Address/Label	
./City/Value	Patient's home city. Free text or selected from the customizable pick list configured in **CityList.txt**.
./City/Label	
./State/Value	Patient's home state.
./State/Label	
./PostalCode/Value	Patient's home postal (zip) code.
./PostalCode/Label	
./Country/Value	Patient's home country.
./Country/Label	
./HomePhone/Value	Patient's home phone number.
./HomePhone/Label	
./WorkPhone/Value	Patient's work phone number.
./WorkPhone/Label	
./ReferringPhysician/Value	Full name of referring physician. Free text or selected from the customizable pick list configured in **ReferringPhysicianList.txt.**
./ReferringPhyscian/Label	
./AttendingPhysician/Value	Full name of the attending physician. Free text or selected from the customizable pick list configured in **AttendingPhyList.txt.**
./AttendingPhysicianLabel	
./Smoker/Value	Values can be: • **Yes** • **No** • **Unknown**
./Smoker/Label	

XML Tag	Description
./Diabetic/Value	Values can be: • **Yes** • **No** • **Unknown**
./Diabetic/Label	
./HistoryOfMI/Value	Values can be: • **Yes** • **No** • **Unknown**
./HistoryOfMI/Label	
./FamilyHistory/Value	Values can be: • **Yes** • **No** • **Unknown**
./FamilyHistory/Label	
./PriorCABG/Value	Values can be: • **Yes** • **No** • **Unknown**
./PriorCABG/Label	
./PriorCath/Value	Values can be: • **Yes** • **No** • **Unknown**
./PriorCath/Label	
./Angina/Value	Values can be: • **Atypical** • **Typical** • **None**
./Angina/Label	
./Indications/Line	There is one Line per indication. Free text or selected from the customizable pick list configured in **IndicationsList.txt**.
./Indications/Label	
./Medications/Line	There is one Line per medication. Free text or selected from the customizable pick list configured in **MedicationsList.txt**.
./Medications/Label	
./Notes/Line	There is one Line per note. Free text or selected from the customizable pick list configured in **NotesList.txt**.
./Notes/Label	

XML Tag	Description
./MessageID/Value	Values carried over from the XML requests.
./MessageID/Label	
./OrderNumber/Value	
./OrderNumber/Label	
./BillingCode1/Value	
./BillingCode1/Label	
./BillingCode2/Value	
./BillingCode2/Label	
./BillingCode3/Value	
./BillingCode3/Label	
./ExpansionField1/Value	
./ExpansionField1/Label	
./ExpansionField2/Value	
./ExpansionField2/Label	
./ExpansionField3/Value	
./ExpansionField3/Label	
./ExpansionField4/Value	
./ExpansionField4/Label	
/StressTest/TestSummary	
./Institution/Value	From “Dept. Footer” setting on the Miscellaneous tab of the User Settings.
./Protocol/Value	Name of the stress protocol used. Factory defaults include: • BRUCE • Cycle • Modified Bruce • Balke • Ellestad • Naughton • Pharmacological • Low Ramp • Medium Ramp • High Ramp • Astrand • USAF/SAM 2.0 • USAF/SAM 3.3
./Protocol/Label	
./ExamDate/Value	Date of exam, in format displayed to user.
./ExamDateEx/Value	Date of exam, in XML format, yyyy-MM-dd.
./ExamTime/Value	Local time of day when exam began in hh:mm format.
./ExcerciseTime/Value	Total exercise time in h:mm:ss format.
./JPoint/Value	Milliseconds from J-point where ST level is measured.
./JPoint/Unit	Always **ms** (milliseconds).
./JPoint/Label	

XML Tag	Description
./LeadsWith100uV_ST/Value	One Value for every lead having at least 100 uV of ST elevation or depression. Values can be: • **I** • **II** • **III** • **aVR** • **aVL** • **aVF** • **V1** • **V2** • **V3** • **V4** • **V5** • **V6**
./PVCs/Value	Total number of PVCs detected during the exam.
./PVCs/Label	
./DukeScore/Value	Duke treadmill score when the Bruce exercise protocol is used. Ranges from approximately -57 to 21.
./DukeScore/Label	
./FAI/Value	Functional Aerobic Impairment score, expressed as a percentage. Two values are given separated by a / slash. The first value listed is for a person with a sedentary lifestyle (does not exercise at least once per week sufficient to perspire) and the second value is for an active person (exercises at least once per week sufficient to perspire).
./FAI/Label	
./MaxSpeed/Value	Maximum treadmill speed during exam. Expressed as a number with units (e.g., “5.0 MPH”).
./MaxSpeed/Units	• **MPH** = miles per hour • **km/h** = kilometers per hour
./MaxSpeed/Label	
./MaxGrade/Value	Maximum treadmill grade during exam. Expressed as a number with a percentage sign (e.g., “18.0%”).
./MaxGrade/Units	Always **%**.
./MaxGrade/Label	
./MaxPower/Value	Maximum ergometer power during exam. Expressed as a number.
./MaxPower/Units	Always **Watts**.
./MaxPower/Label	
./MaxMets/Value	Maximum METs (estimated metabolic equivalents) achieved during test.
./MaxMets/Label	
./MaxHR/Value	Maximum heart rate achieved during exam.
./MaxHR/Units	Always **BPM** (beats per minute).
./MaxHR/Label	
./MaxSBP/Value	Maximum systolic blood pressure during exam. Expressed as “systolic/diastolic” (e.g. “160/80”).
./MaxSBP/SBP	Systolic value.

XML Tag	Description
./MaxSBP/DBP	Diastolic value.
./MaxSBP/Time	Time of measurement, from beginning of the exercise phase. Expressed as h:mm:ss.
./MaxSBP/Units	Always **mm Hg** (millimeters of mercury).
./MaxSBP/Label	
./MaxDBP/Value	Maximum diastolic blood pressure during exam. Expressed as "systolic/diastolic" (e.g. "160/80").
./MaxDBP/SBP	Systolic value.
./MaxDBP/DBP	Diastolic value.
./MaxDBP/Time	Time of measurement, from beginning of the exercise phase. Expressed as h:mm:ss.
./MaxDBP/Units	Always **mm Hg** (millimeters of mercury).
./MaxDBP/Label	
./MaxDoubleProduct/Value	Maximum double product (systolic BP * HR) achieved during exam.
./MaxDoubleProduct/Label	
./MaxPercentTargetHR/Value	Maximum percentage of target heart rate achieved during exam.
./MaxPercentTargetHR/Unit	Always **%**.
./MaxPercentTargetHR/Label	
./MaxST_Elevation/Value	ST level of leading having the most elevation during exam.
./MaxST_Elevation/Units	• **mm** = millimeters • **uV** = microvolts
./MaxST_Elevation/Lead	Lead having the most ST elevation during the exam.
./MaxST_Elevation/Time	Time elapsed from the beginning of the exam when the maximum ST elevation was measured. Expressed in h:mm:ss format.
./MaxST_Elevation/Label	
./MaxST_Depression/Value	ST level of lead having the most depression during the exam.
./MaxST_Depression/Units	• **mm** = millimeters • **uV** = microvolts
./MaxST_Depression/Lead	Lead having the most ST depression during the exam.
./MaxST_Depression/Time	Time elapsed from the beginning of the exam when the maximum ST depression was measured. Expressed in h:mm:ss format.
./MaxST_Depression/Label	
./MaxST_ElevationChange/Value	The amount of change measured in lead having the most positive ST change during the exam.
./MaxST_ElevationChange/Units	• **mm** = millimeters • **uV** = microvolts
./MaxST_ElevationChange/Lead	Lead having the most positive ST change during the exam.
./MaxST_ElevationChange/Time	Time elapsed from the beginning of the exam when the most positive ST change was measured. Expressed in h:mm:ss format.
./MaxST_ElevationChange/Label	
./MaxST_DepressionChange/Value	The amount of change measured in lead having the most negative ST change during the exam.

XML Tag	Description
./MaxST_DepressionChange/Unit	• **mm** = millimeters • **uV** = microvolts
./MaxST_DepressionChange/Lead	Lead having the most negative ST change during the exam.
./MaxST_DepressionChange/Time	Time elapsed from the beginning of the exam when the most negative ST change was measured. Expressed in h:mm:ss format.
./MaxST_DepressionChange/Label	
./MaxSTHR_Index/Value	The maximum ST/HR index measured during the exam.
./MaxSTHR_Index/Label	
./ReasonsForEnd/Label	
./ReasonsForEnd/Line	One Line per reason. Free text or selected from the customizable pick list configured in **ReasonsForEndList.txt**. Factory default list is: • T1 Target HR • T2 Planned Submax • T3 Chest Pain • T4 Ischemic ECG • T5 Fatigue • T6 Arm Pain • T7 Neck Pain • T8 MD Discretion • T9 Dyspnea Maximum heart rate obtained • T10 Nausea/Headache • T11 Dizziness • T12 Hypotension • T13 Vent Arrhythmia • T14 Atrial Arrhythmia • T15 Claudication • T16 Poor Motivation • T17 Syncope • T18 Completion of Infusion • T19 Completion of Protocol • T20 Other
./Symptoms/Label	
./Symptoms/Line	One Line per symptom. Free text or selected from the customizable pick list configured in **SymptomsList.txt**.
./Conclusions/Label	
./Conclusions/Line	One Line per line of conclusion block. Free text, template, or selected from the customizable acronym list configured in **ConclusionsList.txt**. Factory default list is: • myo ECG finding suggestive of myocardial ischemia • C1 No ST Changes • C2 Min Depr ST (0.5-0.9 mm) • C3 Mod ST Depr (1.0-1.9 mm) • C4 Marked Depr ST (=>2.0 mm) • C5 ST Elevation During Exercise • C6 Non-Diagnostice TW Abn • C7 Cond Defects Appeared • C8 RBBB Appeared • C9 Inadequate BP Resp (<30)

XML Tag	Description
	• C10 Hypertensive BP Response • C11 Inadequate HR c/w Betablocker • C12 Inadequate HR c/w Low level Exercise • C13 Normal Stress Test • C14 Abnormal Stress Test • C15 No Evidence of Ischemia • C16 Chest Pain did not Occur • C17 Atypical Chest Pain • C18 Typical Angina Occured • C19 Exertional Hypotension • C20 Inappropriate Dyspnea • C21 ECG & Sx Typical of CAD • C22 ECG typical of CAD • C23 Sx Typical of CAD • C24 ECG and Sx Suggest CAD • C25 ECG Suggests CAD • C26 Sx Suggest CAD • C27 Markedly abnormal test c/w Extensive CAD • C28 Equivocal Study • C29 Nondiagnostic Test, Inadequate HR Response • C30 Nondiagnostic test, Pt unable to complete • C31 Nondiagnostic Test, Baseline ST depression • C32 Nondiagnostic Test, Conduction Abnormality • C33 Nondiagnostic, Technically Inadequate • C34 Baseline St Abnormality increased during Stress • C35 Baseline ST abnormality unchanged during Stress • C36 Report of Radionuclide study attached • C37 Test within normal limits
./Technician/Value	Name of technician performing the stress exam. Free text or selected from the customizable pick list configured in **TechnicianList.txt**.
./Technician/Label	
./ReviewingPhysician/Value	Full name of physician reviewing and finalizing the stress report. Free text or selected from the customizable pick list configured in **AttendingPhyList.txt**.
./ReviewingPhysician/Label	
/StressTest/SummaryTable	
/StressTest/SummaryTable/StageSummaryLine	One StageSummaryLine per stage. One per line of STAGE SUMMARY section of the stress report. Each line reports values at the **end** of that stage.
./Stage/Value	Name of stage. Values can be: • **M-LIKAR** = Mason-Likar event during pre-exercise • **STANDING** = Standing event during pre-exercise • **HYPERV** = Hyperventilation event during pre-exercise • **SUPINE** = Supine event during pre-exercise • **START EXE** = end of pre-exercise phase • **STAGE 1** = end of stage 1 • **STAGE 2** =end of stage 2 • **STAGE *n*** = end of stage n, where n is the stage number • **PEAK EXE** = time and values of peak exercise before entering the recovery phase

XML Tag	Description
	• **RECOVERY** = end of 1 minute of recovery. There can be multiple RECOVERY stages, one per minute. • **END REC** = end of recovery
./StageTime/Value	Time when stage ended, expressed as time elapsed from beginning of exercise or recovery phase. Format is: • **PRE-X** = pre exercise stage • **EXE h:mm:ss** = exercise stage • **REC h:mm:ss** = recovery stage
./Speed/Value	Treadmill speed at end of stage.
./Speed/Unit	• **MPH** = miles per hour • **km/h** = kilometers per hour
./Power/Value	Ergometer workload at end of stage.
./Power/Unit	Always **Watts**.
./Grade/Value	Treadmill grade at end of stage.
./Grade/Unit	Always **%**.
./HR/Value	Heart rate at end of stage.
./HR/Unit	Always **BPM** (beats per minute).
./SystolicBP/Value	Last measured systolic blood pressure in stage.
./SystolicBP/Unit	Always **mm Hg** (millimeters of mercury).
./DiastolicBP/Value	Last measured diastolic blood pressure in stage.
./DiastolicBP/Unit	Always **mm Hg** (millimeters of mercury).
./METS/Value	METs (estimated metabolic equivalents) at end of stage.
./DoubleProduct/Value	Double product (systolic BP * HR) at end of stage.
./ST_Level/Lead_I/Value	ST level at end of stage.
./ST_Level/Lead_I/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_II/Value	ST level at end of stage.
./ST_Level/Lead_II/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_III/Value	ST level at end of stage.
./ST_Level/Lead_III/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_aVR/Value	ST level at end of stage.
./ST_Level/Lead_aVR/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_-aVR/Value	ST level at end of stage.
./ST_Level/Lead_-aVR/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_aVL/Value	ST level at end of stage.
./ST_Level/Lead_aVL/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_aVF/Value	ST level at end of stage.
./ST_Level/Lead_aVF/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_V1/Value	ST level at end of stage.

XML Tag	Description
./ST_Level/Lead_V1/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_V2/Value	ST level at end of stage.
./ST_Level/Lead_V2/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_V3/Value	ST level at end of stage.
./ST_Level/Lead_V3/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_V4/Value	ST level at end of stage.
./ST_Level/Lead_V4/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_V5/Value	ST level at end of stage.
./ST_Level/Lead_V5/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Level/Lead_V6/Value	ST level at end of stage.
./ST_Level/Lead_V6/Unit	• **mm** = millimeters • **uV** = microvolts
./ST_Slope/Lead_I/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_I/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_II/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_II/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_III/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_III/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_aVR/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_aVR/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_-aVR/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_-aVR/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_aVL/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_aVL/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_aVF/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_aVF/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_V1/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_V1/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_V2/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_V2/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_V3/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_V3/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_V4/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_V4/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_V5/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_V5/Unit	Always **mV/s** (millivolts per second).
./ST_ Slope/Lead_V6/Value	Slope of waveform at ST measurement point.
./ST_ Slope/Lead_V6/Unit	Always **mV/s** (millivolts per second).

XML Tag	Description
/StressTest/SummaryTable/MinuteSummaryLine	The XML structure of the MinuteSummaryLine is the same as StageSummaryLine described above except for the tags described below. Each MinuteSummaryLine describes the state of the patient at the end of each minute and at manually created events and recorded RPEs.
./Stage/Value	Blank for automatically-created minute lines. Contains the name of the event for manually-created events. If the event is "Shortness of Breath", X-Scribe exports "Short of Breath". For other events, it exports the first 16 characters of the event name. When an RPE is recorded, this is **RPEn**, where **n** is the value on the configured scale of 0-10 or 6-20.

STRESS REQUEST (ORDER) XML

APPENDIX B

XSD file name: **XScribeInput3_30.xsd**.
File location: on the X-Scribe installation CD, in the **misc** folder.

Stress Request (Order) XML Description

XML Tag	Description
/StressRequest	
./Manufacturer	Leave blank.
./Version	Leave blank.
/StressRequest/PatientDemographics	
./LastName/Value	Patient's last name.
./LastName/Label	Leave blank.
./FirstName/Value	Patient's first name.
./FirstName/Label	Leave blank.
./MiddleName/Value	Patient's middle name.
./MiddleName/Label	Leave blank.
./ID/Value	Patient's primary medical record number.
./ID/Label	Leave blank.
./SecondaryID/Value	Patient's alternate ID. Site-specific use.
./SecondaryID/Label	Leave blank.
./DobEx/Value	Patient's date of birth in XML format, **yyyy-MM-dd**.
./DobEx/Label	Leave blank.
./Age/Value	Patient's age in years, if DOB is unknown. If DOB is known, age will be calculated at the time of the exam.
./Age/Units	Leave blank.
./Age/Label	Leave blank.
./MaxHR/Value	Leave blank. Calculated by X-Scribe.
./MaxHR/Label	Leave blank.
./TargetHR/Value	Leave blank. Calculated by X-Scribe.
./TargetHR/Label	Leave blank.
./TargetWatts/Value	Target workload for tests with the ergometer.
./TargetWatts/Label	Leave blank.
./Gender/Value	Patient's gender. Values can be: • **Male** • **Female** • **Unknown**
./Gender/Label	Leave blank.
./Race/Value	Patient's race. Free text. Factory defaults in English are: • Caucasian • Afro American • Black • Asian • Hispanic • Indian • Other
./Race/Label	Leave blank.
./Height/Value	Patient's height.

XML Tag	Description
./Height/Units	• **in** = inches • **cm** = centimeters
./Height/Label	Leave blank.
./Weight/Value	Patient's weight.
./Weight/Units	• **lbs** = pounds • **kg** = kilograms
./Weight/Label	Leave blank.
./Address/Value	Patient's home address. House number and street.
./Address/Label	Leave blank.
./City/Value	Patient's home city.
./City/Label	Leave blank.
./State/Value	Patient's home state.
./State/Label	Leave blank.
./PostalCode/Value	Patient's home postal (zip) code.
./PostalCode/Label	Leave blank.
./Country/Value	Patient's home country.
./Country/Label	Leave blank.
./HomePhone/Value	Patient's home phone number.
./HomePhone/Label	Leave blank.
./WorkPhone/Value	Patient's work phone number.
./WorkPhone/Label	Leave blank.
./ReferringPhysician/Value	Full name of referring physician. Free text.
./ReferringPhyscian/Label	Leave blank.
./AttendingPhysician/Value	Full name of the attending physician. Free text.
./AttendingPhysicianLabel	Leave blank.
./Smoker/Value	Values can be: • **Yes** • **No** • **Unknown**
./Smoker/Label	Leave blank.
./Diabetic/Value	Values can be: • **Yes** • **No** • **Unknown**
./Diabetic/Label	Leave blank.
./HistoryOfMI/Value	Values can be: • **Yes** • **No** • **Unknown**
./HistoryOfMI/Label	Leave blank.
./FamilyHistory/Value	Values can be: • **Yes** • **No** • **Unknown**
./FamilyHistory/Label	Leave blank.

XML Tag	Description
./PriorCABG/Value	Values can be: • **Yes** • **No** • **Unknown**
./PriorCABG/Label	Leave blank.
./PriorCath/Value	Values can be: • **Yes** • **No** • **Unknown**
./PriorCath/Label	Leave blank.
./Angina/Value	Values can be: • **Atypical** • **Typical** • **None**
./Angina/Label	Leave blank.
./Indications/Line	There is one Line per indication. Lines are free text.
./Indications/Label	Leave blank.
./Medications/Line	There is one Line per medication. Lines are free text.
./Medications/Label	Leave blank.
./Notes/Line	There is one Line per note. Lines are free text.
./Notes/Label	Leave blank.
./MessageID/Value	Values can be used to carry information from the stress order to the stress results. None of the values are displayed to the user on the screen or on the report.
./MessageID/Label	
./OrderNumber/Value	
./OrderNumber/Label	
./BillingCode1/Value	
./BillingCode1/Label	
./BillingCode2/Value	
./BillingCode2/Label	
./BillingCode3/Value	
./BillingCode3/Label	
./ExpansionField1/Value	
./ExpansionField1/Label	
./ExpansionField2/Value	
./ExpansionField2/Label	
./ExpansionField3/Value	
./ExpansionField3/Label	
./ExpansionField4/Value	
./ExpansionField4/Label	

ALTERNATE 1 XML

XSD file name: (not available)
File location: (not available)

***NOTE**: When ST levels are reported in millimeters, the gain is assumed to be 10 mm/mV.*

Alternate 1 XML Description

XML Tag	Description
/Q-Stress_Final_Report	
@UNC	Full path and filename of report in PDF format.
./message_id	
./expansion_field1	
./expansion_field2	
./expansion_field3	
./expansion_field4	
./order_number	
./billing_codes/billing_code	
./machine_id	
./software_version	Product name and version.
/Q-Stress_Final_Report/Summary	
./EvIDProductName	Always **X-Scribe**.
./EvIDStudyKey	
./EvIDPatientLastName	Patient's last name.
./EvIDPatientFirstName	Patient's first name.
./EvIDPatientMiddleName	Patient's middle name.
./EvIDPatientMRN	Patient's primary medical record number.
./EvIDPatientAccount	
./EvIDPatientSSN	
./EvIDStudyAcqDateISO	Study start date, formatted as **yyyy-MM-dd**.
./EvIDStudyAcqTimeISO	Local study start time, formatted as **HH:mm:ss**.
./EvIDStudyDepartment	
./EvIDStudyInstitutionID	
./EvIDStudyInstitution	From "Dept. Footer" setting on the Miscellaneous tab of the User Settings.
./EvIDStudyInstitutionAddress1	
./EvIDStudyInstitutionAddress2	
./EvIDStudyInstitutionCity	
./EvIDStudyInstitutionState	
./EvIDStudyInstitutionZipCode	
./EvIDStudyInstitutionZipCountry	
./EvIDStudySite	
./EvIDStudyAttendingPhysicianEntry	Full name of attending physician.
./EvIDStudyReferringPhysicianEntry	Full name of referring physician.
./EvIDStudyTechnicianEntry	Name of technician.
./EvIDPatientDOBISO	Patient's date of birth, formatted as **yyyy-MM-dd**.

XML Tag	Description
./EvIDPatientAge	Patient's age in years at time of exam.
./EvIDAgeUnit	Always **Years**.
./EvIDPatientGender	Patient's gender. Values can be: • **Male** • **Female** • **Unknown**
./EvIDPatientHeightValue	Patient's height.
./EvIDPatientHeightUnit	Height units. Values can be: • **in** = inches • **cm** = kilograms
./EvIDPatientWeightValue	Patient's weight.
./EvIDPatientWeightUnit	Weight units. Values can be: • **lb** = pounds • **kg** = kilograms
./EvIDPatientAddress1	Patient's home street address.
./EvIDPatientAddress2	
./EvIDPatientCity	Patient's home city.
./EvIDPatientState	Patient's home state.
./EvIDPatientZipCode	Patient's home zip code.
./EvIDPatientCountry	Patient's home country.
./EvIDPatientAddress1Mailing	
./EvIDPatientAddress2Mailing	
./EvIDPatientCityMailing	
./EvIDPatientStateMailing	
./EvIDPatientZipCodeMailing	
./EvIDPatientCountryMailing	
./EvIDPatientAddress1Office	
./EvIDPatientAddress2Office	
./EvIDPatientCityOffice	
./EvIDPatientStateOffice	
./EvIDPatientZipCodeOffice	
./EvIDPatientCountryOffice	
./EvIDPatientPhone	Patient's home phone number.
./EvIDPatientPhoneWork	Patient's work phone number.
./EvIDPatientMedicationEntry	Names of medications. One Entry per medication.
./EvIDFinalRestingHR	Heart rate at end of pre-exercise phase.
./EvIDFinalRestingSysBP	Last measured systolic blood pressure during pre-exercise phase.
./EvIDFinalRestingDiaBP	Last measured diastolic blood pressure during pre-exercise phase.
./EvIDStudyTargetRate	Patient's target heart rate for the exam.
./EvIDStudyMaxPredictedRate	Patient's target heart rate for the exam.
./EvIDFinalPercentMaxHR	Percentage of target heart rate achieved.
./EvIDFinalMaxHR	Maximum heart rate achieved.
./EvIDFinalMaxSysBP	Blood pressure having maximum systolic value, expressed as systolic/diastolic. E.g. "200/110".

XML Tag	Description
./EvIDFinalMaxDiaBP	Blood pressure having maximum diastolic value, expressed as systolic/diastolic. E.g. “180/120”.
./EvIDFinalMaxBPStage	
./EvIDProtocol	Name of the stress protocol used. Factory defaults include: • BRUCE • Cycle • Modified Bruce • Balke • Ellestad • Naughton • Pharmacological • Low Ramp • Medium Ramp • High Ramp • Astrand • USAF/SAM 2.0 • USAF/SAM 3.3
./EvIDExerciseDevice	Type of exercise device used. Values can be: • **Treadmill** • **Ergometer**
./EvIDMaxHRxBP	Maximum double product (systolic BP * HR) achieved.
./EvIDFinalOverallWCSlopeValue	
./EvIDFinalOverallWCSlopeLead	
./EvIDFinalOverallWCLevelValue	Worst case ST level (elevation or depression), expressed in millimeters.
./EvIDFinalOverallWCLevelLead	Lead having the worst ST level.
./EvIDFinalTotalExerciseTime	Total exercise time, in **h:mm:ss** format.
./EvIDFinalMETsAchieved	Maximum METs achieved.
./EvIDLastProtocolStageAchieved	Number of last exercise stage achieved.
./EvIDReasonForTest	Reasons for performing the test. Multiple reasons are separated by spaces.
./EvIDReasonForEndingTest	Reasons for ending the test. Multiple reasons are separated by spaces.
./EvIDTestObservation	Symptoms. Multiple symptoms are separated by spaces.
./EvIDTestConclusion	Test conclusions.
./EvIDExerDevWkldLable	
./EvIDPatientDiagnosisEntry	Diagnosis. One Entry per diagnosis.
./EvIDPatientProcedureEntry	Clinical procedure. One Entry per procedure.
./EvIDPatientRestingECGEntry	
/Q-Stress_Final_Report/Tabular	
/Q-Stress_Final_Report/Tabular/Stage	
@id	Stage. Values can be: • **REST** = pre-exercise • **n** = exercise stage *n*, where n is the stage number, starting at 1. • **RECOVERY** = recovery
@stage_time	Time from beginning of exam, in **h:mm:ss** format.

XML Tag	Description
./EvIDComment	Name of event. Values can be: • Supine • Standing • Chest Pain • Mason-Likar • Shortness of Breath • (free text)
./EvIDExTotalStageTime	Total time in stage, in **h:mm:ss** format.
./EvIDLogCurrentHR	Heart rate at end of stage.
./EvIDLogCurrentER	
./EvIDLogCurrentBP	Last measured blood pressure in stage, in **S/D** format. S = systolic, D = diastolic.
./EvIDLogHRxBP	Last measured double product (systolic BP * HR) in stage.
./EvIDExTreadmillSpeed	Treadmill speed at end of stage.
@unit	Units of treadmill speed. Values can be: • **mph** = miles per hour • **km/h** = kilometers per hour
./EvIDExTreadmillGrade	Treadmill grade at end of stage.
@unit	Always **%**.
./EvIDSTLevel	ST level at end of stage, in millimeters.
@lead	Lead. Values can be: • **I** • **II** • **III** • **aVR** • **aVL** • **aVF** • **V1** • **V2** • **V3** • **V4** • **V5** • **V6**
./EvIDSTSlope	ST slope at end of stage, in mV/s.
@lead	Lead. Values can be: • **I** • **II** • **III** • **aVR** • **aVL** • **aVF** • **V1** • **V2** • **V3** • **V4** • **V5** • **V6**

DICOM ERROR MESSAGES

APPENDIX D

Below lists possible error codes returned from the DICOM library used by HX-Gate.

DICOM Error Codes

1. MC_NORMAL_COMPLETION
4000. MC_ALREADY_REGISTERED
4001. MC_ASSOCIATION_ABORTED
4002. MC_ASSOCIATION_CLOSED
4003. MC_ASSOCIATION_REJECTED
4004. MC_ATTRIBUTE_HAS_VALUES
4005. MC_BUFFER_TOO_SMALL
4006. MC_CALLBACK_CANNOT_COMPLY
4007. MC_CALLBACK_DATA_SIZE_NEGATIVE
4008. MC_CALLBACK_DATA_SIZE_UNEVEN
4009. MC_CALLBACK_PARM_ERROR
4010. MC_CALLBACK_REGISTERED
4011. MC_CANNOT_COMPLY
4012. MC_CANT_ACCESS_PROFILE
4013. MC_CONFIG_INFO_ERROR
4014. MC_CONFIG_INFO_MISSING
4015. MC_DDFILE_ERROR
4016. MC_DOES_NOT_VALIDATE
4017. MC_EMPTY_VALUE
4018. MC_END_OF_DATA
4019. MC_EXT_INFO_UNAVAILABLE
4020. MC_FOUND
4021. MC_FUNCTION_UNAVAILABLE
4022. MC_INCOMPATIBLE_VR
4023. MC_INCOMPATIBLE_VALUE
4024. MC_INVALID_APPLICATION_ID
4025. MC_INVALID_APPLICATION_TITLE
4026. MC_INVALID_ASSOC_ID
4027. MC_INVALID_CHARS_IN_VALUE
4028. MC_INVALID_COMMAND
4029. MC_INVALID_DATA_TYPE
4030. MC_END_OF_LIST
4031. MC_INVALID_GROUP
4032. MC_INVALID_HOST_NAME
4033. MC_INVALID_ITEM_ID
4034. MC_INVALID_LENGTH_FOR_TITLE
4035. MC_INVALID_LENGTH_FOR_VR
4036. MC_INVALID_LICENSE
4037. MC_INVALID_MESSAG_ID
4038. MC_INVALID_MESSAGE_RECEIVED
4039. MC_INVALID_PARAMETER_NAME
4040. MC_INVALID_PORT_NUMBER
4041. MC_INVALID_PRIVATE_CODE
4042. MC_INVALID_SERVICE_LIST_NAME
4043. MC_INVALID_TAG
4044. MC_INVALID_TRANSFER_SYNTAX
4045. MC_INVALID_VALUE_FOR_VR
4046. MC_INVALID_VALUE_NUMBER
4047. MC_INVALID_VR_CODE

4048. MC_LOG_EMPTY
4049. MC_MESSAGE_EMPTY
4050. MC_MESSAGE_VALIDATES
4051. MC_MISSING_CONFIG_PARM
4052. MC_MSGFILE_ERROR
4053. MC_MUST_BE_POSITIVE
4054. MC_NETWORK_SHUT_DOWN
4055. MC_NO_APPLICATIONS_REGISTERED
4056. MC_NO_CALLBACK
4057. MC_NO_CONDITION_FUNCTION
4058. MC_NO_FILE_SYSTEM
4059. MC_NO_INFO_REGISTERED
4060. MC_NO_LICENSE
4061. MC_NO_MERGE_INI
4062. MC_NO_MORE_ATTRIBUTES
4063. MC_NO_MORE_VALUES
4064. MC_NO_PROFILE
4065. MC_NO_REQUEST_PENDING
4066. MC_NON_SERVICE_ATTRIBUTE
4067. MC_NOT_FOUND
4068. MC_NOT_ONE_OF_ENUMERATED_VALUES
4069. MC_NOT_ONE_OF_DEFINED_TERMS
4070. MC_NULL_POINTER_PARM
4071. MC_NULL_VALUE
4072. MC_PROTOCOL_ERROR
4073. MC_REQUIRED_ATTRIBUTE_MISSING
4074. MC_REQUIRED_DATASET_MISSING
4075. MC_REQUIRED_VALUE_MISSING
4076. MC_STATE_VIOLATION
4077. MC_SYSTEM_CALL_INTERRUPTED
4078. MC_SYSTEM_ERROR
4079. MC_TAG_ALREADY_EXISTS
4080. MC_TEMP_FILE_ERROR
4081. MC_TIMEOUT
4082. MC_TOO_FEW_VALUES
4083. MC_TOO_MANY_BLOCKS
4084. MC_TOO_MANY_VALUES
4085. MC_UNABLE_TO_CHECK_CONDITION
4086. MC_UNACCEPTABLE_SERVICE
4087. MC_UNEXPECTED_EOD
4088. MC_UNKNOWN_ITEM
4089. MC_UNKNOWN_SERVICE
4090. MC_VALUE_MAY_NOT_BE_NULL
4091. MC_VALUE_NOT_ALLOWED
4092. MC_VALUE_OUT_OF_RANGE
4093. MC_VALUE_TOO_LARGE
4094. MC_VR_ALREADY_VALID
4095. MC_LIBRARY_ALREADY_INITIALIZED
4096. MC_LIBRARY_NOT_INITIALIZED
4097. MC_INVALID_DIRECTORY_RECORD_OFFSET
4098. MC_INVALID_FILE_ID
4099. MC_INVALID_DICOMDIR_ID

4100. MC_INVALID_ENTITY_ID
4101. MC_INVALID_MRDR_ID
4102. MC_UNABLE_TO_GET_ITEM_ID
4103. MC_INVALID_PAD
4104. MC_ENTITY_ALREADY_EXISTS
4105. MC_INVALID_LOWER_DIR_RECORD
4106. MC_BAD_DIR_RECORD_TYPE
4107. MC_UNKNOWN_HOST_CONNECTED
4108. MC_INACTIVITY_TIMEOUT
4109. MC_INVALID_SOP_CLASS_UID
4110. MC_INVALID_VERSION
4111. MC_OUT_OF_ORDER_TAG
4112. MC_CONNECTION_FAILED
4113. MC_UNKNOWN_HOST_NAME
4114. MC_INVALID_FILE
4115. MC_NEGOTIATION_ABORTED
4116. MC_INVALID_SR_ID
4117. MC_UNABLE_TO_GET_SR_ID
4118. MC_DUPLICATE_NAME
4119. MC_DUPLICATE_SYNTAX
4120. MC_EMPTY_LIST
4121. MC_MISSING_NAME
4122. MC_INVALID_SERVICE_NAME
4123. MC_SERVICE_IN_USE
4124. MC_INVALID_SYNTAX_NAME
4125. MC_SYNTAX_IN_USE
4126. MC_NO_CONTEXT
4127. MC_OFFSET_TABLE_TOO_SHORT
4128. MC_MISSING_DELIMITER
4129. MC_COMPRESSION_FAILURE
4130. MC_END_OF_FRAME
4131. MC_MUST_CONTINUE_BEFORE_READING
4132. MC_COMPRESSOR_REQUIRED
4133. MC_DECOMPRESSOR_REQUIRED
4134. MC_DATA_AVAILABLE
4135. MC_ZLIB_ERROR
4136. MC_NOT_META_SOP
4137. MC_INVALID_ITEM_TRANSFER_SYNTAX
4138. MC_LICENSE_ERROR