RELEASEnotes

Version 8.40

1. Update information

These release notes describe changes between Perception (including GEN series firmware) versions V8.30.22203 and V8.40.23009.

2. Mid- and long-term support roadmap

Starting with Perception V8.00 some legacy features, mainframe and card support are no longer present. (A Perception V7.6x maintenance version is available for critical bug fix support.)

Supported on latest Windows versions

Including all updates until June 2022:
- Windows 10 Pro 1607 and higher   (64 bit only)
- Windows 11 Pro

Installation requirements:
- Dot Net Framework V4.8
  (distributed with the install CD and available for download on the internet)
- Microsoft Direct3D® capable graphics card.

Downgrade

Perception V8.40 can be downgraded to the following versions.

⚠ **Note**: When an EtherCAT card is installed, a downgrade to any version before V8.28 must go through version V8.28 first. ⚠

- Perception V8.3x
- Perception V8.2x
- Perception V8.1x
- Perception V8.0x
- Perception V7.6x
- Perception V7.5x

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3. Perception versions

Version	Description	
	Perception Standard	Free
1-PERC-AD-0x	Perception Advanced	Paid
1-PERC-VA-0x	Perception Viewer Enterprise	Paid
1-PERC-E64-0x	Perception Enterprise	Paid

Perception supports the following application extensions:

Version	Description	
1-PERC-OP-EDR	eDrive application (setup, live and efficiency mapping table)	Paid
1-PERC-OP-STL	Advanced High Voltage/High Power analysis according STL standards	Paid
1-PERC-OP-HIA	High Voltage Impulse Analysis	Paid
1-PERC-OP-CSI	CSI Runtime extensions (Customized Software Interfaces)	Paid

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4. Known Issues

Below table lists known issues.

Perception settings	Mainframe settings changed via the Fieldbus remote control are not updated in the UI. Reconnecting to the mainframe will show the changes.

5. New Features

Perception – General new Features

FDB	The FDB has been extended with the IntegrateGated function, which is the counterpart of the new IntegrateGated function in the RTFDB. This function allows integrating a signal over a user-specified time interval. The integration interval is started when a user-specified signal goes from zero to one. See also 'RTFDB functions' below.
Percentage representation of harmonics in the Harmonic Analysis Display	Where the scaling options for the Y-axis used to be linear, logarithmic and decibel, it is now also possible to show the amplitude of the harmonics in terms of a percentage relative to the amplitude of the fundamental (i.e., the harmonic with order 1). The percentages can be shown on a linear or logarithmic scale. Right-click in the Harmonic Analysis Display → Properties... → Display Setup → Bar chart → Y-axis and select one of the percentage options.

In many situations, the amplitude of the fundamental is very large as compared to the other harmonics. For this reason, the option was added to not show the fundamental, making the whole Y-scale available to the harmonics. This is especially convenient when combined with the percentage representation mentioned above, because in this case the fundamental is always 100%. Right-click in the Harmonic Analysis Display → Properties... → Display Setup → Bar chart. |
Equivalent Disturbance Current (EDC) in the Harmonic Analysis Display	Next to the THD and PWHD, the Equivalent Disturbance Current (EDC) was added as an indicator for the harmonic content in a signal. EDC has application in the area of AC drive electric locomotives. Right-click in the Harmonic Analysis Display → Properties... → Harmonic Settings → EDC settings.
Two separate x-axis zoom buttons for the Review and the Live window	The time base zoom buttons at the bottom of each display work either on the Review window or on the Live window, depending on which one is active. To make this more user-friendly, both the Review and Live window now have their own zoom controls under a so-called hamburger menu (three stacked horizontal lines) at the top-left of each window.
Double clicking on channel label opens the window where the properties of the display can be changed.	In the Yt-Display in Perception, double clicking on a channel label opens the window where the properties of the display can be changed. This is more convenient than going through the context menu of the display.
The cursor readings in the Yt-display moved to small in-display Trace information window	The cursor readings in the Yt-display have been moved from the bottom of the display to small in-display Trace information window to harmonize it with other displays.
For CAN and EtherCAT, specify the publish index in either decimal or hexadecimal format	For CAN and EtherCAT, the publish index can now be specified in either decimal or hexadecimal format.

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Support for the T12HP sensor and the Danisense DL2000ID current transducer in the Measurement Uncertainty sheet	Next to the T40B sensor, the Measurement Uncertainty sheet now also supports the T12HP torque sensor. The Danisense DL2000ID current transducer is now also supported.
Inversion of analog signals	The polarization of the signal can be inverted for GN61xB, GN31xB, GN120xB, GN1640B, GN840B and GN810xB

Perception – New ePower Suite Features

Support for the measurement uncertainty of efficiencies in the Measurement Uncertainty sheet	The Measurement Uncertainty sheet now also allows calculating the uncertainty in efficiencies based on the uncertainties calculated for the DC, AC and mechanical power numbers. The efficiencies and their measurement uncertainty can be made visible by clicking the dotted button at the bottom of the sheet, by choosing the eta symbol in the Perception toolbar, or by right-clicking the 'MU Estimation (Basic)' tab and selecting 'Show Efficiency Calculation Results'. If the Measurement Uncertainty sheet is not visible, in Perception choose from the menu bar Sheets and then 'MU Estimation (Basic)'. Once the sheet is loaded, the Quick Start Guide can be found by opening the context menu of the sheet's tab and choosing Quick Start Guide... .
Added the possibility to perform averaging on the mainframe	Based on the new RTFDB functions for determining the average and standard deviation (see above with new functionality for Perception), the ePower suite now has the option to perform the averaging for setpoints and meters on the mainframe rather than in Perception. This has the benefit that the values that are used to generate a setpoint are not only available in the setpoint table but also in the recording. Furthermore, they can be published on the field buses. The user now has the option to calculate the average for a setpoint over a fixed user-defined time (which is how it is currently done) or over a fixed user-defined number of samples. The last option may speed up the generation of efficiency maps if it is allowed to average over a fixed number of cycles or revolutions to determine a setpoint value in the efficiency map. To select averaging on the RTFDB, go to the ePower suite → Generic setting... → Averaging. For 'Averaging method' there are the following options: • Time based: when choosing this option, averaging is done by Perception as in earlier releases. The averaging time is defined by 'Averaging duration'. • Time based (|RTFDB): averaging is done on the RTFDB and the averaging time is defined by 'Averaging duration' • Number of cycles (RTFDB): averaging is done on the RTFDB. the averaging duration is defined by the number of cycle events Some further remarks: • RTFDB averaging generates many additional formulas. Depending on the setup, not all mainframes may be able to handle all those additional formulas. In those cases, the current approach to averaging is still available • Due to the additional formulas, the mapping of signals onto field buses may be changed. Therefore, care should be taken when moving to RTFDB averaging for existing setups • For the ePower suite, it is possible to translate the RTFDB functions to FDB functions for post-processing. Due to the underlying mechanisms used in the RTFDB and the FDB, the functions for calculating the average over a user-defined number of samples (NumSamplesMean() and NumSamplesStdDev()) will not be translated to the FDB
Store setpoint mapping in a recording and as	Setpoint mappings can now be automatically stored in the recording and as a separate CSV or XML file. To enable this, in the ePower suite go to Setpoint storage in the left

separate CSV or XML file	panel and move the switch to the right of Enable to On. The choice for CSV or XML storage can be made by, in the left panel, going to Generic Settings → Setpoint storage setting → Store setpoints in format and selecting CSV or XML.

New Features for Hardware

EtherCAT control	The GHS mainframe settings and acquisition control can be controlled via EtherCAT. The protocol and commands are the same as CAN remote control. Sending command SDO triggers execution of the command with provided parameters.
RTFDB functions	The RTFDB has been extended with the functions IntegrateGated, OneShotTimer and SetScalarFromFieldbus. Together, those functions allow integrating a signal over a user-specified time interval which is started at a user-specified time. Both the integration time and the start time can be controlled from the fieldbuses by, for the integration time, defining the appropriate value on the fieldbus and, for the start time, causing a signal transition on the fieldbus at the moment the integration should start.
GEN4tB	Support for a second source CPU module is added.
New functions for mean and standard deviation in the RTFDB	Several new functions were added to the Real-Time Formula DataBase (RTFDB) related to determining the average and standard deviation of signals. The first new function is CycleStdDev(). and forms a pair with the exisiting CycleMean() function: where the CycleMean() function determines the mean (or average) over all samples between two cycle events, the CycleStdDev() calculates the standard deviation over the samples. We further introduce the pair of functions TimedMean() and TimedStdDev(). Those functions repeatedly calculate the mean and standard deviation, repectively, over a user-defined time interval. For example, if the user-defined time is set to 1 second, every 1 second, a mean (or standard deviation) for the input signal will be generated over the previous 1 second. The next new pair of functions is NumSamplesMean() and NumSamplesStdDev(). Those functions repeatedly calculate the mean and standard deviation, repectively, over a user-defined number of samples. For example, if the user-defined number of samples is set to 10, for every 10 samples of the input signal, a mean (or standard deviation) will be generated over the previous 10 samples. It is important to note that the outputs of the last four functions cannot be used as the input of another RTFDB function, but they can be published on the fieldbuses. With the proper setup, the standard deviation functions, possibly in combination with the corresponding function for the mean, make it possible, for example, to get an indication on the field buses if a system is in steady state.

6. Improvements

Improvements in Perception

Async live data	Improved stability of async live stream by avoiding unneeded buffering which could result in an out of resources.
Export data	Fix for exporting segments where FDB does not detect any cycles.
Display traces	Fix for incorrect initial display range causing flipped display traces.
RTFDB traces	Resolved scaling issue for @CycleHarmonicRMS/Phase function result
Usability	Added an UI control to open the PDF describing the Fieldbus Remote Control.

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G082 EtherCAT	Calibration software shows mainframe in use when an EtherCAT card is installed. Fixes SUPEPT-195
Spectral display	The spectral display always gives the spectral representation between the cursors. This is true for Review as well as ReviewSweep. Using this functionality in ReviewSweep allows the user to compare spectral content of sweeps even if they are not completely aligned in time. Fixes SUPEPT-197
Phasor display	The phasor display is populated with available data. Fixes SUPEPT-194
Improved status information for triggers and trigger arm	The information on triggers and trigger arming was improved and visible in the Trigger field in the Status window and under Acquisition in the Acquisition Control window.
Give correct acquisition time already from the start of the recording	In Perception, the Time entry under Acquisition in the Acquisition Control window indicates the progress of the recording in terms of elapsed time. In some situations, this time indication was updated too slowly even though the underlying recording was running correctly. The update of the time wind has been improved giving immediate feedback to the user on the progress of the recording.

Improvements in the Perception ePower Suite

Workbench loading	Fixed issue with loading the setpoint table resulting in missing results.
FDB cut-off frequency	The FDB converted RTFDB HWFilter function is mapped onto the same filter characteristics. Fix issue SUPEPT-191
Setpoint file	Fix for using Greek letters in setpoint XML file. Fix issue SUPEPT-193

Improvements for CAN and GEN DAQ API

Improvements for Hardware

Internal disk support	The following disks can be used within the GHS mainframes. • M.2_Samsung SSD 980 PRO 500GB • Samsung SSD 860 PRO 1TB
Samba share	The Samba file sharing issue has been fixed.
EtherCAT	List of SDO for EtherCAT Control are added in ESI file.
GEN DAQ API	GenDaqAPI • Improved error codes on ConfigBoot • GHSDeleteAllRecordings now returns RecordingNoFound if no recordings exist
Fieldbus	Naming of fieldbus signals is user selectable.

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Support items and requests

EtherCAT Distributed Clock with TwinCAT	The revision numbers of ESI files generated by Perception and required by TwinCAT are now aligned. Solves SUPEPT-180.
Allow for zeroing of channels in Perception for channels controlled by the ePower suite	It is now possible to zero channels in Perception that are controlled by the ePower suite. Previous, the ePower suite blocked the settings of those channels from being edited. Solves SUPEPT-74.
Show trigger arm status in Perception and on the field buses	Since the introduction of trigger arming, the arming status was not properly indicated in Perception and on the field buses. In this release, the indication of status of trigger arming and the triggers themselves has been improved. Solves SUPEPT-189.
Exporting through process display	An issue where exporting through Process Display did not give all data is now solved. Solves SUPEPT-125.
Assigning CAN channels	A problem with assigning CAN channels leading to a Perception freeze is solved. Solves SUPEPT-176.
Export to Matlab of pnrf files generated in previous versions	It is now possible to export pnrf files generated by 7.xx versions of Perception to MatLab using the 8.40 version of Perception. Solves SUPEPT-178.
Traces are shown correctly immediately	Sometimes, traces where very briefly shown in an inverted format. This is nog longer the case; Traces are now shown correctly immediately. Solves SUPEPT-179.
Loading older workbenches in 8.30	A problem with loading a Virtual WorkBench generated by an earlier version in 8.30 is solved. Solves SUPEPT-182.
RTFDB traces	Resolved scaling issue for @CycleHarmonicRMS/Phase function result. Solves SUPEPT-183.
FDB cut-off frequency	The FDB converted RTFDB HWFilter function is now mapped onto the same filter characteristics. Solves SUPEPT-191.
Corrected representation of inetegers in German version	A confusing translation error for the German version of the software related to (un)signed and 32/64-bit intergers is solved. Solves SUPEPT-192.
Keeping Greek symbols when reading back an XML setpoint file	When saving a setpoint file containing Greek characters and reading back the setpoint file into Perception, the Greek characters are now properly shown. Solves SUPEPT-193.
Phasor display	The phasor display is populated with available data. Fixes SUPEPT-194
G082 EtherCAT	Calibration software shows mainframe in use when an EtherCAT card is installed. Fixes SUPEPT-195
Compare an active trace with a reference trace in the Spectral Display	It is now possible the properly compare an active trace with a reference trace in the Spectral Display in Perception, both in Review and ReviewSweep mode. Solves SUPEPT-197.
Access to internal SSD	A problem with when an internal disk os a mainframe could not be accessed is solved. Solves SUPEPT-202.

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Generating setpoints using RTFDB triggers	It is now possible to generate setpoints using RTFDB triggers. Solves SUPEPT-204.
Documentation RPC extended	Extended RPC functionality has been added to the RPC manual. Solves SUPEPT-207.

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7. Deprecated support

The following is no longer supported within Perception.
- GPS2750

8. Supported Genesis HighSpeed Mainframes

The following Genesis HighSpeed Mainframes are supported:
- GEN2tB
- GEN3t
- GEN4tB
- GEN7tA
- GEN17tA
- GEN3i
- GEN3iA
- GEN7i
- GEN7iA
- BE3200

9. Supported QuantumX Modules

> ⚠️ **Note**: The support of QuantumX Modules in Perception will stop with future versions of Perception!
>
> QuantumX modules can be integrated in systems with tethered mainframes using the CAN-interface together with a QuantumX MX471C. ⚠️

The following QuantumX models are supported:
- MX1609KB
- MX1609TB
- MX471B
- MX809B
- CX27B as single network access point only, no setup or control of CX27B

Data streaming is available for all other B type QuantumX modules.

Note: Former Release notes mentioned to support MX471B / MX471C, but this should have been only the MX471B. The MX471C might work in some cases, but this is not guaranteed.

Note: Perception includes and only works with the following QuantumX software components:
- QuantumX firmware: V4.12.32.0
- HBM common API: V4.0.0.56

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