RELEASEnotes eDAQ XR

May 2018
Version 2.2.7

Thank you for choosing HBM for your test, analysis and measurement task. This document shows the released product package of eDAQXR. Please always check whether an updated version is available at: http://www.hbm.com. Please note that the firmware has been optimized. We recommend installing the latest firmware on all existing modules.

What's new?

Modules / Firmware
- **Firmware**
  - eDAQXR Firmware Version 2.2.7
  - MX Module Firmware Version 4.10.4.0
    - Included in eDAQXR firmware to update from the Web Interface.
- **New Module Support**
  - None

Software Tools / Libraries
- **Software Updates**
  - eDAQXR Emulator v2.2.0

Documentation
- **New Documentation**
  - None
- **Updated Documentation**
  - eDAQXR User Manual   Version 3.0

Accessories
- **New Accessories**
  - None
- **Updated Accessories**
  - None

A complete listing of all supported modules, accessories, and documentation of the eDAQXR line is available at the end of these release notes.

Notes about the eDAQXR firmware v2.2.1

- **Bugs Fixed / Issues Resolved**

    - **Classic data rate domain nominal vs. actual sample rate issue.**
        - This issue affected sequential CX23R/eDAQXR CAN and GPS channels, and MX471 CAN channels only. The sequential MX840 CAN channels were not affected. The raw CAN and GPS message channels were also not affected.
        - The cause of this issue was incorrectly using the nominal Classic domain sample rates instead of the actual Classic domain sample rates in the code used to generate the sequential channel data from the raw message data. As one example, the 300 S/s rate was used instead of the ~300.0781 S/s rate.
        - The correction factor for this is completely deterministic. The sample rate on affected channels is low by a factor of exactly 8388608/8386425 (which is ~1.0002603016183892421383366571573).
        - To fix SIE files subject to this issue, the sample rate for all affected channels needs to be divided by 8388608/8386425. Or more simply, replace the replace the actual Classic domain sample rates resident in the SIE file with the corresponding nominal Classic domain sample rates.
        - SIE file corrections: The above information provides the numerical correction methods needed to correct individual SIE channel data. For channels stored using the SXR Collect storage option or channels stored using any of the sequential DataModes, correcting the SIE file is straightforward.
        - However, for computed channels derived from affected channels, things are a little more complex.
            - 1) Most computed channels have only one input channel. For all of these the sample rate of the output channel needs to be set to the corrected sample rate of the input channel.
            - 2) There are 2 computed channels that support more than one input channel with the same sample rate - Signal calculator and Directional velocity.
        - If all of the input channels have sample rates that need to be corrected, then the output channel sample rate needs to be set to the corrected sample rate of the input channels. However, if some of the input channel sample rates are incorrect and some are correct, it is not possible to correct the output channel sample rate, and in this case, the channel data should be viewed as invalid.
        - **Note: It is advised that any users who are concerned with any of these issues contact HBM customer service for assistance in getting their SIE files corrected.**
    - **Binary sample rate sync across legacy eDAQ layers issue.**
        - This issue sources from the sync clock signal distributed to the legacy eDAQ layers. As such, all EBRG, EHHS, EDIO and ENTB layer channels were affected by this issue.
        - By design, the FPGA generates a 98304 Hz clock signal. However, due to a bug in the FPGA, this clock signal was generated at nominally 98280.1 Hz. The exact incorrect clock frequency is not completely deterministic. However, based on multiple tests run for 12 to 24 hours to characterize this, the clock signal was determined to be low by a factor of 1.0002432 with an uncertainty of about +/- 0.000000060. As one example, for an SXR test run for 8 hours using the 512 Hz sample rate, the data skew correction uncertainty would be less than one sample period.
        - To fix SIE files subject to this issue, the sample rate for all affected channels needs to be divided by 1.0002432.
    - **Synchronization phase issue with CAN / Raw CAN.**
        - An incorrect phase lag of exactly 0.25 seconds exists for all of these channels.

- This issue sources from a system code bug that applied the wrong test "pre-start" time to the affected channel types. By design, in the Decimal domain, a "pre-start" time of 1 second is used, and in the Binary domain, a "pre-start" time of 1.25 second is used. However, due to the bug, the 1 second time was used for some channels in the Binary domain.
- To correct for this, subtract 0.25 seconds from all of the time stamps for applicable channel data. Unfortunately, the SIE files do not support a means to apply such a correction, and as such, this will need to be done in a post processing environment.

o **CAN mask value parsing issue.** Previously, the db_msg_mask SXR parameter was being ignored and as a result all channels behaved as if the db_msg_mask was 0xFFFFFFFF. This issue has been corrected.

o **eDAQ txt database issue with request bytes.** Previously the optional "request" column in the eDAQ CAN txt database was ignored. Now this information will be imported and stored as a new parameter in the internal CAN database format and used as the default value if request messages are enabled for that channel.

o **Issue when running a test with more than one CAN request message.** Previously when more than one CAN request message was on the CAN bus the test running would end. This issue has been corrected.

o **Two point calibration issue.** Previously under certain circumstances, when performing a two point calibration, the system would become unresponsive. This issue has been corrected.

o **CAN DBC Importer Message name delimiter issue.** Fixed a bug with the CAN Vector DBC importer not honoring the option to prepend the Message name to the Signal name with the "::" delimiter.

o **CAN DBC Importer issue with big-endian signals.** Previously when attempting to import DBC files containing big-endian signals, the import would fail. This issue has been corrected.

o **User preference honoring in single channel editor issue.** Previously the "Select cell text on focus" user preference was not being honored in the single channel editor, this issue has been corrected.

Notes about the eDAQXR firmware v2.2.1

- **Bugs Fixed / Issues Resolved**

  o **Chrome Aw Snap Issue.** Fixed a bug in the handling of strip charts displays that resulted in Chrome Aw Snap web browser crashes. These crashes became much more frequent starting with Chrome release 64.0.3282.140.

  o **SIE Viewer Issue.** In certain situations the SIE Viewer would not be usable within the GUI, this issue has been corrected.

  o **Use Of MX firmware v4.10.4.0.** This release uses MX firmware version 4.10.4.0 in place of the 4.12.14.0 version used in the v2.2.0 release. The primary reason for this is that the MX471 interface works properly using 4.10.4.0, but does not work properly using 4.12.14.0 in some test scenarios.

Notes about the eDAQXR firmware v2.2.0

- **New Features**

  o **SIE Viewer.** A new feature currently released but provided as is, as a beta feature is the on device SIE Viewer. Users can now look at SIE data without having to download the SIE file and use a desktop application to view data. This SIE Viewer is intended to allow operators

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to do quick checks of data to ensure integrity and existence of data, and is not intended to be a replacement for deep data analysis software found on desktop platforms. Please see the help system for more information.

- o **Quantum Module Firmware upgraded to version 4.12.14.0.** The support for MX module firmware v4.12.14.0 has been added to this release.
- o **Support for notifications with the Over Range Detector Computed Channel.** Support for the Over Range Detector Computer Channel to notify the user in the event of over ranges set by the DataMode has been added to this release. Please see the help system for more information.
- o **Network check feature.** A new feature has been added to check the state of the network connection between the client's GUI session, and the XR. If any issues exist which may cause usability or performance issues, they will be listed here. This feature was added to help the customer maintain visibility of what issues are inherently a result of their client side machine or network configuration. See the help system for more information.
- o **Multiplexed CAN signal decoding support.** Added support for decoding multiplexed CAN signals. Such signals can be loaded from either a DBC file or an eDAQ CAN database text file. At this time "extended multiplexing" (where messages contain more than one multiplexor field) -are -is not supported. Refer to Vector application note AN-ION-1-0521 for more information on simple and extended multiplexing.
- o **3 node networked eDAQXR functionality.** Extended eDAQXR networking functionality to support 3 eDAQXR nodes without using an EX23R switch, and to an unlimited number of nodes using multiple eDAQXR switches. Also, MX modules and Axis cameras are supported on these networks. See the Help system for details on connections and other pertinent information.

- **Optimizations**

  - o **SIE metadata extension.** The SIE metadata was extended to include SSI encoders, HBM SDB parameters, and CAN message request parameters.
  - o **SIE file size overhead for slow sample rate tests.** Significantly reduced SIE file size overhead for tests primarily comprised of channels using sample rates below 50 Hz. See the Help system Operational note 'SIE file size issues' for more information.
  - o **Charts to remain open when last channel removed.** Previously when the last channel was removed from a chart, the chart would be also removed. Currently the chart will now stay in place to allow for new channels to be dropped into it.
  - o **Extension of SDBX importer functionality with sensor drops.** Extended SDBX importer to be less restrictive on sensor drops. For example, a bridge sensor with excitation range set at 0.5V can now be dropped on to a MX840 module channel which supports 2.5V and 1V excitation ranges only. The excitation is increased to the minimum of 1V. Prior to this release, the bridge sensor could not nave been dropped on to any MX840 channel.
  - o **Support for importing display configurations from other setups.** The chart configuration area of the GUI has been enhanced to allow for importing of chart display configurations from other setups. This should reduce customer time needed to configure multiple tests which have similar display chart configurations.
  - o **General GUI enhancements and performance improvements.** The GUI has continued to undergo optimization and performance gaining enhancements through this release.
  - o **FPGA and Power Micro Firmware Versions now listed.** The current FPGA and Power Micro firmware version numbers are now listed in the hardware panel for improved visibility and understanding of the system currently being used.
  - o **Various code optimizations to GUI controller code.** Continual improvement and optimization has taken place on the code underlying the core and foundational operation of the GUI interface.

- o **Smart Module icons in GUI.** Smart Module icons have been added to the GUI represented in the spreadsheet grid and the Add Channels dialog.
- o **Recommendations dialog on GUI load.** A message outlining security and browser recommendations has been added to the loading screen for the GUI.

- **Bugs Fixed / Issues Resolved**

  - o **TEDS enabled system preference removed.** The System preference 'TEDS enabled' is no longer supported. TEDS is always enabled. It was originally provided for internal development debugging purposes only. However, it was recently found that disabling TEDS can cause problems with MX840B-R channels that are configured for Pulse frequency and Encoder frequency sensor input modes (using MX firmware versions 4.12.14.0, 4.10.4.0, and possibly earlier versions). See the release note below for more information on that.
  - o **MX840 encoder frequency channel issue.** Fixed as issue with MX840 Encoder frequency channels not generating valid data after a system power cycle or eDAQXR reboot. The invalid data would typically be at or near 0 independent of the actual sensor input frequency. The fix in part requires that TEDS never be disabled. The source of the problem with disabling TEDS is in the MX840B-R module and as such this 'fix' is more aptly termed a eDAQXR code workaround for that MX840B-R module problem.
  - o **Low sample rate CAN and GPS test issue.** Fixed a bug with the first sample stored in the SIE being set to the stale data invalid value when the sample rate was 1/10 or 1/5 Hz. This bug affected CAN and GPS channels only.
  - o **Automatic error reset and restart issue.** Fixed a bug that could result in a test not restarting after an error reset when the system was drawing close to the maximum CPU load of 100% during the restart.
  - o **Adding channels after removing a network node issue.** Previously after removing a network node from the system, it would not be possible to add channels to a test. This issue has been corrected.
  - o **Smart module detection on EHLS issue.** Fixed an issue with EHLS Smart Modules not being discovered on a slave node when the master node was rebooted or power cycled.
  - o **Firmware upgrade with disk full issue.** Previously when attempting to update firmware when the system disk is full, the firmware process would not complete successfully. Checks have been put in place to alert the user before issuing a firmware upgrade if the total space available is insufficient to successfully complete the procedure.
  - o **Max / Min Run Time Display issue.** Previously when using the Max / Min Run Time Display chart, the system would respond erratically and performance of the GUI would in some cases cause a browser crash, or the browser to simply become unresponsive. This issue has been corrected.
  - o **Channel name update on dependent channels or DataModes.** Previously when a channel name was changed, the change would not ripple through any dependent channels or DataModes. This issue has been corrected.
  - o **Burst Message Logger DataMode issue.** Previously the Burst Message Logger DataMode would not record data on the eDAQXR. This issue has been corrected.
  - o **RAW message channels in classic domain with Burst Message Logger DataMode issue.** Previously a RAW message channel in the classic data rate domain being utilized in a Burst Message Logger DataMode would erroneously be set a sample rate, which would case a validation error. This issue has been corrected.
  - o **Ethernet port restriction lifted.** Eliminated the previous restriction on which ETH ports could be used to network eDAQXR units. Now, either ETH port can be used on the master and slave nodes.
  - o **Issues with resizing charts.** Previously when resizing charts in certain configurations, the plots may freeze or being unresponsive. This issue has been corrected.

- o **SMITC TC editing issue.** Previously SMITC TC type channels could not be edited in single channel editor mode. This issue has been corrected.
- o **Erroneous error flag on shut down or power loss.** Previously when the system shuts down or loses power, error flags would be thrown as a result of connected MX modules also losing power. This issue has been corrected.
- o **Networked firmware update issue.** In certain situations, updating firmware of networked eDAQXR's would result in the master eDAQXR not updating and hanging. This issue has been corrected.
- o **System temperature channel in subzero situations.** Previously when the temperature of the module was below zero, the power micro would report erroneous temperatures. This issue has been corrected.
- o **Smart module timeout issues.** Previously in certain situations Smart modules would time out causing an issue when attempting to start a test. This issue has been corrected.
- o **Erratic behavior with save feature in display views tab section.** Previously when attempting to use the Save View option in the displays views tab section in certain situations, the behavior would act like Save View As. In general, the functionality of this feature has been corrected.

- • **Known Issues And Advisories**

  - o **MX840 issue with Pulse frequency or Encoder frequency channels.** In this release and all previous releases, spikes will occur on MX840 channels configured as Pulse frequency or Encoder frequency channels whenever there are no pulses from the sensor for a period of approximately 107 seconds. The magnitude of the spikes will vary and is not deterministic.
  - o **Emulator import of MX460 channels.** Currently importing tests into the CX23R Emulator which contain MX460 channels will not automatically populate MX460 hardware on import. This will be corrected in a future release.
  - o **Excel Import/Export of channel information.** This functionality is very limited at this point. This will be implemented in future releases
  - o **Issue with propagating changes in the hardware panel.** Changes made to test setup parameters in the Hardware page are currently not propagated to computed channels, output channels, DataModes or display charts like they are when changes are made using the Input channel spreadsheet. Until this is fixed, users should keep this in mind when using the Hardware page to edit channels if the test setup contains computed channels, output channels, DataModes or display charts.
  - o **Sensor Database support.** The database format is based on what Catman uses today. This has limited functionality at this time, but will evolve over time.
  - o **Web browser exceptions.** The web browser interface will sometimes lock up or not properly reflect the actual states of the hardware or test. Refreshing the browser will usually correct this.
  - o **SIE file naming issue.** The "Save data file as" option in the Test Control page persists from one test run to the next only in the Normal test run mode. It does not persist in the Cyclic or Remote control run modes.
  - o **Recommended browsers.** The recommended browsers when using the eDAQXR web interface are up to date versions of Chrome and Firefox. The web interface may work on other browsers but may result in degraded or undesirable operation.
  - o **Setups utilizing multiple video channels from a multi-channel video encoder is not supported.** Although the eDAQXR will allow the user to specify multiple video streams from a multi-channel encoder, using more than one channel from a multi-channel encoder is not supported, and configuring a test with this configuration may in not as-configured results, and is at the user's own risk. It is recommended the user only use one channel on a multi-channel video encoder.

o **Live video displays when using the Axis m7001 video encoder.** The Axis m7001 encoder can be used, but there are limitations on video display capabilities with this old and now discontinued Axis product. Video frames will be properly stored in the SIE file; however, viewing of the video frames is supported in the Hardware view only. As such, video frames cannot be displayed when the SIE test is running.

o **Caution when using Netgear networking interfaces.** Certain Netgear switches and routers have been known to not work reliably when connected to the Host port of the eDAQXR. The problem will manifest as the Netgear networking interface showing the eDAQXR is not connected when in fact it is. In certain situations, a power cycle of the Netgear networking interfaces can correct the problem. For these reasons, it is strongly recommended that for any high availability or high assurance test platforms, that Netgear networking interfaces not be used to connect to the eDAQXR Host port.

o **Caution when using Firewire with MX Modules.** In certain atypical usage scenarios, MX modules can lose PTP sync when a test run is restarted after a reboot. See the help system topic that discusses setting up the eDAQXR system for more information.

o **EX23-R PTP Synchronization with MX modules using ports 5 and 6.** Using a system connected with MX modules connected to ports 5 or 6 on the EX23R can rarely result in the MX modules losing sync with the eDAQXR until the EX23R is rebooted or power cycles. This has only been encountered in QA testing a few times and only when the system has been running for relatively long periods of time (e.g., over a week). However, this can be very problematic for long term unattended testing - particularly in scenarios where power is never cycled. As such, it is strongly advised that MX modules are not connected to ports 5 or 6 in long term unattended tests. Network sources such as Axis cameras can be connected to port 6 (or port 5 when routed through a commercial PoE switch).

eDAQXR System Overview

The following information defines the scope of the eDAQXR system relative to the TCE/eDAQ system. Functionality that is not supported in this first release is noted.

Legacy eDAQ layers

The following legacy eDAQ layers are supported, with restrictions noted where applicable. Layers not listed are not supported.

NOTE: It is critical that you verify that the latest firmware is loaded on your existing legacy eDAQ layers before removing the legacy eDAQ processor. There is no ability to upgrade firmware with the new EXRCPU.

- **EBRG – Layer Firmware v1.3**
  - AOM file format for analog out is not supported in this release
- **EHLS – Layer Firmware v1.12**
  - AOM file format for analog out is not supported in this release
- **EDIO – Layer Firmware v1.10**
  - GPS port will not be supported
  - Vehicle Bus modules will not be supported
- **EITB – Layer Firmware v1.5**
- **ENTB – Layer Firmware v1.0**

EDAQXR processor "EXRCPU"

- Axis cameras are supported (limited to the officially supported list).
- Serial Bus modules are not supported.
- The following MXB modules are supported
  - MX1615 B / BR
  - MX1601 B / BR
  - MX1609 KB / KBR
  - MX840 B / BR
  - MX460 B / BR
  - MX411 BR
  - MX471 B / BR
  - MX878 B (Limited Functionality – See Help System)

Channel and Test Setup

This section lists current functional issues that TCE/eDAQ users will likely view as deficiencies. Most of these (and possibly all) will be addressed in future releases.

- There is currently no support for multiple runs. All test runs are currently treated as autonomous runs. A new SIE file is generated for every test run.
- There is currently no support for locking sensor scaling "calibrations" (e.g., after a shunt scaling task is executed, the user needs to be careful to not change the parameter values associated with this experimental task).
- The eDAQXR currently supports Zero and Shunt scaling tasks in an interactive mode only. The user needs to be patient and wait for all channel readings to become stable for each step in the task.
- There is currently no support for automatic zeroing before the start of a test run.
- There is currently no support for "back calculating" lead wire resistance.
- There is currently no provision for assigning data types to channels. All legacy eDAQ and MXB channels are sourced and stored in the SIE file as 32 bit floats. All other channels are sourced and stored in the SIE file as 64 bit floats (including CAN, GPS, and digital input channels).

Networking

Networking is handled much differently in the eDAQXR compared to the eDAQ. There is currently only one networking mode supported. Mode 1 networking is a "seamless" mode where the test is setup and executed using only one node that we call "master". The other nodes on the network source data only and we call these nodes "slaves". Normally, the user only connects to the "master" node for all test setup and test control tasks.

- Currently only two "slave" nodes and the "master" node configuration is supported
- MX modules are not yet supported with a networked system
- SMSTRB4 modules are supported on the master node only.
- AOX files that contain the scaling information for the EHLS and EBRG analog output signal must be downloaded from each network node independently.
  - Computed channels and DataModes:
- Some of the eDAQ computed channels currently have no use in the eDAQXR and are not supported (e.g., Engineering Scalar and Integer Scalar).
- Power Saver computed channel is not supported.
- Time at Level (multi-dimensional) DataMode is not supported.

RELEASEnotes

Complete Listing of Modules, Accessories, Documentation and available Support Software Tools / Libraries

Modules

• eDAQXR: EXRCPU-32GB w/eDAQ adapt, lid, cables	1-EXR-E-32GB-2
• eDAQXR: EXRCPU-64GB w/eDAQ adapt, lid, cables	1-EXR-E-64GB-2
• eDAQXR: eDAQXR CPU 32GB No base, lid, cables	1-EXRCPU-32GB
• eDAQXR: eDAQXR CPU 64GB No base, lid, cables	1-EXRCPU-64GB-2
• SomatXR: Data Processor with 64 GB memory	1-CX23-R-64-2
• SomatXR: Ethernet Switch PTP	1-EX23-R
• SomatXR: Standard Amplifier	1-MX1601B-R
• SomatXR: Bridge Amplifier	1-MX1615B-R
• SomatXR: Thermo Amplifier	1-MX1609KB-R
• SomatXR: Universal Amplifier	1-MX840B-R
• SomatXR: Highly Dynamic Amplifier	1-MX411B-R
• SomatXR: CAN module	1-MX471B-R
• SomatXR: Frequency Amplifier	1-MX460B-R
• QuantumX: Measuring Amplifier / 16 channels	1-MX1601B
• QuantumX: Bridge Amplifier / 16 channels	1-MX1615B
• QuantumX: Thermocouple Type K / 16 channels	1-MX1609KB
• QuantumX: CAN Module / 4 channels	1-MX471B
• QuantumX: Analog Voltage Output	1-MX878B
• QuantumX: Digital Dynamic	1-MX460B
• QuantumX: Universal Amplifier	1-MX840B

Documentation

• eDAQXR Data Sheet (English / German)	Version 1.1
• eDAQXR Compatible Legacy eDAQ Technical Specifications	Version 1.0
• eDAQXR Quick Start Guide	Version 1.0
• eDAQXR Safety Manual	Version 1.0
• eDAQXR User Manual	Version 3.0
• MX1601B-R Data Sheet (English / German)	Version 3.0
• MX1609KB-R Data Sheet (English / German)	Version 3.0
• MX1615B-R Data Sheet (English / German)	Version 4.0
• MX840B-R Data Sheet (English / German)	Version 1.0
• MX878B Data Sheet (English / German)	Version 2.0
• MX411B-R Data Sheet (English / German)	Version 1.0
• MX471B-R Data Sheet (English / German)	Version 1.0
• MX Modules User Manual (English / German)	Version 4.0
• MX Modules Quick Start Guide (English / German)	Version 3.0
• 1-UPX00x-2 UPS Data Sheet (English / German)	Version 2.0
• 1-SCM-R-TCX-2 Data Sheet (English)	Version 1.3
• Reference Manual For libsie	Version 1.0
• 1-SCM-R-SG120-300-1000-2 Data Sheet	Version 1.1
• 1-CON-S3005-2 Adapter Data Sheet	Version 1.1

Software Tools / Libraries

- HBM Device Manager   v1.0.0.1
- XR Download Manager   v1.1.0
- XR Emulator   v2.2.0
- libsie SIE library   v1.1.5

Accessories

- eDAQXR: eDAQXR to eDAQ adapter assembly   1-EXR-E-ADT-2
- eDAQXR: eDAQXR PWR CABLE W/REMOTE-PIGTAILS   1-EXR-PWR-IO-PT-2
- Xcode to Xcode Adapter w/Mount   1-CON-S3005-2
- Fastener CaseLink-Rug, 160mmx80mmx12mm   1-CASELINK-RUG-2
- 2 Unit Mounting System, 200mmx130mmx50mm   1-CASEMOUNT2-2
- 3/4 Unit Mounting Syst,295mmx130mmx50mm   1-CASEMOUNT3-2
- Universal Mounting Bracket   1-CASEMOUNT-UMB-2
- Voltage conditioner .3M 840BR adapter   1-SCM-R-VC60-2
- ¼ bridge 1000 .3M 840BR Adapter   1-SCM-R-SG1000-2
- ¼ bridge 350 .3M 840BR adapter   1-SCM-R-SG350-2
- ¼ bridge 120 .3M 840BR adapter   1-SCM-R-SG120-2
- K type thermal couple .3M 840BR adapter   1-SCM-R-TCK-2
- E type thermal couple .3M 840BR adapter   1-SCM-R-TCE-2
- ICP, with BNC .3M 840BR adapter   1-KAB430-0.3
- AC/DC power supply unit (24 V, 120 W)   1-NTX003-2
- Power supply cable (CX23-R to MX module)   1-KAB2110
- Power supply cable (low loss) with exposed wires   1-KAB2115
- Mounting brackets   1-CASEMOUNT
- Ethernet cable (CX23-R / EX23-R to MX module)   1-KAB2100
- Ethernet cable (CX23-R / EX23-R to PC / access point)   1-KAB2106
- Ethernet cable (CX23-R to EX23-R)   1-KAB2107
- Push-pull sensor cable   1-KAB183
- Break away sensor cable   1-KAB184
- Digital I/O cable with exposed wires   1-KAB2101
- GPS/AUX adapter (CX23-R to EGPS-5Hz)   1-KAB2102
- CAN adapter (CX23-R to SomatCR KAB292)   1-KAB2104
- GPS/AUX cable with exposed wires   1-KAB2108
- CAN cable with exposed wires   1-KAB2109
- Precision GPS Receiver-200Hz   1-EGPS-200-B-2
- Precision GPS Receiver-200Hz-PLUS   1-EGPS-200-P-2
- EGPS-200 GPS Antenna   1-EGPS-200-ANT-2
- EGPS-200 GPS Template – RTK   1-EGPS-200-TEM-2
- Trigger Cable for EGPS-200   1-SAC-GPSTRIG-2
- Cable Extensions   1-SAC-EXT-MF

Accessories (cont'd)

- Full-bridge adapter (to eDAQ M8 connector)   1-KAB2117
  (4 wire - no sense line)
- Quarter-bridge adapter (to eDAQ M8 connector)   1-KAB2118
  (3 wire - no sense line)
- Voltage adapter (to eDAQ M8 connector)   1-KAB2119
- ¼ Bridge Adapter (ODU 14 pin to M8F connector)   1-KAB2122-0.3
- CX23 + eDAQ sync cable (M12 to LEMO)   1-KAB2111-2
- GPS Receiver - 5Hz Update   1-EGPS-5HZ-2
- Pelican Case - eDAQ-lite/SXR   1-PEL1520-2
- Pelican Case - eDAQ/eDAQ-lite/SXR   1-PEL1600-2
- AC/DC Power Supply (24 V, 30 W) ODU 4p   1-NTX002
- Plug (ODU 4p push-pull)   1-CON-P1001
- Power supply (ODU, 5 m, open)   1-KAB294-5
- Connecting elements   1-CASELINK
- Carrying handle   1-CASECARRY
- 4 protective caps for ODU sensors   1-CON-A2013
- 2 protective caps for ODU system   1-CON-A2014
- FireWire ExpressCard adapter   1-IF-002
- FireWire intermodule (ODU, IP68, 2 m)   1-KAB272
- FireWire PC (ODU / FW, IP68, 3 m)   1-KAB276-3
- FireWire (module to PC, IP68, 5 m)   1-KAB293-5
- Ethernet cable (IP65/5m)   1-KAB273-5
- Connector (ODU, 14 pol, IP68)   1-CON-P1007
- Plug (ODU 14p break-away)   1-CON-P1016
- 1-wire-EEPROM DS24B33   1-TEDS-PAK
- 10 Connectors thermo mini (type K, RFID)   1-THERMO-MINI
- QuantumX: UPS   1-UPX001-2
- SomatXR Uninterruptable Power Supply   1-UPX002-2

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