

Perception 8.30

Features and Improvements
September 2022

Perception v8.30.22203

- ▲ Maintenance must be good through August 1, 2022 to install
 - Compatible with all current mainframes and modules
 - <https://www.hbm.com/en/2475/support-downloads-perception/>
- ▲ Unique upgrade requirement: v8.28.22203 upgrade required first
 - Change to upgrade process requires intermediate step
 - All **hardware** needs to go through v8.28 before going to higher firmware
 - EtherCAT update to support distributed clock requires intermediate step

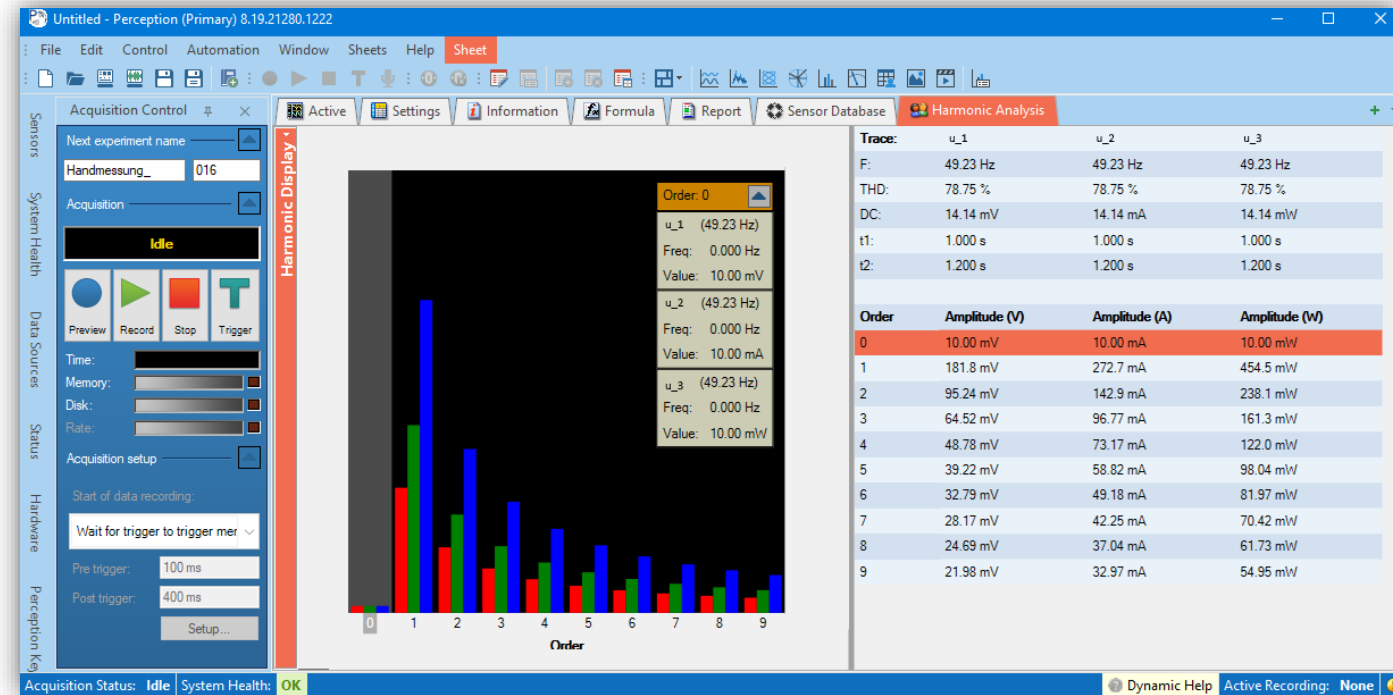


Perception 8.30 overview

- ▲ Harmonic analysis according to IEC 61000-4-7
- ▲ CAN remote control
- ▲ Measurement Uncertainty
- ▲ XY display improvements
- ▲ Complete overhaul of status / health / throughput information
- ▲ Increased number of RT-FDB results calculated / stored
- ▲ EtherCAT distributed clock support
- ▲ eDrive: Improved eDrive Mapping
- ▲ Improved sheet: more components and improved layout
- ▲ New Calculator
- ▲ eDrive: New Optional Analysis setup
- ▲ Other improvements

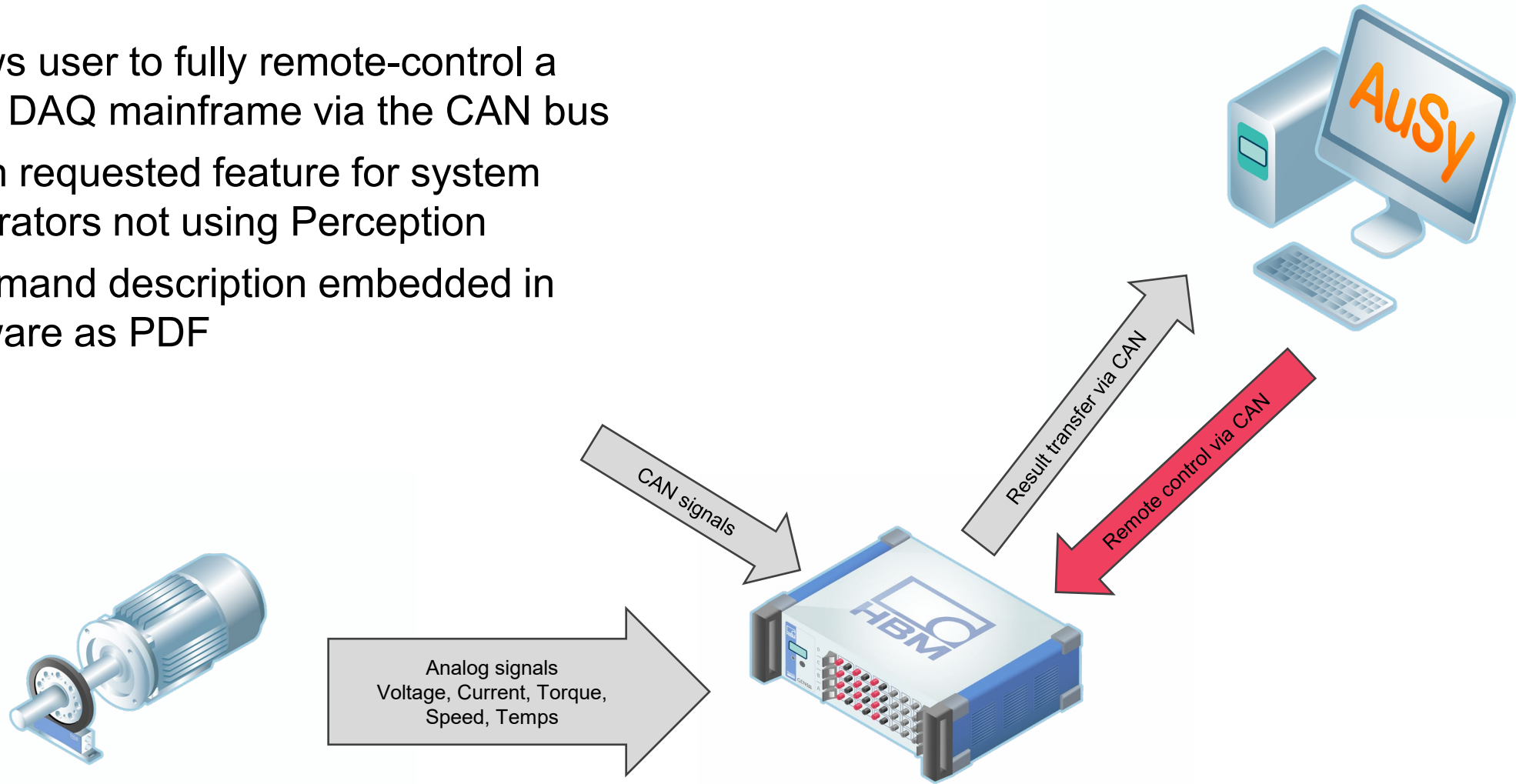
Harmonic Analysis according to IEC 61000-4-7

- Calculate and display harmonic information according to the IEC 61000-4-7 standard
 - Standard analysis for 50/60 Hz signals
 - Does not work with other frequencies*
- Typical request for power grid and power line applications
- Two building blocks integrated
 - New RT-FDB function @HarmonicsIEC61000
 - New Harmonic Analysis display
- Available in Perception & ePower suite
- Quick Start Guide available



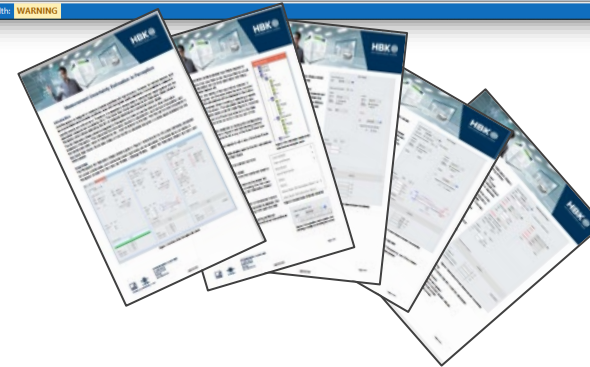
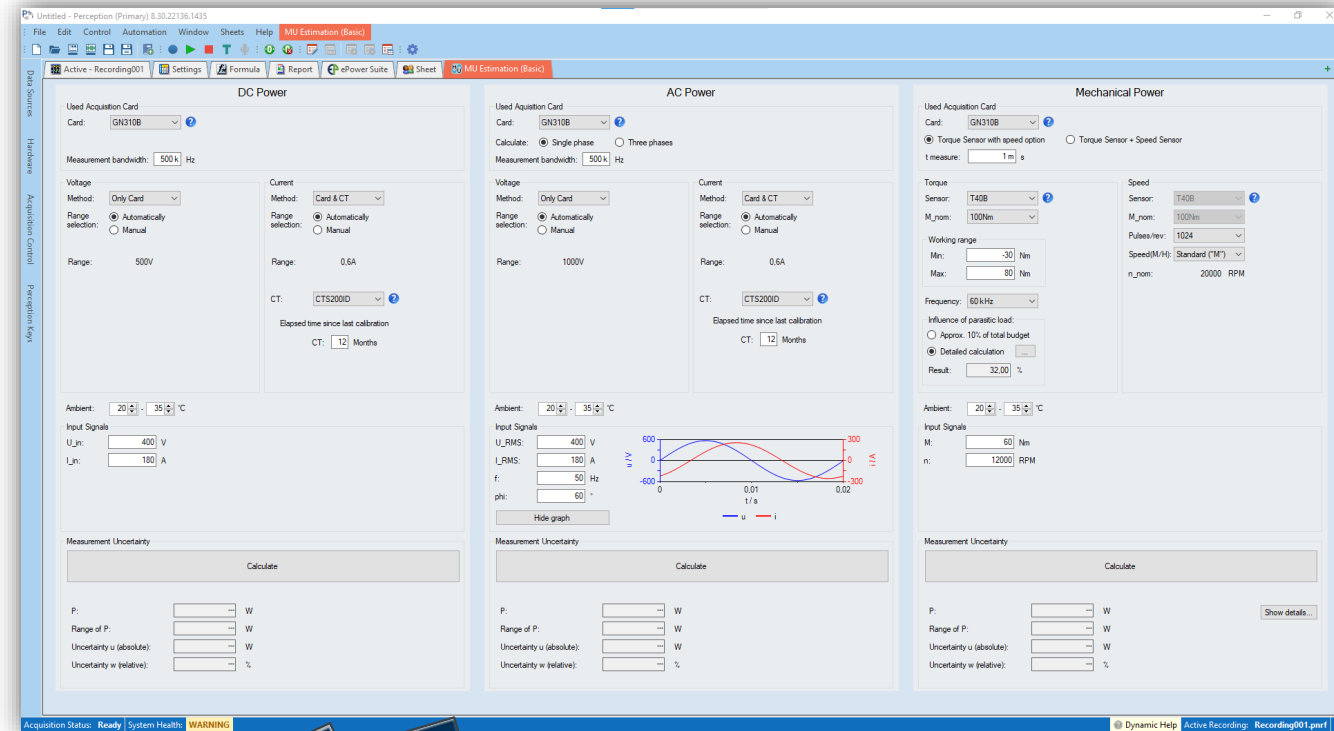
CAN (full) remote control

- ▲ Allows user to fully remote-control a GEN DAQ mainframe via the CAN bus
- ▲ Often requested feature for system integrators not using Perception
- ▲ Command description embedded in software as PDF



Measurement Uncertainty – Free Basic

- ▶ New sheet “**MU Estimation (Basic)**” to calculate the Measurement Uncertainty
 - For static DC, AC, and mechanical power values (single setpoint)
- ▶ Only in Perception Enterprise
- ▶ User selects
 - Sensors
 - *Note: GN310B module only in this release*
 - and enters
 - Measured values
- ▶ Then the sheet calculates the MU
- ▶ Embedded “Quick Start guide”
- ▶ Whitepaper to be available soon
 - Full details will not be given out (IP)
- ▶ “MU Calculation” sheet to follow
 - This will be a cost option



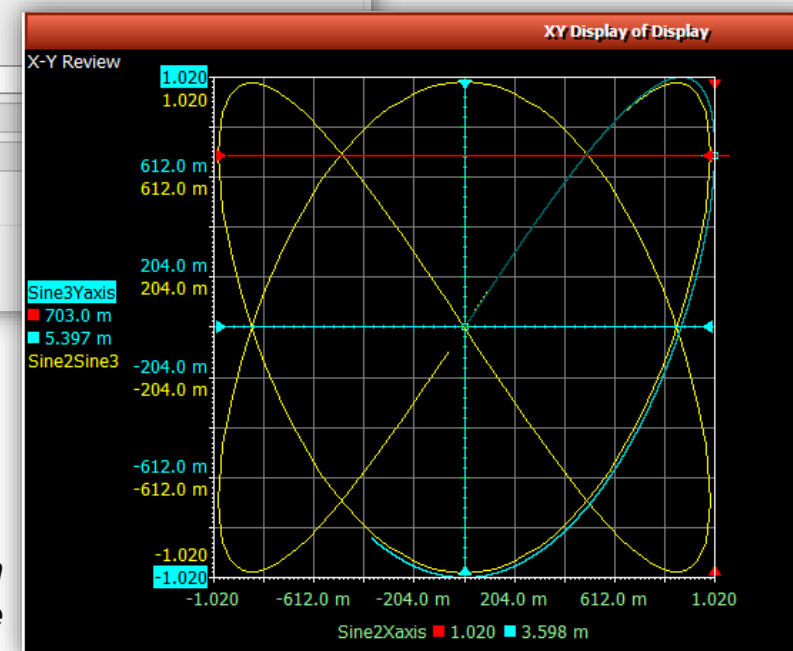
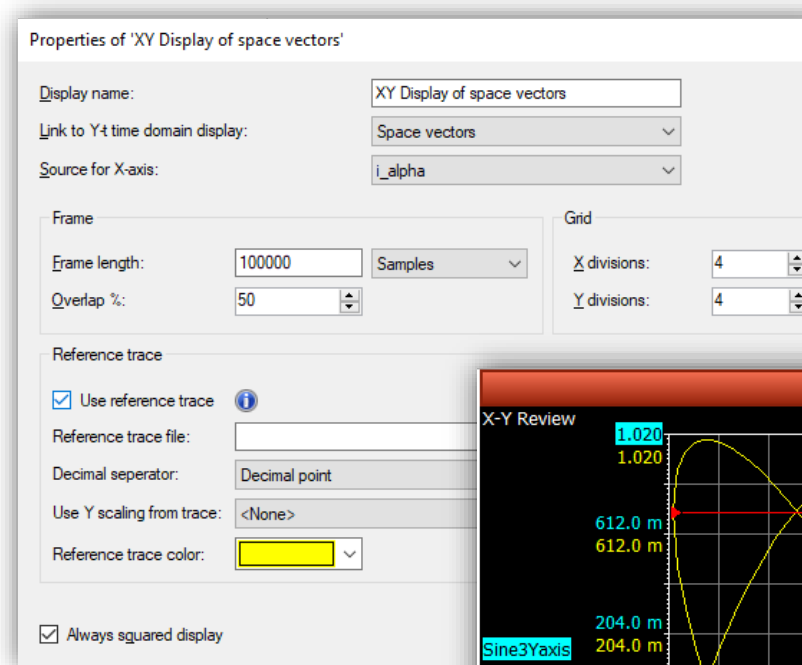
XY Display Improvements

Ability to show more data

- The maximum number of samples has been increased from 1 M to 10 M

Reference trace

- It is now possible to load an X/Y “reference trace” from an ASCII file
- Application example
 - Compare the measured torque/speed XY trace with data from a simulation model (which generates the reference trace) or other reference data

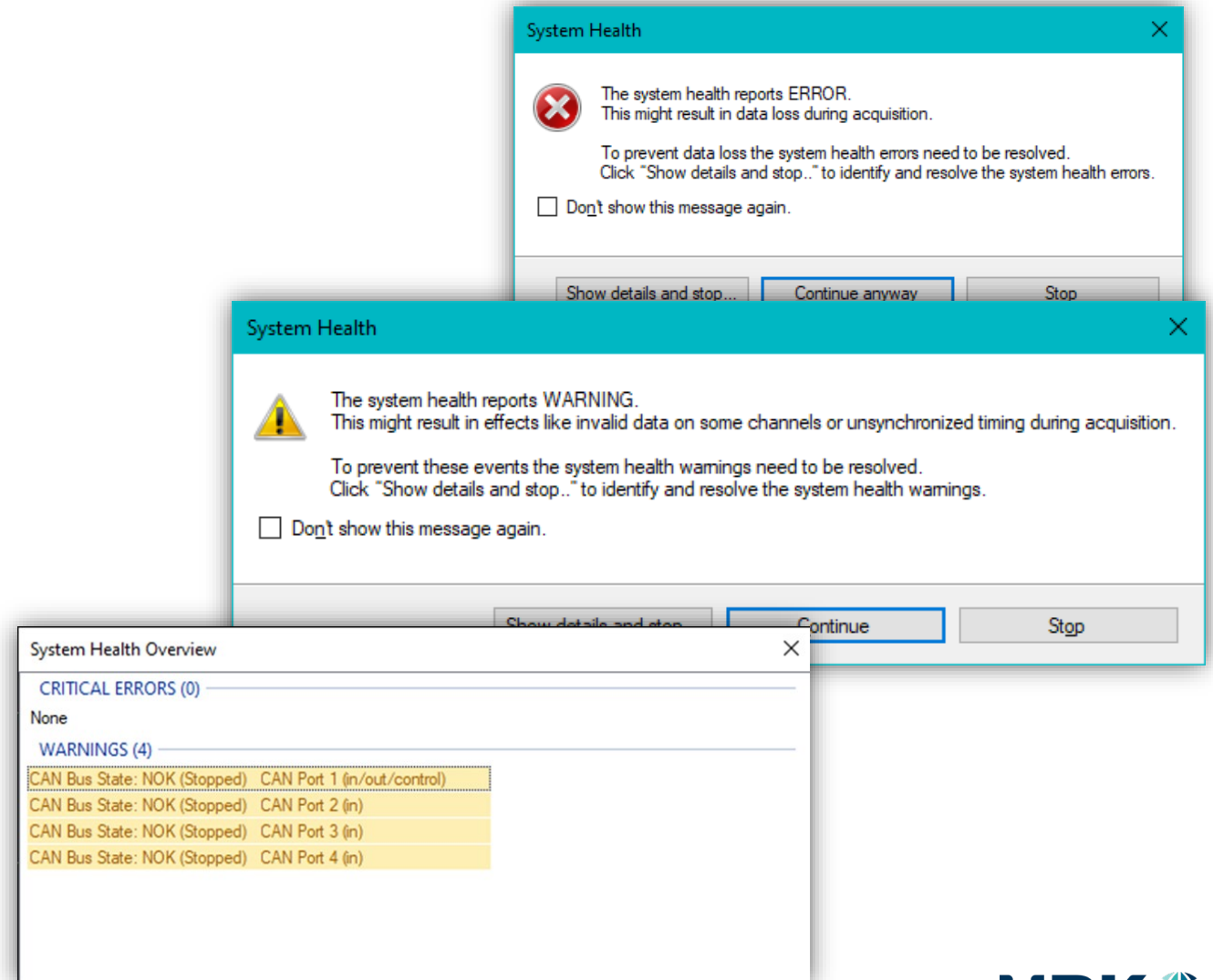


XY trace with
reference trace

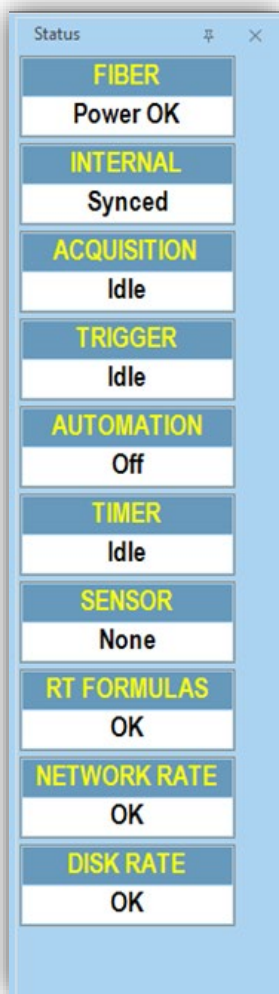
Complete Overhaul of Status / Health / Throughput Information

Improved System Health

- Various new errors are now reported in the SYSTEM HEALTH
 - Network load
 - Storage throughput
 - Missing synchronization
- Starting an acquisition is only possible on confirming the ERROR or WARNING
 - Or disabling them
- *Note: CAN bus NOK is a Warning*



Complete Overhaul of Status / Health / Throughput Information - 2



Improved STATUS navigator

▲ New fields added

- RT Formulas
 - OK
 - Deployment failed
 - All mainframes
- Network rate
 - OK
 - 50% Warning
 - 100 % Error
 - All networks
- Disk Rate
 - OK
 - 50% Warning on PC disk (no warning on embedded disk)
 - 100 % Error
 - All disks

FIBER	INTERNAL	ACQUISITION	TRIGGER	AUTOMATION
Power OK	Synced	Idle	Idle	Off
TIMER	SENSOR	RT FORMULAS	NETWORK RATE	DISK RATE
Idle	None	OK	> 50% Load	OK



Continuous Writing Rate Details					
✓ PC Disk Rate: 24,42 MB/s (Max: 759,2 MB/s) ⚠ PC Network Rate: 420 kB/s (Max: 100 MB/s), 24 MB/s (Max: 30 MB/s)					
Name	Sample Rate	Channels	Storage Width	Disk Rate	Network Rate
> GEN2tBKL		6		24 MB/s	24 MB/s (Max: 100 MB/s)
> sim_NB6030		18		420 kB/s	420 kB/s (Max: 100 MB/s)

FIBER	INTERNAL	ACQUISITION	TRIGGER	AUTOMATION
Power OK	Synced	Idle	Idle	Off
TIMER	SENSOR	RT FORMULAS	NETWORK RATE	DISK RATE
Idle	None	OK	Overload	OK

Complete Overhaul of Status / Health / Throughput Information - 3

Updated Throughput information

Ready

Preview Record Stop Trigger

Time:

Memory:

Disk:

Rate:

Acquisition setup

Start of data recording:

On start of acquisition

Group1

Sample rate: 100 S/s

GroupCAN1

Sample rate: 100 S/s

INTERNAL

Type

Firmware version

FPGA Version

IP address

Port

MAC Address

Number of recorders

Number of acquisition slots

Extended Master/Sync

Digital I/O

Local storage

Continuous Writing Rate

PC Storage:

GEN2tB_GN610: 651,4 kB/s (Max: 759,2 MB/s) Load: 0,086 %

GEN4tB_KL: 6,4 kB/s

GEN2tBKL: 645 kB/s

Network Rate

Ethernet 4:

GEN2tB_GN610: 649,8 kB/s (Max: 100 MB/s) Load: 0,65 %

GEN2tBKL: 645 kB/s (Max: 100 MB/s) Load: 0,645 %

GEN4tB_KL: 4,8 kB/s (Max: 100 MB/s) Load: 0,005 %

Status

Active Settings Formula Report ePower Suite Input Signals Power SpaceVectors

General

Acquisition

Mainframe Recorder

Analog Channel

Marker Channel

Timer-Counter

CAN Channel

Continuous Writing Rate Details

Name	Sample Rate	Channels	Storage Width	Disk Rate	Network Rate
GEN2tBKL		12		4,8 MB/s (Max: 200 MB/s)	0 B/s
Recorder AS1	200 kS/s	6		2,4 MB/s	0 B/s
Recorder BS1	200 kS/s	6		2,4 MB/s	0 B/s
Async RT-FDB	≤ 2 kS/s	0	128 bits	0 B/s	0 B/s
GEN4tB_KL		86		117 MB/s (Max: 200 MB/s)	0 B/s
Recorder A	2 MS/s	13		76,38 MB/s	0 B/s
Recorder B	2 MS/s	2		8 MB/s	0 B/s
Recorder C	500 kS/s	8		16 MB/s	0 B/s
Recorder D	500 kS/s	8		16 MB/s	0 B/s
CAN Recorder 1	≤ 100 S/s	0		0 B/s	0 B/s
CAN Recorder 2	≤ 100 S/s	0		0 B/s	0 B/s
CAN Recorder 3	≤ 100 S/s	0		0 B/s	0 B/s
CAN Recorder 4	≤ 100 S/s	0		0 B/s	0 B/s
Async RT-FDB	≤ 2 kS/s	55	128 bits	≤ 1,76 MB/s	0 B/s

System Health Overview

CRITICAL ERRORS (0)

None

WARNINGS (1)

Mainframe storage load exceeds 50% GEN4tB_KL

Complete Overhaul of Status / Health / Throughput Information - 4

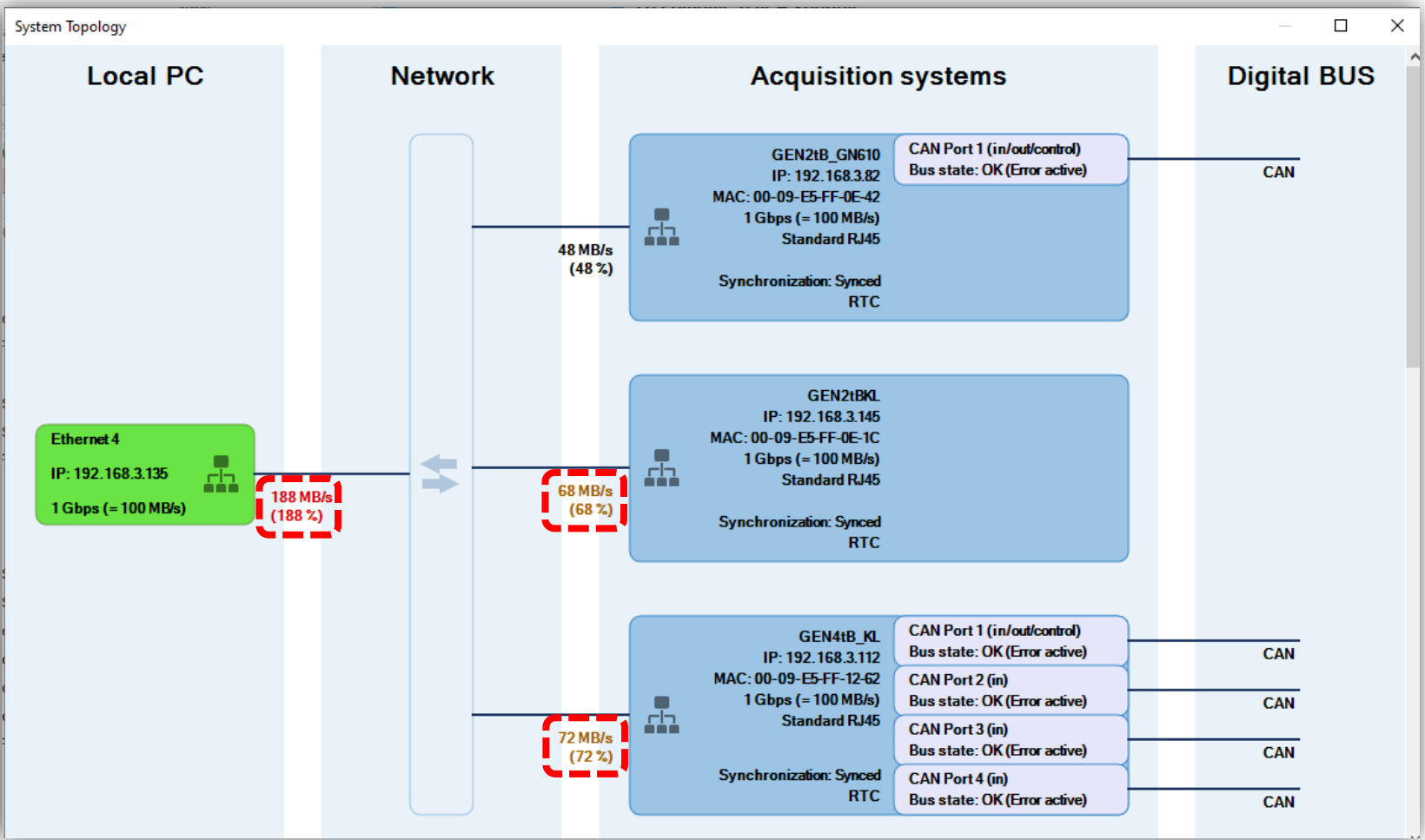
Improved system topology

Continuous Writing Rate Details

PC Disk Rate: 196 MB/s (Max: 759.2 MB/s)

PC Network Rate: 188 MB/s (Max: 100 MB/s)

Name	Sample Rate	Channels	Storage Width	Disk Rate	Network Rate
GEN2tB_GN610		12		48 MB/s	48 MB/s (Max: 100 MB/s)
> Recorder B	2 MS/s	6		24 MB/s	24 MB/s
> Recorder A	2 MS/s	6		24 MB/s	24 MB/s
> CAN Recorder 1	< 100 S/s	0		0 B/s	0 B/s
> Async RT-FDB	< 2 kS/s	0	128 bits	0 B/s	0 B/s
GEN2tBKL		15		68 MB/s	68 MB/s (Max: 100 MB/s)
> Recorder BS1	2 MS/s	6		24 MB/s	24 MB/s
> Recorder AS1	2 MS/s	9		44 MB/s	44 MB/s
> Async RT-FDB	< 2 kS/s	0	128 bits	0 B/s	0 B/s
GEN4tB_KL		28		80 MB/s	72 MB/s (Max: 100 MB/s)
> Recorder D	500 kS/s	8		16 MB/s	12 MB/s
> Recorder C	500 kS/s	8		16 MB/s	12 MB/s
> Recorder BS2	2 MS/s	6		24 MB/s	24 MB/s
> Recorder AS2	2 MS/s	6		24 MB/s	24 MB/s
> CAN Recorder 4	< 100 S/s	0		0 B/s	0 B/s
> CAN Recorder 3	< 100 S/s	0		0 B/s	0 B/s
> CAN Recorder 2	< 100 S/s	0		0 B/s	0 B/s
> CAN Recorder 1S1	< 100 S/s	0		0 B/s	0 B/s
> Async RT-FDB	< 2 kS/s	0	128 bits	0 B/s	0 B/s



Increased # of RT-FDB results to be calculated / stored

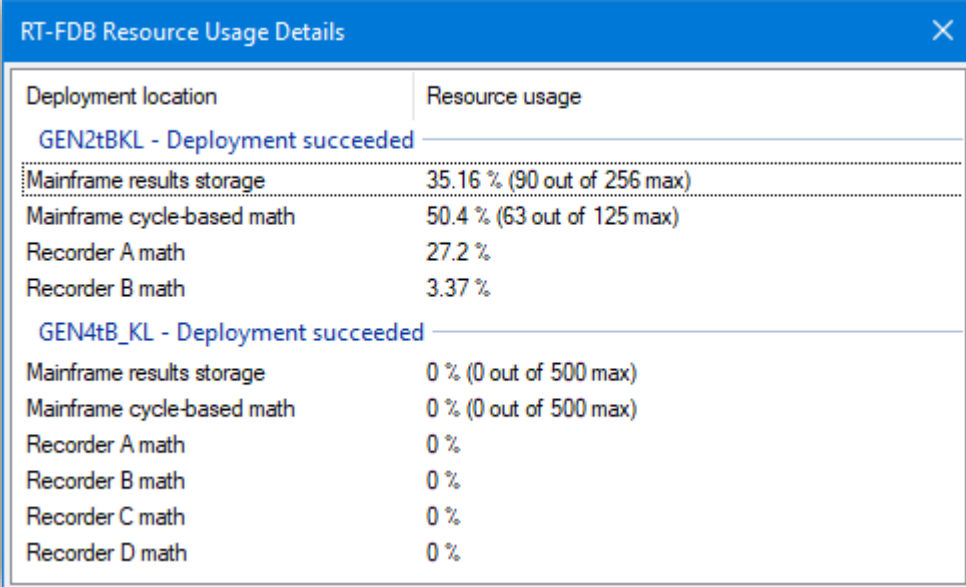
▲ Up to Perception v8.22:

- Different mainframes could calculate a different number of RT-FDB results (128 up to 1000)
- But all mainframes could only store 256 RT-FDB results
 - Additional problem: No indication in GUI to inform user about this limit, nor on resource usage
 - Only got a “Deployment failed” if exceeded

▲ New, and increased limits (already in v8.24):

Mainframe	Cycle based results limit	RT-FDB result storage limit
GEN2tB	125	256
GEN3i	300	300
GEN4tB	500	500
GEN7tA	1000	1000
GEN7i	1000	1000
GEN17tA	1000	1000

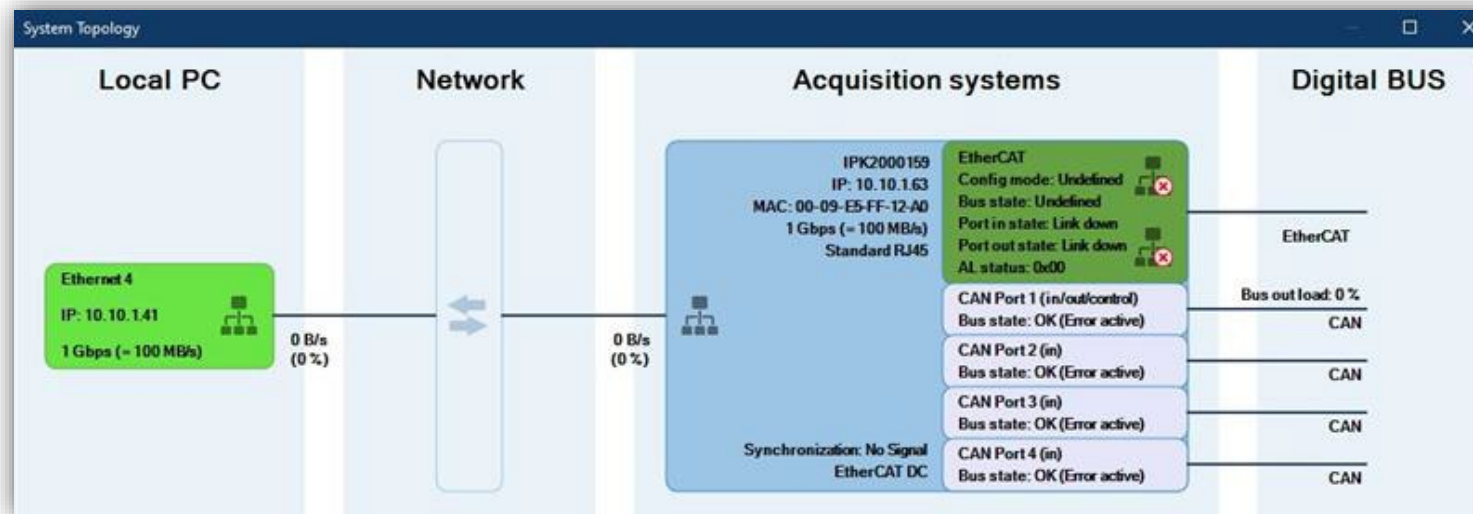
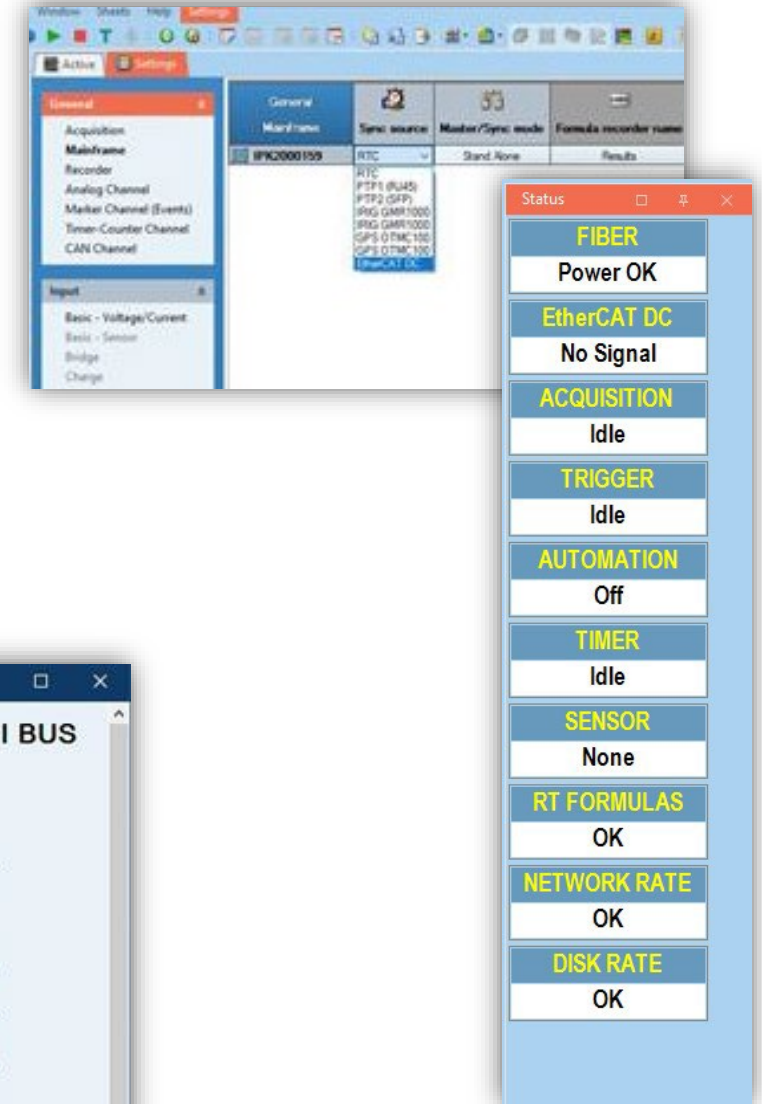
- Enhanced info dialog on resource usage



RT-FDB Resource Usage Details	
Deployment location	Resource usage
GEN2tBKL - Deployment succeeded	
Mainframe results storage	35.16 % (90 out of 256 max)
Mainframe cycle-based math	50.4 % (63 out of 125 max)
Recorder A math	27.2 %
Recorder B math	3.37 %
GEN4tB_KL - Deployment succeeded	
Mainframe results storage	0 % (0 out of 500 max)
Mainframe cycle-based math	0 % (0 out of 500 max)
Recorder A math	0 %
Recorder B math	0 %
Recorder C math	0 %
Recorder D math	0 %

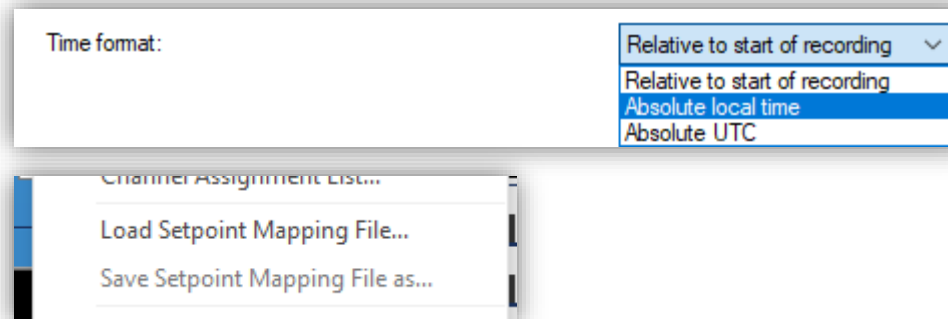
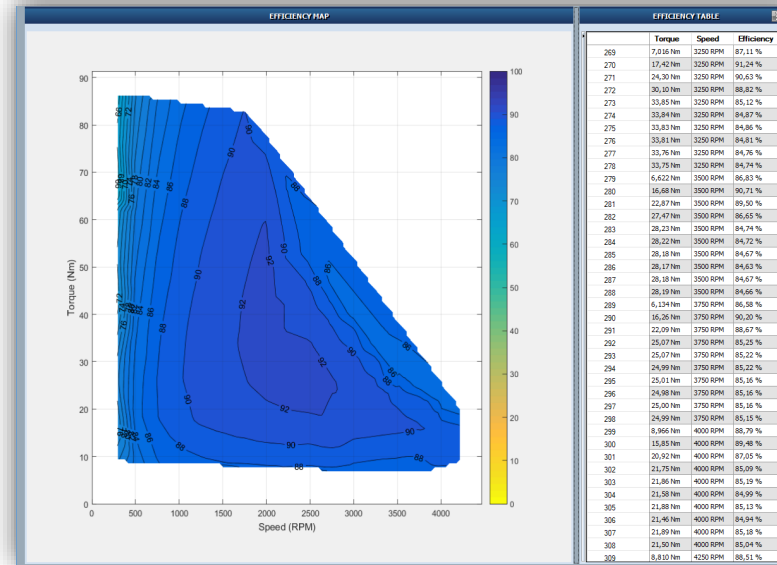
EtherCAT distributed clock

- With EtherCAT installed in a mainframe, this can be made the clock master using “EtherCAT DC” (distributed clock).
- When doing so, all Master and Clients connected to the EtherCAT bus are synchronized via EtherCAT DC.
- Highly requested feature by all EtherCAT users, as complete test rig synching is really easy with EtherCAT DC
 - No extra hardware, no extra cables, no other protocol



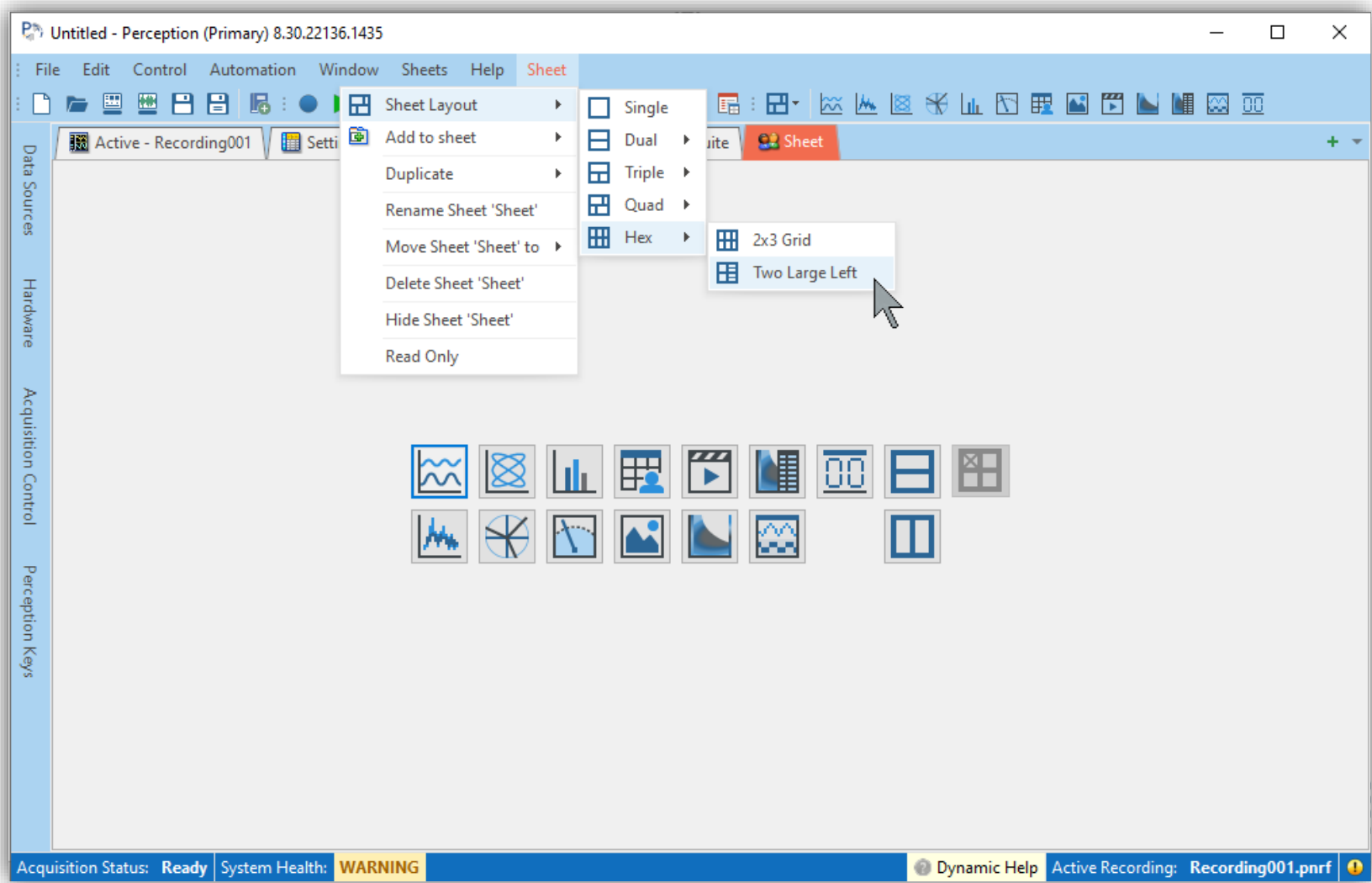
eDrive: Improved mapping

- ▶ So far maps were “Efficiency maps”
 - Torque / speed / Efficiency
- ▶ Customers requested to create other maps like vibration over torque/speed or flux maps
- ▶ Now any map can be created
 - Free selection of x / y / z
 - Automatic or manual scaling (zoom)
 - # of height lines
 - Suppress / show datapoints
 - Click for cursor readout
- ▶ User selectable time format
- ▶ Save / Load setpoint tables



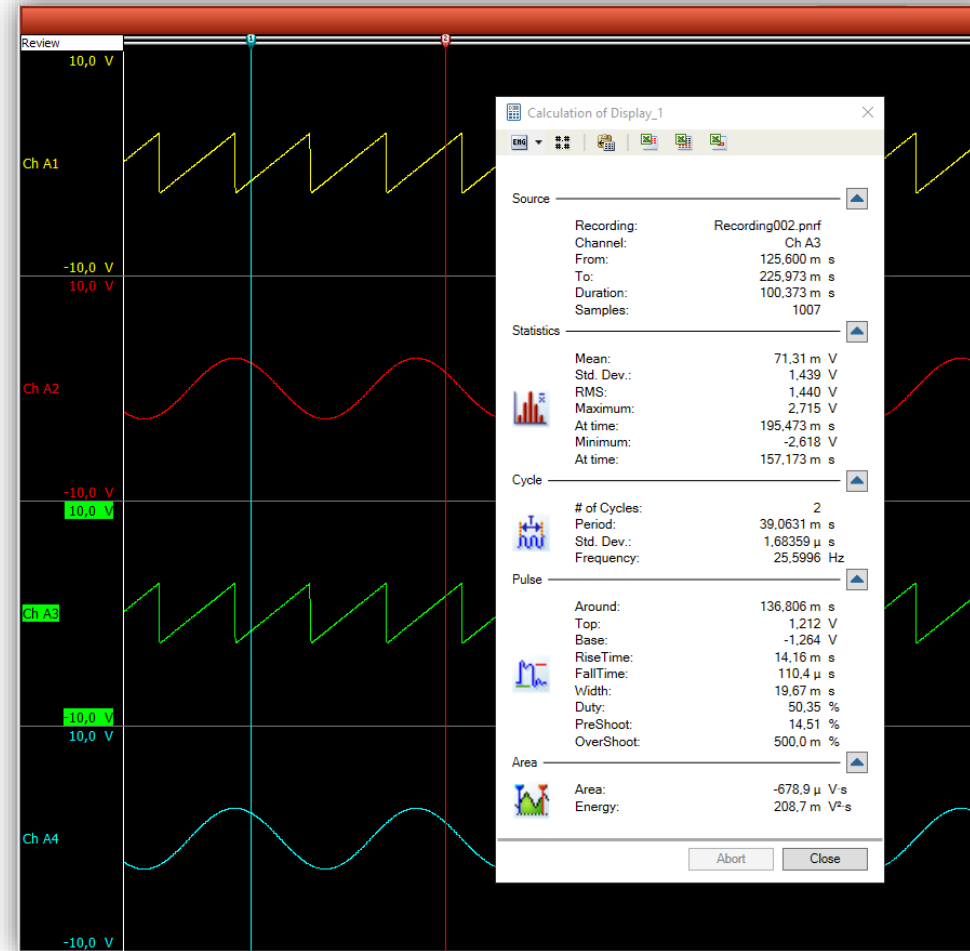
The screenshot shows the 'Settings' window for the eDrive software. It is divided into three sections: X-axis, Y-axis, and Z-axis. Each section has a 'Source' dropdown menu (all set to 'None') and a 'Scaling' section. The 'Scaling' section has two options: 'Automatic' (selected) and 'Fixed'. The 'Fixed' option has 'From' and 'To' input fields. For the X-axis, 'From' is 0.000 and 'To' is 1,000 k. For the Y-axis, 'From' is 0.000 and 'To' is 1,000 k. For the Z-axis, 'From' is 0.000 and 'To' is 100.0. There is also a 'Height Lines Interval (%)' field set to 2. At the bottom, there is an 'Others' section with a checkbox for 'Show data points' which is currently unchecked.

Improved sheet: more components and improved layout



New calculator

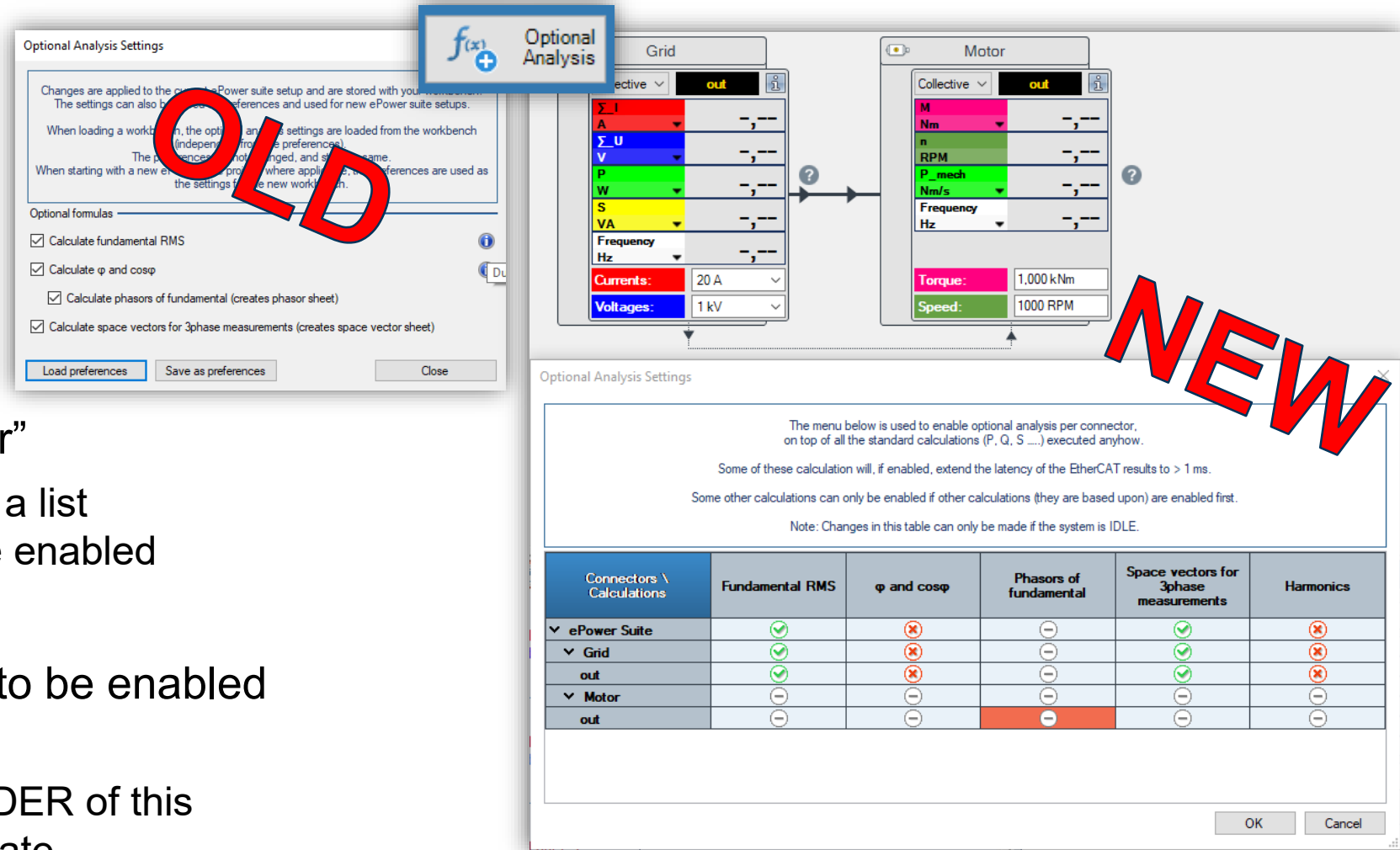
- ▲ Completely rewritten
- ▲ Now shows all results of all groups at the same time, if desired
 - Open/close subgroups
- ▲ Results can be formatted
- ▲ Results can be transferred into EXCEL and to the clipboard
- ▲ Calculator table is available in REPORTS



*New calculator:
all four groups
visible if desired*

eDrive: Improved Optional Analysis setup

- So far Optional Analysis was enabled per system
 - Waste of resources
 - Creates useless displays
- New Optional Analysis enables this per “connector”
 - Each connector is shown in a list and desired analysis can be enabled
- Allows Harmonic Analysis to be enabled for a single connector only
 - But sets the whole RECORDER of this connector to lower sample rate

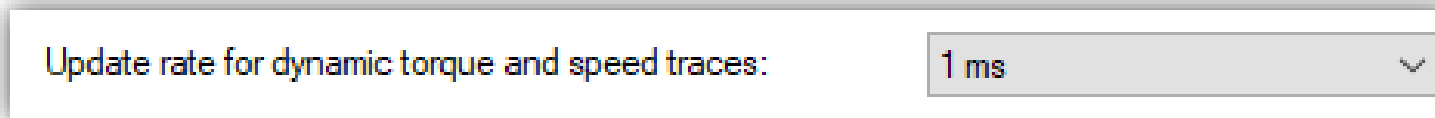


Other Improvements

- eDrive: User definable time constants for M_inst and n_inst
- Sharing pVWBs between mainframes
- Automatic Y-axis display scaling
- Shortcut to open Trace setup & Zoom back
- Improved Acquisition menu
 - Also: Indicate enabled groups in acquisition control panel
- Streamlined context menus
 - Same structure
 - Same icons
 - Same naming
 - Previous: two different meanings for SPLIT – now one SPLIT and one DIVIDE

User definable time constants for M_inst and n_inst

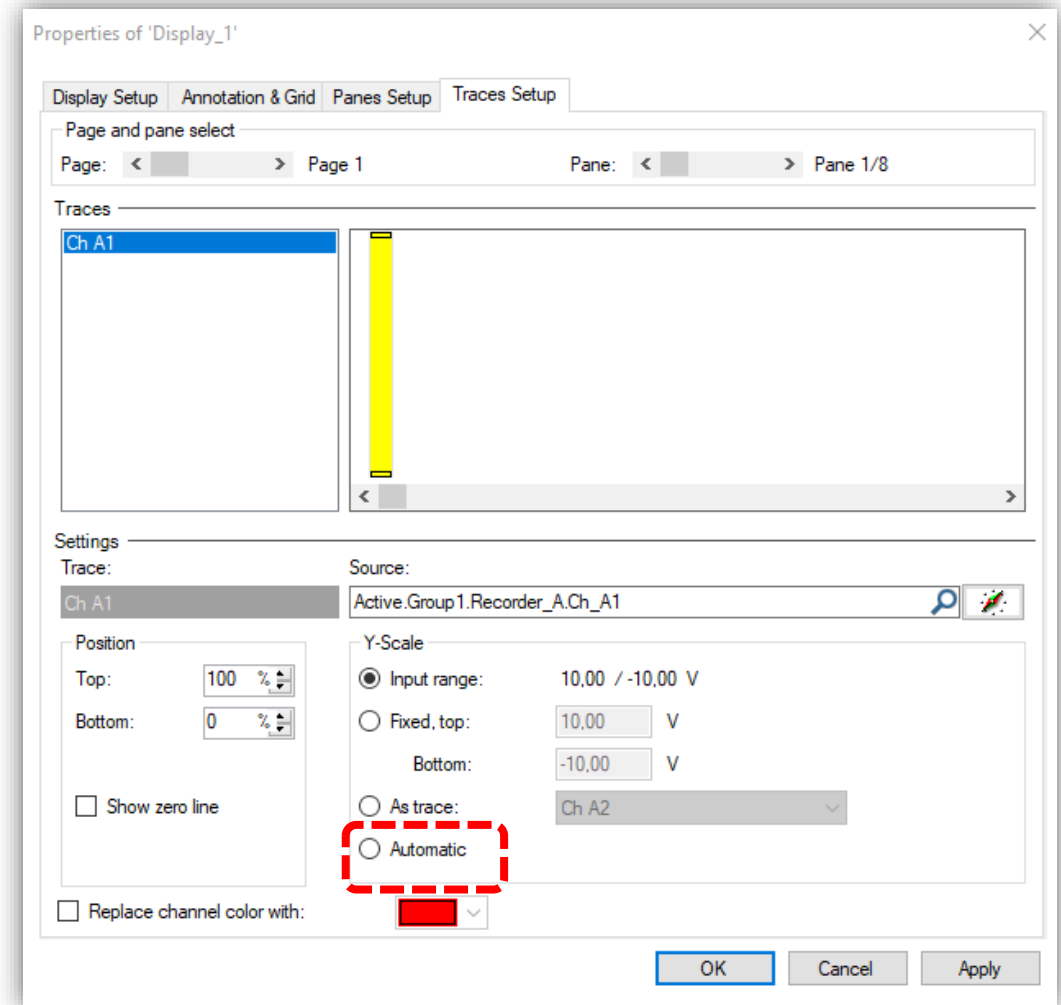
- ▲ So far: Fixed to 1 ms
- ▲ Very often requested by customers to make this user selectable
 - Could only be “tricked” in the RD-FDB so far creating own formulas
- ▲ Now this is a user selection, done in the Generic Settings



- ▲ Selection goes 1-2-5 from 1 ms to 500 ms
- ▲ Allows to exchange dynamics vs accuracy for the instantaneous traces

Automatic Y-axis display scaling

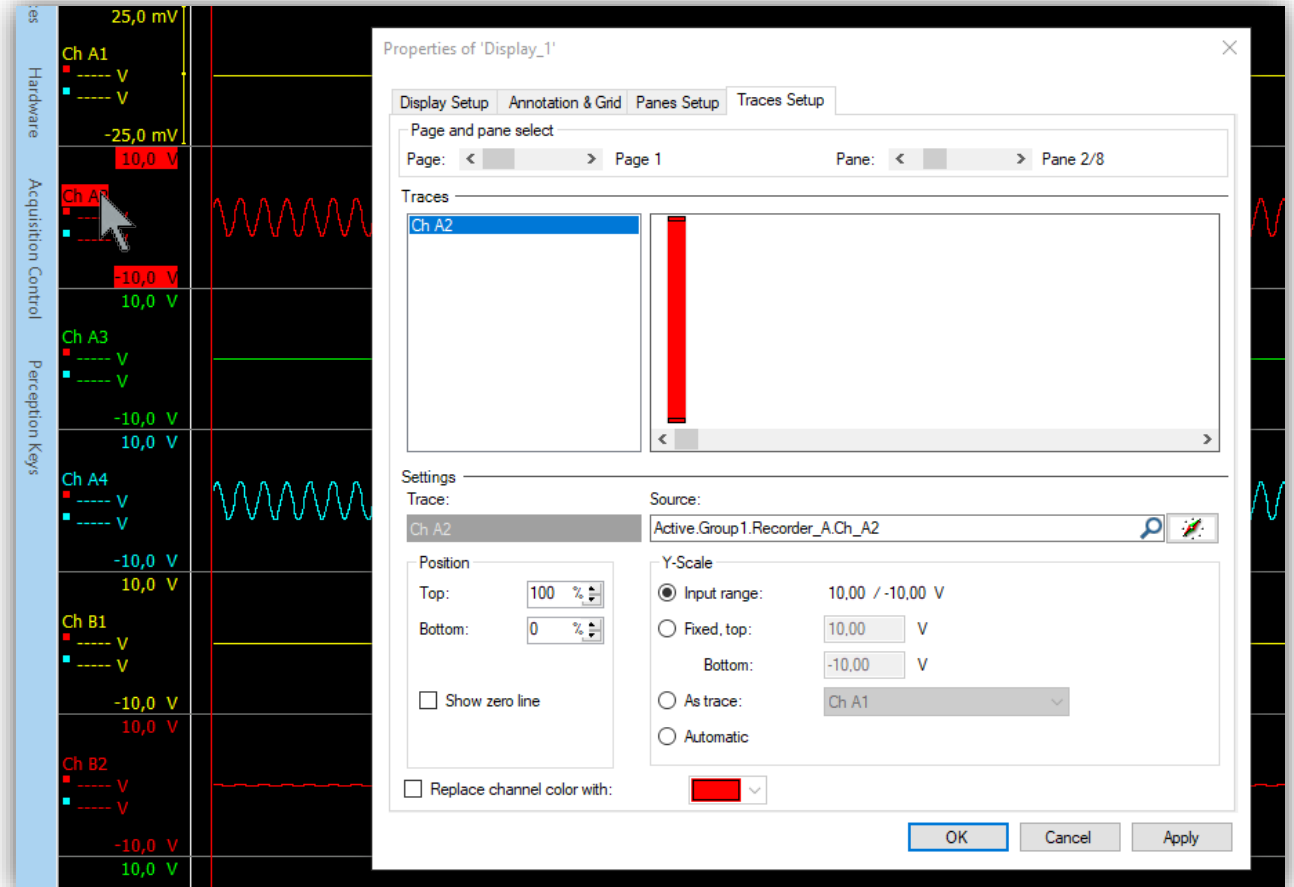
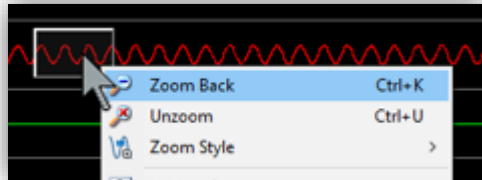
- ▲ Y-axis auto scaling of what is visible
- ▲ This only affects the DISPLAY range, not the INPUT range
- ▲ Will continuously adapt display y-range while acquiring



Shortcut to open Trace setup & Zoom back

- In the Y-t display, double clicking the channel label now opens the display properties window with the Trace Setup tab active

- Also:
In the Y-t display, when doing multiple zoom actions, a keyboard shortcut for zoom back is available (Ctrl+K)



Sharing pVWBs between mainframes

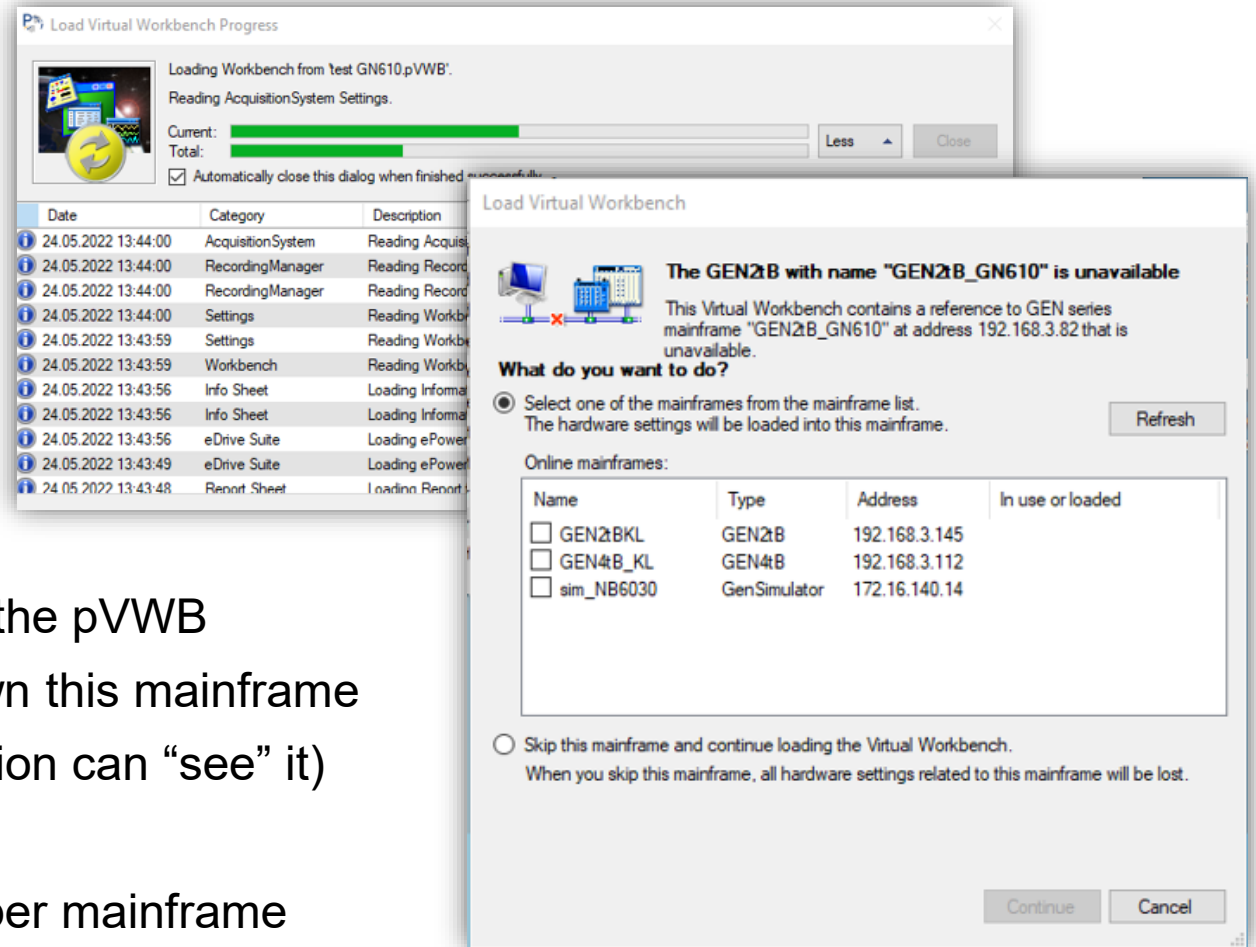
Strong customer demand:

- Create a workbench with one mainframe and use it with other mainframes

Now possible with “Replace mainframe” dialog

Process:

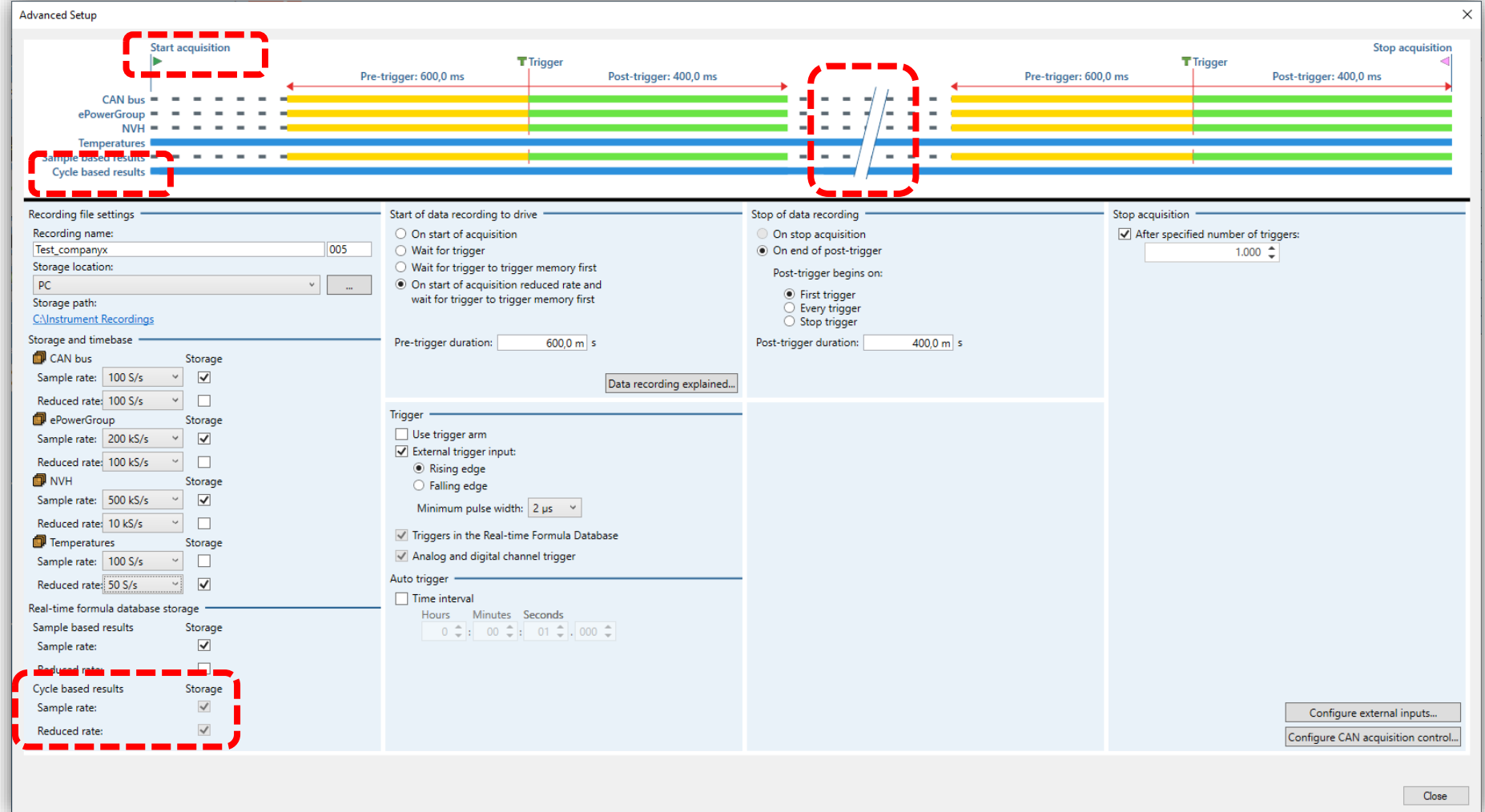
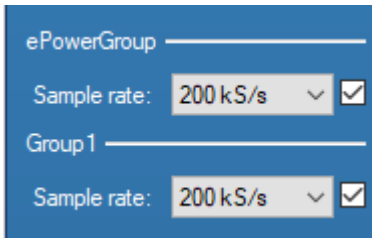
- Create a setup with a mainframe and save the pVWB
- Disconnect from Perception and power down this mainframe
- Power on other mainframe (so that Perception can “see” it)
- Load pVWB back
- On loading, Perception will not find the proper mainframe from this pVWB and bring up the “Replace mainframe dialog”
- Select mainframe to use



Improved Acquisition setup and Acquisition Control Panel

- Show asynch RT-FDB results in overview
- Show “interruption” brackets for more than 2 triggers

- And for Control Panel: Storage condition for groups now shown here as well



Perception 8.30 summary

- ▲ Maintenance must be good through August 1, 2022 to upgrade
- ▲ Variety of user-requested new features and enhancements
- ▲ Download today and enjoy!

Questions?

- ▲ Don't hesitate to contact me directly: Krista.Tweed@hbkworld.com or 217-607-5737
- ▲ Reach out to our general support team at support@usa.hbm.com or 1-800-578-4260





HBM Electric Power Testing

Thank You

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