# Release Notes

**Perception & GEN Series Firmware**          **Version v8.80**

**HBK**
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# Contents

# 1 Update information

These release notes describe changes in Perception (including GEN series firmware) V8.80.

# 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.)

## 2.1 Supported on latest Windows versions

### 2.1.1 Running Perception

Including all updates until January 2025:

- Windows 10 Pro 20H2 and higher (64 bit only)
- Windows 11 Pro

Installation requirements:

- Dot Net Framework V4.8.1 (distributed with Perception installer)
- Microsoft Direct3D® capable graphics card.

### 2.1.2 Network license server

The license server for network licenses can run on Windows 10 or Windows 11. Note that Windows Server 2008 is the last version of Windows Server which can be used to run the license server.

## 2.2 Downgrade

Perception V8.80 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 V8.7x
- Perception V8.6x
- Perception V8.5x
- Perception V8.4x
- Perception V8.3x
- Perception V8.2x
- Perception V8.1x
- Perception V8.0x
- Perception V7.6x
- Perception V7.5x

# 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 |

# 4 Known Issues

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| **Perception recording** | When in Perception -> Settings -> Acquisition all optional storage is disabled, the recording will not stop the normal way. It will stop after a timeout of several minutes. |
| **Split recording and RTFDB functions** | When using the option for split recording (in Perception go to File -> Preferences... -> Perception -> Recordings) together with one of the RTFDB functions TimedMean(), TimedStdDev(), NumSamplesMean() or NumSamplesStdDev(), the different parts of the recording will remain locked until the end of the acquisition. |
| **Limit of 900 sweeps when using split recording using the mainframe disk** | When a recording is made to the drive in a mainframe and split recording is active, after 900 sweeps, the recording continues but no longer as a split recording. Also, a continuous recording can be split every 'x' seconds, if this is the case, the same will stop and the number of splits in continuous and sweeps is added together and cannot exceed 900.<br>Workaround: The user can record to the PC drive instead of to the mainframe drive. Alternatively, the user may stop and start the recording again after a large number of sweeps. |
| **Perception does not update settings modified through the fieldbuses** | If Perception is connected and mainframe settings are changed via CAN acquisition control, Perception doesn't update setting with new value. Workaround: disconnect and reconnect to the mainframe. |
| **Workbench behavior with ePower (using GN800B card)** | If loading the workbench saved with 8.70 or before with GN800B card in 8.80 version, workbench reload will be incomplete with respect to ePower. |
| **Intermittent issues with CT Power Status of the Remote Probes not reflecting correctly** | At some occasions after powering on, the CT power of the current Remote Probes is not yet present the status becomes "Not OK".<br>Later, as the power is OK the status is not updated back and remains "Not OK". |

# 5 Perception

## 5.1 New Features in Perception

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| **Updated look of the Acquisition Settings page** | The acquisition settings page has been updated to a more modern and easy to work with look and feel. Although most of the functionality remains unchanged, there are impactful changes on the available options on when to store data at the start of an acquisition. The available options can be seen under the "Start" section and are described as follows: |

- On start of acquisition: Recorded data is continuously streamed into the recording file residing on a mainframe or PC drive;
- On trigger: Recorded data is continuously streamed into the recording file residing on a mainframe or PC drive, but only the data before (pre-trigger) and after (post-trigger) a single trigger event, is retained in the recording file. In previous version, this option was named "Wait for trigger";
- On trigger – buffered: Part of the data is directly stored into a recording file whereas other parts of the data are first buffered in high-speed memory before being stored in the recording file. In previous versions this option was split between "Wait for trigger-to-trigger memory first" and "On start of acquisition reduced rate and wait for trigger-to-trigger memory first". Reduced rate can be controlled by enabling/disabling "low rate" storage. For example, the previous "Wait for trigger-to-trigger memory first" mode, can now be achieved by disabling all "low rate" storage.

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| **Save GEN DAQ API compatible settings from Perception** | The supported types when saving settings from Perception has been extended to include "GenDAQ Settings File (*.gen)". This file type can be used to load settings into a mainframe, using GEN DAQ API. Note that it is not possible to load GEN DAQ API extracted setting into Perception. |
| **New Biquad filter functtions in FDB** | A new function named "FilterBiquad" was introduced in the Formula Database (FDB). A universal biquad is a linear transfer function with a 2nd order polynomial in both the numerator and denominator, Biquad transfer functions are building blocks that can be used to make any linear transfer function. By cascading several biquad function a user can design any linear transfer function of any order. |
| **New workflow to rename a component** | It is now possible to easily rename a component by simply double clicking the name in the component's header. |
| **Allow low and high sample rate to be equal** | When in "On triggers - buffered" it is possible to select a low and high sample rate. These sample rates can now have the same value (up to a certain limit). This feature enables the possibility of having a certain group of recorders recording with two different sample rates (low and high) while having other recorders recording with a single one. The low sample rate is still capped to the maximum allowed for the given input board, meaning that the high and low sample rate can only be equal until the maximum value possible for the low sample rate. |
| **SSD streaming rate included in the HW properties** | The SSD streaming rate of the mainframe can now be checked in the Properties panel. |
| **Horizontal cursors added to y(t) display live view** | Horizontal cursor support has been extended to the y(t) display live view. The visibility of said cursors is coupled with the visibility of the horizontal cursors in the review view of the same display. The cursor values window box in the live view indicates a "Level", which corresponds to the y value of the selected trace at the active cursor position. The ΔLevel indicates the difference between the two horizontal cursors relative to the active trace. For details on each cursor value press Space to view the Cursor Table. |

| **Publish CAN signals to fieldbus (through RT-FDB)** | It is now possible to add CAN signals to RT-FDB (and apply needed calculations) and have these results published in the fieldbus. |

## 5.2 Improvements in Perception

| **Improved support to loading settings into a mainframe** | When loading the settings to a mainframe through the Settings sheet toolbar menu, unless the settings to be loaded belonged to the same mainframe that they are being loaded to, the settings wouldn't be applied. In this release a new pop-up window will allow the user to select which mainframe to apply the settings to. The behavior is thus similar to loading a workbench in Perception. |
| **Allow changing CAN Message ID for Acquisition State, Time and Latency** | Up until this release the CAN messages for AcquisitionState, AcquisitionTime and Latency had a fixed, non-editable, ID. When using multiple mainframes, with a single CAN bus, both mainframes get the same CAN message ID, which implies that there is a single ID for two different messages. This can, in some cases, present an issue.<br>To avoid facing ID clashes, Perception now allows a user to edit the CAN Message ID for AcquisitionState, AcquisitionTime and Latency. |
| **RPC Improvement - System Health status and problems** | Two new commands have been added to the RPC supported command list:<br>&bull; GetSystemHealth : returns an integer reflecting the status of the System Health. 0 if the System Health has no problems and 1 otherwise;<br>&bull; GetSystemHealthProblems : returns an array of string that represents the problems stated in the System Health. |

# 6 ePower Suite

## 6.1 New Features in ePower Suite

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| **Setpoints stored as part of a recording** | Setpoint collections are now visible in the data source view of Perception. This facilitates handling several setpoint collections from different recordings. In addition, it is now possible to visualize different setpoint collections, from different recording, simultaneously. This can be achieved by choosing which setpoint collection should be used in each setpoint map or table. |
| **MU for setpoints supported for remote probes** | The possibility to calculate the measurement uncertainty for each setpoint has been included in a previous version of Perception. In this release this functionality has been extended to support the measurement uncertainty calculations when using a GN800B card. The constraint to have companion channels measuring each power measurement still applies (similarly to the GN310B input card). For more details on MU for setpoints please refer to the Quick Start Guide "Measurement Uncertainty Estimation for Power and Efficiency Setpoint Values" that comes with a Perception install (Perception_QSG_MU_for_Setpoints_v1.0.pdf or a later version). |
| **DQ0 Transformation as optional analysis** | The DQ0 transform is used to convert three measured quantities of a 3-phase system, into two orthogonal quantities, that represent the same space vector. It is a mathematical tool used to transform AC quantities into DC signals. Thus, it is commonly used to simplify three-phase machine modelling and three-phase inverter control algorithms.<br>Perception has supported DQ0 Transformation calculation for a few versions, in the most recent one this analysis has been added as an optional analysis in ePower Suite. This allows to carry out the DQ0 Transformation in the click of a button. The needed formulas are automatically deployed and the cycle averaged results can be published on the fieldbuses. The input and output of this analysis can be tailored by going into the DQ0 Transformation settings and more details on the available options and requirements can be found in the context help of this window. |
| **Adjust Timer/Counter channel pulse width when setting a sensor** | When setting a sensor for a Torque or Speed measurement channel in ePower Suite the Minimum Pulse Width is adjusted as to only allow pulses with a pulse width greater than the maximum frequency of the sensor. This value can still be overwritten in the "Filter" section of the ePower Suite. |
| **Minimum cycle frequency for fundamental optional analysis increased to 20Hz for sample rates greater than 2 MS/s** | In ePower it is possible to enable the "Fundamental RMS" and "φ and cosφ" optional analysis. These analysis will calculate the RMS values of the fundamental voltage and current , the phase shift between both and the power factor of each phase. All these values refer to the fundamental harmonic of both voltages and currents. Thus, it is important to first calculate the fundamental waveforms. One needed parameter for this step is to establish a minimum cycle frequency, any cycle events below the set minimum frequency will not yield results. So far, as default, the minimum cycle frequency was set to 10Hz. In this release, this frequency is chosen based on the sample rate. If the sample rate is above 2 MS/s the minimum cycle frequency is set to 20 Hz, below or at 2MS/s the same 10Hz value is kept. |

## 6.2 Improvements in ePower Suite

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| **Show a notification when non companion channels are used to measure power** | When measuring the voltage and current of an electrical phase it is common that the end goal is to retrieve the electrical power based on the measured quantities. When measuring said signals using a power input card (e.g. GN310B) the best accuracy is achieved using what are referred to as companion channels. These channels have been calibrated together to get the most accurate power measurement.<br>This improvement will notify a user in the bottom right of the Perception window, when non companion channels are used in a phase measurement, when using a power card. Using non companion channels will result in a higher measurement uncertainty. |

# 7 Hardware

## 7.1 New Features in Hardware

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| **20 MS/s Remote Probes and Fast RTFDB** | The previous Perception release version, the Remote Probes supported sample rates up to 2MS/s. Perception version 8.80 will be the first release to support the new 20 MS/s Remote Probes. The 20MS/s support is on raw data. Real-time math can be performed at a sample rate of 4MS/s. The different variants supported in this category are: <br><br> • 1-P201I-4: Voltage Remote Probe 20 MS/s; <br> • 1-P211I-4: Current Remote Probe 20 MS/s; <br> • 1-P212I-4: Current Remote Probe w CT Power supply 20 MS/s. <br><br> Known Limitations for fast real-time formula data base (Fast RTFDB) in software version 8.80: <br><br> • Fast RTFDB remains limited to 16-bit resolution and local storage on the mainframe. Deployment errors will be notified upon set differently; <br> • Fast RTFDB with Sample Rates > 2 MS/s is not supported for the mainframe types – Gen3i and Gen2tB. <br><br> The Remote Probes's manual and data sheets may be referred for more details on the Remote Probes. |

# 8 Support items and requests

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| **For the GEN17tA mainframe type, when using the 10GB interface extensively the link on the network interface is lost and does not recover anymore without rebooting** | SUPEPT-371 | A problem that was causing the GEN17tA mainframe type to lose the network connection when using the 10GB interface has been resolved. |
| **Gen2tB status display shows incorrect information** | SUPEPT-439 | A problem that caused the Gen2tB status display to show incorrect information has been fixed. |
| **Peak at torque signal** | SUPEPT-461 | When doing cycle based recording it could happen that one extra cycle was included in the sweep. If the asynchronous signal was much greater (or smaller) than the previous cycle, including one extra cycle would result in a single sample spiking the signal at the very end of the sweep. This issue has been fixed. |
| **Lower resolution in the Live view of the Spectral display than review display** | SUPEPT-463 | An issue that caused the Spectral display to show data in lower resolution in the review view was fixed. The comparison with the live view made it obvious that the data was being retrieved correctly but the review view was not displaying it accurately. |
| **Export progress bar not updating** | SUPEPT-476 | Exporting long recordings will take a considerate amount of time. It was observed that the progress bar of the export dialog was not being updated. Although the recording was exported successfully the issue made it difficult to track the progress. A fix was done to correctly report and update the progress bar. |
| **Display cursor from active sheet not available in data sources tree** | SUPEPT-480 | An issue with the Active Display not appearing in the "Data Sources" tree when loading multiple recordings as reference has been fixed. |
| **User settings are gone after reboot** | SUPEPT-485 | A problem that was not allowing to retain certain user settings has been solved. |
| **Missing some cycles in cycle detection in FDB** | SUPEPT-486 | An issue that caused some cycles to not be detected when using FDB cycle detect has been fixed. |
| **Slight deviation between FDB and RT-FDB cycle based results** | SUPEPT-486 | Some slight deviations when comparing FDB and RT-FDB results were observed. The issue was identified as being caused by a one sample shift in the calculation which led to minor differences in the results. The issue has been fixed and shouldn't impact existing calculations. |
| **Double entries in setpoint table** | SUPEPT-489 | An issue that caused repeated entries in the setpoint table has been fixed. |
| **Signals not being exported until end of recording** | SUPEPT-490 | An issue that caused signals to not be exported until the end of the recording time was fixed. The issue only occurred if one of the signals being exported was shorter (less duration) than the others. |

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| **External trigger settings not saved in the workbench** | SUPEPT-494 | When reloading a workbench, the external I/O settings, namely the external trigger input and the external start/stop, were not being restored. |
| **FDB result missing if cycle master from RT-FDB is used** | SUPEPT-510 | An issue that caused no output results for the FDB formulas, created using the "Review formulas" in ePower, when using the CycleMaster from RT-FDB has been fixed. |
| **Efficiency signals for both direction not exported to fieldbuses** | PERC-6432 | When selecting the efficiency to be calculate "For both directions" in ePower, several new signals are created. These signals name usually end with I>O or O>I. When trying to publish these signals on the fieldbus no results were retrieved. This is due to the special character ">" in the signal names. To fix this the check mark "Use Greek characters in formula names" in Generic Settings > Setup Parameters in ePower Suite has been renamed to "Use Greek and special characters in formula names". It now also replaces the special character ">" by "to" in the needed efficiency formulas. |
| **RT-FDB results are inconsistent with PNRF** | GENSW2-1699 | A problem that caused the inconsistency between RTFDB and post process data has been solved. |

# 9 Deprecated support

The following is no longer supported within Perception:

- GPS2750
- GN610 (without B) Perception 8.72 is the last release supporting this acquisition card

# 10 Supported Genesis HighSpeed Mainframes

The following Genesis HighSpeed Mainframes are supported:

- GEN2tB
- GEN3t
- GEN4tB
- GEN7tA
- GEN17tA
- GEN3i
- GEN3iA
- GEN7i
- GEN7iA
- GEN7iB
- GEN7tB
- GEN17tB
- BE3200

# 11 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

**Patents no: 7,868,886**