

# RELEASEnotes

## catman Easy / AP / PostProcess

### V5.3.3

#### Legend:

FUN: functional enhancement

MOD: modification

FIX: bug fix

PRB: known problem

#### **Supported Windows versions**

- Windows 10
- Windows 8.1
- Windows 7

#### **Modifications**

##### **MOD419: Importing of ASCII files + header up to 2 GB**

ASCII files + header up to a size of 2 GB can now be imported. This was only possible for ASCII files without header.

##### **MOD420: EasyScript function EA\_Test.Remove**

Removing tests from the analysis project via EasyScript got an optional parameter to prevent the removal of display sources and computations pointing to the removed test.

##### **MOD421: Stacking of graph axes made possible via EasyScript**

Stacking and unstacking of y axes of standard graphs are now possible in Easy Script function EA\_Graph.SetProperty (reading out of stacking via GetProperty).

##### **MOD422: EasyScript function EA\_DAQ.AddComment in automatic execution stages**

Creation of DAQ comments via EasyScript now also possible in automatic execution stages "After DAQ stop" and "Before data saving". The DAQ job is already stopped at these points but the test file is not yet written.

##### **MOD423: Pt500 supported by QuantumX/SomatXR 840B**

Pt500 thermocouples are now supported by QuantumX/SomatXR 840B.

##### **MOD424: List of supported filters by MGCplus**

The list of filters supported by MGCplus is extended with "Bessel 25 Hz" filter for use by CANHEAD modules.

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www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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## **MOD425: DAQ job verification extended**

DAQ job verification has been extended to check if catman is running in logger mode (e.g. on a CX22) and the job is configured to stop with error message in case of an error. In this case a warning is shown at first start.

## **Fixes**

### **FIX1121: Crash of hybrid system on DAQ job start**

A hybrid system with FS22DI optical interrogator and QuantumX modules with hardware channels being activated could crash on DAQ job start.

### **FIX1122: FS22: catman not working if too many peaks are detected**

catman did not work if more than 256 peaks were detected on a FS22 optical interrogator. The maximum number of channels on an optical interrogator is 256. Any more peaks detected are now ignored.

### **FIX1123: Activation/deactivation of shunt sometimes not working**

Activation or deactivation of shunt sometimes did not work on channels of MGCplus devices if a sensor is assigned.

### **FIX1124: Sensor adaptation: incorrect type displayed in dialog for MGCplus**

In case of adapting a sensor assigned to a MGCplus channel some types of frequency sensor were identified as counter sensors.

### **FIX1125: MGCplus ML60: some frequency sensors rejected**

Frequency sensors with a maximum electrical value above 200 kHz were rejected by MGCplus ML60 amplifiers on assignment.

### **FIX1126: MX410: incorrect analog output**

The analog output of a QuantumX MX410 module could be incorrect if a sensor with table scaling was assigned.

### **FIX1127: Incorrect live readings after Excel parametrization**

Live reading display of MX471 CAN channels could be incorrect after Excel parametrization if the CAN parameter setup was also done via Excel and no CAN bus was connected.

### **FIX1128: Repeated DAQ jobs not starting under certain conditions**

The first repetition of a repeated DAQ job failed to start if QuantumX modules are using the decimal sample rate group and the modules are automatically reconnected on each job start.

### **FIX1129: Limit value monitoring with waiting time not working under certain conditions**

Monitoring of a limit value was not working if a waiting time higher than 0 seconds was specified (default is 0 seconds) and the limit value was assigned to more than one channel.

### **FIX1130: Wrong DAQ start time in test file**

Under certain circumstances the DAQ job start time in the test file could be wrong (incorrect hour). Time in the data file was correct.

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www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

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## **FIX1131: Matlab 5 export not working with CAN raw channels**

Data export in Matlab 5 format was not working and could lead to a crash if CAN raw channels were present. CAN raw channels are now ignored in the export.

## **FIX1132: Inconsistencies in modifying computations of type "Dataset"**

There were some inconsistencies in modifying a manually created dataset based on formulas (e.g. "Sin(x)") in analysis project computations.

## **FIX1133: Disappearing visualization panel scrollbars during main window resizing**

Visualization panel scrollbars were disappearing if the main window was not maximized, vertical and horizontal scrollbars scrolled to the end position and then the main window maximized.

## **FIX1134: EasyScript function EA\_IO.CPDCControl for setting digital output not working**

EasyScript function EA\_IO.CPDCControl was not working for setting the digital output of MGCplus CP42/52. Reading digital input was working correctly.

## **FIX1135: EasyScript: plots assigned to wrong graph layer**

In case of standard graphs with multiple stacked layers plots assigned via EasyScript functions EA\_Panel.SetRTDisplayChannel, EA\_Test.PlotYT and PlotYX were always assigned to the last layer.

HBM GmbH

[www.hbm.com](http://www.hbm.com)

Email: [info@hbm.com](mailto:info@hbm.com)

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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# RELEASEnotes

## V5.3.2

### Legend:

FUN: functional enhancement

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## Overview about the most important new functions and modifications

### **New functions**

- CAN raw data recording for CAN FD
- Support a new QuantumX gateway functionality
  - MX471C acts as a Firewire to Ethernet gateway
- Recording of uncompressed video stream
  - Performance optimized because no decompression is needed
  - Tested with Axis cameras
- Discontinuation of products: SI410 and DI410 optical interrogator, MGCplus CP32 and QuantumX CX22

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www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

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## **FUN470: MX471C CAN raw FD**

With version 5.3.2 catman supports the CAN raw FD functionality of the MX471C module. The user can select in the scan options if raw messages should be read in classic format (up to 8 byte payload) or FD format (up to 64 byte payload).

## **FUN471: MX471C gateway function**

With version 5.3.2 the MX471C can serve as a communication gateway for other QuantumX modules similar to the CX27. Modules behind the MX471C are automatically included into your project. The gateway functionality can be activated or deactivated in the device manager.

## **FUN472: Support of AXIS RTP video camera**

catman V5.3.2 supports AXIS RTP video cameras as a new camera type.

## **FUN473: New script methods**

- EA\_Panel.SetObjectFocus allows to set the focus to an user input object (e.g. textbox).
- EA\_Graph.CursorActivation allows to activate/deactivate cursor mode for all graphs in the project.
- EA\_Graph.MapSetPosition allows to center a map on a specific coordinate and set a zoom level (replacement for MapQuery function).

## **FUN474: New sensors added to sensor database**

The new T21WN torque sensors and the C6B and C15 force transducer groups have been added to the HBM sensors in the sensor database.

## **Modifications**

### **MOD392: MGCplus CP32 discontinued**

The CP32 communication processor of the MGCplus is discontinued for new projects in catman 5.3.2.

### **MOD393: Scan for QuantumX modules with firmware <4.0 removed**

HBM device manager is not any longer supporting scan for QuantumX modules with firmware version <4.0.

### **MOD394: SI410 and DI410 optical interrogator no more supported**

SI410 and DI410 optical interrogator are not any longer supported by catman.

### **MOD395: No support on old CX22 Data Recorder**

Beginning with version V5.3.2 catman cannot be installed on old CX22 Data Recorder. All CX22B versions are supported.

### **MOD396: Restrictions in channel naming removed**

The channel name restrictions introduced in V5.2.2 (e.g. no brackets or blanks in name) have been removed as being too strict. The error message in case of invalid algebraic formulas has been extended instead to cover the case of invalid characters in channel names since this was the main reason to introduce these restrictions.

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## **MOD397: CAL info column in channel configuration table**

This column is now displaying the expiration date of the assigned sensor. It can be made visible in the channel list options.

## **MOD398: Channel display filter "Hide time channels" changed to "Hide hardware time channels"**

The channel display filter option only effects on the hardware time channels. The catman software time channels can be made visible/invisible in the general options.

## **MOD399: Zero balance locking also set in QuantumX module**

Zero balance locking/unlocking was only stored in software. This is now kept in sync with the zero balance locking in the hardware itself otherwise it was not possible to perform a zero balance operation if it was locked from the outside (e.g. MX Assistant).

## **MOD400: Added 30 kHz Bessel and Butterworth filters**

The list of manual filters is extended with 30 kHz Bessel and Butterworth filters.

## **MOD401: Prompt for activation of statistics journal**

The user is asked if statistics journal should be activated if a channel is set active for the journal but the journal itself is not yet activated.

## **MOD402: Check for correct key format in SFTP upload**

catman supports only DSA and RSA encryption for SSH authentication. Correct key format is now checked on server login and the user is getting feedback about wrong key format.

## **MOD403: Min/max column of simple DAQ table in analysis project**

Min and max columns are now also available for simple DAQ tables in analysis project.

## **MOD404: Changing cell type in flex table**

Cell type in DAQ project flex tables can now be changed if a datasource is assigned to the particular cell. This allows greater flexibility to use built-in formulas in the table because these require numerical cell types.

## **MOD405: Dynamic compression of real-time graphs used in fewer circumstances.**

catman V5.2.1 introduced dynamic compression of real-time graphs. If the time window of the graph was larger than 5 minutes the compression factor was initially smaller to overcome the problem of the long waiting time until the graph was updated for the first time because of long update intervals. However this causes the graph to not adhere to the configured time window until the expected compression factor is reached. For this reason catman 5.3.2 uses dynamic compression only if the time window is longer than 10 minutes and if the update interval derived from configured time window and number of points to be displayed uncompressed is greater than 20 seconds.

HBM GmbH

[www.hbm.com](http://www.hbm.com)

Email: [info@hbm.com](mailto:info@hbm.com)

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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## **MOD406: No setting of x-axis caption by assigning frequency computation to graph**

If a frequency computation is assigned to a graph via EasyScript function EA\_Graph.PlotYX the x-axis caption is not automatically changed to "Frequency [Hz]".

## **MOD407: Option to update a text object periodically during a DAQ job**

Text objects got an individual parameter to continuously update the object during a DAQ job. This is primarily intended for text objects displaying the system text "Time" so they can act as a clock.

## **MOD408: DAQ job terminated if maximum channel length is reached**

catman is not able to record more than 2 billion values in a single channel. This was only checked before DAQ job start if the number of values per channel could be determined from job settings (i.e. job termination by number of samples or time). With catman 5.3.2 the recording is now terminated if the limit is reached.

## **MOD409: Saving default selection for switching to analysis mode in DAQ project**

If the user is switching directly from the DAQ project into analysis mode, the selection (e.g. analyze data with existing analysis project) can be remembered as default so the user is not prompted at every switching operation. However this default is only remembered in the current session. It is now possible to save the default into the current DAQ project.

## **MOD410: Auxiliary channels in recorders**

Auxiliary channels with manual timebase excluded from downsampling.

## **MOD411: Program startup command parameter "/data" made independent from Test Explorer file extension filter**

The "/data" startup command parameter to start catman in analysis mode with a specified test is now ignoring the file extension filter specified in the options allowing to load the test or data file independent of this option.

## **MOD412: MGCplus CP52: Min and Max poll interval for NTP sync**

NTP synchronization with MGCplus CP52 communication processor got additional parameters to control the minimum and maximum poll interval for NTP messages.

## **MOD413: Single strain gage computation in EasyScript**

The EasyScript functions for creating strain gage computation channels (EA\_IO.CreateRosetteChannel) and strain analysis in offline mode (EA\_Test.StrainAnalysis) are now supporting also single strain gage computations. These computations deliver only principal nominal stress 1 as result.

## **MOD414: More information in EasyScript function EA\_IO.ChannelAttributes**

EA\_IO.ChannelAttributes extended to provide the firmware version of a channel from a QuantumX module and if a channel is an auxiliary channel.

## **MOD415: catman version info added to system log**

The system log entry about catman being started is now also logging the version number of the program.

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www.hbm.com

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## **MOD416: Online computation channel formula in Excel and ASCII export**

The online computation channel formula is now also part of the header info in Excel and ASCII files if the export is done in analysis mode.

## **MOD417: SIE file conversion**

Data format "rainflow/range\_only" is now also supported in conversion of SIE files.

## **MOD418: FTP upload sped up**

Upload of files to FTP servers has been sped up.

## **Fixes**

### **FIX1076: Fast-Stream files could be corrupt**

Fast-Stream data files could be corrupt if the project contained CX27 digital IO channels.

### **FIX1077: FastStream conversion not working on network drive**

FastStream conversion did not work on a network drive. Attempting to do so could lead to a crash.

### **FIX1078: DAQ project with QuantumX and KiRoad sometimes unsynchronous**

In a new DAQ project with QuantumX modules and a KiRoad device the signals in the DAQ job were sometimes unsynchronous. Reloading the project solved the problem.

### **FIX1079: Too many GPS samples generated**

A GPS device could generate too much samples in a DAQ job if active MX471 CAN raw channels were part of the project.

### **FIX1080: Wrong number of samples in catman time channel generated**

The catman time channel of the default sample rate group of a MX471 module could have the wrong number of samples if a CAN raw channel was activated on the module.

### **FIX1081: High precision zero balancing failing**

In some circumstances the high precision zero balancing could fail if the channel to be measured was in the fast sample rate group.

### **FIX1082: Wrong limit value assigned to channel**

A wrong limit value/event could be assigned to a channel if events which are not assigned to a channel (e.g. time interval) are intermixed with limit values and the assignment to the channel was done via channel list context menu and not the ribbon bar. Could also happen if an event not intended for a channel was created via channel list context menu and not the ribbon bar.

### **FIX1083: Repeated warning actions in limit value monitoring**

Warning actions of limit value monitoring were continuously executed as long as the warning condition was fulfilled even if repeated actions in case of the condition pending was not set.

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www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

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## **FIX1084: Sensordatabase: switching scaling type between zero span and two point scaling**

Switching the scaling type between zero span and two point was not formatting the current content of the GUI. Switching to two-point-scaling was reading the data of the current sensor from the sensor database overwriting the current content and switching to zero span was doing nothing at all to the content.

## **FIX1085: Channel detail info and trace data table not displaying all points of linearization table**

If the linearization table of a sensor with table scaling had close to the maximum 64 scaling points the detail info and the trace data table were not displaying all points because of insufficient number of table rows.

## **FIX1086: CANHead Direct: wrong unit and traceability data**

The unit of CANHead Direct channels after assignment of strain gage sensors was "mV/V" instead of "µm/m". In addition some traceability data was incorrect.

## **FIX1087: CANBus commands could be lost after removing a device from a project**

The CANBus commands sent to a CAN module could be lost if the last module in a DAQ project was removed either in the hardware mapping dialog or in the DAQ project itself.

## **FIX1088: Component window layout could become corrupt**

In rare circumstances the component window layout became corrupt after editing sensors which were assigned to channels.

## **FIX1089: Bottom help text of computation channel dialog initially wrong**

The bottom help text of the computation channel dialog was initially wrong.

## **FIX1090: Formula collection for optical functions overwritten**

The formula collection for optical functions provided in the DAQ computation algebra was overwritten on each catman start. Additions or modifications done by the user got lost.

## **FIX1091: DataView search function: small issues with searching for consecutive values**

In some cases the function was searching for one consecutive value more than specified in the dialog (e.g. searching for 2 consecutive values specified in dialog, the function was searching for 3 consecutive values). Also DataView was jumping to the last value of the detected block of values. Jumping to the first value is better for investigation purposes.

## **FIX1092: Unnecessary prompt for project saving**

The user was sometimes prompted to save the project despite having made no changes to the project.

## **FIX1093: Project hardware mapper not called**

The project hardware mapper was not called if a module behind a CX27 was replaced by a module of the same type. The project was functioning but the trace data was incorrect displaying data like firmware version of the original module.

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## **FIX1094: Wrong module type in project hardware mapper**

MX840B modules were labelled as "MX840A" in the hardware mapper project view.

## **FIX1095: Visibility of design/run mode switching control in system controls**

The control was not made visible if slider and knob objects were in the projects. These objects can control analog out channels without a script.

## **FIX1096: Overflow in adapting sensor with table scaling**

Sometimes sensor adaptation of a channel with table scaling delivered overflow on the first try if not momentary value was used as measuring method. It was okay on the second attempt.

## **FIX1097: Sensor adaptation by measuring mean or RMS value**

Measuring mean or RMS value to adapt a sensor was delivering a result in physical values if the channel had no sensor assigned. This has been fixed for mean value. RMS value not selectable in that case.

## **FIX1098: Adapting sensor parameters not working**

Changing sensor parameters in sensor adaptation did not work for frequency and counter sensors on MX440.

## **FIX1099: Running average**

The running average computation in analysis project was adapted for an odd number of window points.

## **FIX1100: Statistics values in algebra not working for computations**

The statistics values min/max/mean in algebraic computations might not be delivered if the argument channel is an analysis project computation.

## **FIX1101: Inconsistencies in creating/modifying computations of type "Dataset"**

There were some inconsistencies in manually creating or modifying datasets in analysis project computations if both datasets based on formulas (e.g. "Sin(x)") and values from the input table were used.

## **FIX1102: Cursor sync in analysis project not working for computations**

Synchronizing visualization objects with the cursor display in analysis project was only working for channels from a data file but not for analysis project computations.

## **FIX1103: Auxiliary channels: wrong dt in real-time graphs**

Auxiliary channels got the dt of the slow sample rate group if the channels were filled by EasyScript project and the time base was provided by sample rate group specification or manual dt. This caused the graphs to scroll far too quickly. The actual data and number of values was correct.

## **FIX1104: Graph region selector tool: zoom not working in xy graph**

Zoom via graph region selector tool did not work in xy graphs with x values not being monotonous.

## **FIX1105: Graph region selector tool: last value of dataset not included**

If the selected region was going beyond the end of the plot the last value of the dataset was not included into the operation (e.g. copying or removing data).

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## **FIX1106: Real-time graph losing data after DAQ job**

In rare circumstances real-time graphs could lose all displayed data after a DAQ job if the user was selecting the graph.

## **FIX1107: Creating/modifying graph annotations**

Annotation type "Arrow SE" was missing. Annotations created on current cursor position (via cursor window) could not be modified.

## **FIX1108: Graph annotations not visible after redraw**

Graph annotations in a project created before version 5.0 were not made visible after graph redrawing. They only became visible if the user was creating or deleting an annotation. Annotations created in newer versions did not have that problem.

## **FIX1109: Deleting of annotation not possible**

An annotation could not be deleted after project loading. The user had to activate the cursor window first.

## **FIX1110: Wrong scope panel duplicated**

The wrong scope panel was duplicated if an empty placeholder object was selected on the panel to be duplicated.

## **FIX1111: Bar indicator distorted after project loading**

The indicator part of a bar indicator was distorted after project loading if the minimum value was larger than 0.

## **FIX1112: Resize problem of digital indicator on floating panel and scope**

Limit value displays in digital indicators on floating and scope panels were wrongly positioned if the panel or the objects inside were resized.

## **FIX1113: Return values of message boxes in EasyScript and Autosequences could become corrupt**

The return value of message boxes in EasyScript and Autosequences could become corrupt if the status update of the visualization panel channel selector was active.

## **FIX1114: EasyScript function EA\_IO.QuantumX.GetXMLView could fail**

This EasyScript function failed if a very large XML view (e.g. MX471 CAN connector view) should be retrieved.

## **FIX1115: EasyScript function EA\_Graph.MapQuery not functional**

EasyScript function EA\_Graph.MapQuery was not functional. It has been removed and replaced by the new function EA\_Graph.MapSetPosition.

## **FIX1116: Icon missing in Test Explorer for strain analysis computation**

The main treeview node in Test Explorer for the strain analysis computation was missing if it was created by EasyScript (EA\_Test.StrainAnalysis).

## **FIX1117: Script execution stage "After DAQ error" not working**

Script code assigned to the automatic script execution stage "After DAQ error" was not executed.

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www.hbm.com

Email: info@hbm.com

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## **FIX1118: DAQ status incorrect in virtual DAQ project**

In virtual DAQ projects containing only signal generator computations the DAQ status was only correct for the default sample rate group. There was no status for slow and fast sample rate group even if computations were part of these groups. This could cause further problems like FTP upload of MATLAB data files connected to these sample rate groups not being executed.

## **FIX1119: SIE file conversion: some channels were not converted**

Channels of data type "rainflow" were not converted if the computation contained more than 22 classes. Now up to 256 classes are supported for all rainflow types.

## **FIX1120: SIE file conversion: conversion not working for very large channel counts**

The converted file was corrupt if the SIE file contained a very large number of channels (more than around 4800 channels).

HBM GmbH

[www.hbm.com](http://www.hbm.com)

Email: [info@hbm.com](mailto:info@hbm.com)

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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## Overview about the most important new functions and modifications

### **New functions for vehicle testing**

- CAN FD support (with QuantumX MX471C / SomatXR MX471C-R)
- Enhanced GPS support
  - Support of Ethernet based GPS devices
  - Support of HBM EGPS200plus and Vectornav VN200/300
  - GPS time synchronization via NTP
- Export CAN raw data to Vector CANalyzer Log ASCII format

### **New functions for lab testing**

- NTP support in pure optical systems with FS22

### **New general functions**

- Save and export data in NI TDMS format
- New EasyScript functions

For more functions, details, modifications and fixes please read below.

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Email: info@hbm.com

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## New functions

### **FUN452: Support for QuantumX MX471C CAN FD module**

With version 5.3 catman supports the CAN FD functionality of the QuantumX MX471C module. catman allows sensors with start bit up to 511 and is capable to configure all parameters relevant for CAN FD (Data phase bit rate, sample point ratio and synchronization jump width). Observe that the CAN FD data bit rate is always a multiple of the CAN classic bit rate (i.e. the bit rate used during the arbitration phase of the bus). Configuration of the CAN FD occurs via "Configure CAN bus" context menu of the channel list or ribbon bar "Special functions/CAN Bus". The sensor database has been adapted to the larger StartBit positions provided by CAN FD.

Important notes:

- Data types > 8 byte currently not supported by this module
- CAN Raw currently not supported by this module
- Sending CAN out message currently not supported by this module

### **FUN 453: Support of Ethernet based GPS *peplink* MAX series/Surf SOHO**

catman V 5.3 supports the GPS forwarding of the peplink MAX router. To make use of this functionality the "Allow Ethernet based GPS" option must be selected (s. "Options/Functions"). If this option is active the "Add manual device" dialog of catman will allow you to select "TCP/IP" as communication protocol. The IP address must refer to the local computer (i.e. 127.0.0.1) and port number is 6700.

To make the GPS data available the peplink router must be configured (via Web interface) as follows:

- In section "Advanced" enable "GPS forwarding"
- In the same dialog specify the IP address and the port to which GPS data should be sent. The IP address must always refer to the PC catman is running on and the port number must be 22.

### **FUN454: GPS - support of EGPS 200 plus and VECTORNAV**

catman V5.3 supports the additional channels of the EGPS 200 plus IMU and RTK units: Accelerations, Gyro (roll, pitch, yaw), RTK (Gyro rates, baseline, accuracy), Heading/Gradient and 2D,3D speeds. It also supports similar channels coming from the VECTORNAV VN 200/300 like Yaw,Pitch,Roll, Gyro rates, accelerations, positions and velocities.

For the VECTORNAV make sure the device is configured (via the VECTORNAV configuration tool) to "Async output" = "INS ECE2".

### **FUN455: GPS time synchronization via NTP**

Former versions of catman did not offer an online time synchronization of the GPS in hybrid systems. Per data transfer block of the master device (i.e. a QuantumX or MGCplus) only one reading from the GPS was considered (and duplicated n times). This caused plateaus of repeated samples in the DPS data. While this was ok for slow GPS sending at 1 or 2 Hz, it completely ignored the much higher resolution delivered with GPS sending at 20, 50 or even 100 Hz.

With version 5.3 a hybrid project can be configured for online NTP synchronization just as any other hybrid project containing e.g. an optical interrogator. With this the full resolution of the GPS is used.

See Using NTP synchronization for hybrid systems including a GPS for more details.

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www.hbm.com

Email: info@hbm.com

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Observe that for GPS NTP synchronization to work, a hybrid system with either QuantumX/SomatXR or MGCplus is necessary. Optical interrogators FS22 can NOT act as NTP synchronization masters.

## **FUN 456: New script method to restart catman**

The EasyScript method EA.Terminate supports an additional option by which catman can be terminated and immediately restarted afterwards.

## **FUN 457: Event monitoring**

Version 5.3 adds a new event type "After DAQ job start".

## **FUN 458: Optics - Use NTP synchronization in non-hybrid systems containing FS22 devices only.**

Up to catman 5.2 online time synchronization based upon NTP (Network Time Protocol) in projects with optical interrogators FS22 always required additional QuantumX/SomatXR modules or MGCplus devices to be present. Synchronization of a pure FS22 project was not possible. With catman 5.3 FS22 DI/SI devices will be automatically synchronized based on NTP even if no other device types are present - there is no need for a special configuration.

If for some reason you experience problems with this, the registry key HKEY\_CURRENT\_USER/SOFTWARE/VB AND VBA PROGRAM SETTINGS/HBM/CATMANEASY/DEFAULTS/FS22\_SYNCNONHYBRID allows you to turn off the sync. feature (set to "0").

## **FUN 459: Optical instruments FS22 SI Smart Peak Detection**

Up to version 5.2 the FS BraggMONITOR software tool was required to configure the Smart Peak Detection parameters of the FS22 SI. With 5.3 this is no longer necessary. The builtin catman spectrum display ("Optical functions") will be able to configure the bands of the SPD via the ribbon buttons "SPD ON" and "SPD OFF". In case of "SPD ON" a band for each peak will be defined and transmitted to the FS22 SI.

See also: FS22 SI Smart Peak Detection

## **FUN460: DataViewer**

V 5.3 extends the Data Finder utility by two new search methods:

- Find data point exactly equal to zero
- Find OVFL value

## **FUN461: Digital I/O triggers - debouncing**

V 5.3 provides configurable delay times to prevent unwanted triggers caused by bouncing (e.g. the start/stop switch of a CX22B).

## **FUN462: Cyclic sending of CAN out messages on MX471**

Up to 5.2 catman could send CAN Out messages only once, with every DAQ job start. For several sensors/devices (like ECU, OBD II) it is however necessary that these bus commands are sent cyclically at regular time intervals. catman 5.3 makes use of the MX471 OnBoard Cyclic CAN Out facility which can transmit up to 10 out messages per connector at regular time intervals. See "CANbus configuration/Bus commands").

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## **FUN463: EasyScript - control event monitoring via script**

Version 5.3 provides a set of script functions allowing to manage events at runtime. It is possible to create new events (EA\_DAQ.AddEventDefinition), read the configuration of existing ones, (EA\_DAQ.ReadEventDefinition), delete an event (EA\_DAQ.DeleteEvent) and assign an event to a channel (EA\_DAQ.AssignEvent).

## **FUN464: Create an online computation from a sensor scaling**

In some cases, it might be desirable to measure the electrical or optical raw value of a channel together with the values scaled to engineering unit (e.g. for traceability purposes). Obviously, this can only be achieved by means of computation channels. While the original hardware channel delivers the electrical raw value (i.e. uses a 1:1 scaling), the computation channel transforms the raw data into engineering units based upon sensor scaling information. Version 5.3 supports this by offering a mechanism to quickly create a computation based upon the scaling parameters of a sensor (see context menu of the SENSOR column). The following steps describe the workflow:

- Assign sensors from the sensor database to hardware channels
- Select the channels for which computations shall be created
- Select "Create computation channel from sensor" in the context menu of the SENSOR column or the ribbon group SENSOR dropdown menu
- The computations will be created while simultaneously the original hardware channel is switched back to electrical raw values (1:1) scaling while retaining all other sensor properties like excitation voltage or measuring range.
- Finally the connection of the hardware channel to the sensor database is disconnected

Observe that several sensor types can not be converted: Thermocouple, Pt100, SSI

## **FUN465: Curve configuration for standard and cursor graph**

Several curve properties (like plot style, symbol type, line type) can be set for all curves in the graph in one go. In the standard graph curve config dialog check the "All" checkbox, in cursor graph use the multiselect feature of the curve list.

## **FUN466: Analysis mode algebra computations**

The functions `cmin(ChannelName)`, `cmax(ChannelName)`, `cmean(ChannelName)` and `cSTD(ChannelName)` allow the use of statistical data of a channel in an expression. The following example subtracts the minimum of the channel "Accel\_right" from each sample of the channel "Accel\_left":

```
AccelLeft - cmin(AccelRight)
```

## **FUN467: Full support of new QuantumX/SomatXR modules MX590B-R and MX1609TB-R**

This version fully supports the MX590B-R pressure module and the rugged thermocouple modules supporting thermo type T.

## **FUN 468: Watchdog program to restart catman in case of crashes or catman no longer responding**

See "catman Watchdog" for details.

## **FUN469: EasyScript time measurement**

Added a function `EA.HighResTime()` to retrieve a high resolution timer (seconds since computer startup) useful for measuring time intervals. Resolution is better than 1  $\mu$ s.

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## Modifications

### MOD385: File history

The file history (i.e. files recently used) will now distinguish between DAQ and Analysis mode and only offer the file types appropriate to the corresponding mode.

### MOD386: Prevent changing sample rates with "New DAQ project"

The "Do not touch filters when connecting to device" option (s. catman startup screen "Measasure/Hardware devices and interfaces/More") has been extended to also prevent touching the sample rates currently configured in the hardware. The three sample rate groups in catman will be reconfigured according to the hardware settings.

Applicable to QuantumX/SomatXR only!

### MOD387: Dropdown and context menus

The height of the menu items has been increased to give a more pleasant look. In addition the descriptive texts which some menu items possessed have been removed. The descriptive text is now shown as a tooltip when hovering the mouse over a menu item.

### MOD388: Campus licenses

The initial message box informing the user that a campus license is used has been removed.

### MOD389: Date/Time formatting independent from locale setting

Dates and times in test files, DAQ comments, events etc. are now formatted independently of any locale settings. The format will always be yyyy/mm/dd hh:mm:ss (e.g. 2018/10/21 09:15:30). Date time formats with for instance 09:00 PM will no longer occur.

### MOD389: Sensor database

The "Export sensor" and "Import sensor" functions can now handle multiple sensors in one go. Export can either export a single sensor or a group of sensors (select the group before export). The import now allows multiple file selection, i.e. import of more than one sensor in one go.

### MOD390: Export of CAN raw data (Canalyzer log format, PCAN Trace format)

The ASCII export (either channel context menu "Export data" or EasyScript command EA\_Test.ConvertCANRawToASCII) supports export in the standard Vector CANalyzer ASCII log format where each line comprises:

Timestamp Busnumber CanId "Rx|Tx" "d" Number-of-bytes Byte1, Byte2, ..., Byte8

separated by a blank. This file format can be read by many CAN tools and HBM GlyphWorks. Alternatively you can also export in PCAN Trace Log format (.trc) which also can be read by several analysis tools.

Selection of export format is done in the file dialog which shows up after you clicked the "Export data" menu. The script method features a new ExportFormat parameter: 0=ASCII tab delimited, 1=Vector, 2=PCAN.

### MOD391: Channel naming

catman 5.3 supports a new registry entry which allows the use of otherwise forbidden characters in channel names if set to 1:

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HKEY\_CURRENT\_USER/SOFTWARE/VB AND VBA PROGRAM  
SETTINGS/HBM/CatmanEasy/DEFAULTS/ALLOWSPECIALCHANNELNAMES  
Allowed are then: spaces, brackets and math. operators like "-"

## Fixes

### **FIX1054: Recorders using very small pre-trigger times**

Recorders using pre-trigger times < 0.2 s could sporadically crash. It is however still not recommended to use pre-trigger times that small.

### **FIX1055: Low screen resolution might cause parts of dialogs becoming invisible**

Running catman with a screen resolution of 1024x768 might cause the online and post process math dialogs as well as some of the DAQ job configuration to be only partially visible.  
Workaround: collapse ribbon bar via the "^" button of the ribbon menu.

### **FIX1056: QuantumX sensors with incorrect electrical range**

In rare cases a sensor configuration could result in either an illegal max. electrical range value (causing "Sensor not supported by hardware" error) or too small a range value, causing a signal overflow. This happened in particular in case of a zero-span characteristics with a very large, negative electrical zero (e.g. displacement transducers where 0 mm could correspond to -253 mV/V).

### **FIX1057: Sensor database**

Displacement transducers of type WI had a wrong input characteristics causing the measurement values to be 50% smaller than expected.

### **FIX1058: CAN 800 kBit baudrate**

If a project contained a CAN configuration with 800 kBit/s this bitrate was not set after project or Excel parametrization file load.

### **FIX1059: CAN mode dependent (multiplexed) signal**

Mode values (multiplexer values) larger than 65535 were not considered properly.

### **FIX1060: Optical computation channels**

A computation of type "wavelength -> temperature" was not displayed correctly when editing immediately after project load.

### **FIX1061: Assigning a x-channel to a graph via EasyScript (*EA\_Panel.SetRTDisplayChannel* and *EA\_Panel.SetXAxisChannel*)**

- Assigning the channel failed in large graphs (covering most of the panel). The channel was instead assigned as a y curve.
- Unwanted message appeared which must be suppressed if the assignment is done by script
- CANraw and classcounting channels could be used as x dataset - this is however not meaningful.

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## **FIX1062: Visual panel textbox with *MultiLine* property set**

The textbox could become visible even if it was not on the current panel (e.g. via EA\_Panel.SetValue).

## **FIX1063: EasyScript function EA\_IO.QuantumX.SetArbitrarySignalGenerator**

The function did not accept negative voltage values.

## **FIX1064: Download files from MGCplus hard disk**

Version 5.3 will now also support a download via the USB interface

## **FIX1065: MGCplus sensor adaptation**

Since version 5.2 measuring an electrical value in the sensor adaptation could result in OVFL even if a sensor was properly connected.

## **FIX1066: Auxiliary channels**

Math channels using auxiliary channels as argument received wrong sample rate. As a result they did not refresh in real-time graphs.

## **FIX1067: MGCplus ML74 CANHead configuration**

In case a project contained more than one MGCplus with ML74 an attempt to configure (i.e. assign the CANHeads, ribbon bar "Special/CANHead") all devices other than the first one, crashed catman.

## **FIX1069: CAN signals of type INT32 on QuantumX**

CAN signals with CAN raw format "Unsigned IN32" or "Signed Int32" with a scale factor of 1 could experience a loss of resolution in case the value gets bigger than 1000000. A typical example for this would be a UTC time (seconds since 1.1.1970) transmitted as unsigned Int32.

## **FIX01070: Drop channel to graph legend "Replace channel"**

This function did not correctly replace the channel if the the curve resided in a layer other than the first one.

## **FIX1071: MGCplus sample rate and filter setting**

On a ML801 multichannel board all subchannels must share the same filter and the same sample rate. When attempting to change rate or filter on a single subchannel, catman prompts the user that all subchannels will be changed accordingly. This verification however failed in case the subchannel belonged to the last board in the device.

## **FIX1072: MGCplus high definition filters (HD)**

catman incorrectly reported a type Bessel (BE) characteristics in the channel list. Filter setup in the device however were set correctly.

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## Known problems in this version

### **PRB 1: MGCplus CP52 with more than 256 channels (relevant for ML71 CANBus cards only)**

catman currently only supports up to 256 channels per device in one sample rate group. The CP52 however supports up to 512 channels per device - in case the channel number exceeds 256 and all are in the same sample rate group a DAQ error BLOCK\_TOO\_LARGE (-214) occurs. Workaround: put all channels above 256 in another sample rate group.

### **PRB2: MX471C maximum number of CAN signals per connector**

The MX471C potentially supports up to 256 decoded CAN signals per connector. In catman 5.3 however only 128 can be used.

In future versions, however catman will allow recording of all CAN signals on vehicle bus transferred from MX471C as raw data, decoded on PC or recorder and within catman and not on the device.

### **PRB3: MX471B/C using CAN raw only (i.e. no CAN signal (decoder) channels)**

In case the option "Only CAN raw" is set for QuantumX MX471 (Startup screen/MEASURE/Hardware and interface settings/Options/CANBus) other modules in your project will fail to deliver measurement values if they run in the standard sample rate group. Workaround: put these modules either in FAST or SLOW group or do not use the "CAN raw only" mode. In this case you still get CAN raw data but together with a certain number of decoder channels. At least one of these decoder channels must be active!

HBM GmbH

[www.hbm.com](http://www.hbm.com)

Email: [info@hbm.com](mailto:info@hbm.com)

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## V5.2.2

### Legend:

FUN: functional enhancement  
MOD: modification  
FIX: bug fix  
PRB: known problem

### **New functions**

#### **FUN444: Support of National Instruments TDMS data format**

With version 5.2.2 you may save or export your measurement data into the National Instruments TDMS format (e.g. for further processing in NI Diadem). The files will contain all traceability data. In addition, in catman analysis mode you can directly access TDM/TDMS files without prior conversion to the catman standard format.

If you load TDM/TDMS files in analysis mode which have not been created by catman, it cannot be guaranteed that the content of the file can be interpreted correctly in all cases. For instance catman will not support TDM/TDMS data channels with DataFormat=String. The catman TDM/TDMS reader was however tested with the example files coming with NI Diadem and most of these load correctly.

#### **FUN445: EasyScript support to configure the MX878/879 arbitrary signal generator**

A new script method EA\_IO.QuantumX.SetArbitrarySignalGenerator allows you to transfer a waveform into the signal generator. The waveform can either be passed as a list of values separated by blanks or read from a text file (one column, each row is one value). The signal generator runs with 96 kHz output rate, use the SampleRepetitions parameter to slow down the output by n-times repetition of an individual sample. Observe that the signal generator must be configured as "Arbitrary". This cannot be done from within catman - use the MX Assistant tool.

#### **FUN446: Support of new QuantumX gateway module CX27C**

catman 5.2.2 supports the new module CX27C as a gateway (i.e. access to QuantumX/SomatXR modules which are connected to the CX27C via FireWire). The throughput of the CX27C is significantly higher than that of the CX27B (up to 2 MS/s).

Observe that in contrast to the CX27B the CX27C does not feature any digital I/O's!

#### **FUN447: New online math filter functions**

catman 5.2.2 features three new filter types: Bessel band pass, Butterworth band pass, Butterworth band stop filter. Due to the weaker attenuation of the Bessel characteristic no Bessel band stop filter is provided!

#### **FUN448: Extension of the Excel Parametrization Tool**

Configuring a project via an Excel workbook now allows the addition of GPS devices.

#### **FUN449: Password protection**

The sensor protection mechanism (OPTIONS/SENSORS) has been extended to protect other actions also:

- Configuration of sample rates and filter

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- Configuration of limit values and events
- Editing online math channels
- Deactivation/Activation of channels
- Firmware Update

Access to the password protection setup is additionally provided in OPTIONS/SAFETY.

## **FUN450: New online computations for strain gages**

- Temperature compensation with up to 5 polynomial coefficients and gage factor temperature dependency
- Change of strain over time (strain rate)

## **FUN451: DataViewer**

The DataViewer module (i.e. quick examination of measurement data) now contains a Data Finder utility, which allows the location of specific conditions in a dataset. Supported methods:

- Go to specific line (data point)
- Find data point > value
- Find data point < value
- Find data point larger than predecessor by value
- Find data point smaller than predecessor by value
- Find data point exactly equal to predecessor

The search will start at the active row in the data table, thus allowing browsing through the whole dataset (i.e. Find Next).

## **Modifications**

### **MOD377: DataViewer: Edit data in table**

Enable/Disable editing values is no longer possible on a per channel base. Allowing edit mode will allow to edit values for all channels displayed in the DataViewer table.

### **MOD378: Standard graphs inverted axes**

- Axes inversion may now also be applied to the x-axis of a standard graph
- Axes inversion is now also supported by real-time charts

Observe that axes inversion is not supported by cursor graphs.

### **MOD379: Detection of loss of communication to devices already during configuration phase**

This feature can be turned OFF via OPTIONS/SAFETY.

### **MOD380: Channel and sensor comments**

- Assigning a sensor will transfer the sensor comment into the channel comment if the OPTIONS/SENSORS/ "Sensor name as channel name" is active.
- Sensor and channel comments are no longer restricted to 50 characters - sensor comments can have up to 256 characters, channel comments can have an arbitrary size

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- Hovering the mouse over the Name column of the channel list will display the channel comment
- Hovering the mouse over a sensor in the sensor list will display the sensor comment

## **MOD381: Strain gage sensors**

With version 5.2.2 the unit label can be chosen different from " $\mu\text{m}/\text{m}$ ": additional units are " $\mu\text{strain}$ " and " $\text{microstrain}$ ".

## **MOD382: MGCplus and sample rates in synchronized systems**

It is no longer allowed that a slave has channels in a sample rate group which is not also used by the master (the first MGCplus in your DAQ project).

## **MOD383: Channel names**

Blanks in a channel name will automatically be replaced by an underscore (`_`).

## **Fixes**

### **FIX1034: Optical strain sensors with temperature compensation using sensitivity instead of gage factor**

If the temperature channel resided AFTER the strain channels to be compensated the strain value was incorrect.

### **FIX1035: Rescan of project with optical sensors**

Only the original sensor properties (from the sensor database) were restored after the scan - not the sensor adaptation.

### **FIX1036: Online computation of type "Rate of change" (derivation)**

The first two samples after DAQ start contained invalid values.

### **FIX1037: CAN mode dependent signals**

Mode values  $> 32767$  were not supported. With 5.2.2 a mode value up to 65535 is allowed.

### **FIX1038: CAN Raw data table**

Filtering the table for ID's with 29 Bit Extended Frame Format did not work correctly.

### **FIX1040: MGCplus filter settings on inactive channels**

Setting filters on a multichannel board (like ML801) which only provides one common filter frequency for all subchannels caused a misleading display in the channel list if channels were deactivated. The list pretended different frequencies while in reality all subchannels shared the same frequency.

### **FIX1041: Strain sensors wit unit " $\mu\text{m}/\text{m}$ " could not be assigned to QuantumX modules on a Japanese Windows OS**

Assigning such a sensor resulted in a "Sensor not supported by hardware" error.

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## **FIX1042: Measuring electrical value for 2-point sensor scaling could result in weird value**

Measuring the electrical value could unintentionally deliver a physical value in engineering units. This happened under the following circumstances:

- Only on QuantumX/SomatXR modules
- Only if measurement performed from within the Sensor Database Manager
- Only if measurement method was "Average over n seconds"
- Only if channel was zerobalanced (i.e zerobalance <> zero)

## **FIX1043: Online computation channels**

If a computation consisted of a pure constant expression (like "1 + pi/2"), i.e. did not contain an argument channel, catman could crash or deliver an unexpected result.

## **FIX1044: Edit online computation channels**

Edit multiple channels in one go: only the selected channel was really initialized. That is the changes for the other channels did not become effective if a DAQ starts immediately following the edit operation.

## **FIX1045: Execute EasyScript after DAQ job termination**

Script to be executed after DAQ job termination (the DAQ job configuration dialog "General\Execute automatically on DAQ stop", NOT the auto exec stages!) did not get executed in case of a regular DAQ stop via the ribbon button.

## **FIX1046: Optical interrogators and band locking**

The band lock information got lost after project load.

## **FIX1047: FastStream converter**

Conversion of files with a large number of channels (> 200) and sample rates > 50 KHz could lead to a crash of the converter program.

## **FIX1048: Statistics journal**

Using the statistics journal with wavelength channels from an optical interrogator resulted in insufficient precision of the wavelength data written to the statistics text file (.stat).

## **FIX1049: Changing sample rates or filters on MGCplus**

In rare cases (e.g. with ML77 boards present) this operation crashed catman.

## **FIX1050: Hybrid systems including more than 16 QuantumX/SomatXR modules**

Catman crashed when creating a new DAQ project.

## **FIX1051: Terminating DAQ job**

Terminating DAQ jobs which had repetitions failed to restore the ribbon GUI in the following scenario: "Abort all repetitions" selected in the DAQ stop prompt dialog.

## **FIX1052: MGCplus and ML74 CANHead**

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In case sensors with differing excitation voltages were assigned to channels of one and the same CANHead module, the channel list live readings could produce incorrect values. All channels of a module must share the same excitation voltage.

## **FIX1053: UDP output on CX22B**

On a CX22B the [UDP output of measurement data](#) during a DAQ job ("DAQ job settings/Advanced") incorrectly used the IOverFirewire network adapter to stream the data instead of the regular LAN adapter.

## **Known problems in this version**

### **PRB 1: MGCplus CP52 with more than 256 channels (relevant for ML71 CAN bus cards only)**

catman currently only supports up to 256 channels per device in one sample rate group. The CP52 however supports up to 512 channels per device - in case the channel number exceeds 256 and all are in the same sample rate group a DAQ error BLOCK\_TOO\_LARGE occurs. Workaround: put all channels above 256 in another sample rate group.

### **PRB2: Triggered video recordings**

Depending on the camera type it may happen that the video recording starts too early (immediately when the DAQ job starts). This can be prevented by putting a "Live video" display object on the visualization panel and activate its "Preview" mode.

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## V5.2.1

### Legend:

FUN: functional enhancement

MOD: modification

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PRB: known problem

## Overview about the most important new functions and modifications

### **New functions for lab testing**

- Data acquisition from GOM Aramis 3D Motion and Deformation Sensor
- Enhanced FS22DI device support: Support NTP synchronization and new sample rate 1000S/s

### **New functions for vehicle testing**

- Enhanced device support
  - QuantumX CX22B-W-R: UPS (Uninterruptible Power Supply) feature support
  - Enhance synchronization status display
- Visualization of GPS data in Baidu maps

### **New general functions**

- Personal formula library for algebra calculations
- Enhanced analysis and post process functions
  - New Channel overflow event
  - Add single channels to analysis project
  - Enhanced search in test explorer using meta data parameters
- Enhancements for large channel applications (100-1000 channels)
  - Edit multiple online computations in one step
  - Intelligent renaming of channels
  - Online algebra computations with channels of mixed sample rate
- Many new functions in EasyScript
  - E.g. functions to directly access data in measurement files for analysis

For more functions, details, modifications and fixes please read below.

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## New functions

### **FUN431: NTP synchronization with Fiber Sensing optical interrogators**

With firmware 2.0 or higher the HBM Fiber Sensing interrogators FS22 SI/DI feature an onboard NTP clock synchronization. catman will make use of this in case of hybrid systems (QuantumX/MGCplus + interrogator) to improve the time synchronization between the systems. Under "Special/Configure external time synchronization" you may monitor the sync quality.

Observe that the interrogators always expect the NTP server to be the PC where catman is running on. It is currently not possible to select a different server. This has several important consequences:

- The local PC must run NTP services. This is always the case if you installed catman with the option "Install NTP time server" (ON by default). You can verify this in the windows start menu, program folder "Meinberg/Network Time Protocol/Quick NTP Status". The folder "Meinberg/Network Time Protocol/Service Control" allows you to restart the NTP service. In case the "Meinberg" program folder is not present no NTP services are available. You may either reinstall catman with the above mentioned option set or download the NTP service software from the Meinberg web site ([www.meinbergglobal.com/english/sw/ntp.htm](http://www.meinbergglobal.com/english/sw/ntp.htm)).
- The NTP time sources of the QuantumX/MGCplus devices must be configured in a way that they use the local PC as NTP server (see "Special/Configure external time synchronization").

### **FUN432: Support of CX22B-W-R UPS (Uninterruptible Power Supply)**

The CX22B-R comes with an UPS which takes over the power supply in case of a power line failure. The UPS can power the CX22 for several minutes. A new type of event (see also Event Monitoring) in catman "CX22B power supply interrupted - UPS operation active" allows you to take actions (e.g. sending an e-mail). A special type of action "Save data, terminate catman and restart on return of power" will allow you a clean shutdown without the risk of losing data. During the shutdown process catman will launch the Restart Monitor on the CX22. This software will automatically restart catman in case the power line comes back while the CX22 is still in UPS mode.

Observe that the CX22 UPS does NOT power the connected QuantumX/SomatXR modules. If these are connected to the same power line as the CX22, any running DAQ job in catman will immediately abort. Still the event described above will fire before(!) catman terminates the DAQ job.

### **FUN434: Analysis mode: new search functions in Test Explorer**

Formerly the file search mechanism could only search based upon filenames (e.g. "Brake\*.TST"). With version 5.2 files can be searched for by the content of the TST file. In the search field type Parameter name=Parameter value. The following example shows how to list all files created by all brake test DAQ jobs: Jobname=Braketest\*

You may use the wildcard character in front or after the parameter value. In most cases you will search for the content of test parameters, e.g. Operator=Smith. Several search expressions may be combined with the AND and OR operators: Operator=Smith AND Jobname=TestDrive\*.

The "Search sub folders" option now works independently from any search text. Even without a search criterium, i.e. displaying all test files of a folder, the sub folders may be included.

### **FUN435: Online computations and analysis mode computations**

Computations of type "Algebra" feature so called Formula Collections. A formula collection is a plain text file (.for, by default located in the \Templates folder of the catman working directory) containing formulae,

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[www.hbm.com](http://www.hbm.com)

Email: [info@hbm.com](mailto:info@hbm.com)

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including title and description. From within the "Computation" dialogs you can open a formula collection, add a formula to the collection and copy a formula from the collection to the formula edit window. As an example catman comes with a formula collection "OpticalFormulas.for" which contains several useful formulae for the conversion of wavelength changes to strain or temperature.

Hint: Hovering the mouse over the formula collection combo box shows the description for the formula.

## **FUN436: CX22 digital outputs**

A new option (OPTIONS/CX22) allows you to automatically sync the LED state of the "DAQ running" and "Error" LEDs with the digital outputs No. 1 and No.2. That is, the state of these outputs reflects the LED on/off state.

## **FUN437: Renaming of DAQ channels**

Formerly a name was rejected if a channel with that name already existed. Version 5.2 will offer several options how to handle the naming conflict:

- Keep the new name for the channel under edit and set the already existing one to the default channel name
- Keep the new name for the channel under edit and increment the already existing one by an appendix `_1`, `_2` etc.
- Keep the new name for the channel under edit and replace the already existing name by some arbitrary name
- Do not accept the new name and return to the edit dialog

Once an option is selected it may be applied automatically without showing the dialog again (Hint: menu bar window/Show prompt windows will show the dialog again).

## **FUN438: Online computations and analysis mode computations**

A new function "Rate of change (derivative over time)" (residing in the "Predefined formulas" tab of the "Formulas" group) allows a quicker and easier way to use derivation with respect to time. The function calculates the  $dy/dt$  of a signal  $y$  based upon the sample rate of the signal. In analysis mode the computation additionally provides a smoothing option (based upon Savitzky-Golay filtering) to suppress noise in the derivation amplified from the noise in the input signal. This option is not available for the online computation in DAQ mode.

## **FUN439: Edit multiple online computations in one go**

With version 5.2 it is possible to change a parameter (e.g. the cutoff frequency of a filter) of multiple online computations of the same type for many channels in one go. Simply highlight the desired computation channels and select "Edit computation" from the context menu.

Please observe the following notes:

- Multiple edit does not apply to algebraic formulas
- Changing the formula type (e.g. changing a class count type) is not possible for multiple channels
- Multiple edit is not supported in analysis mode post-process computations

## **FUN440: EasyScript: Access catman .BIN files**

Version 5.2 significantly enhances the EasyScript support for accessing .BIN files (catman standard format). Up to this version, access to measurement data from script required the test to be loaded into the analysis project at first (EA\_Test.Load). Sometimes it would however be more flexible to have access to the .BIN file directly. One great benefit: this could be done in DAQ mode. For this reason catman 5.2 adds several new script methods:

- EA\_Test.GetDataFileChanCount: retrieves the number of channels in the .BIN file.

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# RELEASEnotes

- EA\_Test.GetDataFileInfo : retrieves header information for all channels in the .BIN file, e.g. number of samples, byte offset of channel data in .BIN file and so on.
- EA\_Test.GetDataFileData: retrieves the samples for one channel out of the .BIN file.
- A new set of methods FILE\_xxxx in the EA\_Comm class allows file access more powerful than the VBA built in functions. The methods simply wrap the Win API file functions (CreateFile, ReadFile, WriteFile, SetFilePointer, CloseHandle). In particulate the EA\_Comm.FILE\_SetFilePointer method can handle offsets  $> 2^{32}$  (which is not possible with VBA Seek method).

This set of functions gives the programmer a huge amount of analysis power.

## FUN441: EasyScript new helper functions

- The new property EA\_IO.DeviceCount (delivers the number of devices in your DAQ project) and the method EA\_IO.GetDeviceNameFromPos (returns the name of a device based on position) are useful for functions which expect a device name and you want to iterate over all devices in the project (e.g. EA\_IO.QuantumX.ReadXML).
- A new property EA\_Test.TestCount allows you to iterate through all loaded tests of your analysis project.
- Two other methods allow the manipulation of online computation channels: EA\_IO.GetFormula and EA\_IO.SetFormula  
Depending on the type of math channel the formula expression can be a complex string including delimiters like "~". In case of an algebraic formula it is simply the formula (e.g. "PressureLeft + PressureRight/2"), in other cases like for instance a rosette it might look like "ROSETTE~Strain\_a~Strain\_b~Strain\_c~45~235000~0.3~0.14~0.14~0.14~11". If you examine a few formula strings by hovering the mouse over the SENSOR/FUNCTION column you will easily understand the structure of most expressions.
- A new method EA\_Job.TriggerPowerBIDataTransfer allows you to force an immediate transfer of channel data to Microsoft Power BI or Influxdb, regardless of the update interval set in the catman Power BI console.

## FUN442: Standard and cursor graph axis layers for curves - shortcut to create new layers

The legend context menu (i.e. clicking on legend name) allows the quick creation of a new y-axis layer and automatically moves the curve into this layer.

## FUN443 Support for GOM Aramis camera system

catman can acquire position and strain data from the GOM (Gesellschaft für Optische Messtechnik) ARAMIS camera system. Under "Hardware options" select the device type "Optical instruments" and specify the IP address of the computer running the GOM ARAMIS Professional software (alternatively you may also add the camera in the HBM Device Manager in case you want to create a hybrid system including for instance HBM QuantumX and the GOM camera). catman interacts with this software only - never with the camera controllers. Please observe some important notes when working with the GOM software:

- In the ARAMIS software make sure the "Deformation Tracking" is running and the "SCPI interface" option is enabled -otherwise catman will not be able to connect to the system. Do not stop deformation tracking while catman is running - otherwise you have to restart catman and reload your project. Observe that catman has no means to detect if the ARAMIS configuration (i.e. number of points etc.) does still match your catman project!
- Make sure to terminate catman before you stop the deformation tracking in ARAMIS! If you reconfigure ARAMIS (i.e. add or remove points) you need to create a new DAQ project in catman.

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- catman can only acquire data - no configuration of the ARAMIS system can be done from within catman. This applies in particular to the sample rate: the sample rate you select in catman must match the rate configured for the ARAMIS Deformation Tracking!
- The sample rate you selected in ARAMIS deformation tracking (recommended: 1,2, 5,10, 20, 50) must also be selected in your catman DAQ project. Observe that ARAMIS does not guarantee to provide this rate under all circumstances. Several reasons (high computing load in ARAMIS, disturbed camera image) can slow down this rate. For this reason we recommend to use the REL\_TIME catman provides - it contains the actual timestamp of each data packet delivered by the ARAMIS processor. Drag this channel to the x-axis of a graph to obtain a correct y vs. time representation. The channel NTP\_TIME contains the absolute timestamps in s since 1.1.970 (UTC).

## Modifications

### **MOD365: Online computations of type algebra allow mixed sample rates**

Up to version 5.1 all argument channels in a formula must belong to the same sample rate group. With version 5.2 this is no longer required - argument channels can belong to different sample rate groups. This is for instance useful in calculations involving a temperature channel, which usually is sampled at a lower rate. The sample rate group of the first argument channel appearing in the formula will determine the number of results generated - usually this channel will belong to the fastest sample rate group used.

Observe that this only applies to online computations in DAQ mode. Algebraic computations in Analysis mode still require the argument channels in a formula to belong to the same sample rate group!

### **MOD366: Input of numerical values**

Input boxes for the entry of numerical values will also accept an algebraic expression, i.e. instead of "1.5" you may also type "3/2" or "sqrt(2)" instead of "1.414". Observe that this is only an input aid - the value shown in the textbox when redisplaying a dialog will always be the result.

### **MOD367: Display of external time sources and sync topology (s. SPECIAL/CONFIGURE EXTERNAL TIME SYNCHRONIZATION)**

This dialog has been reviewed in order to improve the display of sync master/slave relationships and the usage of external time sources like NTP or PTP. The former dialog proved to be confusing in some scenarios.

### **MOD368: Limit value and OVFL checking**

- The event monitoring facility allows the specification of a minimum hold time for the events of type level crossing or sensor range exceedance. The condition must persist for at least this time until the event is triggered. Default is 0, i.e. immediately.
- Added new event type "Channel in overflow". The above mentioned "minimum hold time" also applies to this event type.

### **MOD369: Recorders**

It has been observed that in some cases the launch of the FastStream converter, which occurs immediately after a recording is finished, sometimes takes unusually long (several seconds). In rare cases this could cause a buffer overflow error in the DAQ job process. With version 5.2 the FastStream conversion may be deferred to a later time when it can be done manually (see topic FastStream storage for details how this can be done). Set the registry entry RECORDERNOAUTOFSCONVERT to 1 to switch off automatic FastStream conversion:

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HKEY\_CURRENT\_USER\Software\VB and VBA Program  
Settings\catmanEasy\DEFAULTS\RECORDERNOAUTOFS CONVERT

## **MOD370: New DAQ option to ignore Re-sync messages**

The DAQ option "Resume measurement also in case of re-sync messages" (in "Synchronization" group of the "DAQ jobs" tab) allows you to continue a DAQ job even in case of a re-sync performed by QuantumX/SomatXR modules. See Ignore Re-sync of QuantumX/SomatXR modules for more details.

## **MOD371: Long term cyclic storage module snapshot storage**

Up to version 5.1 snapshots recorded (i.e. sequence plan contained "Save cycle every....." and only one data point stored for this cycle) and Min/Max values were only written to disk after the DAQ job terminated. With version 5.2 the cyclic storage module offers the option to save the file at selectable intervals.

## **MOD372: Time information in test file (.TST)**

With version 5.2 catman will add the time zone information (the time zone where the test was done) to the .TST file.

## **MOD373: Data storage in ASCII format**

If a precision other than "Auto" was selected, the numbers in the file contained trailing spaces. While this is legal and most programs like MS Excel have no problems with this kind of formatting, it seems that some programs fail to correctly convert the ASCII file back to numbers. For this reason with version 5.2 catman will remove the spaces.

## **MOD374: Online computations of type Linearization and Polynomial**

With version 5.2 you may create multiple computations (assign multiple input channels) for these types in one go.

## **MOD375: Overview graphs**

A new option for the x-axis (see config dialog, register tab "General\X-axis in point index") allows the use of the point index instead of time as x-dataset.

## **MOD376: Recorders**

Added some disk space checks. A recorder is now terminated if disk space capacity falls below 100 MB. In addition, before FastStream conversion is started, a check is done if the total number of bytes recorded plus a safety buffer of 100 MB exceeds the free disk space. If this is the case no conversion will be done. In both cases a message will be written to the log (recorder log and catman event log).

## **Fixes**

### **FIX1006: Optical strain sensors with temperature compensation**

The measurement value shown in the channel list (live reading) was not correct (measurement data collected by a DAQ job however were ok).

### **FIX1007: Online computation: Optical strain + temperature compensation**

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The "Temperature Cross Sensitivity" parameter entered was not displayed correctly when the computation was edited again and computation results were wrong.

## **FIX1008: Connecting to QuantumX/SomatXR modules not found in scan**

If for some reason modules were not contained in the device scan results (e.g. behind a router boundary or scanning ports blocked by Firewall) catman was not able to connect to these modules even if a connection was theoretically possible. With V 5.2 it is possible to build up a DAQ project without the HBM Device Manager (i.e. adding all addresses manually, separated by a ";") even in case the modules are not found by the device scan.

## **FIX1009: QuantumX CANBus: Synchronicity between CAN and analog signals on MX840**

Depending on the number of analog channels as well as on the sample rates in use it could happen that an analog signal appeared to occur before a CAN signal which gave rise to the change in the analog signal (i.e. response before stimulus).

## **FIX1010: Online computation channel of type LINEARIZATION**

If the input value to be linearized exceeded the last x-point of the linearization table, a wrong result was computed.

## **FIX1011: Import of visualization from a project**

This import failed in case the project has been created with version 5.1. Older versions were not affected.

## **FIX1012: Cyclic storage module**

If the module was configured to use a counter channel in order to count cycles and this counter channel (e.g. MX460) did not start with 0 (because already counting before your DAQ job started) catman created too many snapshots at the begin of the test. This did not occur if the option "Reset counter on start" was set.

## **FIX1013: EasyPlan**

The option "Automatically create default channels for device" was always active and could not be changed (grayed out) in case of MGCplus systems.

## **FIX1014: MGCplus AP402/S38**

Sensor type "Current" (mA) could not be set for this custom version of the AP402 and resulted in a "Sensor not supported by hardware" error.

## **FIX1015: Project hardware mapper (i.e. device not found after project load) with MGCplus and PMX**

With version 5.1 it was no longer possible to manually specify an address range to be used in the scan for available devices.

## **FIX1016: Sensor database - changing sensor name of existing sensor**

Changing the name of a sensor already assigned to a channel did not update the channel list display. The new name was not reflected in the channel list.

## **FIX1017: Channel health check**

Nominal shunt values for MX1615/1616 corrected.

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## **FIX1018: Data file name (see DAQ job configuration/Storage) had .TST extension**

This could lead to loss of data - the .TST file did overwrite the binary data file .BIN. The extension .TST will no longer be accepted.

## **FIX1019: catman freezes when attempting to create an online computation channel of type algebraic formula**

If one of the argument channels was named "c1" catman did freeze after clicking "Create computation".

## **FIX1020: Vaisala weather station AutoBaud detection not working**

The AutoBaudDetect routine only looked for \$GP but the Vaisala station sends \$WI in NMEA mode.

## **FIX1021: Analysis mode file converters (SIE)**

Adding multiple files to project which needed to be converted could display repeated, unwanted prompt messages.

## **FIX1022: Kistler KiRoad**

Loading a project containing a KiRoad failed to connect to the KiRoad.

## **FIX1023 Adding all files from folder to the analysis project**

In case the "Use channels automatically" option was set the computations and display sources for the last test added were created twice.

## **FIX1024: Import of CAN dbc file into sensor database**

In rare cases a file can contain a leading TAB character at the beginning of a "SG\_" line. This caused the import to not read any sensor at all.

## **FIX1025: Cursor sync with maps**

With version 5.1 the cursor sync between graphs/video and maps didn't work correctly. Sync was off by a factor of 2 and zoomed sync (graph was zoomed) didn't work at all.

## **FIX1026: Error message "Unexpected error loading catman: component File.OCX or one of its dependencies not correctly registered: a file is missing or invalid"**

This error could appear if the setup program needed to restart the computer after the installation. Depending on the user account in effect during this restart the registration of OCX components could fail due to missing privileges. With version 5.2 catman ensures the registration after a computer restart regardless of the type of user account.

For this to work the SYSTEM account must be available and the Scheduled Task function of Windows must not be deactivated.

## **FIX1027: Digital indicators**

Digital indicators will no longer show a previous value after loading a project. Instead they will show 0.

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## **FIX1028: Visual panel object "Data table"**

Setting font type and size for this object had no effect

## **FIX1029: MGCplus ML460 invalid frequency range**

Depending on the input characteristics (i.e. transforming kHz into engineering units) of a sensor an invalid frequency range (not supported by ML460) could be selected. This resulted in a "Sensor not supported by hardware" error.

## **FIX1030: MX840 CANbus - DAQ could not be started (Error: Unknown reason).**

CAN decoders were not activated upon catman project start, so it depended on the activation state of the decoders (e.g. set by MX Assistant) if a DAQ job could be started or not. This error applied to version 5.1.3 only.

## **FIX1031: EasyScript method EA\_Test.GetChannelData**

An array bounds check introduced with 5.1 did no longer allow to dimension the buffer receiving the sample data to exactly SampleCount-1 (i.e. 0 to SampleCount-1 elements). The upper bound of the array needed to be SampleCount at least.

## **FIX1032: Incorrect DAQ status displays if MX471 CAN raw channels present**

If CANRaw receivers were activated and the MX471 was the last device in the DAQ project, the DAQ status information like remaining disk space and RT lag where incorrect.

## **FIX1033: MGCplus frequency measurement with ML60 and ML460**

The sensor options "5V/100 mV input" (ML60) and "Direct/Integrating" (ML460) where not provided.

## **Known problems in this version**

### **PRB 1: MGCplus CP52 with more than 256 channels (relevant for ML71 CAN bus cards only)**

catman currently only supports up to 256 channels per device in one sample rate group. The CP52 however supports up to 512 channels per device - in case the channel number exceeds 256 and all are in the same sample rate group a DAQ error BLOCK\_TOO\_LARGE occurs. Workaround: put all channels above 256 in another sample rate group.

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# RELEASEnotes

## V5.2.2

### Legend:

FUN: functional enhancement

MOD: modification

FIX: bug fix

PRB: known problem

### **New functions**

#### **FUN444: Support of National Instruments TDMS data format**

With version 5.2.2 you may save or export your measurement data into the National Instruments TDMS format (e.g. for further processing in NI Diadem). The files will contain all traceability data. In addition, in catman analysis mode you can directly access TDM/TDMS files without prior conversion to the catman standard format.

If you load TDM/TDMS files in analysis mode which have not been created by catman, it cannot be guaranteed that the content of the file can be interpreted correctly in all cases. For instance catman will not support TDM/TDMS data channels with DataFormat=String. The catman TDM/TDMS reader was however tested with the example files coming with NI Diadem and most of these load correctly.

#### **FUN445: EasyScript support to configure the MX878/879 arbitrary signal generator**

A new script method EA\_IO.QuantumX.SetArbitrarySignalGenerator allows you to transfer a waveform into the signal generator. The waveform can either be passed as a list of values separated by blanks or read from a text file (one column, each row is one value). The signal generator runs with 96 kHz output rate, use the SampleRepetitions parameter to slow down the output by n-times repetition of an individual sample.

Observe that the signal generator must be configured as "Arbitrary". This cannot be done from within catman - use the MX Assistant tool.

#### **FUN446: Support of new QuantumX gateway module CX27C**

catman 5.2.2 supports the new module CX27C as a gateway (i.e. access to QuantumX/SomatXR modules which are connected to the CX27C via FireWire). The throughput of the CX27C is significantly higher than that of the CX27B (up to 2 MS/s).

Observe that in contrast to the CX27B the CX27C does not feature any digital I/O's!

#### **FUN447: New online math filter functions**

catman 5.2.2 features three new filter types: Bessel band pass, Butterworth band pass, Butterworth band stop filter. Due to the weaker attenuation of the Bessel characteristic no Bessel band stop filter is provided!

#### **FUN448: Extension of the Excel Parametrization Tool**

Configuring a project via an Excel workbook now allows the addition of GPS devices.

#### **FUN449: Password protection**

The sensor protection mechanism (OPTIONS/SENSORS) has been extended to protect other actions also:

- Configuration of sample rates and filter

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- Configuration of limit values and events
- Editing online math channels
- Deactivation/Activation of channels
- Firmware Update

Access to the password protection setup is additionally provided in OPTIONS/SAFETY.

## **FUN450: New online computations for strain gages**

- Temperature compensation with up to 5 polynomial coefficients and gage factor temperature dependency
- Change of strain over time (strain rate)

## **FUN451: DataViewer**

The DataViewer module (i.e. quick examination of measurement data) now contains a Data Finder utility, which allows the location of specific conditions in a dataset. Supported methods:

- Go to specific line (data point)
- Find data point > value
- Find data point < value
- Find data point larger than predecessor by value
- Find data point smaller than predecessor by value
- Find data point exactly equal to predecessor

The search will start at the active row in the data table, thus allowing browsing through the whole dataset (i.e. Find Next).

## **Modifications**

### **MOD377: DataViewer: Edit data in table**

Enable/Disable editing values is no longer possible on a per channel base. Allowing edit mode will allow to edit values for all channels displayed in the DataViewer table.

### **MOD378: Standard graphs inverted axes**

- Axes inversion may now also be applied to the x-axis of a standard graph
- Axes inversion is now also supported by real-time charts

Observe that axes inversion is not supported by cursor graphs.

### **MOD379: Detection of loss of communication to devices already during configuration phase**

This feature can be turned OFF via OPTIONS/SAFETY.

### **MOD380: Channel and sensor comments**

- Assigning a sensor will transfer the sensor comment into the channel comment if the OPTIONS/SENSORS/ "Sensor name as channel name" is active.
- Sensor and channel comments are no longer restricted to 50 characters - sensor comments can have up to 256 characters, channel comments can have an arbitrary size

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- Hovering the mouse over the Name column of the channel list will display the channel comment
- Hovering the mouse over a sensor in the sensor list will display the sensor comment

## **MOD381: Strain gage sensors**

With version 5.2.2 the unit label can be chosen different from " $\mu\text{m}/\text{m}$ ": additional units are " $\mu\text{strain}$ " and " $\text{microstrain}$ ".

## **MOD382: MGCplus and sample rates in synchronized systems**

It is no longer allowed that a slave has channels in a sample rate group which is not also used by the master (the first MGCplus in your DAQ project).

## **MOD383: Channel names**

Blanks in a channel name will automatically be replaced by an underscore (`_`).

## **Fixes**

### **FIX1034: Optical strain sensors with temperature compensation using sensitivity instead of gage factor**

If the temperature channel resided AFTER the strain channels to be compensated the strain value was incorrect.

### **FIX1035: Rescan of project with optical sensors**

Only the original sensor properties (from the sensor database) were restored after the scan - not the sensor adaptation.

### **FIX1036: Online computation of type "Rate of change" (derivation)**

The first two samples after DAQ start contained invalid values.

### **FIX1037: CAN mode dependent signals**

Mode values  $> 32767$  were not supported. With 5.2.2 a mode value up to 65535 is allowed.

### **FIX1038: CAN Raw data table**

Filtering the table for ID's with 29 Bit Extended Frame Format did not work correctly.

### **FIX1040: MGCplus filter settings on inactive channels**

Setting filters on a multichannel board (like ML801) which only provides one common filter frequency for all subchannels caused a misleading display in the channel list if channels were deactivated. The list pretended different frequencies while in reality all subchannels shared the same frequency.

### **FIX1041: Strain sensors wit unit " $\mu\text{m}/\text{m}$ " could not be assigned to QuantumX modules on a Japanese Windows OS**

Assigning such a sensor resulted in a "Sensor not supported by hardware" error.

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## **FIX1042: Measuring electrical value for 2-point sensor scaling could result in weird value**

Measuring the electrical value could unintentionally deliver a physical value in engineering units. This happened under the following circumstances:

- Only on QuantumX/SomatXR modules
- Only if measurement performed from within the Sensor Database Manager
- Only if measurement method was "Average over n seconds"
- Only if channel was zerobalanced (i.e zerobalance <> zero)

## **FIX1043: Online computation channels**

If a computation consisted of a pure constant expression (like "1 + pi/2"), i.e. did not contain an argument channel, catman could crash or deliver an unexpected result.

## **FIX1044: Edit online computation channels**

Edit multiple channels in one go: only the selected channel was really initialized. That is the changes for the other channels did not become effective if a DAQ starts immediately following the edit operation.

## **FIX1045: Execute EasyScript after DAQ job termination**

Script to be executed after DAQ termination (the DAQ job configuration dialog "General\Execute automatically on DAQ stop", NOT the auto exec stages!) did not get executed in case of a regular DAQ stop via the ribbon button.

## **FIX1046: Optical interrogators and band locking**

The band lock information got lost after project load.

## **FIX1047: FastStream converter**

Conversion of files with a large number of channels (> 200) and sample rates > 50 KHz could lead to a crash of the converter program.

## **FIX1048: Statistics journal**

Using the statistics journal with wavelength channels from an optical interrogator resulted in insufficient precision of the wavelength data written to the statistics text file (.stat).

## **FIX1049: Changing sample rates or filters on MGCplus**

In rare cases (e.g. with ML77 boards present) this operation crashed catman.

## **FIX1050: Hybrid systems including more than 16 QuantumX/SomatXR modules**

Catman crashed when creating a new DAQ project.

## **FIX1051: Terminating DAQ job**

Terminating DAQ jobs which had repetitions failed to restore the ribbon GUI in the following scenario: "Abort all repetitions" selected in the DAQ stop prompt dialog.

## **FIX1052: MGCplus and ML74 CANHead**

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In case sensors with differing excitation voltages were assigned to channels of one and the same CANHead module, the channel list live readings could produce incorrect values. All channels of a module must share the same excitation voltage.

## **FIX1053: UDP output on CX22B**

On a CX22B the [UDP output of measurement data](#) during a DAQ job ("DAQ job settings/Advanced") incorrectly used the IOverFirewire network adapter to stream the data instead of the regular LAN adapter.

## **Known problems in this version**

### **PRB 1: MGCplus CP52 with more than 256 channels (relevant for ML71 CAN bus cards only)**

catman currently only supports up to 256 channels per device in one sample rate group. The CP52 however supports up to 512 channels per device - in case the channel number exceeds 256 and all are in the same sample rate group a DAQ error BLOCK\_TOO\_LARGE occurs. Workaround: put all channels above 256 in another sample rate group.

### **PRB2: Triggered video recordings**

Depending on the camera type it may happen that the video recording starts too early (immediately when the DAQ job starts). This can be prevented by putting a "Live video" display object on the visualization panel and activate its "Preview" mode.

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Email: [info@hbm.com](mailto:info@hbm.com)

Tel. +49 6151 803-0

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# RELEASEnotes

## V5.2.1

### Legend:

FUN: functional enhancement

MOD: modification

FIX: bug fix

PRB: known problem

## Overview about the most important new functions and modifications

### **New functions for lab testing**

- Data acquisition from GOM Aramis 3D Motion and Deformation Sensor
- Enhanced FS22DI device support: Support NTP synchronization and new sample rate 1000S/s

### **New functions for vehicle testing**

- Enhanced device support
  - QuantumX CX22B-W-R: UPS (Uninterruptible Power Supply) feature support
  - Enhance synchronization status display
- Visualization of GPS data in Baidu maps

### **New general functions**

- Personal formula library for algebra calculations
- Enhanced analysis and post process functions
  - New Channel overflow event
  - Add single channels to analysis project
  - Enhanced search in test explorer using meta data parameters
- Enhancements for large channel applications (100-1000 channels)
  - Edit multiple online computations in one step
  - Intelligent renaming of channels
  - Online algebra computations with channels of mixed sample rate
- Many new functions in EasyScript
  - E.g. functions to directly access data in measurement files for analysis

For more functions, details, modifications and fixes please read below.

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## New functions

### **FUN431: NTP synchronization with Fiber Sensing optical interrogators**

With firmware 2.0 or higher the HBM Fiber Sensing interrogators FS22 SI/DI feature an onboard NTP clock synchronization. catman will make use of this in case of hybrid systems (QuantumX/MGCplus + interrogator) to improve the time synchronization between the systems. Under "Special/Configure external time synchronization" you may monitor the sync quality.

Observe that the interrogators always expect the NTP server to be the PC where catman is running on. It is currently not possible to select a different server. This has several important consequences:

- The local PC must run NTP services. This is always the case if you installed catman with the option "Install NTP time server" (ON by default). You can verify this in the windows start menu, program folder "Meinberg/Network Time Protocol/Quick NTP Status". The folder "Meinberg/Network Time Protocol/Service Control" allows you to restart the NTP service. In case the "Meinberg" program folder is not present no NTP services are available. You may either reinstall catman with the above mentioned option set or download the NTP service software from the Meinberg web site ([www.meinbergglobal.com/english/sw/ntp.htm](http://www.meinbergglobal.com/english/sw/ntp.htm)).
- The NTP time sources of the QuantumX/MGCplus devices must be configured in a way that they use the local PC as NTP server (see "Special/Configure external time synchronization").

### **FUN432: Support of CX22B-W-R UPS (Uninterruptible Power Supply)**

The CX22B-R comes with an UPS which takes over the power supply in case of a power line failure. The UPS can power the CX22 for several minutes. A new type of event (see also Event Monitoring) in catman "CX22B power supply interrupted - UPS operation active" allows you to take actions (e.g. sending an e-mail). A special type of action "Save data, terminate catman and restart on return of power" will allow you a clean shutdown without the risk of losing data. During the shutdown process catman will launch the Restart Monitor on the CX22. This software will automatically restart catman in case the power line comes back while the CX22 is still in UPS mode.

Observe that the CX22 UPS does NOT power the connected QuantumX/SomatXR modules. If these are connected to the same power line as the CX22, any running DAQ job in catman will immediately abort. Still the event described above will fire before(!) catman terminates the DAQ job.

### **FUN434: Analysis mode: new search functions in Test Explorer**

Formerly the file search mechanism could only search based upon filenames (e.g. "Brake\*.TST"). With version 5.2 files can be searched for by the content of the TST file. In the search field type Parameter name=Parameter value. The following example shows how to list all files created by all brake test DAQ jobs: Jobname=Braketest\*

You may use the wildcard character in front or after the parameter value. In most cases you will search for the content of test parameters, e.g. Operator=Smith. Several search expressions may be combined with the AND and OR operators: Operator=Smith AND Jobname=TestDrive\*.

The "Search sub folders" option now works independently from any search text. Even without a search criterium, i.e. displaying all test files of a folder, the sub folders may be included.

### **FUN435: Online computations and analysis mode computations**

Computations of type "Algebra" feature so called Formula Collections. A formula collection is a plain text file (.for, by default located in the \Templates folder of the catman working directory) containing formulae,

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Email: [info@hbm.com](mailto:info@hbm.com)

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including title and description. From within the "Computation" dialogs you can open a formula collection, add a formula to the collection and copy a formula from the collection to the formula edit window. As an example catman comes with a formula collection "OpticalFormulas.for" which contains several useful formulae for the conversion of wavelength changes to strain or temperature.

Hint: Hovering the mouse over the formula collection combo box shows the description for the formula.

## **FUN436: CX22 digital outputs**

A new option (OPTIONS/CX22) allows you to automatically sync the LED state of the "DAQ running" and "Error" LEDs with the digital outputs No. 1 and No.2. That is, the state of these outputs reflects the LED on/off state.

## **FUN437: Renaming of DAQ channels**

Formerly a name was rejected if a channel with that name already existed. Version 5.2 will offer several options how to handle the naming conflict:

- Keep the new name for the channel under edit and set the already existing one to the default channel name
- Keep the new name for the channel under edit and increment the already existing one by an appendix `_1`, `_2` etc.
- Keep the new name for the channel under edit and replace the already existing name by some arbitrary name
- Do not accept the new name and return to the edit dialog

Once an option is selected it may be applied automatically without showing the dialog again (Hint: menu bar window/Show prompt windows will show the dialog again).

## **FUN438: Online computations and analysis mode computations**

A new function "Rate of change (derivative over time)" (residing in the "Predefined formulas" tab of the "Formulas" group) allows a quicker and easier way to use derivation with respect to time. The function calculates the  $dy/dt$  of a signal  $y$  based upon the sample rate of the signal. In analysis mode the computation additionally provides a smoothing option (based upon Savitzky-Golay filtering) to suppress noise in the derivation amplified from the noise in the input signal. This option is not available for the online computation in DAQ mode.

## **FUN439: Edit multiple online computations in one go**

With version 5.2 it is possible to change a parameter (e.g. the cutoff frequency of a filter) of multiple online computations of the same type for many channels in one go. Simply highlight the desired computation channels and select "Edit computation" from the context menu.

Please observe the following notes:

- Multiple edit does not apply to algebraic formulas
- Changing the formula type (e.g. changing a class count type) is not possible for multiple channels
- Multiple edit is not supported in analysis mode post-process computations

## **FUN440: EasyScript: Access catman .BIN files**

Version 5.2 significantly enhances the EasyScript support for accessing .BIN files (catman standard format). Up to this version, access to measurement data from script required the test to be loaded into the analysis project at first (EA\_Test.Load). Sometimes it would however be more flexible to have access to the .BIN file directly. One great benefit: this could be done in DAQ mode. For this reason catman 5.2 adds several new script methods:

- EA\_Test.GetDataFileChanCount: retrieves the number of channels in the .BIN file.

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- EA\_Test.GetDataFileInfo : retrieves header information for all channels in the .BIN file, e.g. number of samples, byte offset of channel data in .BIN file and so on.
- EA\_Test.GetDataFileData: retrieves the samples for one channel out of the .BIN file.
- A new set of methods FILE\_xxxx in the EA\_Comm class allows file access more powerful than the VBA built in functions. The methods simply wrap the Win API file functions (CreateFile, ReadFile, WriteFile, SetFilePointer, CloseHandle). In particulate the EA\_Comm.FILE\_SetFilePointer method can handle offsets > 2<sup>32</sup> (which is not possible with VBA Seek method).

This set of functions gives the programmer a huge amount of analysis power.

## FUN441: EasyScript new helper functions

- The new property EA\_IO.DeviceCount (delivers the number of devices in your DAQ project) and the method EA\_IO.GetDeviceNameFromPos (returns the name of a device based on position) are useful for functions which expect a device name and you want to iterate over all devices in the project (e.g. EA\_IO.QuantumX.ReadXML).
- A new property EA\_Test.TestCount allows you to iterate through all loaded tests of your analysis project.
- Two other methods allow the manipulation of online computation channels: EA\_IO.GetFormula and EA\_IO.SetFormula  
Depending on the type of math channel the formula expression can be a complex string including delimiters like "~". In case of an algebraic formula it is simply the formula (e.g. "PressureLeft + PressureRight/2"), in other cases like for instance a rosette it might look like "ROSETTE~Strain\_a~Strain\_b~Strain\_c~45~235000~0.3~0.14~0.14~0.14~11". If you examine a few formula strings by hovering the mouse over the SENSOR/FUNCTION column you will easily understand the structure of most expressions.
- A new method EA\_Job.TriggerPowerBIDataTransfer allows you to force an immediate transfer of channel data to Microsoft Power BI or Influxdb, regardless of the update interval set in the catman Power BI console.

## FUN442: Standard and cursor graph axis layers for curves - shortcut to create new layers

The legend context menu (i.e. clicking on legend name) allows the quick creation of a new y-axis layer and automatically moves the curve into this layer.

## FUN443 Support for GOM Aramis camera system

catman can acquire position and strain data from the GOM (Gesellschaft für Optische Messtechnik) ARAMIS camera system. Under "Hardware options" select the device type "Optical instruments" and specify the IP address of the computer running the GOM ARAMIS Professional software (alternatively you may also add the camera in the HBM Device Manager in case you want to create a hybrid system including for instance HBM QuantumX and the GOM camera). catman interacts with this software only - never with the camera controllers. Please observe some important notes when working with the GOM software:

- In the ARAMIS software make sure the "Deformation Tracking" is running and the "SCPI interface" option is enabled -otherwise catman will not be able to connect to the system. Do not stop deformation tracking while catman is running - otherwise you have to restart catman and reload your project. Observe that catman has no means to detect if the ARAMIS configuration (i.e. number of points etc.) does still match your catman project!
- Make sure to terminate catman before you stop the deformation tracking in ARAMIS! If you reconfigure ARAMIS (i.e. add or remove points) you need to create a new DAQ project in catman.

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- catman can only acquire data - no configuration of the ARAMIS system can be done from within catman. This applies in particular to the sample rate: the sample rate you select in catman must match the rate configured for the ARAMIS Deformation Tracking!
- The sample rate you selected in ARAMIS deformation tracking (recommended: 1,2, 5,10, 20, 50) must also be selected in your catman DAQ project. Observe that ARAMIS does not guarantee to provide this rate under all circumstances. Several reasons (high computing load in ARAMIS, disturbed camera image) can slow down this rate. For this reason we recommend to use the REL\_TIME catman provides - it contains the actual timestamp of each data packet delivered by the ARAMIS processor. Drag this channel to the x-axis of a graph to obtain a correct y vs. time representation. The channel NTP\_TIME contains the absolute timestamps in s since 1.1.970 (UTC).

## Modifications

### **MOD365: Online computations of type algebra allow mixed sample rates**

Up to version 5.1 all argument channels in a formula must belong to the same sample rate group. With version 5.2 this is no longer required - argument channels can belong to different sample rate groups. This is for instance useful in calculations involving a temperature channel, which usually is sampled at a lower rate. The sample rate group of the first argument channel appearing in the formula will determine the number of results generated - usually this channel will belong to the fastest sample rate group used.

Observe that this only applies to online computations in DAQ mode. Algebraic computations in Analysis mode still require the argument channels in a formula to belong to the same sample rate group!

### **MOD366: Input of numerical values**

Input boxes for the entry of numerical values will also accept an algebraic expression, i.e. instead of "1.5" you may also type "3/2" or "sqrt(2)" instead of "1.414". Observe that this is only an input aid - the value shown in the textbox when redisplaying a dialog will always be the result.

### **MOD367: Display of external time sources and sync topology (s. SPECIAL/CONFIGURE EXTERNAL TIME SYNCHRONIZATION)**

This dialog has been reviewed in order to improve the display of sync master/slave relationships and the usage of external time sources like NTP or PTP. The former dialog proved to be confusing in some scenarios.

### **MOD368: Limit value and OVFL checking**

- The event monitoring facility allows the specification of a minimum hold time for the events of type level crossing or sensor range exceedance. The condition must persist for at least this time until the event is triggered. Default is 0, i.e. immediately.
- Added new event type "Channel in overflow". The above mentioned "minimum hold time" also applies to this event type.

### **MOD369: Recorders**

It has been observed that in some cases the launch of the FastStream converter, which occurs immediately after a recording is finished, sometimes takes unusually long (several seconds). In rare cases this could cause a buffer overflow error in the DAQ job process. With version 5.2 the FastStream conversion may be deferred to a later time when it can be done manually (see topic FastStream storage for details how this can be done). Set the registry entry RECORDERNOAUTOFSCONVERT to 1 to switch off automatic FastStream conversion:

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HKEY\_CURRENT\_USER\Software\VB and VBA Program  
Settings\catmanEasy\DEFAULTS\RECORDERNOAUTOFS CONVERT

## **MOD370: New DAQ option to ignore Re-sync messages**

The DAQ option "Resume measurement also in case of re-sync messages" (in "Synchronization" group of the "DAQ jobs" tab) allows you to continue a DAQ job even in case of a re-sync performed by QuantumX/SomatXR modules. See Ignore Re-sync of QuantumX/SomatXR modules for more details.

## **MOD371: Long term cyclic storage module snapshot storage**

Up to version 5.1 snapshots recorded (i.e. sequence plan contained "Save cycle every....." and only one data point stored for this cycle) and Min/Max values were only written to disk after the DAQ job terminated. With version 5.2 the cyclic storage module offers the option to save the file at selectable intervals.

## **MOD372: Time information in test file (.TST)**

With version 5.2 catman will add the time zone information (the time zone where the test was done) to the .TST file.

## **MOD373: Data storage in ASCII format**

If a precision other than "Auto" was selected, the numbers in the file contained trailing spaces. While this is legal and most programs like MS Excel have no problems with this kind of formatting, it seems that some programs fail to correctly convert the ASCII file back to numbers. For this reason with version 5.2 catman will remove the spaces.

## **MOD374: Online computations of type Linearization and Polynomial**

With version 5.2 you may create multiple computations (assign multiple input channels) for these types in one go.

## **MOD375: Overview graphs**

A new option for the x-axis (see config dialog, register tab "General\X-axis in point index") allows the use of the point index instead of time as x-dataset.

## **MOD376: Recorders**

Added some disk space checks. A recorder is now terminated if disk space capacity falls below 100 MB. In addition, before FastStream conversion is started, a check is done if the total number of bytes recorded plus a safety buffer of 100 MB exceeds the free disk space. If this is the case no conversion will be done. In both cases a message will be written to the log (recorder log and catman event log).

## **Fixes**

### **FIX1006: Optical strain sensors with temperature compensation**

The measurement value shown in the channel list (live reading) was not correct (measurement data collected by a DAQ job however were ok).

### **FIX1007: Online computation: Optical strain + temperature compensation**

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The "Temperature Cross Sensitivity" parameter entered was not displayed correctly when the computation was edited again and computation results were wrong.

## **FIX1008: Connecting to QuantumX/SomatXR modules not found in scan**

If for some reason modules were not contained in the device scan results (e.g. behind a router boundary or scanning ports blocked by Firewall) catman was not able to connect to these modules even if a connection was theoretically possible. With V 5.2 it is possible to build up a DAQ project without the HBM Device Manager (i.e. adding all addresses manually, separated by a ";") even in case the modules are not found by the device scan.

## **FIX1009: QuantumX CANBus: Synchronicity between CAN and analog signals on MX840**

Depending on the number of analog channels as well as on the sample rates in use it could happen that an analog signal appeared to occur before a CAN signal which gave rise to the change in the analog signal (i.e. response before stimulus).

## **FIX1010: Online computation channel of type LINEARIZATION**

If the input value to be linearized exceeded the last x-point of the linearization table, a wrong result was computed.

## **FIX1011: Import of visualization from a project**

This import failed in case the project has been created with version 5.1. Older versions were not affected.

## **FIX1012: Cyclic storage module**

If the module was configured to use a counter channel in order to count cycles and this counter channel (e.g. MX460) did not start with 0 (because already counting before your DAQ job started) catman created too many snapshots at the begin of the test. This did not occur if the option "Reset counter on start" was set.

## **FIX1013: EasyPlan**

The option "Automatically create default channels for device" was always active and could not be changed (grayed out) in case of MGCplus systems.

## **FIX1014: MGCplus AP402/S38**

Sensor type "Current" (mA) could not be set for this custom version of the AP402 and resulted in a "Sensor not supported by hardware" error.

## **FIX1015: Project hardware mapper (i.e. device not found after project load) with MGCplus and PMX**

With version 5.1 it was no longer possible to manually specify an address range to be used in the scan for available devices.

## **FIX1016: Sensor database - changing sensor name of existing sensor**

Changing the name of a sensor already assigned to a channel did not update the channel list display. The new name was not reflected in the channel list.

## **FIX1017: Channel health check**

Nominal shunt values for MX1615/1616 corrected.

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## **FIX1018: Data file name (see DAQ job configuration/Storage) had .TST extension**

This could lead to loss of data - the .TST file did overwrite the binary data file .BIN. The extension .TST will no longer be accepted.

## **FIX1019: catman freezes when attempting to create an online computation channel of type algebraic formula**

If one of the argument channels was named "c1" catman did freeze after clicking "Create computation".

## **FIX1020: Vaisala weather station AutoBaud detection not working**

The AutoBaudDetect routine only looked for \$GP but the Vaisala station sends \$WI in NMEA mode.

## **FIX1021: Analysis mode file converters (SIE)**

Adding multiple files to project which needed to be converted could display repeated, unwanted prompt messages.

## **FIX1022: Kistler KiRoad**

Loading a project containing a KiRoad failed to connect to the KiRoad.

## **FIX1023 Adding all files from folder to the analysis project**

In case the "Use channels automatically" option was set the computations and display sources for the last test added were created twice.

## **FIX1024: Import of CAN dbc file into sensor database**

In rare cases a file can contain a leading TAB character at the beginning of a "SG\_" line. This caused the import to not read any sensor at all.

## **FIX1025: Cursor sync with maps**

With version 5.1 the cursor sync between graphs/video and maps didn't work correctly. Sync was off by a factor of 2 and zoomed sync (graph was zoomed) didn't work at all.

## **FIX1026: Error message "Unexpected error loading catman: component File.OCX or one of its dependencies not correctly registered: a file is missing or invalid"**

This error could appear if the setup program needed to restart the computer after the installation. Depending on the user account in effect during this restart the registration of OCX components could fail due to missing privileges. With version 5.2 catman ensures the registration after a computer restart regardless of the type of user account.

For this to work the SYSTEM account must be available and the Scheduled Task function of Windows must not be deactivated.

## **FIX1027: Digital indicators**

Digital indicators will no longer show a previous value after loading a project. Instead they will show 0.

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## **FIX1028: Visual panel object "Data table"**

Setting font type and size for this object had no effect

## **FIX1029: MGCplus ML460 invalid frequency range**

Depending on the input characteristics (i.e. transforming kHz into engineering units) of a sensor an invalid frequency range (not supported by ML460) could be selected. This resulted in a "Sensor not supported by hardware" error.

## **FIX1030: MX840 CANbus - DAQ could not be started (Error: Unknown reason).**

CAN decoders were not activated upon catman project start, so it depended on the activation state of the decoders (e.g. set by MX Assistant) if a DAQ job could be started or not. This error applied to version 5.1.3 only.

## **FIX1031: EasyScript method EA\_Test.GetChannelData**

An array bounds check introduced with 5.1 did no longer allow to dimension the buffer receiving the sample data to exactly SampleCount-1 (i.e. 0 to SampleCount-1 elements). The upper bound of the array needed to be SampleCount at least.

## **FIX1032: Incorrect DAQ status displays if MX471 CAN raw channels present**

If CANRaw receivers were activated and the MX471 was the last device in the DAQ project, the DAQ status information like remaining disk space and RT lag where incorrect.

## **FIX1033: MGCplus frequency measurement with ML60 and ML460**

The sensor options "5V/100 mV input" (ML60) and "Direct/Integrating" (ML460) where not provided.

## **Known problems in this version**

### **PRB 1: MGCplus CP52 with more than 256 channels (relevant for ML71 CAN bus cards only)**

catman currently only supports up to 256 channels per device in one sample rate group. The CP52 however supports up to 512 channels per device - in case the channel number exceeds 256 and all are in the same sample rate group a DAQ error BLOCK\_TOO\_LARGE occurs. Workaround: put all channels above 256 in another sample rate group.

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## V5.0.2

### Legend:

FUN: functional enhancement

MOD: modification

FIX: bug fix

PRB: known problem

### Fixes

#### **FIX980: QuantumX/SomatXR - DAQ job aborts with error**

Automatic time change (winter to summer) of the operating system frequently caused a measurement interruption. Also setting the PC clock time to the future by more than 5 seconds frequently caused a measurement interruption.

#### **FIX981: Replay of SIE file video content**

Positioning the video via cursor synchronization did not update the time and scrollbar position.

#### **FIX982: FTP configuration**

Leaving the input field "Target directory" empty frequently caused repeated warning messages.

#### **FIX983: SIE file conversion**

.BIN files created by the SIE converter could not be read by nCode GlyphWorks. Only the first channel was loaded.

#### **FIX984: Zooming in large datasets**

Under some circumstances the end of the dataset did not become visible. Depending on the size of the dataset and the location of minima and maxima, several seconds of data always remained outside the graph visible area, regardless of zoom level.

#### **FIX985: Recorders**

In case a DAQ job containing recorders was started automatically during catman startup or during project load the recorders were not launched. The same applied if the job was started via the standard action of a panel button or via script.

#### **FIX986: Long term cyclic data storage**

Storage of full cycles aborted after 24 h if the cycle was defined via time interval (i.e. 1 cycle = 5 s)

#### **FIX987: MDF4 format**

Under rare conditions activating the sample reduction (preview) option could corrupt the file.

#### **FIX988: Push notifications**

Sending push notifications failed if either the subject or the body contained special characters like ä, ö, ü, ° or μ.

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## V5.0.1

### Legend:

FUN: functional enhancement

MOD: modification

FIX: bug fix

PRB: known problem

## Overview about the most important new functions

### **New additional EasyMonitoring module to extend functionality of catman Easy**

All functions are also included in catmanAP

- Parallel recording: Define parallel recordings with individual triggers and files
- FTP/SFTP upload: Automatic upload of measurement files to an FTP/SFTP server
- Push notifications: Automated sending of push messages to smart phones or tablets triggered by detected events/alarms
- Integration of Vaisala weather station to measure wind speed, barometric pressure, air temperature, humidity, rainfall and hail

### **New functions for vehicle testing**

- Acquisition, display and analysis of CAN raw data
- Extended support for CCP/XCP communication

### **New functions for lab testing**

- Use CX22B as Firewire gateway
- New peak-valley computation

### **New general functions**

- Zoom In and Zoom Out visualization
- Favourite folders in PostProcess

For more functions, details, modifications and fixes please read below.

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## New functions

### **FUN401: Acquisition, display and analysis of CAN raw messages**

With version 5 catman can acquire and store raw CAN messages from a QuantumX MX471 module. Incoming messages can be displayed in a table including filtering for a certain message ID. catman event monitoring supports a new type of event "CAN message received". This event is triggered if a specific CAN message ID is received.

To acquire CAN raw messages on a MX471 firmware 4.8 or higher is required!

In analysis mode catman can display the raw messages in tabular manner and apply filtering. Export to an ASCII text file is supported. A new computation function allows decoding specific signals from the raw message stream based upon a Vector CANdb file. Raw messages can also be analyzed from a SIE file generated by a Somat CX23R. See topic CAN raw messages in catman for more details.

### **FUN402: CCP/XCP transmission control**

Together with a QuantumX MX471 catman can start/stop the transmission of CCP/XCP messages from an ECU. Transmission can be controlled via EasyScript, executed automatically upon DAQ job start or controlled via event monitoring.

To use this function on a MX471 firmware 4.8 or higher is required and the module must be parametrized to support CCP/XCP via MXAssistant. It is not possible to do this configuration from within catman.

### **FUN403: Multiple data recordings**

With version 5 catman introduces a new powerful concept of data recordings. Each DAQ job can have a subset of up to 15 data recorders. Each recorder runs a separate and independent data storage process based upon individual start/stop trigger conditions. It has its own set of channels to be recorded and individual sample rates including downsampling. Recordings can be repeated, i.e. after one recording the recorder again starts waiting for a trigger. A good example for the use of recorders is the monitoring of a railway bridge, where each of two tracks should be monitored separately.

Each recorder generates its own data file and also supports FTP upload.

Data recorders and FTP upload require an EasyMonitoring license or a catmanAP license.

See Data Recorders for more details.

### **FUN404: Event driven push notifications**

Push notifications are short messages which can be send via the HBM Push Server (a service offered by HBM in the internet) to any mobile smart device (e.g. iPhone, Android based devices) worldwide. Push notifications will be sent event driven by the catman event monitoring engine.

See Push notifications for more details.

### **FUN405: FTP/SFTP support**

Data files generated after a DAQ job can be automatically uploaded to a FTP server. SFTP with authentication and data encryption is supported. The FTP upload runs asynchronously in the background so it does not block further DAQ jobs. If a DAQ job contains video capture the video files can also be uploaded. FTP configuration is part of the DAQ job settings, register tab "Remote data storage". See the knowledgebase article FTP Upload for more details.

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FTP upload requires an EasyMonitoring license or a catmanAP license.

## **FUN406: Support for Vaisala weather station WXT520**

The weather station must be added as a manual device (in HBM Device Manager use "Add additional devices"). The channels to acquire are selectable and comprise wind speed and direction, barometric pressure, air temperature, rel. humidity, rainfall and hail. Observe that the WXT must be configured properly (use the Vaisala configuration software tool) for catman to be able to acquire the weather data:

- Automatic composite NMEA messages must be turned ON
- All other messages must be turned OFF
- In the composite message config panel (the right hand panel in the Vaisala config tool) the messages "min/max wind speed, direction" must be turned OFF

## **FUN407: Support Quantum/SomatXR modules**

- Support for MX809 temperature and DC voltage module
- Support for thermocouple type C
- Support for digital RS485 crankshaft-wheel sensors

## **FUN408: CX22B routing functions**

Instead of acting as an autonomous data recorder the CX22B can also act as a router, similar to a QuantumX CX27. In contrast to the CX27 the CX22B has a throughput performance of a factor 10 higher! Up to 3 MS/s can be acquired. A CX22B which is configured as a router will show up in the catman HBM Device Manager together with the modules connected to it.

## **FUN409: Analysis mode Test Explorer**

Several new features have been added to the Test Explorer:

- Search filter for file names (i.e. typing "vehi" will list all files with "vehicle" in their name)
- Load a test to the analysis project using a standard Windows file dialog, including multiple file selection
- The "Favourites" group in the file explorer view collects your favourite folders
- Search for files in a specific folder and its subfolders.
- Show file comment in the list of search results.
- Improved display of file details and loading of single channels into the analysis project. See tab "Channels" of the Test Explorer file view. Drag or double-click a channel to the analysis project to load it.

## **FUN410: CX23 SIE file support**

Several improvements were made related to the conversion of SIE files into catman standard .BIN and further analysis:

- Video frames will no longer be extracted as individual JPEG files. Instead all video frames are extracted into a single file (extension .video). catman can use this file as source for the video player object and synchronizes it with other data. The SIE video channel appears in the analysis project and can simply be dragged to the video player. The video replay also supports the new CX23 video burst mode.
- GPS raw messages (NMEA messages) including timestamps can be extracted to a separate text file.
- Start time of test and test description will be recognized.

## **FUN411: Online computation channels**

The algebraic formula editor computations supports new functions allowing the control of formula parameters via user interface elements or process variables during a running DAQ job:

- `input(ObjectName)` returns the current value of a panel object (e.g. a slider position or a textbox content)
- `cursorx(GraphName)` returns the x-value of a graph cursor
- `cursory(GraphName)` returns the y-value of a graph cursor
- `procvar(VarName)` returns the current value of a process variable. The % characters usually enclosing the variable name can be omitted.

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The following example changes an IF condition at DAQ job runtime: `if(Acceleration > input(Slider_AccelLevel), 1, 0)`

## **FUN412: Online computation channels and analysis mode computations**

A new computation in the group "Fixed formula" provides the computation of a polynomial  $y = a_0 + a_1 \cdot x + a_2 \cdot x^2 + \dots$ . This computation executes significantly faster than the same expression in the formula editor.

## **FUN413: Visualization - shrink or enlarge panel area, object resize**

Two new ribbon controls in the Visualization ribbon allow to up/downscale all objects on a panel by 10%. This is useful if a project contains a visualization created on a computer with a high screen resolution and the project is loaded on a computer with a lower screen resolution. Related to this is another new option for standard, polar and 3D graphs: "Dynamic font size" (see graph configuration dialog register tab "Layout" or register tab "Fonts/Colors"). If this option is set catman will automatically adjust font sizes if the graph size changes.

## **FUN414: Visualization - LED object**

With version 5 the LED object exposes additional operation modi:

- Digital input state: links the LED to a digital input of your hardware and reflects the state of the input. Just select the DIO channel in the configuration dialog of the LED.
- Simple level monitoring: allows you to monitor any channel for level crossing without the need of creating a limit value first. Just select the channel to be monitored in the configuration dialog of the LED and enter a level value.

## **FUN415: Analog-OUT and Digital-OUT control**

With version 5 you may link a visual object of type controller (slider, knob, switchslider or switch) to an analog or digital output of your hardware. Just select the A-OUT or DIG-OUT channel in the configuration dialog of the controller.

This functionality is currently only supported by QuantumX/SomatXR MX878/879 and PMX 878!

Observe that on the MX878 or MX879 the analog outputs must be activated for the controllers to work. Right click to the Sensor/Function column in the catman channel list to open the configuration dialog for the analog outputs and activate the outputs with an empty source reference.

## **FUN416: QuantumX OnBoard math - PID controller**

With version 5 the real-time PID controller of the MX878/879 can be fully configured. Formerly this type of math was not supported by catman (only MX Assist). See QuantumX OnBoard math for more details.

## **FUN417: EasyScript - sensor adaptation**

A new method `EA_IO.AdaptSensor` allows to manipulate the hardware configuration of a channel. It can be used on a channel where a sensor from the sensor database is already assigned, but can also be used to configure the hardware without a sensor assigned. A typical example for the use of this function is the assignment of an individual gage factor to channels, which all have the same generic S/G sensor assigned. See the EasyScript reference for more details.

## **FUN418: Optical interrogator FS22 DI**

catman version 5 supports the 1000 Hz sample rate.

HBM GmbH

www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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# RELEASEnotes

## Modifications

### MOD342: GPS support

Formerly the number of channels allocated for a GPS device could not be altered. With catman version 5 you may select which GPS channel shall be included in your project. So for instance you can have a project containing only the LAT and LONG channels.

### MOD343: Cursor window

This window can now be minimized.

### MOD344: Display of units

Version 5 adds a significant usability enhancement regarding the display of units in graph axis labels and legends. Up to now catman always appended a unit enclosed in []. Not everybody likes this and it is not conformal to some standards like DIN. We thus added a new option (OPTIONS/PANELS/DISPLAY OF UNITS) which allows to specify a kind of format string for the unit: the unit is always indicated by %u, everything else is left as is. So a format string like "in %u" would label an axis "Pressure in bar". By default "[%u]" is preset.

### MOD345: Channel health check

Added full and halfbridge channels of SomatXR MX840B-R to list of channels with internal shunt test.

### MOD346: QuantumX MX471 CANBus support

Activation/Deactivation of CAN channels on the MX471: up to now this was a "logical" operation restricted to catman - the decoder in the hardware was not touched. The user could gain the impression that he could lower the computation load on the module by deactivating some decoders, but that wasn't true. With 5.0 CAN decoders and the raw receivers are really deactivated/activated if the user does a channel activation or deactivation.

### MOD347: Peak-valley computation

If the COUNTER channel is displayed in the graph, the first value will be plotted vs. 1 (cycle) not vs. 0 as before.

### MOD348: Event monitoring and limit values dialog

The way this dialog is operated has changed:

- NEW does no longer use the settings currently entered, but creates a new event with default settings.
- APPLY and DISCARD buttons were removed - any change in the settings section immediately applies to the event currently selected in the event list.

### MOD349: Communication logging

A new option (OPTIONS/SAFETY/ALWAYS LOG DEVICE COMMUNICATION) allows enabling the communication log automatically with catman start. Additionally the log file storage scheme has been changed: formerly only one log file (COMLOG.LOG) existed. With catman version 5 the last 5 logs will be kept, each with its unique name. This number can be changed in the catman registry DEFAULTS/MAXCOMLOGFILES.

### MOD350: Panel scrollbars

catman will automatically show the scrollbars if visualization objects extend beyond the visible panel area.

HBM GmbH

www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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## **MOD351: DAQ data transfer parameters**

The transfer parameters "Maximum number of samples per transfer", "Time interval between transfers" and "Transfer read timeout" which formerly were located under OPTIONS/DAQ CHANNELS are now part of the DAQ job and thus part of a DAQ project. See "DAQ job configuration/Advanced settings/Data transfer and error handling".

## **MOD352: QuantumX MX879 Digital I/O**

The channel list of your DAQ project will now show the operation mode (Input, Output) so there is no need to open the DIO configuration window if one wants to know this. In addition, the state of the DIO (high,low) is visualized in the STATUS column of the channel list if the channel is active.

## **MOD353: GPS devices and Vaisala weather station**

It is now possible to modify the serial communication parameters (COM port, baudrate etc.) from within an already opened DAQ project. Right click the device row in the channel list to open the configuration dialog.

## **MOD354: Online computations Linearization Table and Polynomial**

The linearization table or the polynomial coefficients can be saved to file and in this manner reused in other projects or easily applied to other input channels without the need of retyping them.

## **MOD355: Channel detail info - clipboard function**

The channel info window toolbar features a "Copy to clipboard" button allowing to copy the channel detail info, QuantumX XML view, command window or NMEA log to the clipboard.

## **MOD356: GPS devices and Vaisala weather station**

With version 5 it is possible to add QuantumX/Somat XR modules, MGCplus or PMX devices to an already existing project containing GPS or Vaisala. The modules added will always reside before the GPS or Vaisala.

## **Fixes**

### **FIX952: GPS delivering too many samples**

In certain cases a GPS device delivered more samples per second than to be expected from the sample rate set for the device. This could happen if:

- the GPS used a low sample rate < 10 Hz
- and at least one QuantumX channel was in the same sample rate group

### **FIX953: Conversion of SIE files and file merging**

catman standard format files originating from a SIE file conversion could not be merged. A result file was created but this file could not be opened.

### **FIX954: Analysis mode FFT graph**

RMS and peak output were interchanged: selecting RMS did peak and vice versa.

### **FIX955: MX879 analog out and digital I/O setup**

HBM GmbH

www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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Depending on the channel list row currently selected, errors could occur when invoking the configuration dialog (context menu or ribbon group "OnBoard"). These errors occurred if the highlighted row belonged to a QuantumX OnBoard math or peak value channel.

## **FIX956: ASCII file converter**

In some cases it could occur that the conversion failed or produced incorrect results if the first line contained text but no column separators.

## **FIX957: Import of Vector CANdb into sensor database**

If multiple CANdb (.dbc) files were imported and two or more of these files contained the same message/signal name, all sensors following this duplicate became invisible in all but the first imported file.

## **FIX958: Angle synchronous display**

- Zoom Out/Zoom Reset did not always restore correct axis scaling.
- Analysis mode: Displaying a computation channel together with a hardware channel caused a "Sample rate mismatch" error even if the sample rates were identical.

## **FIX960: MX410/411/403 Highspeed mode**

catman crashed if a project containing a MX410 was loaded and the MX410 at this moment was in HS mode. This error occurred rarely since catman disables HS mode when terminating.

## **FIX961: Autosequences**

- Save As for a project containing Autosequences could sometimes fail to include the autosequences in the project.
- Loading an Autosequence workbook did only load the first Autosequence in the workbook.

## **FIX962: Statistics journal**

The larger update intervals introduced with 4.2.2 caused the statistics update to fail if interval was larger than 9 hours.

## **FIX963: Sensor database, import of Vector CANdb (.dbc) files**

The import failed if a single message contained a very large number (> 256) of signals.

## **FIX964: TEDS, display of traceability data**

Only the first character of the TEDS model was displayed

## **FIX965: QuantumX very low sample rates**

DAQ jobs using very low rates 0.2 Hz or 0.1 Hz in the decimal sample rate domain failed to start.

## **FIX970: Data storage failures with 4k sector size disks**

Several problems could occur if a disk had a native 4k sector size (large disks > 2 TB):

- Data files (standard .BIN and FastStream) were corrupted and could not be read anymore. All other formats worked without problems.
- If the temporary store was located on such a disk, catman crashed upon startup.

The problems did not occur with 4k sector size disks offering a 512e emulation mode (currently still the majority of disks).

HBM GmbH

www.hbm.com

Email: info@hbm.com

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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## **FIX971: QuantumX excitation voltage 7.5 V**

This voltage was not properly reflected in traceability data. Instead 10 V was shown.

## **FIX972: Hybrid systems containing optical interrogators or GPS devices**

In case of very low sample rates < 10 Hz the number of samples acquired for the GPS could be too low or too high.

## **FIX973: Projects containing two GPS devices**

Number of samples acquired for the 2nd device was wrong.

## **FIX974: Sending CAN messages**

In case the message ID was > 2047, catman did not set the Extended 29-Bit Frame bit. This caused the message not to be sent. The error affected the EasyScript command EA\_IO.SendCANMessage as well as the CAN option "Send message on DAQ start".

## **FIX975: Sample rate and filters dialog**

In some cases this dialog was not correctly sized if it only displayed the filter settings. Also the "Sample rate domain" combobox was unintentionally visible in this case.

## **FIX976: GPS**

GPS using very low baud rates below 9600 Baud could fail to acquire data correctly.

## **FIX977: CANbus configuration**

catman did not set baudrate and termination after loading a project. Only upon DAQ job start the settings were applied to the hardware. With version 5 these settings will be applied immediately after project load.

## **FIX978: Analysis projects**

An analysis project link to a DAQ project (i.e. an analysis project automatically loaded when switching from DAQ mode to analysis mode) was not preserved between subsequent sessions of catman.

HBM GmbH

[www.hbm.com](http://www.hbm.com)

Email: [info@hbm.com](mailto:info@hbm.com)

Tel. +49 6151 803-0

Fax +49 6151 803-9100

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