Honeywell

enSuite for UFM Q.Sonic Series 6

Manual
Configuration and analysis with enSuite

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1 About these instructions

The enCore manual has a modular design. To get an overview of the enCore/enSuite concept and safety and risk instructions, refer to following manuals.

- ⇨ "Operation and Maintenance" for your specific Q.Sonic device type
- ⇨ UFM Series 6 “Safety instructions”

⇨ 2.3 Relevant user documentations (p. 12)

The main content of this manual is the description of the most important enSuite functions for ultrasonic flow meter, such as:

- ⇨ 4.1 The dashboard at a glance (p. 20)
- ⇨ 4.4 “Health Care Tests” (HCTs): monitoring the health of the meter (p. 30)
- ⇨ 6 Live logs (p. 63)
- ⇨ 8 Support package (p. 67)
- ⇨ 9 Reference cases at a glance (p. 70)
- ⇨ 10 Signal capture (p. 78)

enSuite and the enCore device series

enSuite is the configuration and analysis software for Honeywell Elster devices in the field of flow computers, data loggers, gas analyzers and ultrasonic flow meters. enSuite offers tools for configuration, parameterization, diagnosis, software downloads as well as other service purposes, and supports all activities required for the commissioning and maintenance of these devices.

This manual focuses enSuite for Ultasonic Flow Meter Series 6. Under this name all (enCore) Q.Sonic devices are summarized, which are multi-path ultrasonic gas meters. They record velocity, performance and other profile components.
⇨ 1.1 Device types (p. 9)

This manual is intended for specialist personnel who are responsible for the service activities of the following tasks after the successful assembly of the device and installation of the current enSuite version on PC:

- adaptation of device parameterization
- monitoring the operating status, maintenance and health care check of the Q.Sonic meter
- other service activities

The illustrations in these instructions serve to depict the facts that are being explained, and therefore deviate depending on the configuration of device and enSuite.

Saving documentation on the service PC

This manual is delivered in electronic form. We recommend saving the document on the PC intended for service activities so that it is available at all times.

⇨ 2.3 Relevant user documentations (p. 12)

1.1 Device types and firmware version

This manual is applicable for the following meter types of the Ultrasonic Flow Meter Series 6:

- Q.Sonic-plus with firmware V03-40-A
- Q.Sonic-max8 with firmware V03-40-A

2 Ultrasonic Flow Meter Series 6

2.1 Terminology

The Ultrasonic Flow Meter Series 6 is also referred to as USM Series 6, UFM Series 6 or Q.Sonic Series 6.

2.2 Software

The meter software shares with other enCore products the following modules:

- the Basic System
  It contains different basic functionalities, the **S**ystem **F**unction **B**locks (SFBs)
- several so-called **A**pplication **F**unction **B**locks (AFBs)

The Basic System is responsible for all basic functionalities (such as the I/O coupling or connection to digital protocol interfaces, time service and user management). Thus, the Basic System is a key component of the software for all enCore devices.

An AFB is a single application-specific functionality that can be added or removed via the parameterization. The AFB arrangement is variable; most AFBs can also be used several times.

It depends on the individual device type which AFBs are necessary for a device or which AFBs can be used optionally. In the delivery state optional AFBs are not included in every configuration of the device software but can be added via the software configuration of enSuite.
Optional AFBs may be subject to a charge. In enSuite extra buyable AFBs are marked with the icon .
⇨ Please contact your local Honeywell Support team for further details.

2.2.1 Available AFBs

For devices of the Ultrasonic Flow Meter Series 6 the following AFBs are supported for the Basic System V03-40-A and higher:

USM functionality

- USM
  is the "heart" of the Q.Sonic modules. It is the measure application and is responsible to provide various values and diagnostics. It processes the meter data from the I/O (e.g., pressure and temperature), the Density & Viscosity AFB and from the Geometry Correction AFB.
- Density & Viscosity
  provides density and dynamic viscosity which are typically used by the USM AFB for velocity of gas (VOG) and velocity of sound (VOS) calculations.
- Geometry Correction
  calculates various correction factors for the housing size of the measuring tube. The USM AFB can use the corrected path lengths to increase the accuracy of the VOG and VOS calculations.

General functionality

- Modbus
  Handles the communication over a Modbus connection (serial or TCP/IP). The AFB manages user defined registers which are linked over the parameterization to enCore values.
- Postprocessing
  Allows the creation of new values based on existing values, such as actual values, differential values, average values or weighted values.
- User Archives
  Manages the archiving of values (e.g., measurements and counters) which are provided as export values by other AFBs.

Optional functionality

- Flow Conversion
  This AFB is used for enCore devices that perform a volume conversion for gas.
- Gas Quality
  Calculates the necessary characteristics for a constant or measured gas quality according to several European calculation standards.
- Simulation
  This AFB can simulate export values for measurements, counters, and events.
- Station
  Provides various functions for the control and monitoring of a system, like “Station load” or “Construct bit string”.

2.3 Relevant user documentations

Elster Gas Metering business provides the user documentations such as manuals, certificates, technical information for your UFM Series 6 meter in a ZIP file. The download information for this ZIP file is delivered with your device. Manuals referenced by this manual are included in this ZIP, such as UFM Series 6 “Safety Instructions” and “Operation and Maintenance” for Q.Sonic-plus and Q.Sonic-max.

Single documents are published in the Docuthek. The documents are updated regularly.

www.docuthek.com/
Use the device series or the device type as search term, for example, **UFM Series 6**, **Q.Sonic-max**

The enSuite installation manual is enclosed in the enSuite software package. It is also available on the website.

process.honeywell.com/us/en/site/elster-instromet/support#software-downloads

3 First steps

3.1 Prerequisite: Q.Sonic and enSuite are installed

This manual assumes that both the assembly and installation of the Q.Sonic as well as the installation of enSuite software on the computer have already been completed. If this is not the case, follow these manuals:

- ⇨ The “Operation and Maintenance” for your specific Q.Sonic device type
- ⇨ “enSuite installation instructions” **process.honeywell.com/us/en/site/elster-instromet/support**

In this manual the basic working steps are described, which are always necessary when dealing with Q.Sonic devices and the associated enSuite PC software. It is therefore recommended that you read through this section in full before handling the device for the first time.

3.2 Starting enSuite: first steps

You usually start enSuite under Windows via the desktop or the start menu.

3.2.1 The graphical user interface (GUI)

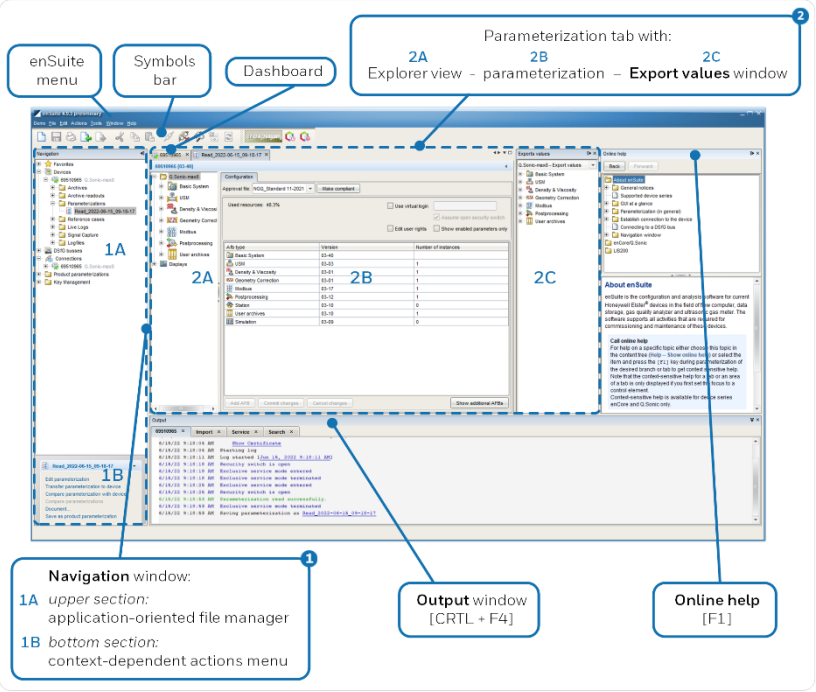


Fig. 3-1: Overview enSuite GUI – example

1 The navigation window is divided in an upper and a bottom section:

1A The upper section is structured as an application-oriented file manager with a fixed tree structure.
By default, only the current level of this tree structure is displayed – in this view, you navigate analogously to the known file view of the **Open** dialog.

The contextual actions are offered in the context menus of the main and sub nodes, showing general and specific actions. The specific actions can also be selected in the actions menu (**1B**).

1B The lower section is the context-sensitive action menu. Depending on which branch or which item you select in the upper part of the window, the actions that can be executed in a context are displayed as hyperlinks.

Adapting the look of the navigation window

By default, the upper section of the navigation window only shows the currently selected branch. You can navigate to a lower level by double clicking, or a higher level by pressing the button.

The navigation window is normally located on the left-hand edge of the screen. You can hide it to increase the available work-space. The navigation window is displayed again after clicking on the **Navigation** button on the left-hand edge of the enSuite window. If you simply move over the button using the cursor, the navigation window is temporarily displayed. You lock the navi-gation window with the box in the upper right corner of the window.

2 The parameterization window allows you to edit the parameters of various device types.

2A The data structure is displayed in a tree view.

2B If you click on a topic (node), all related parameters are displayed on the right side of the window in a table. In these tables you edit the parameter values. In addition, dialogs are available for some frequently used functions, which provide values in their context more clearly and display these on tabs next to the tabular presen-tation.

2C The export values window shows all values that can be used to link different parts of the parameterization together. For example, you can select a value that is created from an input channel and link it to an archive or output channel.
The values are displayed analog to the parameterization in an explorer view and are assigned to their Functions Blocks. They can be processed by other function blocks.

With the dropdown list you determine whether export values or parameters are displayed:

- **<device> – Export values** (default use case)
  Here, the calculated results, or determined or passed through values are displayed.

- **<device> – Parameters**
  This selection provides the possibility to access SFB and AFB parameters from the "outside" (other function blocks). This view is needed in rare cases only.
  A use case is to map parameters to Modbus export registers or to display parameters in Live Values.

You open the export values window with **Window – Export values** via the enSuite menu.

You can organize single windows, tabs, or views in the Microsoft Windows typical manner.

3.2.2 Change language used in enSuite

By default, enSuite obtains the language from the Windows system settings. However, you can change it independently in enSuite. The language change will take effect after restarting enSuite.

Call

Tools – Options, tab **General**

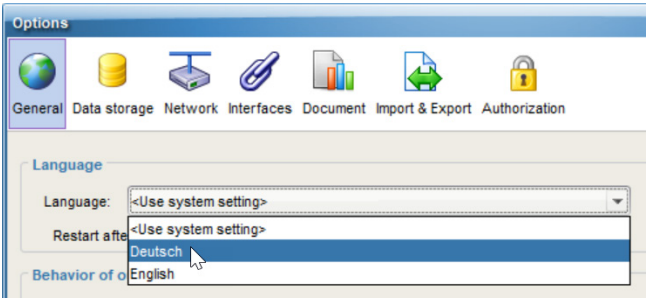


Fig. 3-2: Change enSuite's display language – example

3.2.3 Activating the online help

There is an extensive online help available in enSuite. The help supports you with the parameterization and the device actions.

Call

- General online-help:
  Help – Show online help
- Context-sensitive help:
  Simply highlight a parameter or a parameter tree and press [F1] in the parameterization window or dialog.

3.3 Establishing a connection to the meter

Typically, a data connection between computer and Q.Sonic is established via a TCP/IP computer network.

Special case: a local connection via USB

Optionally a local USB connection can be established to the Q.Sonic. Since this is possible with an open meter housing, it is typically performed by service technicians only and not described in this manual.

Prerequisites:

- The meter can be accessed by enSuite via TCP/IP.
  ⇨ Contact your local Honeywell Support team for further details.
- IP address of the enCore device is known.
- Ports for MMS and HTTP communication are known in case the default ports are not used.

► To establish a data connection to a service PC and one or more devices, select one of the following options in enSuite:

- **Search device** (or press the [F3] key)

Searches for all accessible devices and establishes the connection. All unknown devices are added to the enSuite database.

This option is recommended for all initial connections established to one or more devices.

- **Connect**

  Establishes the connection to a specific device. The device must already exist in the enSuite database and be selected in the navigation window under the **Devices** branch (identification via serial number).

► In the **Connect** dialog select **Remote connection**.

► If necessary, enter or adapt the network name or IP address of the enCore device, and adjust the default ports.

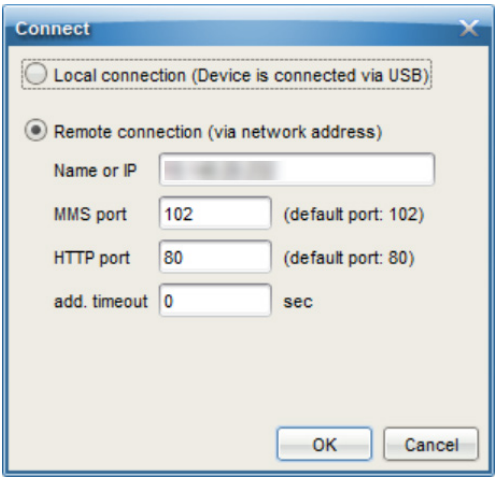


Fig. 3-3: This dialog appears with action **Connect** – example

► Confirm with **[OK]**.

✓ (Since Basic System V03-39)
The enCore device tries to authenticate itself with its self-signed TLS certificate.
If the certificate is unknown to enSuite, enSuite will display the certificate for validation. If the connection is trustworthy, confirm with **[OK]** to accept the certificate and continue.

For further information ⇨ 12.1.1 How to validate the TLS certificate of the Q.Sonic (p. 104).

In the enSuite navigation window, all devices with serial numbers which are contained in the database are listed under the **Devices** branch.

Device ID

The individual devices are identified in the enSuite database via their serial numbers. In addition, it is possible to append an individual name to the serial number (highlight device, select **Properties** in the context menu and enter the name) – this is only possible when enSuite is not connected to the meter..

With respect to devices for which a connection has currently been requested but has not yet been established, the device symbol is marked under the **Devices** branch with a yellow dot. The device symbol is then marked with a green dot during the data connection.

In addition, all devices for which a connection has been established during the current enSuite session are listed under the **Connections** branch. These entries are retained until enSuite is closed, even if the respective connection is disconnected.

3.4 Disconnecting the meter

There are two further options available to disconnect data connections:

- **Disconnect from all devices** (or press the [F4] key)

  Terminates all active connections.

- **Disconnect**

  Terminates the connection to the device which is selected in the navigation window (identification via serial number).

4 Dashboard with health care tests

4.1 The dashboard at a glance

The dashboard visualizes the most important information of an USM for diagnostic and monitoring purposes in real time. The operating status and errors can be identified at a glance, enabling you to make informed decisions with regard to maintenance and recalibration.

The dashboard opens as soon as enSuite establishes a connection to the device. (⇨ 3.3 Establishing a connection to the meter, p. 17)

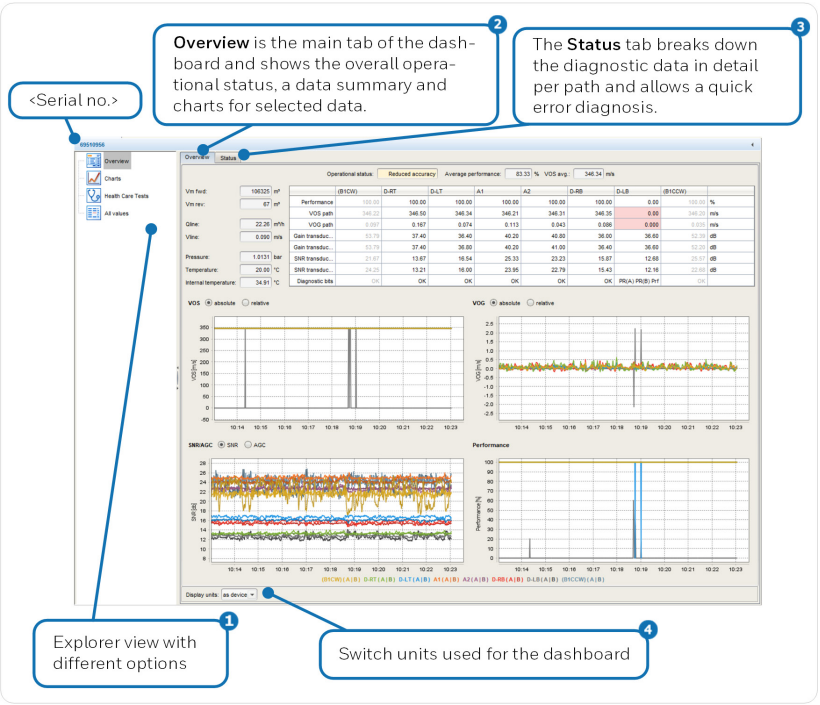


Fig. 4-1: Dashboard

1 The explorer view provides following folders:

Overview
Consists of tab **Overview** (⇨ 2) and tab **Status** (⇨ 3).

Charts
Displays the charts of folder **Overview** enlarged.

⇨ 4.3 Tab “Charts”: view trend (p. 28)

Health Care Tests (HCTs)
Opens the monitoring view of the health care tests.

⇨ 4.4 “Health Care Tests” (HCTs): monitoring the health of the meter (p. 30)

All values (raw data)
Lists the raw data of the USM in detail in tabular form.

⇨ 4.5 Tab “All values”: looking deeper into the raw data (p.36)

2 **Overview** tab
Displays an overall operational status, a data summary, and charts for the selected data.

⇨ 4.2.1 Tab “Overview”: get a good meter overview (p. 24)

3 **Status** tab
Lists the diagnostic bits pathwise in more detail.

⇨ 4.2.2 Tab “Status”: allows a quick error analysis (p. 26)

4 **Display units**
At the bottom of each tab of the dashboard you can switch the view between metric and imperial units.

⇨ 4.1.2 Switch display units for the dashboard (p. 22)

4.1.1 Reopening the dashboard

Background

The dashboard opens as soon as enSuite establishes a connection to the device. You reopen a closed dashboard in the navigation window.

How-to reopen a dashboard

Prerequisite:

- An active data connection is established to the meter.
  ⇨ 3.3 Establishing a connection to the meter (p. 17)

► Call action Dashboard, e.g., via the context menu.

4.1.2 Switch display units for the dashboard

At the bottom left of all tabs of the dashboard, you can use the **Display units** drop-down list to switch the measurement units of parameters and/or values.

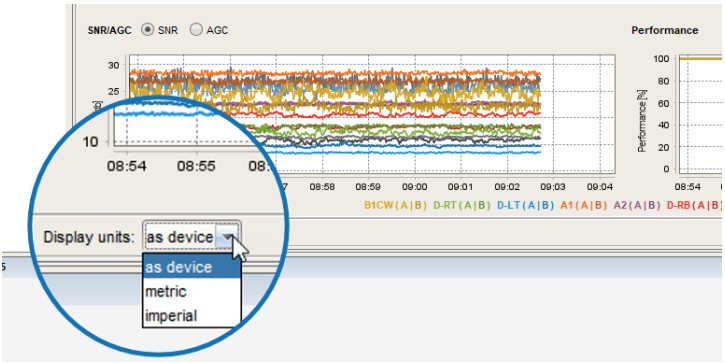


Fig. 4-2: Determine the units used in the dashboard

You can switch from **metric** to **imperial**, and vice versa. With option **as device** the units used in the device are displayed. When switching the units, the units are changed accordingly, and the displayed values are converted.

Hence, for example, a reference case created in Germany with metric units can easily be viewed in the USA with imperial units.
⇨ 8 Reference cases (p. 70)

4.1.3 Color scheme used

On different tabs of the dashboard like **Overview** and **Health Care Tests** the following color scheme is used:

Background, text	Status	Description	Meaning when used in HCTs
green or standard	ok	value is valid and within valid range	test passed
yellow	warning	value is within warning range	test warning
red	alarm	value is erroneous resp. within alarm range	test failed
greyed text	not used	value is not in use (tab **All values**)	–

4.2 Tab “Overview”: the heart of the dashboard

4.2.1 Tab “Overview”: get a good meter overview

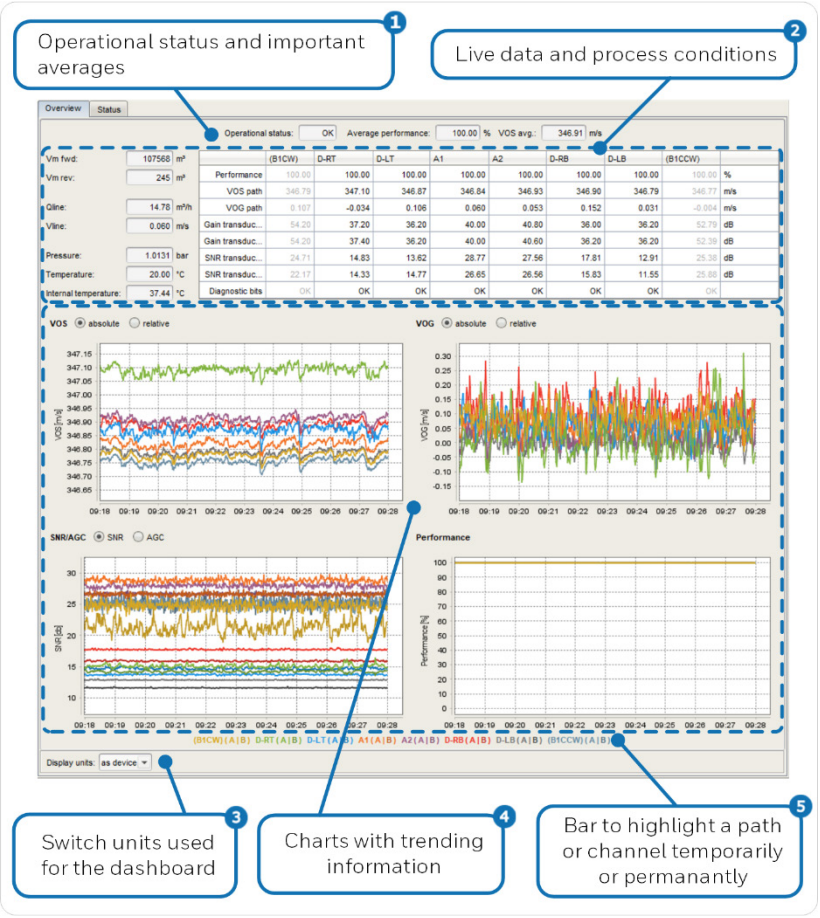


Fig. 4-3: Tab **Overview**

1 The 1st row shows the most important data about the meter.

- **Operational status**
  Current operational status over all paths of the meter.
  ⇨ 13.4 Operational status (p. 118)

- **Average performance (%)**
  Current performance in percent (%) over all paths
  Here, the performance is the ratio of valid samples to the total number of samples taken. It usually decreases with higher gas velocities.
- **VOS avg.**
  Average of all (Mach-)corrected VOS-paths

2 Live data and process conditions

In this section all relevant data and measurements are summarized, including a pathwise more in-depth information in table form. The values are updated every second.

- **Vm fwd**, **Vm rev**
  Volume at measurement conditions in forward (positive) resp. reverse (negative) direction
- **Qline**
  Volume flow at line conditions
- **Vline**
  Adjusted profile-corrected gas velocity
- **Pressure**, **Temperature**, **Internal temperature**
  Values from the pressure sensor (if available), the temperature sensor on the meter housing and the internal temperature measurement.

Pathwise live data in table format:

- **Performance**
  Current performance in percent (%) of each individual path
  Here, the performance is the ratio of valid samples to the total number of samples taken. It usually decreases with higher gas velocities.
- **VOS path**
  Velocity of Sound (VOS) per path
- **VOG path**
  Velocity of Gas (VOG) per path
- **Gain transducer A**, **Gain transducer B**
  Gain of the selected path and transducer
- **SNR transducer A**, **SNR transducer B**
  Signal-to-noise ratio (SNR) of the selected path and transducer
- **Diagnostic bits**
  Here, each set diagnostic and/or alarm bit is listed with its

abbreviation.
⇨ 13.5 Diagnostic and alarm bits (“DiagBits”) (p. 119)

- If one or more diagnostic bits are set, check tab **Status** for a quick error diagnosis.
⇨ 4.2.2 Tab “Status”: allows a quick error analysis p. 26)

3 **Display units**
At the bottom of each tab of the dashboard you can switch the view between metric and imperial units.
⇨ 4.1.2 Switch display units for the dashboard (p. 22)

4 On tab **Overview** and **Charts** the same charts are displayed.
⇨ 4.3 Tab “Charts”: view trending information (p. 28)

5 ⇨ 4.3.1 Graphics – zoom functions and high lightening of paths (p. 29)

4.2.2 Tab “Status”: allows a quick error analysis

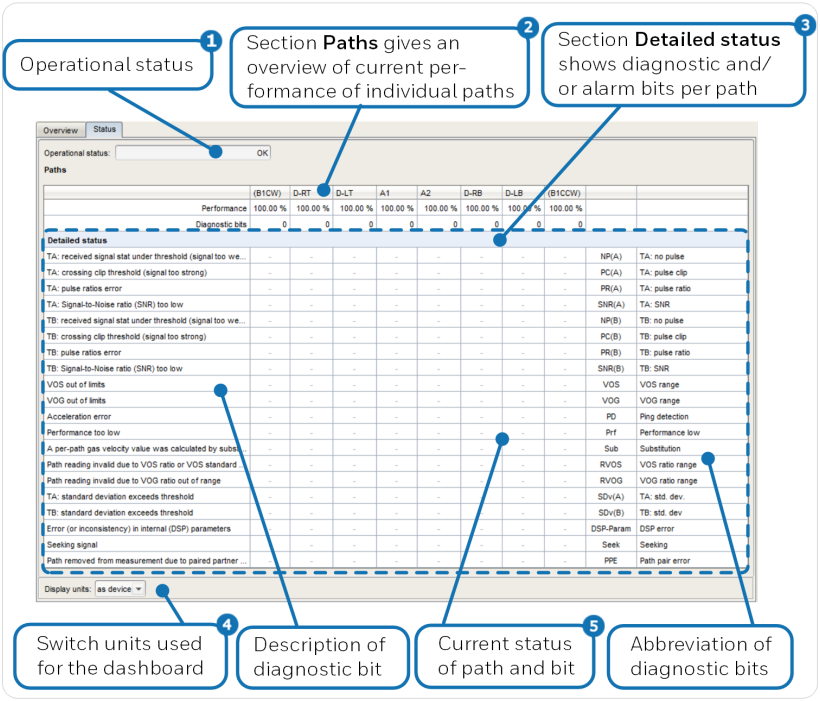


Fig. 4-4: Tab **Status** breaks down diagnostic data per path

1 Current operational status over all paths.
⇨ 13.4 Operational status (p. 118)

2 Here you get an overview of the current performance data of the individual paths.

- **Performance**
  Current performance in percent (%) of each individual path
  Here, the performance is the ratio of valid samples to the total number of samples taken. It usually decreases with higher gas velocities.
- **Diagnostic bits**
  Sum of the set diagnostic bits as decimal number.
  ⇨ 13.5 Diagnostic and alarm bits (“DiagBits”) (p. 119)

3 The table lists all diagnostic and/or alarm bits per path.
⇨ 13.5 Diagnostic and alarm bits (“DiagBits”) (p. 119)

4 **Display units**
At the bottom of each tab of the dashboard you can switch the view between metric and imperial units.
⇨ 4.1.2 Switch display units for the dashboard (p. 22)

5 The current status of the paths is displayed.

A dash ("**–**") means there are no issues present, so this corresponds to the status "`OK`".

In case of an error, the abbreviation of the diagnostic bit is displayed in the relevant cell and is highlighted in color depending on the severity.

4.3 Tab “Charts”: view trending information

On the **Charts** tab the same charts are displayed as on the **Overview** tab, but in this view, they have the focus. The great strength of flow charts is that they contain trending information and show how a value is developing over time.

⇨ 4.3.1 Graphics – zoom functions and high lightening of paths (p. 29)

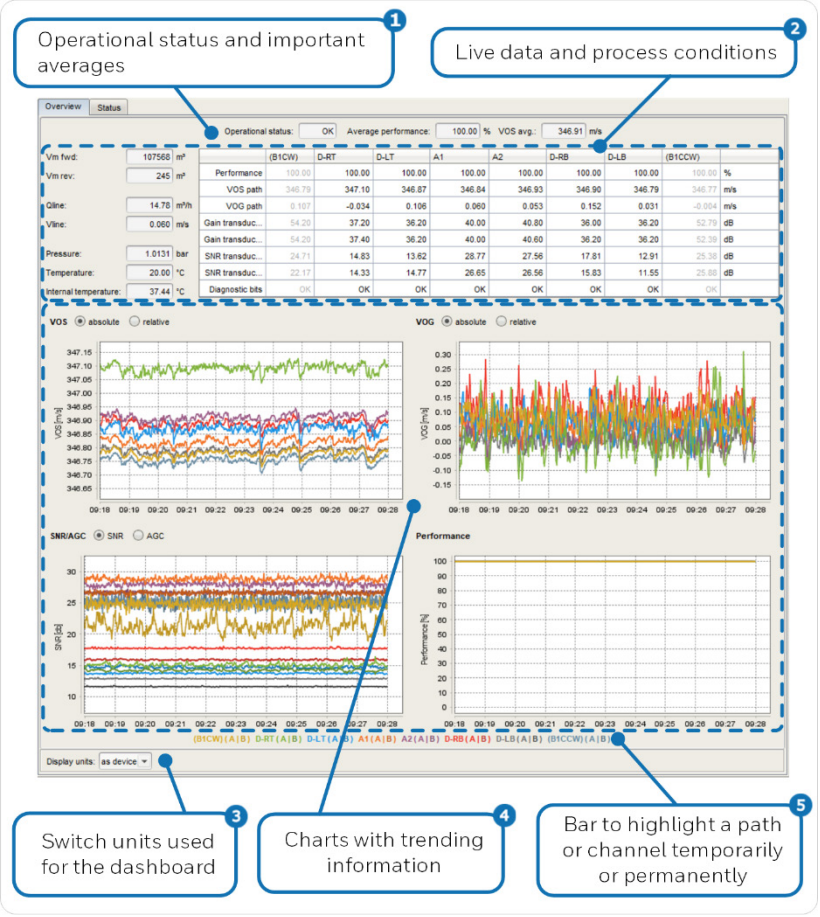


Fig. 4-5: Charts with trending information per path

1. **VOS**,and/or **VOG** can be displayed either as absolute or as relative values. “Relative values” means the ratios of the velocities. This setting is especially helpful to determine if a single path deviates strongly from the others.

2. **Performance**
   Current performance in percent (%) of each individual path

   Here, the performance is the ratio of valid samples to the total number of samples taken. It usually decreases with higher gas velocities.

3. **Display units**
   At the bottom of each tab of the dashboard you can switch the view between metric and imperial units.
   ⇨ 4.1.2 Switch display units for the dashboard (p. 22)

4. ⇨ 4.3.1 Graphics – zoom functions and high lightening of paths (p. 29)

4.3.1 Graphics – zoom functions and high lightening of paths

In the dashboard, you can customize the view of a chart: :

- Enlarging a chart. (Folder **Overview**, tab **Overview** only)

  Open the chart in a separate window with a double click on its own tab.

- *Temporarily* highlighting a path or a channel.

  Hover the mouse pointer over the path or transducer and, if required, also over the channel in the legend (mouseover effect). The other paths and channels in the diagram are faded out a bit.

- *Permanently* highlighting path(s) or channel(s).

  Click one or more paths and, if required, one or more channel(s) in the legend to permanently highlight individual paths. The other paths and channels are faded out a bit.

  With another click on a selected path or channel in the legend you reset this highlighting; with reset you reset the entire highlighting.

Furthermore:

- Action Copy chart

  Via the context menu of a chart, you can copy a chart to the clipboard and send it via e-mail to the technical support, for example.

4.4 “Health Care Tests” (HCTs): monitoring the health of the meter

4.4.1 HCTs at a glance

enSuite can monitor the health status (health care status) of the USM in real time as well as the long-term stability through periodically generated status reports. This helps you to detect erroneous measurements caused by contamination and flow disturbances (swirl, deformation of the flow profile) at an early stage, so that you are able to make informed decisions regarding maintenance and recalibration.

Here, enSuite continuously compares the current measured values of the USM with the interpolated reference points (target value, warning and alarm limits) of the active reference case. The comparison is performed several times a second. Most tests check the ultrasonic paths of the meter. The closer a result is to its reference value (**target value**), the better. Based on the warning and alarm limits, the status for each item checked is set as "passed", "warning" or "failed". Reference value of the tests is the velocity of gas of the meter (**Vline**).

4.4.2 Health care monitoring (in real time)

4.4.2.1 Background

enSuite starts the real time health care tests automatically as soon as an active data connection is established to the USM and some pre-tests have been run. The monitoring view is part of the dashboard. This view enables you to immediately identify the current health care status of the USM and the cause of possible unprecise or erroneous measurements.

Ensure the correct reference case is activated.

Health care tests use the limits and target values defined in the active reference case.

Note:
In case no reference case is defined yet, a default reference case with standard values is used. Ensure that the values match your USM.
If you want to check the alarm and warning limits of the default reference case, create a new reference case.

⇨ 9.1.3 Activating a reference case (p. 74)

The tests performed depend on the type of USM in use and its path layout.

Values used in the test are either calculated, or live values of the USM or parameters of USM AFB.

4.4.2.2 Test results

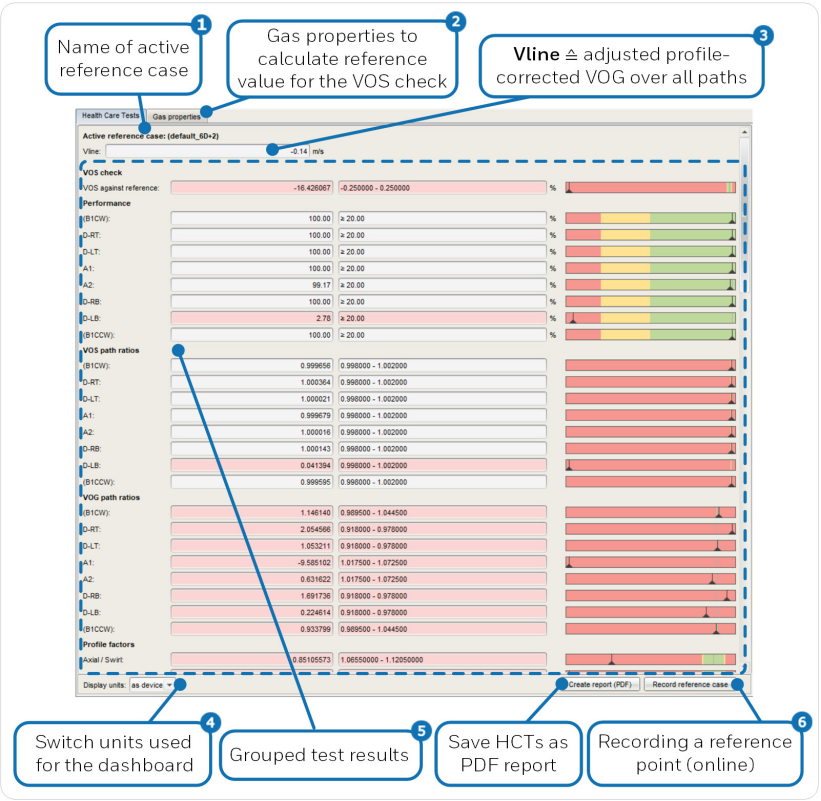


Fig. 4-6: Dashboard – Health care test monitoring (in real time)

1 Name of the currently used reference case

Make sure that the correct reference case is activated here, otherwise:
⇨ 9.1.3 Activating a reference case (p. 74)

2 On tab **Gas properties** you determine pressure, temperature, full gas vector which are used to calculate the VOS reference value for the VOS check of the Health care tests.
Alternatively, a fixed value can be used as reference value.

⇨ 4.4.3 Determining gas properties for the VOS check (p. 33)

3 Export value used:

<USM AFB> – Measurement results, export **Vline**

4 **Display units**
At the bottom of each tab of the dashboard you can switch the view between metric and imperial units.
⇨ 4.1.2 Switch display units for the dashboard (p. 22)

5 The test results are grouped and displayed in table form with 4 columns (⇨ 4.1.3 Color scheme used, p. 23):

1. column: identifier of the tested element

2. column: current value ≙ test result resp. value in real time

3. column: valid range ≙ defined range of good health
For example, when the current value (2. column) is in this range, the test passes (green).

4. column: uses stacked bars with valid, warning and alarm ranges with target and current values.

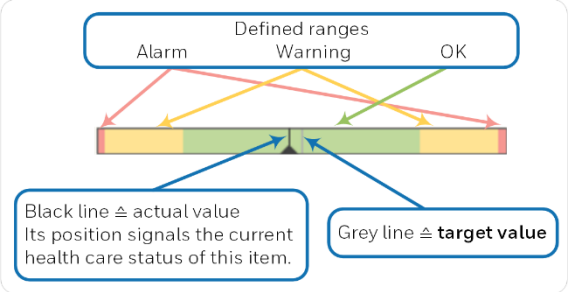


Fig. 4-7: Stacked bar – example for lower and upper ranges

6 ⇨ 9.1.4 Recording a reference case (online) (p. 74)

4.4.3 Determining gas properties for the VOS check

4.4.3.1 Background

On tab **Gas properties** you determine the VOS reference value (**Velocity of sound**) for the VOS check of the Health care tests. This value is either calculated based on measurement values for pressure, temperature, and a full gas vector, or set as a constant.

The sum of all components must equal 100 mol%. Therefore, a normalization of the gas vector is performed, assuming the methane (CH_4) proportion is known. Selected components can be excluded from normalization.

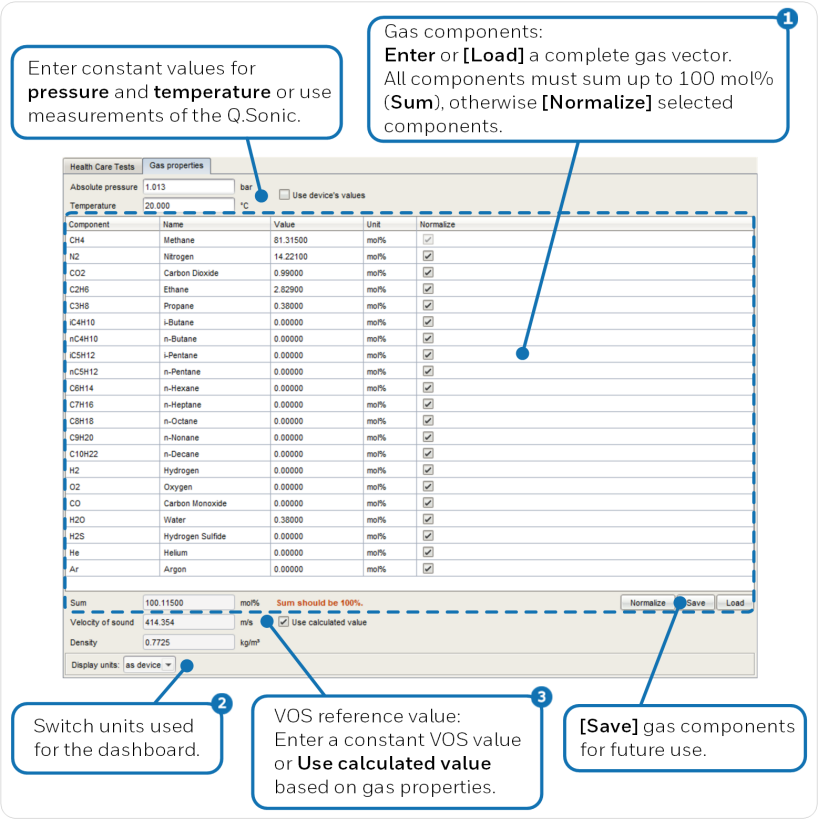


Fig. 4-8: Dashboard – Health care test monitoring (in real time)

1 ⇨ 4.4.4 How-to calculate the VOS reference value (p. 35)

2 **Display units**
At the bottom of each tab of the dashboard you can switch the view between metric and imperial units.
⇨ 4.1.2 Switch display units for the dashboard (p. 22)

3 **Velocity of sound** is the reference value used for the VOS check
It is either calculated based on the values for **Absolute pressure**,

Temperature and the **Gas components** entered or loaded – in the case the check box **Use calculated value** needs to be activated; or you enter the VOS constant directly.

4.4.4 How-to calculate the VOS reference value

Prerequisite:

- The values for pressure, temperature and the full gas vector are available.

► To use **Absolute pressure** and **Temperature** directly from the USM, activate the **Use values from device** checkbox.
Otherwise, enter both constants manually.

► You can enter the individual components manually to the table or **[Load]** an already saved (**[Save]**) or prepared text file containing the gas components and its values.

Preparing a file with components

The text file must have the following format:

- Format: CSV (comma-separated values)
- File extension: (optional) `csv`, `txt`
- 1. row: `Gas Composition` (≙ information line)
- In the further rows the components are listed line by line with this syntax: `<formula symbol>,<n.n>`

For example:

```
Gas Composition
CH4,81.315
N2,14.221
CO2,0.99
C2H6,2.829 …
```

► If necessary, exclude single components from normalization by deactivating the respective checkbox in column **Normalize**.

► (Optional) **[Normalize]** the gas vector.

► Activate the checkbox **Use calculated VOS value**.
✓ The calculated value in the parameter **Velocity of Sound** is used as reference VOS for the VOS check.

4.4.5 How-to use a constant VOS reference value

► Enter the required value in parameter **Velocity of Sound**.
► Deactivate the checkbox **Use calculated VOS value**.
✓ The constant value in the parameter **Velocity of Sound** is used as reference VOS for the VOS check.

4.5 Tab “All values”: looking deeper into the raw data

All values of the USM are listed here in tabular form.
⇨ 4.1.3 Color scheme used (p. 23), if applicable.

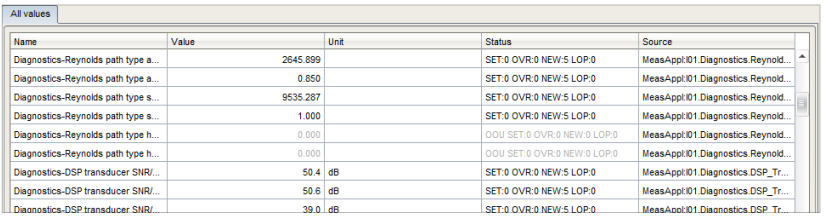


Fig. 4-9: All values showing all values of the USM (raw data)

The table provides following information:

- **Name** and **Source**

  Here, the <export values> of the current device parameterization are displayed. Optionally, the parent folder names are also listed. Which SFB or AFB this export value belongs to can be seen from the first entry in the Source column.

Abbr. used in column “Source”	located in window “Export Values”
I/O	≙ **Basic System – I/O**
System	≙ **Basic System – System**
TimeCron	≙ **Basic System – Time Service**
MeasAppl	≙ **<USM AFB>**
DensVisc	≙ **<Density & Viscosity AFB>**

Example on how to find the related value in the parameterization:

If **Name** = “Current time” and **Source** = “TimeCron”, the value is located in the **Export Values** window:
Basic System – **Time Service**, **Current time**

- **Value**

  live value of the USM
  The value is continuously updated whenever the default identifier `NEW` in the ⇨ **Status** column is incremented.

- **Unit**

  Current unit of the displayed value
  ⇨ 4.1.2 Switch display units for the dashboard (p. 22)

- **Status**

  Here the standard identifier `SET`, `OVR`, `NEW` and `LOP` are displayed.
  In case of an error, all error identifiers with which the value is marked are also displayed.

  ⇨ 13.3 Quality bits: standard and error identifiers (p. 115)

- **Source**

  The internally used path and name are displayed here.

5 Parameterizing the USM with enSuite

5.1 Product and device parameterizations

enSuite distinguishes between two types of parameterizations: product parameterizations and device parameterizations. They are managed in the navigation window.

Parameterizations have the file extension: `par`

5.1.1 Product parameterizations

Product parameterizations are predefined parameterizations and always belong to a specific device type, for example to a Q.Sonic-max8. You can use a product parameterization as a template for creating a parameterization for a specific device. You parameterize the device-specific settings in the device configuration via offline or online parameterization. enSuite manages product parameterizations in the navigation window below the node with the same name.

5.1.1.1 How-tos

- To use a product parameterization as a device parameterization, on device level choose the action **New parameterization** and select the option **Copy from product parameterization**.
- To send one or more product parameterization(s) as an email attachment, select in the context menu of the selected parameterization(s) the entry **Send as email**.
- To save a device parameterization as a product parameterization, in the context menu of a device parameterization select the entry **Save as product parameterization** and set the **Name**.

5.1.2 Device parameterizations

A device parameterization belongs to a specific device with a fixed serial number. A device parameterization can only be transferred to the device with the matching serial number.

5.1.2.1 How-tos

- To create a new device parameterization, choose the action **New parameterization** on device level and select one of the options **Copy from product parameterization** or **From scratch**. For some device types you can optionally create a standard parameterization.
- To send one or more device parameterization(s) as an email attachment, select in the context menu of the selected parameterizations the entry **Send as email**.
- To readout a device parameterization from the device, connect to the device and execute the action **Readout parameterization**. Confirm with **[Save]** after readout. Modify the name of the file for easier identification.
- To modify a device parameterization, execute the action **Edit parameterization**.
- To delete a device parameterization, select the entry **Delete** in the context menu of the parameterization.

5.2 Offline and online parameterization

By using the term **Offline parameterization**, reference is made to parameterization in the following steps:

1. Editing or creating a device parameterization (“offline”, i.e., without a data connection to the device).
2. Transferring the device parameterization to the device with the matching serial number by an authenticated user.
   ⇨ 12.2 Managing access rights (administrator only) (p. 96)

Online parameterization means that the content of certain parameters is changed directly during an existing data connection to the device.

The following table outlines the differences between offline and online parameterization:

Offline parameterization	Online parameterization
Editing the device parameterization without being connected to the device. The parameterization can later be transferred to the device.	Changing of parameter contents during an existing data connection to the device.
The options available for editing the parameterization are in principle available. Whether a parameterization can be accepted or not is decided by the device whilst taking into account the access rights of the logged in user and the condition of the security switch.	It is necessary to log in to the device to start editing. Only changes that the logged in user is allowed to make are possible. In addition, the condition of the security switch is taken into account.
The edited device parameterization must be saved (in the enSuite database) prior to being transferred.	The saving of the edited parameterization as a device parameterization in enSuite is optional.
Changes of the AFB configuration are possible, e.g., adding or removing AFBs.	No changes of the AFB configuration are possible.
In addition to changing parameter *content*, changes of the parameter *structure* are also possible, for example by activating functionalities or adding process boards.	Only the content of parameters which already exist may be changed.
The restart of the device is necessary to activate all changes in one step.	No restart of the device is necessary. The changes are active instantly after selecting saving.

Table 5-1: Offline vs. online parameterization

5.3 Reading out a parameterization

Prerequisites:

- An active data connection is established to the device.
  ⇨ 3.3 Establishing a connection to the meter (p. 17)

► Highlight the device in question in the navigation window under the **Devices** branch.

► Select the action **Readout parameterization** in the context menu.

✓ The **Save As** dialog varies depending on the parameterized authentication mode, login status and position of the security switch.

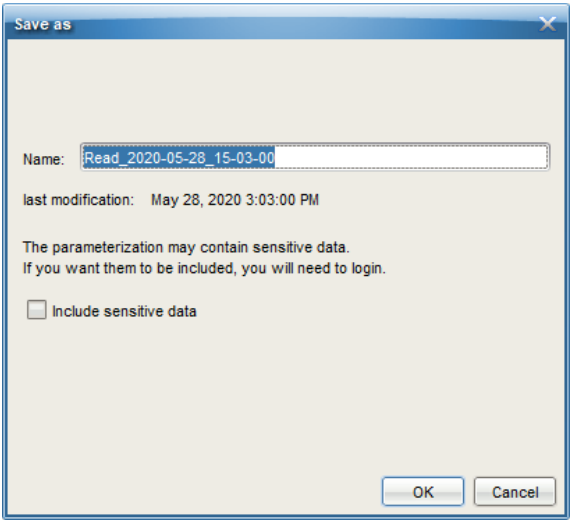


Fig. 5-1: Settings for reading out a parameterization – example

► Enter a file name.
The parameterization will be stored with this name in branch:
Devices – <Serial Number/Name> – Parameterizations

USM parameterizations do not contain sensitive data

Leave the **Include sensitive data** check box deactivated. USM parameterizations do not contain sensitive data; otherwise, the access right **Change general system settings** is required.

5.4 Offline parameterization

5.4.1 Editing a device parameterization offline

► Open an existing device parameterization by double-clicking.
► Edit parameters and/or the AFB configuration (⇨ 12.3 How do I add a second Modbus AFB?, p. 110).
✓ Following color scheme is used to highlight modified and invalid parameters:

- **blue** labels indicate that a parameter was modified but the change has not yet been saved. Any superordinate branches are also marked in **blue**.
- **red** labels signal that the parameterization is not yet valid. The parameterization can be saved, but it cannot be transferred to a device.

► Save the device parameterization .
✓ The parameterization is saved under the old name and thus overwrites the original parameterization.

5.4.2 The approval file for use in legal metrology

If the meter is used in legal metrology special mechanisms come into operation. It depends on the particular application and the applicable EU type examination certificate which parameters are regarded as being legally relevant, and which securing mechanism shall be used in each case. These restrictions are summarized in a special configuration file (“approval file”) that is part of the individual device’s software.

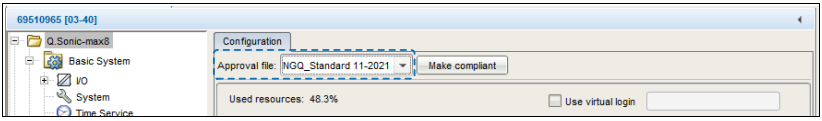


Fig. 5-2: Parameterization with an approval file selected – example

To be able to operate in conformity with an official type examination certificate, the device parameterization must contain at least the same securing mechanisms for legally relevant parameters as described in the approval file. To ensure this, you can select which approval file is valid for

the device when creating or editing a device parameterization in enSuite as well.

The modification of legally relevant parameters is secured by two alternative mechanisms:

- **Security switch**

  Parameters that are marked with the symbol in enSuite can only be changed if the security switch is open.

- **Fiscal audit trail**

  Parameters that are marked with the symbol in enSuite can be changed even if the security switch is closed – in this situation the changes are recorded in the fiscal audit trail. The fiscal audit trail's depth is 1,000 entries. As soon as the fiscal audit trail is full, no more changes of parameters marked can be made when the security switch is closed. You can only erase the fiscal audit trail if the security switch is open

Such parameters (marked or) are called *secured parameters*. And the securing mechanisms are called *official rights* in this manual.

During operation, the enCore device checks whether the device parameterization contains at least the same securing mechanisms as the approval file of the device software. If the meter detects that the securing mechanism for at least one parameter in the parameterization is weaker than specified in the approval file of the device software, the identifying string of the approval file shown within the **Software status** display is highlighted in red and the device generates an alarm.

5.4.3 Different ways to edit a parameterization

The methods for editing the parameterization are explained in this section. The parameterization is edited in the parameterization window of enSuite.

Parameterization window:
Navigation in AFB and parameter structure

The left-hand part of the parameterization window contains the parameter tree. The top level shows the device name; in the

subordinate level, you can see the Basic System, the AFBs (possibly in groups) and node **Displays**.

The tree levels can be opened by clicking on the prefix +. If the selected level contains parameters, you can view and edit these parameters on the right-hand side of the window.

In the **Parameters** tab, typically the parameters of the individual parameter branches are listed in table format and offered for editing. For more complex functionalities, there is sometimes a more convenient editing dialog in a separate tab.

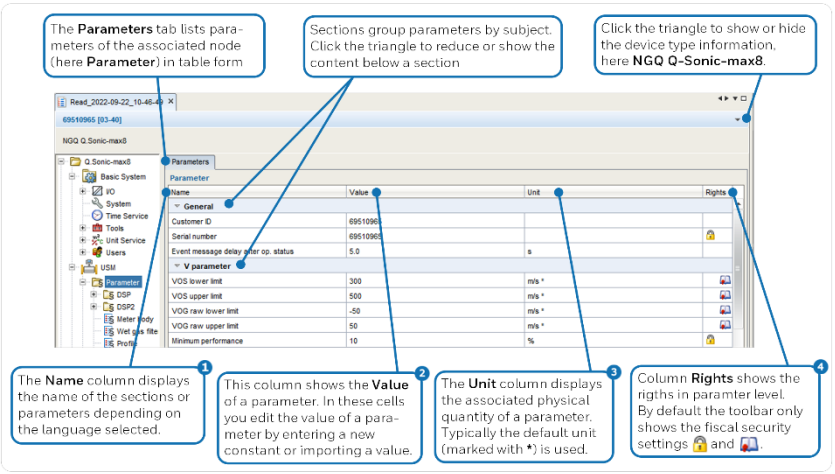
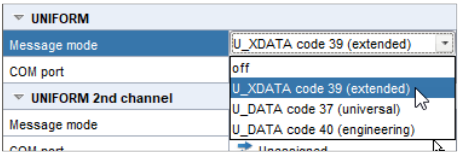
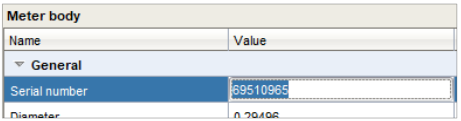


Fig. 5-3: **Parameters** tab overview – example

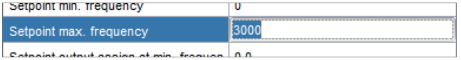
1. Different parameter types are distinguished
   - Selection of one of several options (dropdown list)
     Example: Selecting the operating mode for UNIFORM:



- Name
  Entry of character string for identification purposes
  Example: Serial number of the meter body

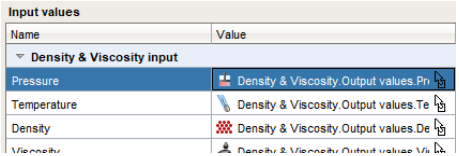


- Constant Entry of numerical constant
  Example: Constant **Setpoint max. frequency** as a limit value



- Import value
  Assignment of an export value (result of another functionality); can be selected from the dropdown list or assigned by drag-and-drop from the **Export values** window.

  Example: Import values from Density and Vicosity AFB



2 You can find out more information on the Unit Service SFB in the ⇨ Online Help.

3 enSuite manages rights on parameter level with the help of symbols. Wherever rights can be assigned at a parameter or system level, a toolbar is shown in the column **Rights**. The toolbar is divided into two sections:

- Buttons 1 to 5 to manage rights for user profiles

- Buttons 6 to 7 to manage fiscal security settings

By default, only buttons 6 and 7 are displayed. To display the extended toolbar open node **<device>** and activate the checkbox **Edit user rights**.

The function blocks of the enCore software provide results which can be further processed by other function blocks. These results are called **Export values**. And displayed in the **Export values** window.
⇨ 3.2.1 The graphical user interface (GUI) (p. 14)

The export value name is derived from the tree structure.

Example: Export value name derived from tree structure

The Density & Viscosity AFB for example provides the export value **Density**, which can either be a fixed values or calculated based on live pressure and temperature depending on the parameterization. This export value is called: **Density & Viscosity.Output values.Density**

enSuite assigns a symbol to export values so that the physical quantity is immediately recognizable, for example:

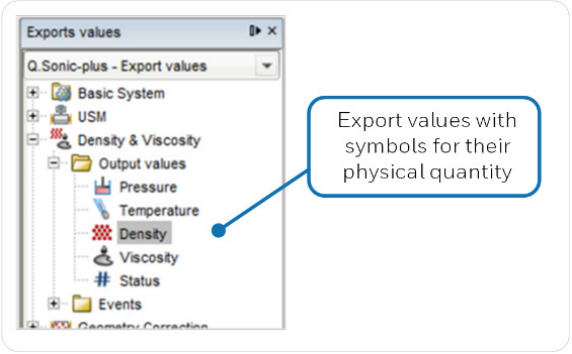


Fig. 5-4: Export values always with symbol for physical quantity – example Density & Viscosity AFB

If a parameter is a so-called import value, i.e., the value is assigned by importing an export value, then the symbol for the physical quantity is shown on the left-hand side and the drag-and-drop sign on the right-hand side within the corresponding **Value** field.

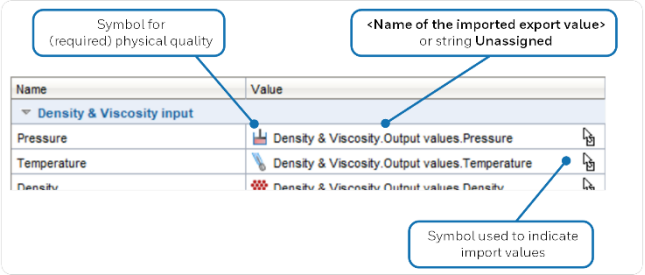


Fig. 5-5: Marking of import values – example

Parameters: Assignment of import values

The assignment of an export value to an import parameter only works if the physical quantity is matching.

You can assign a value by dragging onto the parameter from the value window using drag-and-drop. The cursor turns into a stop sign, if any such assignment is not possible (e.g., because the physical quantity is not matching).

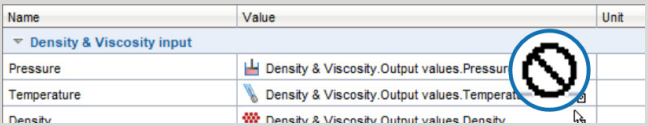


Fig. 5-6: Cursor turns into stop sign to signal that the dragged export value cannot be dropped at this position – example

Alternatively, you can expand the selection list directly at the parameter value and select the required value.

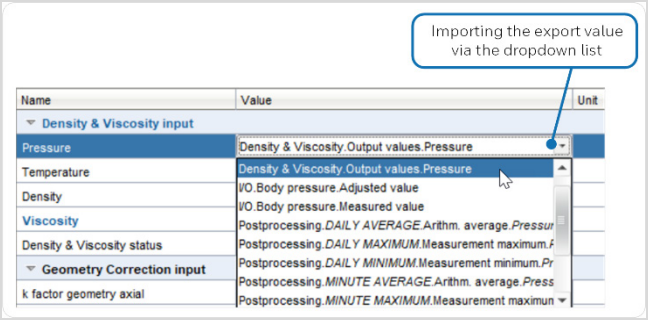


Fig. 5-7: Importing an export value via the dropdown list – example

However, this list contains all export values that match the physical quantity. For more complex parameterizations, the drag-and-drop method is therefore easier to use. If possible, enSuite also adjusts the unit for some imports, e.g., in the Post-processing AFB after the measured value inputs.

There are parameters for which either the use of a constant or an import value is possible. For certain parameters, it is also possible to select the

option **Not used**, e.g., for unavailable input values or to disable a monitoring routine (by choosing **Not used** for a limit value).

Example: Time Service SFB: Setting daylight saving time when an **Import** message is received, as a **Constant** or do not evaluate the DST information by setting it to **Not used**.

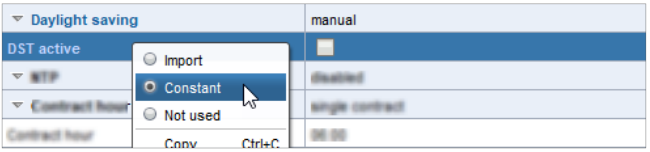


Fig. 5-8: Determining the parameter type via the context menu – example **DST active**

In addition, there is another parameter type for which the option **Automatic** is preset or selectable. The values of such parameters are numerical constants or texts that can be automatically determined by the device. Typically, this is either information supplied by a connected measurement device via digital protocol or determined internally.

Parameters: Switching the parameter type

The possibility of switching the parameter type (import value or constant or not used) depends on the respective parameter. If several options are possible, you can open a context menu by right clicking on the parameter name. You can select the desired option here.

Alongside the **Name** and **Value** of a parameter, the associated physical unit is displayed in the **Unit** column for values that correspond to a particular physical quantity. Under normal circumstances, the default unit is used for the physical quantity in question. This is highlighted in the display with an asterisk *.

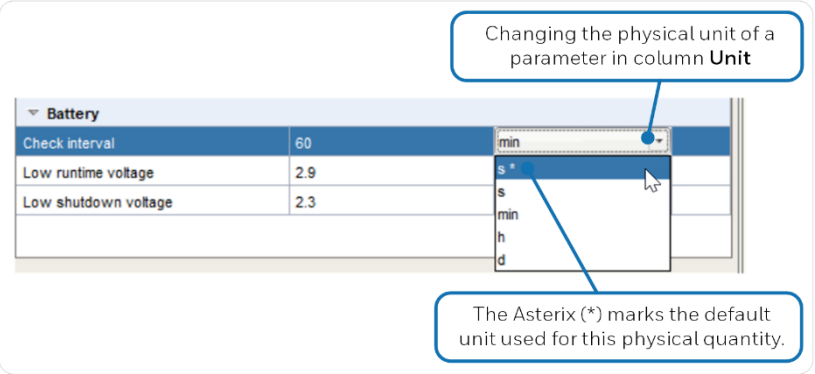


Fig. 5-9: Changing the physical unit – example

Change units

If you click on the unit of a parameter in the **Unit** column, a list opens in which you can select another unit if required.

The default units for specific physical quantities can also be edited. This is carried out centrally under **Basic System – Unit Service – Default units**.

You can find out more information on the Unit Service SFB in the ⇨ Online Help.

5.4.4 Saving an edited parameterization

Once you have made all desired amendments, simply save the parameterization with .

5.4.5 Transferring a parameterization to the device

Background

Prior to the transfer of a parameterization to the device a user authentication is required. The device checks whether the user has the access rights to transfer the changed parameters to the device. If parameters were changed that are under the protection of the security switch, the security switch must also be open. If these requirements are met, the parameterization will be transferred to the device, otherwise transfer of the entire parameterization is rejected.

How to proceed

Prerequisites:

- The device parameterization is saved.
- The serial number of the parameterization and device match.
- Special case:
  The security switch must be open to transfer a parameterization to the device in which parameters under the protection of the security switch have been changed.

► Establish the data connection to the device.
► Highlight the desired device parameterization in the data structure of the navigation window.
► Select the action Transfer parameterization to device.
► Login. ⇨ 12.2 Managing access rights (administrator only) (p. 96)
✓ After successful login, the transfer of the parameterization to the device starts.
✓ After successful transmission, the device restarts automatically.
OR
If the parameterization cannot be successfully transferred to the device,

an error message is displayed. In this case, the device does not restart, and the old parameterization is still used.

5.5 Online parameterization

Background

”Online parameterization” means that the parameterization contained in the device is edited directly.

The editing methods are in principle the same as for the offline parameterization, but with the following restrictions:

- No changes may be made to the AFB composition.
- No changes may be made to the parameter structure.
- The user can change only parameters for which he is authorized.
- Non-editable parameters are listed in gray in the parameter lists.
- The following restrictions apply additionally in case the security switch is closed.

  – Parameters cannot be changed.

  – Parameters may only be changed provided the fiscal audit trail is not full.

How to proceed

► Connect to the meter.
► Select Parameterize online in the action menu of the navigation window.
► Log in with your username and password.
✓ The parameterization is read; the parameterization window then opens for editing purposes.
► Edit the required parameters.
✓ A **green** label indicates that a parameter was modified but the change has not yet been transferred to the device. Any superordinate branches are also marked in **green**.
► **Transfer changes to device** with button .
► Optionally, save the edited parameterization in enSuite.

5.6 Converting the unit system (“metric ↔ imperial")

Background

This function converts the units of measurement of a device parameterization from imperial to metric and vice versa at the touch of a button. The units of all parameters and export values are converted, and the corresponding values are converted into the other unit system.

This is useful, for example, if you need to convert the units of a parameterization from metric to imperial so that the meter can be used in a US plant.

Reconverted parameterizations may show differences to the initial parameterization

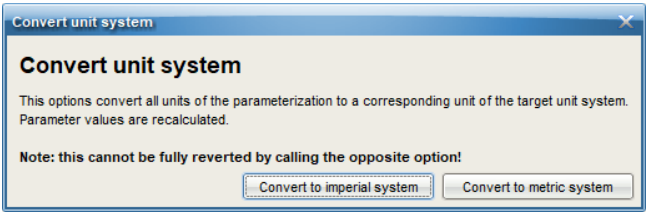
- Rounding differences may occur during conversion.
- In some cases, the reconversion might set other units since there is no 1:1 mapping of metric and imperial units.

How to proceed

► Open the required offline parameterization in enSuite.
OR
Make sure that the opened parameterization has the focus by clicking any place in the parameterization.

► Open the menu item **Tools – Convert unit system** in enSuite.

► Select the unit system.



► Save the converted device parameterization.

5.7 Comparing parameterizations

5.7.1 Compare a parameterization with the device

Background

Since enSuite version 4.9 and higher, you can compare an offline parameterization of an enCore device with the current parameterization of the same connected enCore device. The comparison is made on structural differences and parameter assignments. enSuite shows the comparison in a document viewer. The function is available in the action menu for parameterizations.

How to proceed

Prerequisites:

- An active data connection is established to the device.
  ⇨ 3.3 Establishing a connection to the meter (p. 17)
- An offline parameterization in enSuite is parameterized.
  ⇨ 5.4 Offline parameterization (p. 42)

► Select the required parameterization in the enSuite navigation window in node:
Devices – <device> – Parameterizations

► Call action Compare parameterization with device, e.g., via the context menu.

► The Comparison report is displayed in in the document viewer.
⇨ 5.7.3 Comparison report options (p. 55)

5.7.2 Compare two offline parameterizations

Background

In enSuite you can compare any two parameterizations of enCore devices and/or enCore product parameterizations with each other. The comparison is made on structural differences and parameter assignments. enSuite shows the comparison in a document viewer. The function is available in the action menu for parameterizations.

How to proceed

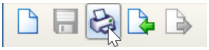
► Select two parameterizations for example by keeping the [Ctrl] key pressed and clicking the required parameterizations with the left mouse button in the navigation window under:
Devices – <device> – Parameterizations
AND/OR
Product parameterizations – Device series Q.Sonic series VI – <device type>

► Call action Compare parameterizations, e.g., via the context menu.

✓ The Comparison report is displayed in in the document viewer.
⇨ 5.7.3 Comparison report options (55)

5.7.3 Comparison report options

In the comparison report of the integrated document viewer, you have following options:

- **[Preview]**
  In this view you scroll forward and backwards between the individual pages, jump directly to a required page, and adapt the viewing size. Matches in Basic System and used AFBs are labelled "MATCH", differences are listed in detail.
- **[Edit]**
  In this explorer view, the differences in the Basic System and the AFBs used are displayed at parameter level.
  The comparison cannot be edited.
- Print or save as PDF file (only in the preview)
  Open the dialog **Print** either via the menu **File – Print...** or via the printer icon in the tool bar.
  
  In dialog **Print** select the required printer from the list of available printers. If a PDF printer driver is installed, you can also save the comparison as a PDF file.

5.8 Remote operation panel

The remote operation panel allows remote access to the meter with your service computer. The remote operation panel is a copy of the local operation panel and is displayed in enSuite. As soon as you open the remote operation panel, enSuite displays the virtual front your device. You can operate the displayed keys, actions or hyperlinks with the mouse and the virtual keyboard.

This remote access is possible via Ethernet and USB connection.

Starting with Basic System V03-39, the implementation of the remote operation panel meets higher requirements for data security and privacy. From that version on:

- The remote operation panel uses a TLS secured MMS connection. The unsecure HTTP protocol is no longer supported, which means the remote operation panel can no longer be viewed in a browser of the service computer.
- Only one remote access is possible at the same time.
- As soon as you open the remote operation panel, the local display shows a lock screen, hiding your operation from users looking at the device. In enSuite you can grant the view or even the operation control to the local user at the device. (⇨ Fig. 5-10, p. 57)

  This may be reasonable e.g., if our technical support from remote and you at the device shall be able to see the device's display at the same time.
- As soon as the user at the device with granted control opens the virtual keyboard for input, enSuite shows a lock screen to hide the input.
  To prevent local users from accidentally blocking the remote operation the virtual keyboard will be closed automatically after one minute without input.
- When a remote operation panel is active, the local user can cancel the remote access at any time by pressing left and right function key simultaneously. (⇨ Fig. 5-11, p. 59)

5.8.1 Starting the remote operation panel in enSuite

Prerequisite:

- An active data connection is established to the meter.
  ⇨ 3.3 Establishing a connection to the meter p. 17)

► Select the device in the enSuite navigation window.

► Call the Remote operation panel action in the lower part of the navigation window.

✓ enSuite displays the remote operation panel on a tab with the following information:

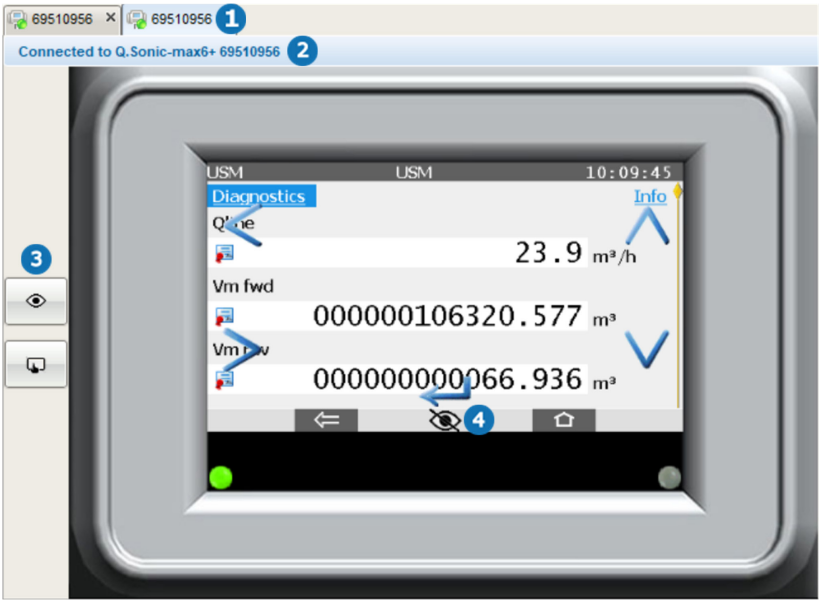


Fig. 5-10: Remote operation panel tab

1. Exit the remote operation panel by closing the tab with the close button ×.
2. **<Device type>** and **<serial number>** of the connected device
3. 2 toggle buttons:
   Use the upper button to grant or revoke the view of the actual display content for the local user:

   Current status: The local user sees a lock screen and the device cannot be operated locally.

   Action: Click on the button to release the device display for the local user. It is now possible to grant the right to operate the device locally with the lower button.

   Current status: The local user sees the content of the device display – both local and remote share the same view (except input).

   Action: Click the button to revoke the view for the local user, a lock screen will be displayed on the device. This action also revokes the right to operate the device locally.

The lower toggle button grants operating control to the local user. This button is only enabled if the local view is active:

Current status: The local user cannot operate the device.

Action: Click the button to grant the right to operate the device locally.

Current status: The local user can operate the device.

Action: Click the button to revoke the right to operate the device locally.

4 Device's status bar (⇨ below)

✓ On the meter, the local user sees the lock screen:

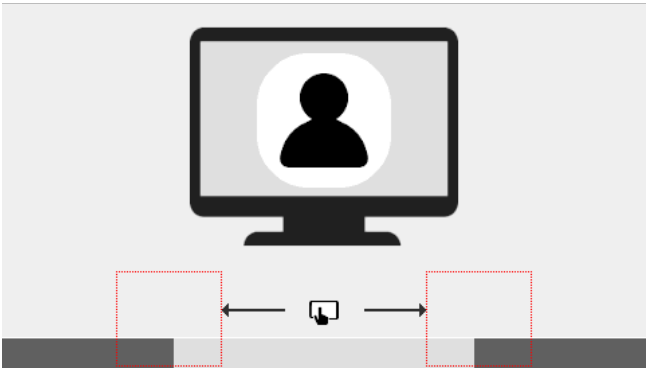


Fig. 5-11: The device displays this lock screen when remote operation is active

On the meter following states are possible locally when the remote operation panel is active:

Status bar icon	Description
(no icon)	A lock screen is displayed, hiding the actual device display. No operation is possible with one exception: The local user can cancel the remote access by pressing the left and right function key simultaneously (⇨ Fig. 5-11, p. 59).
	The local user sees the actual display content and can operate the device.
	The local user sees the actual display content, but the device is operated remotely only.
	The local user has the right to operate the device locally and opened the virtual keyboard for input. enSuite displays a lock screen to hide the (possibly sensitive) key input from the remote user.

When the view is granted to the local user, the remote keyboard entry is visible for the local user!

Please note that your input via remote operation panel can be observed on the device's display. Please revoke view before entering sensitive data, e.g., your user password, with:

The local keyboard entry is never visible on the remote operation panel

As soon as the virtual keyboard is activated on the device the remote operating panel shows this lock screen:

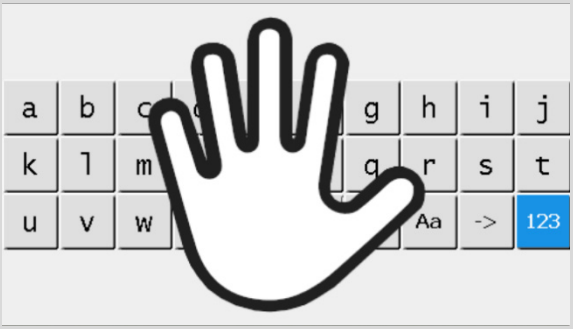
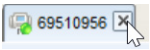


Fig. 5-12: Lock screen shown on remote operation panel (enSuite) during local keyboard entry

5.8.2 Closing the remote operation in enSuite

► You can terminate the remote operation by closing the corresponding window with ×.



✓ The window is closed, the remote operation is terminated, and the device will accept a new remote operation connection.

Mechanisms that terminate the remote operation

Only one remote operation connection per device is possible at the same time. To prevent inadvertent locking of the device, e.g., for another remote operation, the device supports the following mechanisms:

- The remote operation panel will be closed automatically if there was no user interaction for 5 minutes. This timeout duration is fixed and cannot be changed.

- Closing enSuite or closing the connection to the device will also close the remote operation panel.
- At the device, a local user can cancel the remote operation at any time by pressing both left and right function keys simultaneously.
  (There are arrows on the lock screen pointing to the function keys.)

6 Live logs

6.1 At a glance

As soon as a connection to an USM is established, enSuite records a set of (measurement) values every second as so-called live logs. The recording of the standard live log starts automatically when the connection is established and ends when the connection is terminated.

In addition, you can manually start and stop one or more recordings (sublogs) within a standard live log.

enSuite stores all live logs in the subfolder **Live logs** of an USM.

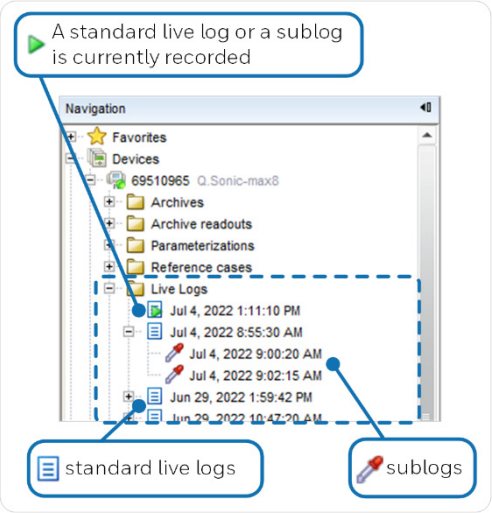


Fig. 6-1: Live logs – meaning of icons

6.2 Viewing

Prerequisite:

- At least one live log exists in folder **<device> – Live Logs** (navigation window).

► Go to **<device> – Live Logs** in the navigation window.
► Open the required log with a double click.
OR
Call action Show archive, e.g., via the context menu for the selected log.

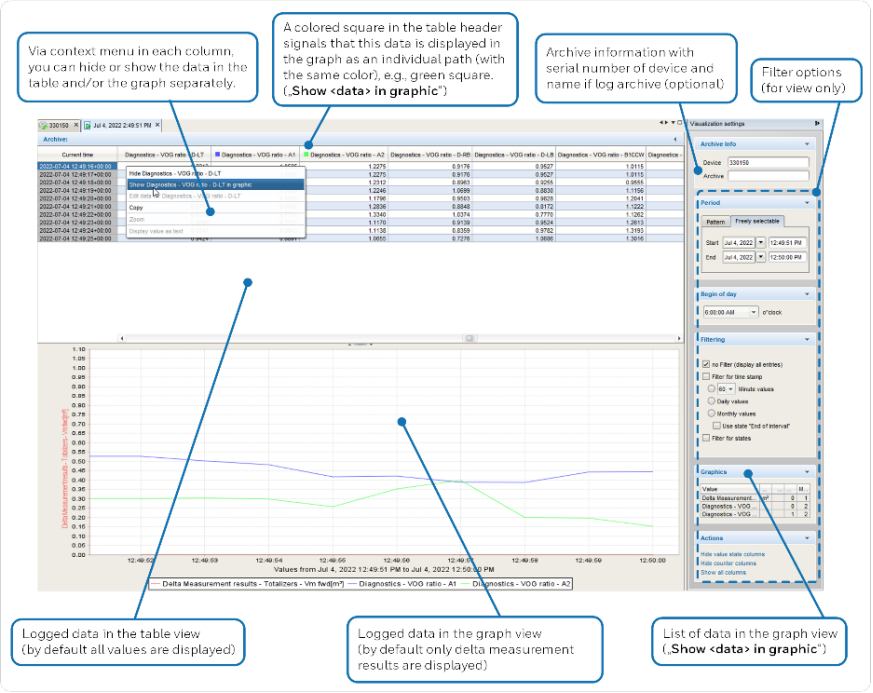


Fig. 6-2: Viewing a live log or sublog – example data

6.3 Exporting

Background

You can export one or more live logs in CSV format at once. A CSV file with the format of SonicExplorer export is also supported. Per default the setting is *not set* to "Sonic Explorer-format".

How to proceed

- ► In the navigation view open the required Live Logs folder(s).
- ► To select more than one log, press the [Ctrl] key.
- ► Select the required entry resp. entries.
- ► Call action Export… via the context menu.

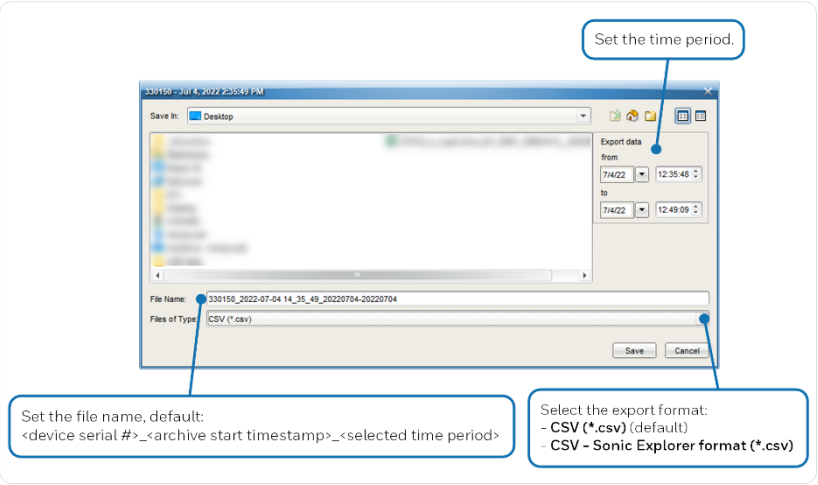


Fig. 6-3: Live log – export dialog

6.4 Starting/stopping

Background

A live log itself is started automatically when the connection is established to the meter and stops when the meter is disconnected. But you can start and stop a sublog for the currently recorded live log.

How-to start or stop sublog

Prerequisite:

- A live log is currently recorded.

► Go to **<device> – Live Logs** in the navigation window.
► To create a new sublog, call action Start new log, e.g., via the context menu for the currently recorded live log.
► To stop the sublog recording, call action Stop log, e.g., via the context menu for the currently recorded live log.

6.5 Deleting

Prerequisite:

- The required live log is not being recorded right now.

► Go to **<device> – Live Logs** in the navigation window.
► Call action Delete, e.g., via the context menu for the selected log.

7 Support package

If required, enSuite creates a so-called support package.

enSuite compiles the relevant information for diagnostic purposes and troubleshooting of one or more enCore devices in a ZIP file, which can be sent directly to the Honeywell support.

7.1 Creating a support package

Prerequisite:

- An active data connection is established to the meter(s).
  ⇨ 3.3 Establishing a connection to the meter (p. 17)

► Select the device resp. devices in the navigation window.
To select multiple devices, keep the [Ctrl] key pressed and select the devices individually with the left mouse button.

► Select the action **Create support package** in the context menu.

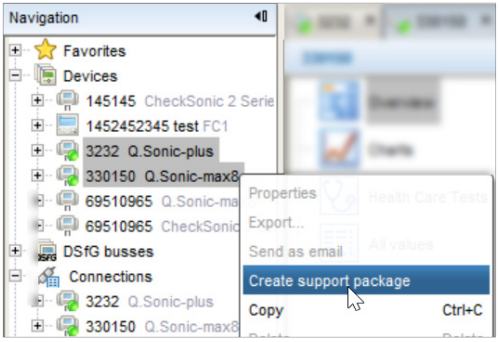


Fig. 8-1: Calling the action "Creating a support package" via the context menu – example with 2 meters selected

► Determine the information included in the support package – by default all options are selected.

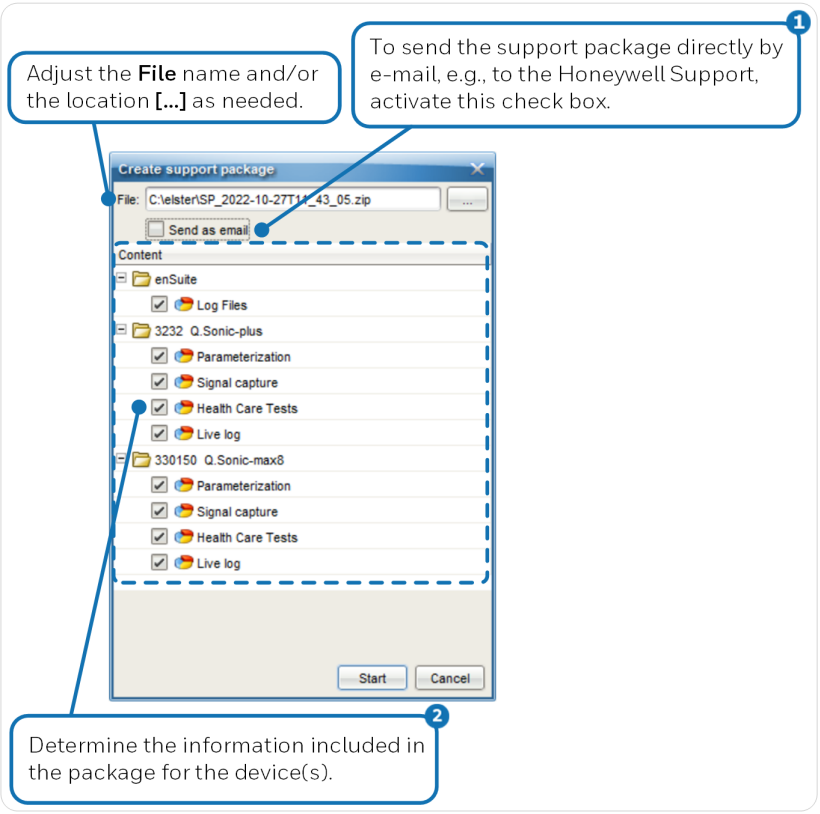


Fig. 8-2: Creating a support package – example

1 If you send an e-mail to the Honeywell support, please list your questions, and specify any anomalies for the diagnosis.

2
- enSuite log files (`*.html`)
  ⇒ 13.1 enSuite log files (p. 114)
- Device parameterization (`*.par`)
  ⇨ 5.1 Product and device parameterizations (p. 38)
- Signal Capture with 5 records (`*.mpc`)
  The capturing starts when the package is created and may take a few minutes.
  ⇨ 10 Signal capture (p. 78)

- Live Logs (Sonic Explorer format `*.csv`)
  ⇨ 6 Live logs (p. 63)
- Health care tests (`*.pdf`)
  together with the active reference case (`*.erc`)
  ⇨ 4.4 “Health Care Tests” (HCTs): monitoring the health of the meter (p. 30)

enSuite logs the single steps on the **Support Package** tab and notes the file name and the link to the support package at the end.

8 Reference cases

8.1 At a glance

enSuite supports monitoring the health care status of an USM. Here, enSuite continuously compares the current measurement values of the USM with the interpolated values of the active reference case.
⇨ 4.4 “Health Care Tests” (HCTs): monitoring the health of the meter (p. 30)

Flow tests are typically performed at several reference points over the operating range of the USM, to capture the current device condition as a reference. You store these reference points when defining a reference case. A reference case contains at least one reference point. Each reference point consists of a table with target values and associated warning and alarm limits at a specific gas velocity VOG with a known standard deviation `Std. dev.`. You adjust the individual reference points separately.

In which cases is editing or recording a reference case necessary?

- When commissioning the USM
  Create several reference points. Here, the lowest reference point starts just below the minimum flow `Qmin` and the highest just above the maximum flow `Qmax`.
- After re-calibration
  Create a reference point for each calibration point.
  Refer to the current calibration report.
- To correct warning and/or alarm limits
  During monitoring the health status, the parameterized warning or alarm limits are violated. The cause might be caused by incorrect limit values (and not necessarily by an erroneous measurement of the measuring device).

You can manage multiple reference cases in the folder of the same name. Only one reference case can be active at a time; the active reference case is used for monitoring the health status.

Operating conditions and station layout can have a significant impact on the flow profile in the meter. Therefore, when performing health care status monitoring, it is important to use the appropriate reference case. You can create a new reference case, record a reference case live or adjust the limits of an existing reference case. Typically, the reference values for a reference case are defined during calibration and/or commissioning of the USM. In addition, Honeywell provides a default reference case for each USM device type. If no own reference case is defined for a device (**Reference cases** folder is empty), then enSuite uses the appropriate default reference case for checking the meter condition ("health check"). The default reference case also serves as a template in the **New reference case** action.

Actions:

- ⇨ 8.2 Creating a new reference case (p. 71)
- ⇨ 8.3 Editing a reference case (p. 72)
- ⇨ 8.4 Activating a reference case (p. 74)
- ⇨ 8.5 Recording a reference case (online) (p. 74)
- ⇨ 8.6 Viewing properties (p. 76)
- ⇨ 8.7 Exporting reference case(s) (p. 76)
- ⇨ 8.8 Importing reference case(s) (p. 77)
- ⇨ 8.9 Deleting self-defined reference cases (p. 77)

8.2 Creating a new reference case

Background

Typically, you create a new reference case when calibrating or commissioning the meter.

How to proceed

► In the navigation window select the required reference case in node: **Devices – <device> – Reference cases**

► Call action New reference case, e.g., via the context menu.

► Adjust the default values of the new reference case on tab **Reference case <timestamp>** as needed:
⇨ 8.3 Editing a reference case (p. 72)

8.3 Editing a reference case

⇨ Note In which cases is editing or recording a reference case necessary? (p. 70)

Caution!

We strongly recommend that reference points and limits of a reference case are adjusted only after consultation with Honeywell.

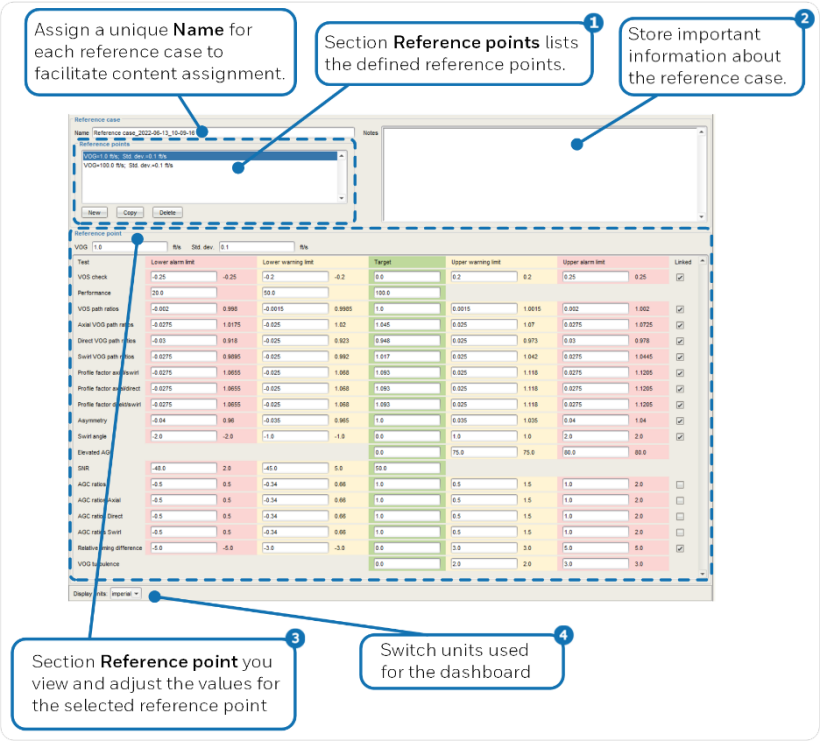


Fig. 9-1: View and edit reference case with reference points – example values

1. Section **Reference points** lists the (self-)defined reference points. For the selected reference point, the ⇨ **Reference point** section displays a table with the associated targets and limits (see below).

   With **[New]**, **[Copy]** and **[Delete]** you create new or delete existing reference points.

2. In Notices you enter important information about the reference case. For example,
   "*created during calibration/commissioning on <timestamp>*", "*the inspection body checked the reference points on <timestamp>*"

3. Section **Reference point** displays following values:

   - **VOG, Std. dev.**
     Enter the gas velocity and the known standard deviation of this reference point.
     Confirm your input with the [Tab] key of your keyboard and accept both values with a click into the **Notes** field.
   - **Target**
     Lower warning limit and **Upper warning limit**
     Lower alarm limit and **Upper alarm limit**
     For each row, adjust as necessary target and associated lower and upper limits to this VOG. The limit values must meet the following condition:
     Lower alarm limit ≤ **Lower warning limit** ≤ 0 ≤ **Upper warning limit** ≤ **Upper alarm limit**

     To facilitate the input of the values, you always enter the deviation from the setpoint in the input fields for the limit values, i.e., the relative and not the absolute value. Whereby the lower alarm and warning limits are typically entered with negative signs. enSuite displays the calculated (absolute) limit values behind the input fields.

     The **Linked** checkbox causes, that an entered value is mirrored in the counterpart with a different sign. For example, if you enter -0.01 as the lower alarm limit, the 0.01 value is automatically copied to the input field for the upper alarm limit, and vice versa.

4. **Display units**
   At the bottom of each tab of the dashboard you can switch the view between metric and imperial units.
   ⇨ 4.1.2 Switch display units for the dashboard (p. 22)

8.4 Activating a reference case

Background

Activate the reference case that shall be used for monitoring the USM health status. Only one reference case can be active at a time.

How to proceed

- ► In the navigation window select the required reference case in node: **Devices – <device> – Reference cases**
- ► Call action Activate reference case, e.g., via the context menu.
- ✓ The blue star icon indicates that the reference case is now active.

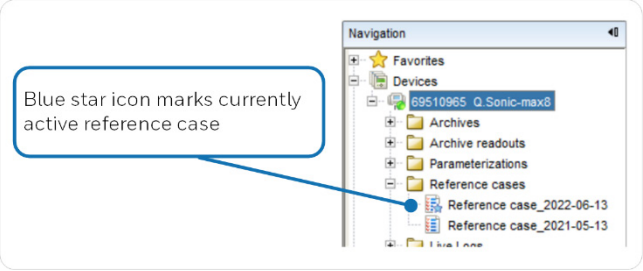


Fig. 9-2: The activated reference case is marked with a blue star

8.5 Recording a reference case (online)

Background

⇨ Note In which cases is editing or recording a reference case necessary? (p. 70)

The function to recording a reference case online with live data is available on tab **Health Care Tests**.

Caution!

We strongly recommend that reference points and limits of a reference case are adjusted only after consultation with Honeywell.

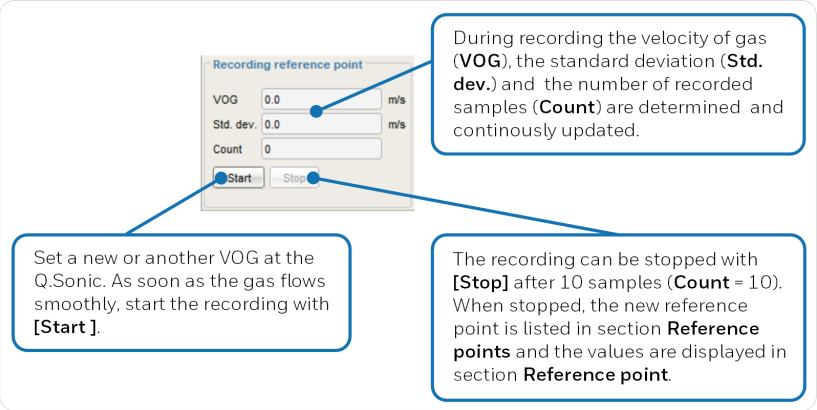
How to proceed

Prerequisites:

- An active data connection is established to the meter.
  ⇨ 3.3 Establishing a connection to the meter (p. 17)
- The Dashboard is open on tab **Health Care Tests**
  ⇨ 4 Dashboard with health care tests (p. 20)

► Click **[Record reference case]**.

✓ The controls for recording a reference point are located in section **Recording reference point** at the bottom of the new tab.



9-3: Controls and fields in section **Recording reference point**

To set further reference points, set another VOG at the USM and start the recording.

As soon as at least one reference point has been recorded, the values for the selected reference point are displayed in the upper area.
⇨ 9.1.2 Editing a reference case (p. 72)

8.6 Viewing properties

Background

You can view the properties (device type, serial number, name of the reference case, and date and time of its last modification. Here, you can also modify the name of the reference case.

How to proceed

► In the navigation window select the required reference case in node:
Devices – <device> – Reference cases
► Call action Properties, e.g., via the context menu.

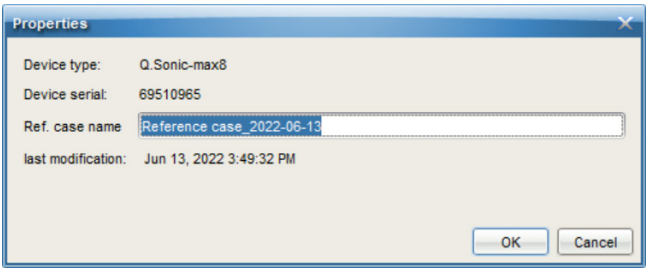


Fig. 9-4: Properties of the selected reference case – example

8.7 Exporting reference case(s)

Background

You can export a reference case and share it with the Honeywell support for example.

How to proceed

► Select one or more reference cases in the navigation window:
Devices – <device> – Reference cases
► Call action Export, e.g., via the context menu.
► Export the file `<name of reference case>.erc` to the required folder.
Note: The file extension `ERC` stands for enSuite Reference Case.

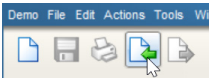
8.8 Importing reference case(s)

Background

You can import a previously exported reference case and for example view or adjust the reference values.

How to proceed

► In the enSuite toolbar click on the import button.



► Select the desired file `<name of reference case>.erc`.

Possible next steps:

⇨ 9.1.2 Editing a reference case (p. 72)
⇨ 9.1.3 Activating a reference case (p. 74)

8.9 Deleting self-defined reference cases

Background

You can delete self-defined reference cases.

In case the folder **Reference cases** is empty, i.e., there is no self-defined reference case for this device, enSuite will use the appropriate default reference case for the health care tests.

How to proceed

► Select one or more reference cases in the navigation window:
Devices – <device> – Reference cases

Note: In case you select more than one reference cases, the active reference case may not be selected.

► Call action Delete, e.g., via the context menu.
► The reference case(s) are deleted after confirmation.

9 Signal capture

9.1 At a glance

Signal Capture is typically used by Honeywell personnel for diagnostic purposes to check the purity and preciseness of the transducer signals.

This function records the signals from the individual ultrasonic transducers of an USM. The peak ratios are used to determine the zero-detection point of the measurement, which is used to evaluate the signals.

The captures are stored by enSuite in so called `MPC` files (**M**ultiple **P**ulse **C**ollection). Depending on the selected capture interval, an MPC file can contain multiple records of a signal. You can open an MPC file in enSuite in a graph view with filter and zoom options or export it. The MPC export files of enSuite are compatible with the MPC files of the SonicExplorer.

9.2 Starting signal capturing

Background

This function records all paths of an USM. The capture can take several minutes and runs in the background.

How to proceed

Prerequisites:

- An active data connection is established to the meter.
  ⇨ 3.3 Establishing a connection to the meter (p. 17)
- No MPC file is currently being recorded, i.e., no play symbol is shown on any MPC file in node:
  Devices – <device> –Signal Capture

► Select the required USM in the navigation window in node:
Devices – <device>

► Call action Start Signal Capture, e.g., via the context menu.

► **[Start]** capturing with one of the following options.

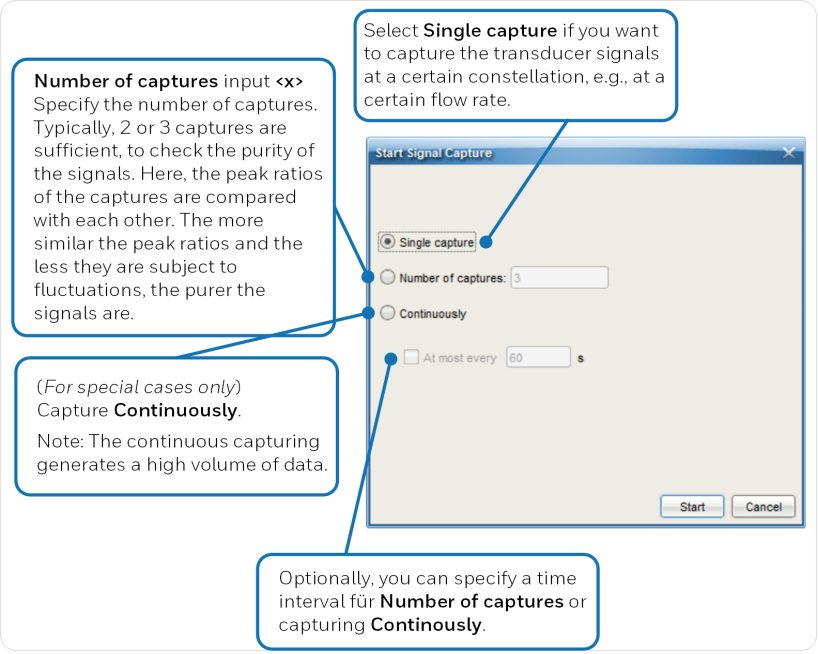
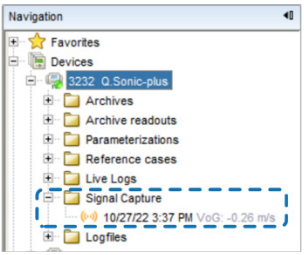


Fig. 10-1: Start signal capture options

✓ The capturing starts:

- enSuite displays the progress of the recording in the status bar (bottom right of the dialog):
  Signal capture <number of captures>

- In folder **Signal Capture**, a new MPC file is created.



  - File format:
    CSV (`*.csv`) ("comma-separated values")
  - File name:
    `<YYYY-MM-DD> <hh-mm> VOG [<lowest VOG>; <highest VOG>] m/s (<no. capture(s)>).csv`
  - The play symbol indicates that a signal capture is currently running and an MPC file is being recorded.

9.3 Canceling a running signal capture

Background

You can cancel a running signal capture. In this case, the signals of the current capture are still read in completely to ensure a consistent state of the MPC file – if only one recording is captured altogether (option **Single capture**) canceling is not possible.

How to proceed

Prerequisite:

- Currently an MPC file is captured, i.e., the play symbol is shown on the MPC file in node:
  Devices – <device> –Signal Capture

► In the status bar of enSuite click on the cancel symbol **[x]** right besides Signal capture (<number>) and confirm the dialog.

✓ The capture of the current record is completed, the MPC file is in a consistent state.

9.4 Opening a signal capture

Prerequisite:

- A least one MPC file is listed in node:
  Devices – <device> –Signal Capture

► Double click a signal capture in node:
Devices – <device> –Signal Capture

9.5 Viewing a signal capture graph

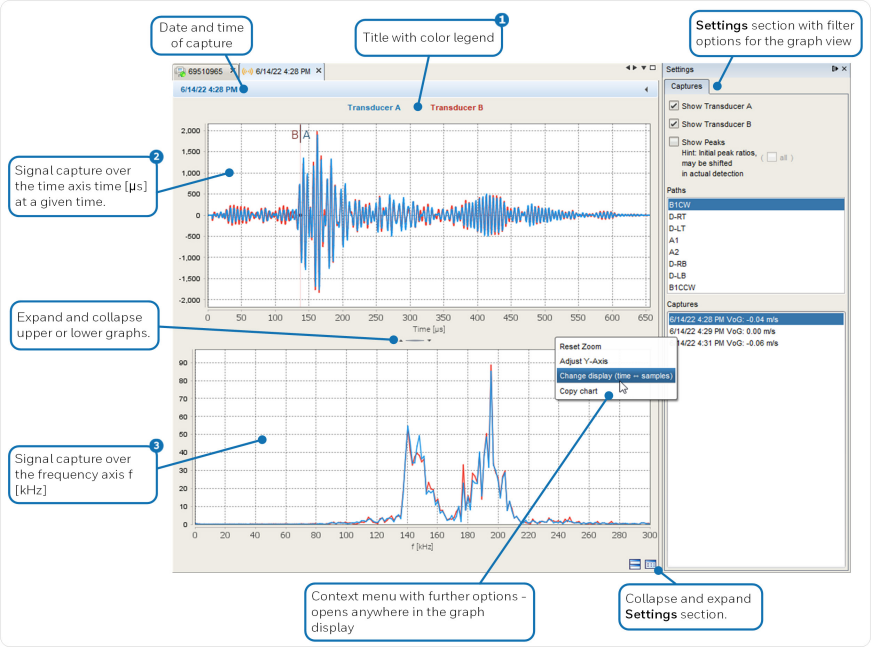


Fig. 10-2: Signal capture graph view with filter settings – example

1. The title information depends on the filter settings.
   It shows which transducers are displayed as a graph. By enabling **Show Peaks** the calculated positive **P3/P1** and **P4/P2** and negative peak ratios **N3/N1** and **N4/N2** are displayed.
2. The upper graph, the range of the detection data comprises the 8 or 10 peaks of the travel time measurement of a path.
3. In the lower graph the discrete-time signal of the upper graph is transformed into its frequency components using the Fast Fourier Transform (FFT) algorithm.

9.5.1 Changing the scaling of a graph (zoom function)

Within a graph display, you can use the integrated zoom function in enSuite to proportionally enlarge or reset the X and Y axes.

- Enlarging

  To zoom in on an area of the graph, click with the left mouse button on the desired position, hold down the button and drag the mouse pointer to the right.
- Resetting

  To reset the scaling, click with the left mouse button anywhere in the graph, hold down the button and drag the mouse pointer to the left.
  OR
  Click icon .

9.6 Exporting signal capturing file(s)

Background

You can export one or more signal capture MPC files and send it to the Honeywell support for further analysis.

How to proceed

► Select one or more MPC files in the navigation window:
Devices – <device> – Signal Capture
► Call action Export, e.g., via the context menu and save the CSV file(s).

✓ The CSV format can be opened with a spreadsheet or evaluated by a script, for example.

9.7 Deleting signal capturing file(s)

Prerequisite:

- Currently no MPC file is viewed or being recorded, i.e., no play symbol ▶ is shown on any MPC file in node:
  Devices – <device> –Signal Capture

How to proceed

► Select one or more MPC files in the navigation window:
Devices – <device> – Signal Capture
► Call action Delete, e.g., via the context menu.
✓ The MPC file(s) are deleted after confirmation.

10 Time Service

10.1 At a glance

The Time Service is part of the Basic System. It manages the internal time within the device, also referred to as the system time. Its tasks include synchronizing and setting the system time (⇨ 12.7 Why does the Time Service distinguish between synchronization and setting the system time? (p. 108)).

Updating the system time is the generic term for both the synchronization and the setting the system time.

In addition, it creates the time-related cyclical events (e.g., **every hour**) that are used as an input signal by other internal device functions to perform time-controlled actions.

The Time Service manages the time display as a time stamp in (*C*oordinated *U*niversal *T*ime, or UTC for short). Time stamps contain the following information:

- the time in seconds since 1970-01-01 as UTC
- the local time zone (deviation from UTC in minutes)
- the local difference between daylight saving time and standard time (deviation in minutes)

The enCore device stores the system time on a battery-backed clock module, so the time display is still available even after the device has been switched off and back on again.

In most device displays, the current time is indicated in the top-right corner, except for the higher-level displays such as the home display.

Time stamp format in the display

The display format of time stamps depends on the language selected on the device. If you select **English** as a language, the date will be displayed in the format **YY-MM-DD** or **YYYY-MM-DD** and the time in the format **HH:mm:ss**.

The Time Service is sub-divided into the following functional areas:

- ⇨ 11.2 Updating the system time (p. 85)
- ⇨ 11.3 Daylight saving (p. 90)
- ⇨ 11.4 Time-controlled actions (p. 92)

10.2 Updating the system time

The system time in the enCore device can be updated in the following ways:

- ⇨ 11.2.1 Synchronizing system time via (remote) operation panel (p. 86)
- ⇨ 11.2.2 Action "Update date and time" via (remote) operation panel (p. 87)
- ⇨ 11.2.3 Action "Update date and time" in enSuite (p. 89)

Setting the time with the protection of the security switch

If the Q.Sonic manages fiscal archives and thus the unsecured adjustment of the time could falsify fiscal values, it is reasonable or required to permit a manual setting of the system time via control panel or enSuite **only** if the security switch is open. Therefore, you put the access right **Update device time** in the user management under the protection of the security switch.

⇨ 12.2 Managing access rights (administrator only) (p. 96)

You can also set individual parameters of the Time Service in the **Rights** column to be under the protection of the security switch or alternatively you can determine that changes to individual parameters must be logged in the fiscal audit trail.

10.2.1 Synchronizing system time via (remote) operation panel

A change in the system time is regarded as synchronization if the difference between the old and the new system time does not exceed the parameterized time window (**Max. synchronization range**). The parameter **Synchronization Interval** determines the time interval that has to pass after an executed synchronization before the next synchronization can be done. By default, you can synchronize the system time by ± 20 seconds every 12 hours without having the access right **Update device time**.

On the device, you can easily synchronize the system time by specifying the difference in seconds relative to the current system time. The Time Service continuously calculates the expected new system time, which you confirm specifically with the **Synchronize now** action. The action can only be executed if a synchronization is possible, that is, the specified difference is greater than zero (0) and the system time has not yet been synchronized within this synchronization interval.

How-to proceed on the enCore device

Prerequisite:

- No user with user right **Update device time** is logged on to the device.
  ⇨ 5.9.2 Rights at a system level (p. 99)

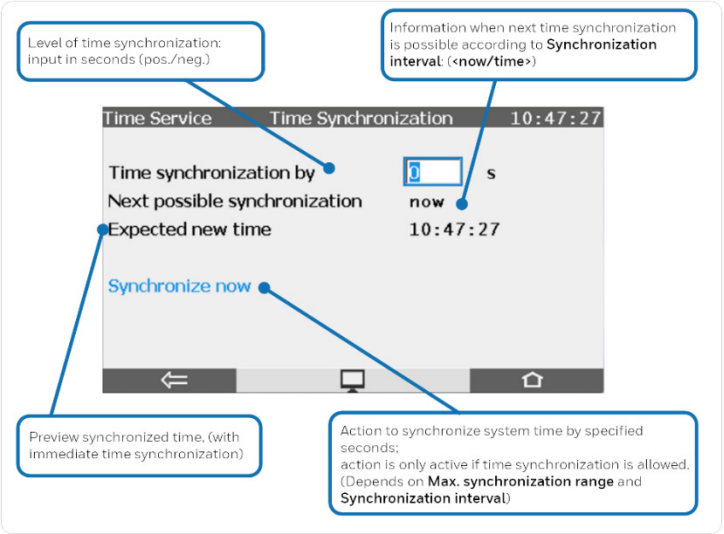


Fig. 11-1: Display **Time synchronization** – example

10.2.2 Action "Update date and time" via (remote) operation panel

You can set the system time using the operation panel of the enCore device, either directly on the device or using the remote operation panel.

Prerequisite:

- A user with user right **Update device time** is logged on to the device.
  ⇨ 5.9.2 Rights at a system level (p. 99)

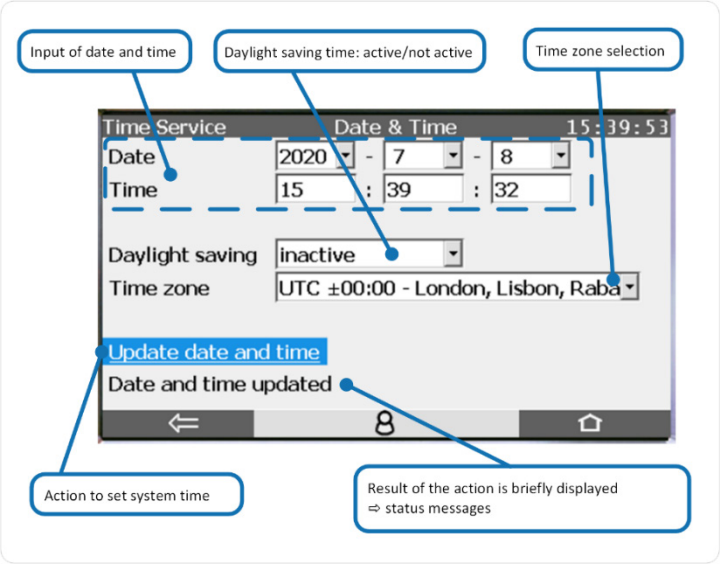


Fig. 11-2: Display **Date & Time** – example

Possible status messages – red font indicates that the update has failed.

- **Date and time updated**
- **Update of date and time prohibited!**
- **Update of date and time failed!**

Prerequisite to be able to change the daylight saving time manually

Following setting is parameterized in enSuite:

Parameter branch: **Basic System – Time Service**, **Daylight saving** area

- **Daylight saving** has the value **manual**

10.2.3 Action "Update date and time" in enSuite

Prerequisites:

- User has the right **Update device time**.
  ⇨ 5.9.2 Rights at a system level (p. 99)
- An active data connection is established to the meter.
  ⇨ 3.3 Establishing a connection to the meter (p. 17)

► Call action Update date and time.

► Login. ⇨ 12.2 Managing access rights (administrator only) (p. 96)

► Update date and time in the following dialog.

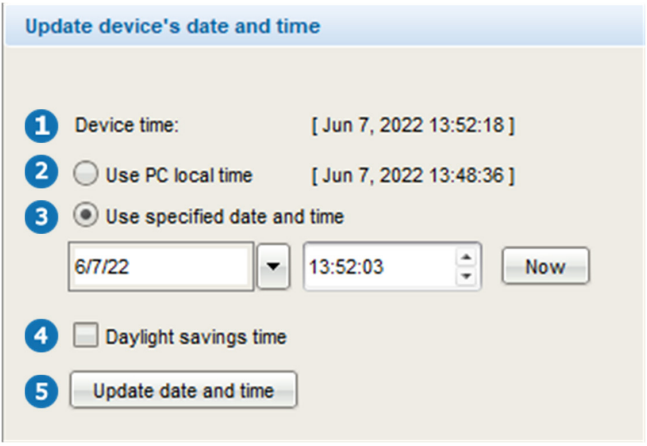


Fig. 11-3: Update date and time with enSuite

1 current device time

2 Synchronize the system time of the device with the PC time – current PC time is displayed in square brackets.

3 Set the system time of the device manually.
To initialize the date and time selection fields with the updated local PC time, click **[Now]**.

4 If the local PC time or the time you have selected is in daylight saving time, activate this checkbox.

5 Transfers your settings to the meter.

Result:

- Update was successfully
  The time display in the header of the device will be updated and in the main display of the Time Service this update time will be displayed as the **Latest update** value.
- Update was **not** successfully executed.
  enSuite displays a warning and the cause of the error in the **Output** [1] window.

10.3 Daylight saving

The time can be switched from standard time (≙ "winter time") to daylight saving time and vice versa in accordance with the regional rules of the European Union, the USA or Mexico (central zone), or on a user-defined basis in accordance with the POSIX standard for time zone information. Alternatively, you can change the time manually on the enCore device or via an external time source (**Prim. external time source**/**Sec. external time source**).

10.3.1 Parameterizing daylight saving in enSuite

► Open the branch **Time Service**.
► On the **Parameter** tab, use the drop-down menu **Daylight saving** to determine the rules the switch should follow. Select the relevant entry:

- **manual**
  This enables you to change the time as follows:
  – at the operation panel of the enCore device
  – via the online parameterization
  – via an event message
  – via the daylight saving time information from an external time source

[1] You open the output window in enSuite via the menu **Window – Output** or the key combination [Ctrl+4].

With parameter **DST active** determine whether the change in time is manual or via a message.

- **predefined**
  The time is changed automatically based on the predefined rules for the selected **Region**.
- **user defined**
  The time is changed automatically based on a user-defined **Posix TZ string**. The notation complies with the POSIX standard for time zone information.

The POSIX standard for time zone information

You enter the time zone information in accordance with the POSIX standard in the TZ[2] string format. To make entry easier, it is sufficient for you to enter the rules for the daylight saving as enCore devices evaluate the user defined TZ string in this context based on the following syntax:

```
[<NT><offset1>[<DST>[<offset2>],]<rule>
```

Where:

- `<NT>` is normal time
- `<offset1>` is time in the format: `HH[:mm[:ss]]`
- `<DST>` is daylight saving time
- `<offset2>` is time in the format: `HH[:mm[:ss]]`
- `,` (separator)
- `<rule>` The rule contains the information to calculate the start and end of daylight saving time. It has the following syntax:

  ```
  <start date>[/<time>],<end date>[/<time>]
  ```

  Where:

[2] `TZ` stands for *T*ime *Z*one. The TZ string is defined as follows:
`<NT><offset1>[<DST>[<offset2>][,<rule>]]`

- `<start date>[/<time>]`
  is the date and time (in normal time) of the changeover from normal time to daylight saving time
- `<end date>[/<time>]`
  is the date and time (in daylight saving time) of the changeover from daylight saving time to normal time

10.4 Time-controlled actions

The enCore device provides time-related events of a signal type. These events can be used as input signals for time-controlled actions in other SFBs or AFBs. This is so that you can automate recurring tasks and for example form new values cyclically with the `Postprocessing AFB`.

The enCore device generates time-related events based on the system time and the (parameterized) contract hour[3]. The following export values are available:

- export values based on the system time in the export branch **Basic System –** or standard time **Time Service – Timer events**:
  - **Every second**
  - **Every <2, 3, 5, 10, 15, 20, 30> seconds**
  - **Every minute**
  - **Every <2, 3, 5, 10, 15, 20, 30> minutes**
  - **Every hour**
  - **Every <2, 3, 4, 6, 12> hours**
  - **Every day (at midnight)**
  - **Every Sunday (at midnight)**

[3] A gas day lasts `24 hours` and begins at `06:00` By default. If another contract hour is contractually agreed to or you want to manage a second contract hour, adjust the default values in the parameterization.
Basic System – Time Service, section **Contract hour**

Every Monday (at midnight)

Every month (midnight on 1st)

Special case: Trigger for a longer cycle duration is activated first

Event signals in a second rhythm are formed relative to a full minute and event signals in a minute rhythm are formed relative to a full hour.
For example:

- **Every other minute**
  e.g., `12:02:00` ... `12:04:00` ... `12:06:00` ..., etc.
- **Every 3 minutes**
  e.g., `12:03:00` ... `12:06:00` ... `12:09:00` ..., etc.

This means that immediately after the device is restarted and until a cyclic event signal is first triggered the time depends on the boot time and may be shorter than the associated cycle. This special case can only occur once immediately after the device is restarted.

Example

If the enCore device is switched on at `12:02:30` and the signals **Every other minute** and **Every 3 minutes** are used as triggers, at system time `12:03.00`, the signal **Every 3 minutes** is formed and only subsequently at `12:04.00` is the signal **Every other minute** formed.

- Export values based on the system time in the export branch **Basic System – Time Service – Contract hour: <single contract/two contracts>**:

  (initial contract or single contract)

  Contract hour (numeric)

  Every day (at contract hour)

  Every Sunday (at contract hour)

- **Every Monday (at contract hour)**
- **Every month (at contract hour on 1st)**

(second contract – optional)

- **Contract hour 2 (numeric)**
- **Every day (at 2nd contract hour)**
- **Every Sunday (at 2nd contract hour)**
- **Every Monday (at 2nd contract hour)**
- **Every month (at 2nd contract hour on 1st)**

11 Software configuration/software update

The device software consists of different modules. These software modules include the Basic System (with its SFBs), all available AFBs as well as the approval file for devices in legal metrology, which defines the official access rights. Hence, the software update works individually for each module. enSuite ensures the compatibility of the software modules.

Whether a software update is relevant for you and which steps are to be performed, is described in detail in the update instructions.

Please contact the Honeywell support

In case you want to update the firmware of a meter, we highly recommended to contact Honeywell support.

⇨ Contact (p. 2)

⇨ Update instructions “Update of the Device Software” for enCore devices

process.honeywell.com/us/en/site/elster-instromet/support/#software-downloads

12 FAQ

12.1 Error list: How to limit accepting errors for users

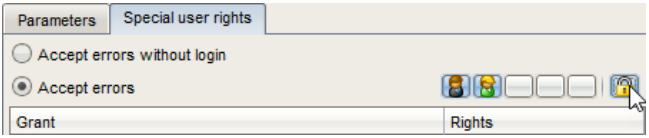
Background

By default, errors in the error list can be accepted without logging in. Alternatively, you may allow only selected user profiles to accept them. In this case, you can also protect this action using the security switch.

Procedure in enSuite

► In the parameterization go to **<Device> – Basic System – Users**, tab **Special user rights**.

► Set the required user profile and/or security switch.



12.2 Managing access rights (administrator only)

Access rights determine which parameters or system settings a user may or may not change on the device. The access rights are managed exclusively by the administrator. Rights are assigned per user profile.

Rights are managed in enSuite with the help of symbols. Wherever rights can be assigned at a parameter or system level, a toolbar is shown in the column **Rights** or **Authorization**.

The toolbar is divided into two and is made up of up to seven buttons:

- Buttons 1 through 5: Rights for user profiles
  Each button is allocated a unique symbol for user profiles 1 through 5.[4] The order corresponds to the position of the profiles in the user management. By default, these buttons are hidden.

[4] The administrator already has all rights which can be parameterized in enSuite, so there is no button for the administrator profile.

- Buttons 6 through 7: fiscal security settings
  Button 6 is allocated to the symbol for the protection of the security switch and button 7 to the symbol for the fiscal audit trail. Button 7 is only displayed at a parameter level.

In general, the following applies: Only when a symbol is enabled does the user profile have the corresponding right (buttons 1 through 5) or do these (fiscal) security settings apply (buttons 6 through 7).

12.2.1 Rights at a parameter level

At a parameter level, only a reduced toolbar is displayed in enSuite as a standard in which the rights for the user profiles are faded out.

12.2.1.1 Managing rights in enSuite

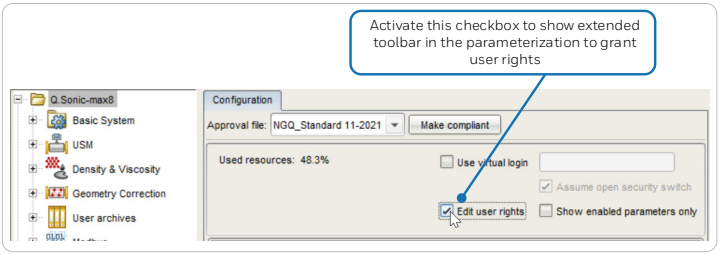
Prerequisites:

- The required offline parameterization is open.
- The user who is transferring the parameterization to the device has administrator rights.

12.2.1.2 Show extended toolbar to grant rights for user profile(s) (Buttons 1..5)

► Open node **<Device>**.

► On tab **Configuration** activate the checkbox **Edit user rights** – by default it is cleared.



✓ In the entire parameterization, the extended toolbar for assigning rights is displayed in the column **Rights** or **Authorization** and you can assign the rights for user profiles 1 through 5.

Reducing the toolbar in the "Rights" column

To reduce the toolbar for the assignment of the profile rights to display only the security settings and , open the node **<Device>** and clear the checkbox **Edit user rights**.

12.2.1.3 Grant or revoke rights for user profile(s) (Buttons 1..5)

Rights can be revoked only in the same way as they were granted.

► You assign or revoke user rights on parameters, section or tab level. The latter are only available in some contexts.

- single parameter
  Grant or revoke a right by enabling the required profile button(s) 1..5 in the parameter row.

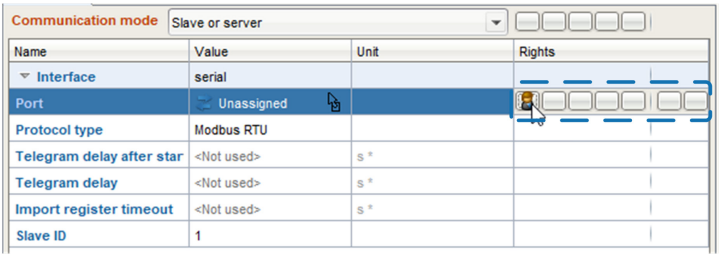


Fig. 5-1: Changing a right for an individual parameter – example with profile 1 for parameter **Port** (Modbus AFB)

- entire section
  Grant or revoke the rights by enabling the required profile button(s) 1..5 in the section row.

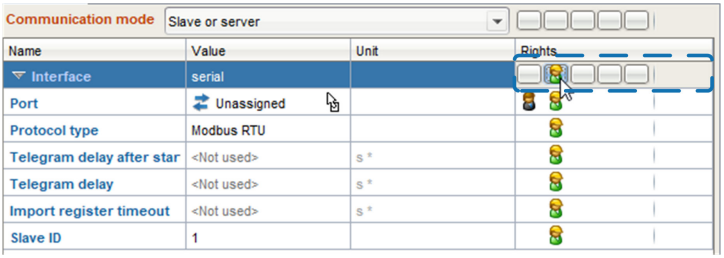


Fig. 5-2: Changing rights for an entire section –
example with user profile 2 for section **Interface** (Modbus AFB)

- entire tab
  Grant or revoke the rights by enabling the required profile button(s) 1..5 in the tab row.

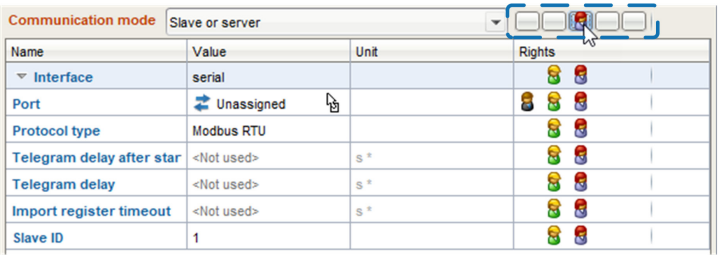


Fig. 5-3: Changing rights for an entire tab –
example with user profile 3 for tab **Communication mode** (Modbus AFB)

12.2.2 Rights at a system level

Using the rights at a system level the administrator is able to determine in a differentiated manner which users changed which device settings or carried out which actions. These settings and actions can also be protected by the security switch.

12.2.2.1 Managing rights in enSuite at a system level

Prerequisites:

- The required offline parameterization is open.
- The user who is transferring the parameterization to the device has administrator rights.

► Open the branch **<Device> – Users**.
► On **Special user rights** tab you grant rights on system level.
For example:

- **Accept errors without login**[5]**/Accept errors**

  By default, accepting the error list is possible without authentication.

  If only authorized user profiles shall be able to accept the error list, activate **Accept errors**. This right can be restricted to selected user groups and also be protected by the security switch.

  Access at the device:
  Error list – Accept all

- **Erase fiscal audit trail/fiscal archives**

  For USM devices the right **Erasing the fiscal audit trail** is supported. The fiscal audit trail has a maximum depth of 1000 entries. As soon as the fiscal audit trail is full, no more parameter with the access right can be changed if the security switch is closed – not until the fiscal audit trail has been deleted.

  Access in enSuite (navigation branch):
  My devices – <Device> – Erase fiscal audit trail

⇨ enSuite online help, **enCore/Q.Sonic – Basic System – Users – Special user rights**

[5] Whether or not only errors which are no longer pending can be accepted or whether errors can always be accepted can be determined in the branch **Basic System – System**, **Error list** area in the parameter **Acceptance procedure**.

12.3 User login for certain actions

Actions that modify the device require user authentication, as for example online parameterization and transferring an offline parameterizations to the device.

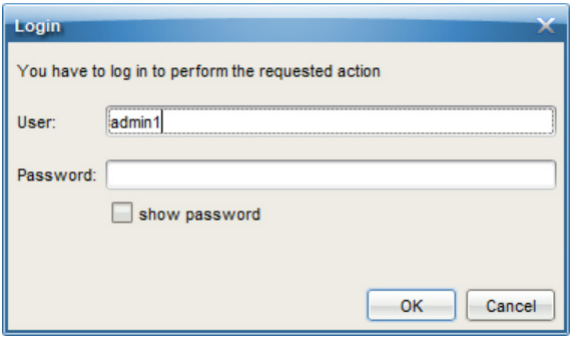


Fig. 11-4: **Login** dialog

By default, three user profiles are available:

- **admin** (*up to meter firmware V3.02*) /
  admin1 (*from meter firmware V03-40 or higher*) –
  can modify all legally relevant and non-fiscal (operational) parameters
- **User1** – can modify non-fiscal (operational) parameters
- **User2** – has read access only

In delivery state the passwords of default users are blank!

For meter firmware version 03-40-A or higher the default passwords are set to blank, also for **admin1**.

We highly recommend changing the default administrator password during commissioning of the meter. The password of other users should be changed on the first login.

For more information on user rights refer to ⇨ “Operating and Maintenance” for your specific Q.Sonic device type.

Administrator password (*meter firmware V 2.8 up to 2.11*)

For meter firmware version 2.8 up to 2.11 request an administrator password directly from Honeywell at:

Aftersales@Honeywell.com

12.4 Simplified login with open security switch

Background

By default, certain actions require a user login with username and password. For the special case that the security switch is open, the meter provides a simplified procedure. In this case the username at login is sufficient. This makes it easier, for example, to carry out necessary tasks in the test center or before commissioning, as the password is not required.

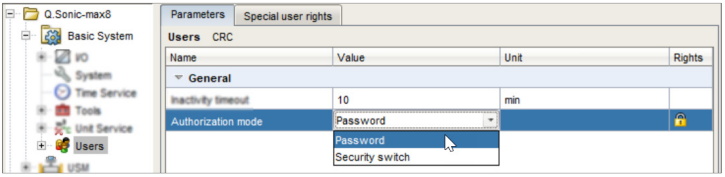
For this purpose, the meter supports two parameterizable modes for logging on to the device.

How to proceed

Prerequisite

- The required offline parameterization is open.

► In the **Basic System** – **Users** branch, switch to the **Parameters** tab.
► Determine the behavior for logging on to the meter with the parameter **Authorization mode**:



- **Password** (default)

  Both <**username**> and <**password**> are required, regardless of the position of the security switch.

- **Security switch**

  If the security switch is open, the <**username**> is sufficient for logging on to the device.

12.5 How to filter a parameterization in advance according to a certain user profile? (Virtual login)

Background

In offline parameterization enSuite opens a parameterization with administrator rights by default. Hence, all parameters are displayed and are also editable due to the expanded authorizations of the administrator. Even those parameters which can only be changed on the device when the security switch is open can be edited.
With virtual login, enSuite offers an option to filter a parameterization in advance by the authorizations of the desired user profile and the status of the security switch. In this way, you can ensure that a user is really entitled to transfer a changed parameterization successfully to a device.
In the virtual login, only a username must be entered, a password only needs to be entered to transfer the parameterization. In this way, you can also prepare parameterizations for other user profiles in advance.

Call

Offline parameterization: node **<Device>**, tab **Configuration**

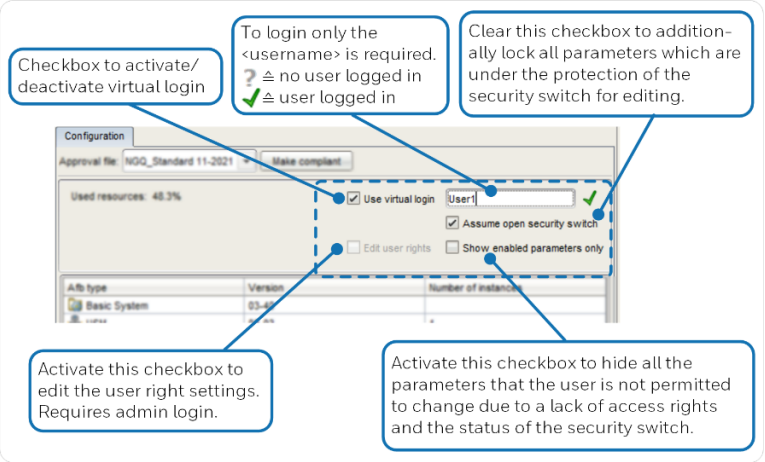


Fig. 11-5: Virtual login – example with logged in **User1**

12.6 TLS certificate

12.6.1 How to validate the TLS certificate of the Q.Sonic

Background

The communication between Q.Sonic and enSuite is carried out via MMS and is secured via TLS since Basic System V03-39. The Q.Sonic uses a self-signed certificate to authenticate itself to enSuite every time an MMS connection is established. The certificate is normally created once when the enCore device is put into operation and is announced to enSuite during the first MMS connection.

Checking the validity of a TLS certificate

If the TLS certificate is unknown when establishing a connection to the meter, enSuite will display the certificate for validation.

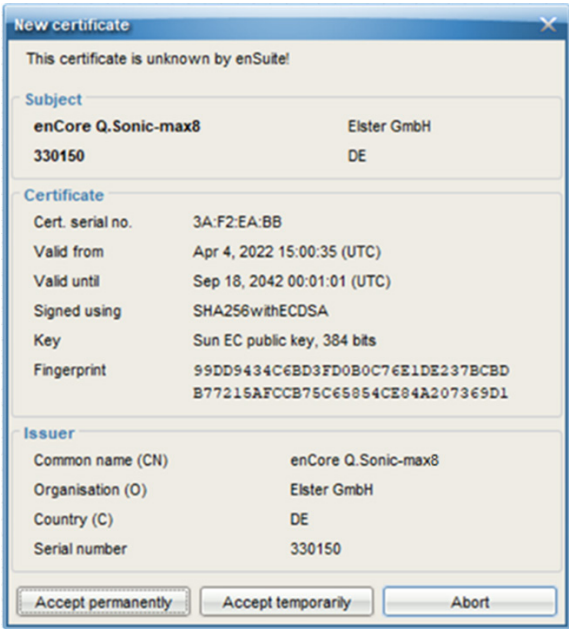


Fig. 12-6: Certificate is (still) unknown –
example: first connection establishment to a Q.Sonic-max8

► You have the following options:

- Check certificate on site directly at the device:
  - Open the certificate information via the basic display of the device:
    Info – <device serial no.>, Certificate
  - Compare subject and fingerprint information between enSuite and the device.
- Check certificate remotely:

  Without a connection to the device, you have no way to compare the fingerprint. Therefore:

– Check the information about the device in the section **Subject** of the dialog.
– If the information is correct, the next step is to establish a temporary connection to the device.
(⇨ next action)

► You have the following options:

- If you trust the certificate (for example, because the fingerprint matches), select **[Accept permanently]**.

  In this case, enSuite saves the certificate in the database. Each time a connection is established, enSuite compares the received certificate in the background with the saved one. As long as both certificates match, enSuite trusts this connection and establishes the connection. Only if the device's certificate changes, e.g., because a user has newly created the certificate, enSuite will display the new certificate information. You can also view the previous certificate information here.

- If you are unsure whether you trust the connection (e.g., because you are not on-site), select **[Accept temporarily]**.

  The current MMS connection is maintained, but enSuite will not save the certificate in the database. The next time a connection is established, the security query will appear again.

- If you do not trust the certificate, select **[Cancel]**.

  In this case, the MMS connection is interrupted.

✓ As soon as the connection is established, you can readout and parameterize the device etc.

To compare the fingerprint of the certificate when accessed remotely, ...

► ... since a temporary connection exists, call the Remote operation panel action.
► Open the certificate information from the basic display of the device: **Info – <device serial no.>**, certificate
► In enSuite, open the output window via **Window – Output**.

✓ Here all transferred certificates are linked with the time stamp of the transfer.

► Open the corresponding certificate with Show certificate.

► Compare fingerprint and subject information of enSuite and device with each other.

► If both match, you can permanently save the certificate in enSuite by reconnecting to the device and **[Permanently accept]** the certificate.

12.6.2 Why can my TLS certificate be accepted temporarily only?

Error behavior

A certificate is invalid and cannot be accepted permanently.

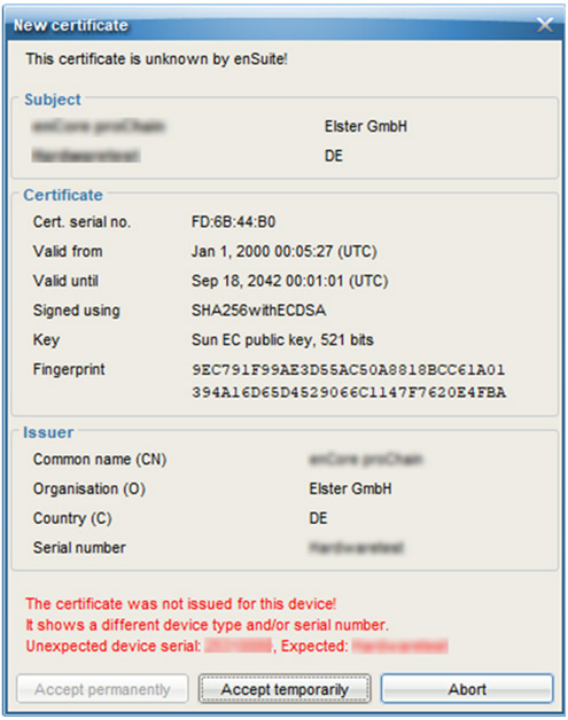


Fig. 12-7: An invalid certificate can be accepted temporarily only – example

Possible causes

- The system time of the meter was not set correctly when the certificate was generated.
- The meter might have been manipulated.

How to proceed

Make sure that the device has not been manipulated and regenerate the TLS certificate.

⇨ Or, contact our technical support directly.

12.7 Why does the Time Service distinguish between synchroni–zation and setting the system time?

Several processes in enCore devices are reliant on a precise time basis, e.g., archive data are written at specific times.

There are therefore two fundamental requirements for the Time Service:

- The system time must correspond as accurately as possible to legal time.

  Since the internal device clock can drift a few seconds over the course of time, it must be possible to synchronize the system time with an external, more accurate, time source.
- A manipulation of data on account of the time adjustment must be prevented due to applicable fiscal requirements.

  The time stamp of the enCore device must be valid, i.e., the changing of the system time must not take place "undetected" to such a degree that, for example, billing-relevant consumption could be manipulated.

To fulfill these requirements, during a time adjustment with **external time sources** (**Prim. external time source**/**Sec. external time source**) the SFB distinguished between synchronization and the setting of the system time:

- Synchronization of the system time

  The Time Service interprets a time change as a synchronization if the system time deviates less from the new time of an external source than predicted by the parameterized time window (**Max. synchronization range**) and the system time is changed, for example, by less than ±20 seconds.

  Regular time synchronization ensures that the system time of the enCore device corresponds as accurately as possible to the external time source. At the same time, from a fiscal perspective, time synchronization is non-critical and is therefore not recorded in the logbook.

- Setting the system time

  The Time Service interprets a time change as a setting of the system time if the system time deviates more from the new time of an external source than predicted by the parameterizable time window (**Max. synchronization range**) and the system time is changed, for example, by more than ±20 seconds.

  Setting the system time may, for example, be required following a battery failure or because of a change in time zone. Because data can be manipulated through such a change, the setting of the system time is considered critical and is always reported in the logbook.

With the help of the parameterization, you set the size of the time window that is to be interpreted as a synchronization (**Max. synchronization range**). To prevent multiple consecutive "undetected" time synchronizations from resulting in a change in the time, you can only permit synchronization only as the **Time update mode** within a certain **Synchronization interval** (for example every 12 hours). Thus, no more than **one** synchronization can be implemented within this synchronization interval; any further synchronization attempts within this interval will be rejected. If the **Time update mode**

parameter has the value **Synch. and setting**, the time from the external time source will always be applied.

With the **Synch. and setting (authentication req.)** setting, you can only allow adjustment via the external time source if a user with the **Change system time** user right is logged on to the device.

The parameterization is described in detail in ⇨ 5 Parameterizing the USM with enSuite (p. 38).

12.8 How do I add a further Modbus AFB?

Background

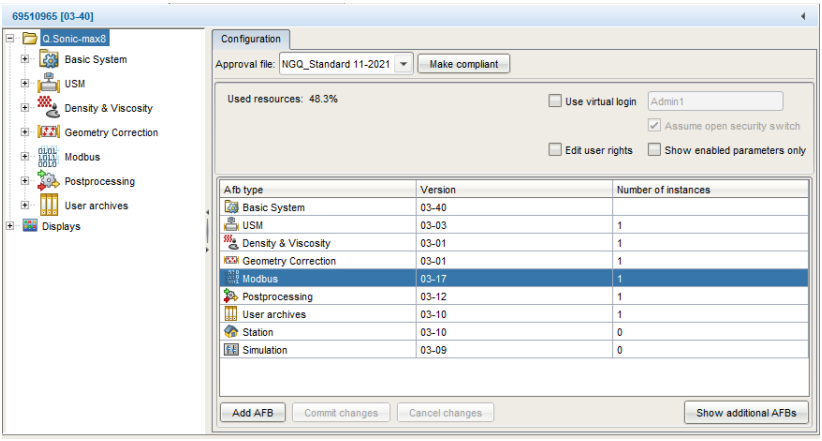
Generally speaking, the AFB composition within the parameterization can be configured by adding or deleting an AFB. Of course, the essential AFBs should not be deleted, otherwise the meter won't function as designed. Most AFBs can be used several times.

Restrictions result for example from the resources already in use or the optional AFB you want to add may be subject to a charge and is marked with the icon .
⇨ Please contact your local Honeywell Support team for further details

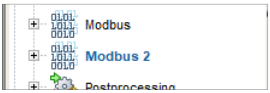
The Q.Sonic meters are delivered with the required AFB setup and typically the configuration does not need to be changed. It already contains one Modbus AFB. In some cases, you might want to add a second Modbus AFB. That is why we picked this AFB as an example of this FAQ, representative of other AFBs.
AFBs are added (or deleted) in den **Configuration** tab.

How to add a Modbus AFB (example)

► In the parameterization select the root node.
► On the **Configuration** select the row **Modbus**.



► Click [Add AFB].
✓ The AFB is added.



✓ Configure the AFB as required and save your changes.

Deleting an unnecessary AFB

► To delete an AFB, highlight the AFB in the parameter tree.
► Via context menu select **Delete AFB**.
✓ If an AFB is deleted, it may happen that the parameterization is no longer valid. In this case, all parameter folders and parameters that contain invalid references to the deleted AFB are marked in **red**.

12.9 How do I simulate velocities on the meter for test purposes?

The Q.Sonic device series supports a simulator mode. Once you operate the unit in this mode, you can change the values for VOG, VOS and Performance for each path with the online parameterization.

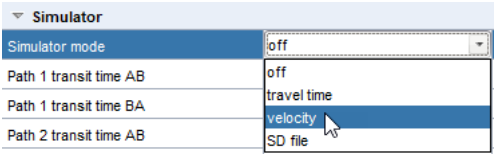
The simulation mode is used for test purposes only, for example, to check the alarm behavior of the meter at different velocities.

12.9.1 Activating the simulator mode

Prerequisite:

- An active data connection is established to the meter.
  ⇨ 3.3 Establishing a connection to the meter (p. 17)

► Highlight the device in question in the navigation window under the **Devices** branch.
► Readout parameterization via the action menu.
⇨ 5.3 Reading out a parameterization (p. 41)
► In the parameterization, open the node **<USM AFB>** – **Parameter**.
► On tab **Parameters** go to section **Simulator**.
► For parameter **Simulator mode**, select the entry **velocity**.
Note: **travel time** and **SD file** are for internal purposes only.



► Save the parameterization and Transfer parameterization to device via the action menu.
✓ After the reboot the meter is in the simulator mode. The velocities can now be simulated online.

12.9.2 Simulating velocities online

Prerequisite:

- The meter is in simulator mode.
  ⇨ 12.4.1 Activating the simulator mode (p. 112)

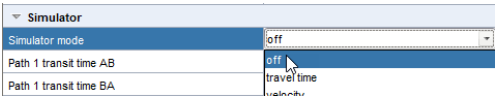
► Start the online parameterization with Parameterize online.
⇨ 5.5 Online parameterization (p. 52)
► In the parameterization, open the node **<USM AFB>** – **Parameter**.
► On tab **Parameters** go to section **Simulator**.
► Set the values for **VOG path <x>**, **VOS path <x>** and **Performance <x>**.
Note: Typically, **Path <x> transit time <direction>** is not modified. This value is for internal purposes only.
► Save the online parameterization and **Transfer changes to device** with button .
✓ The modified values are directly included in the calculations of the meter.

12.9.3 Deactivating the simulator mode

Prerequisite:

- The meter is in simulator mode.
  ⇨ 12.9.1 Activating the simulator mode (p. 112)

► In the readout (offline) parameterization, open the node **<USM AFB>** – **Parameter**.
► On tab **Parameters** go to section **Simulator**.
► For parameter **Simulator mode**, select the entry **off**.



► Save the parameterization and Transfer parameterization to device via the action menu.
✓ The meter reboots.

13 Technical data

13.1 enSuite log files

enSuite logs a lot of messages, fatal errors (exceptions) and security-relevant information in log files. enSuite stores these files in the Windows user directory.

- 1 × security log file

  `C:\Users\<Benutzername>\enSuite\enSuite*_Security.log`

  Here enSuite logs permanently when an enCore device authenticates with a TLS certificate.

- Up to 10 × log files

  `C:\Users\<Benutzername>\enSuite\enSuite*0-0.html .. enSuite*0-9.html`

  Each time enSuite is started, enSuite creates a new log file. A maximum of ten log files are created, then they "rotate" so that the number does not increase excessively. The log files are overwritten one after the other (rotating log files).The file `enSuite*0-0.html` is the youngest, `enSuite*0-9.html` the oldest log file.

- Trace files (optional)

  enSuite supports a trace function. You activate this function under **Tools – Options** on tab **Interfaces**. As soon as you activate the function **Show trace window**, enSuite writes temporary files into the user's temp directory:

  `C:\Users\<user name>\temp\`

  The trace files can contain sensitive data. When the enSuite ends normally, the files are deleted.

13.2 Event labels

Where	Label	Meaning
Logbook	<yellow font>	Message of a *Warning* type begins
	<yellow font>	Message of a *Warning* type ends
	<black font>	Signal of a *Note* type
	<yellow font>	Signal of a *Warning* type
	<red font>	Signal of an *Alarm* type
Error list	<black font>	Message or signal of a *Note* type
	<yellow font>	Message or signal of a *Warning* type
	<red font>	Message or signal of an *Alarm* type
enSuite		Message of a *Note* type
		Message of a *Warning* type
		Message of an *Alarm* type
		Signal of a *Note* type
		Signal of a *Warning* type
		Signal of an *Alarm* type

Table 13-1: Labeling events

13.3 Quality bits: standard and error identifiers

During operation, there are many device-internal data objects (events of "message" and "signal" type, (measurement) values, counters) that are – depending on the object type – measured, calculated, evaluated, set, incremented, and transmitted to other functions.

Quality bits are used in enCore devices to identify the current state or a change in state of a data object. The identifiers are typically used for the internal processing of data objects and marked with a 3-digit letter code. This allows subsequent functions to react appropriately to erroneous input

values, for example, by using a replacement value or generating an alarm. Most of the quality bits are relevant only for export values.

A distinction is made between standard identifiers and error identifiers.

13.3.1 Standard identifiers

The standard quality bits are displayed, for example in enSuite, in the **Live data and trending** view or on the USM **Dashboard**.

Identifier	Length	Description
CHOLD	1 bit	("Counter HOLD") (*DSfG only*) This quality bit is set when the DSfG freeze function has been activated.
LOP	3 bits	("Level Of Preprocessing") Integer value 0..7 indicating the preprocessing level used; the value of zero (0) means that no preprocessing is used for this value.
NEW	3 bits	("NEW value") Counter (0..7), which is incremented each time a data object is updated. Examples: • The parameter value is modified. • A live export value is updated. • A counter is set. Additionally, the quality bit SET is incremented. • Decimal overflow ("rollover") of a counter. Additionally, the quality bit OVR is incremented.
OVR	2 bits	("OVeRflow") (counters only) Counter that is incremented when a data object of type counter has a decimal overflow ("rollover") exceeding the fixed internal number of digits and whose count starts again at zero (0).

Identifier	Length	Description
SET	2 bits	("SET") (counters and events only) Counter that is incremented when a data object of counter or event type is set by the user. Furthermore, SET is used to indicate irregular changes of counters via digital protocol. Examples • Indicates a first reading of a counter via digital protocol after start-up or protocol failure • Special case: SET is used to indicate backward run of an Encode-counter.

Table 2: Quality bits: standard identifiers

13.3.2 Error identifiers

In general, it is not important for users to know the error identifiers. In the case of an error, meaningful export values of Warning or Alarm type are generated by the functions affected, clarifying the exact cause of the error. In addition, alarms and warnings are displayed in the error list.

The error codes are, for example, shown in the preprocessing display to enable an accurate error analysis by experts.

Identifier	Length	Description
INT	1 bit	("*IN*i*T*ial") The value has still not been determined or received since the last start-up of the enCore device.
LWL	1 bit	("out of *L*ower *W*arning *L*imit") An input value is available, but it violates the parameterized lower warning limit (taking a parameterizable hysteresis into account if applicable).
OOC	1 bit	("*O*ut *O*f *C*alculation") This bit is set for calculated or derived values if a required input value is erroneous, or an internal error arises during the calculation process.
OLL	1 bit	("*O*ut *O*f *L*ower *L*imit") An input value is available, but it violates the parameterized lower alarm limit (taking a parameterizable hysteresis into account if applicable).

Identifier	Length	Description
OOO	1 bit	("*O*ut *O*f *O*rder") An input value is not physically available, e.g., due to a defective input board or because of a timeout/protocol error for digitally transmitted values.
OOS	1 bit	("*O*ut *O*f *S*ervice") An input value is marked as invalid for further processing with the Out of service parameter, e.g., during maintenance work.
OOU	1 bit	("*O*ut *O*f *U*se") The value is not used or is intentionally not provided.
OUL	1 bit	("*O*ut of *U*pper *L*imit") An input value is available, but it violates the parameterized upper alarm limit (taking a parameterizable hysteresis into account if applicable).
UWL	1 bit	("out of *U*pper *W*arning *L*imit") An input value is available, but it violates the parameterized upper warning limit (taking a parameterizable hysteresis into account if applicable).

Table 3: Quality bits: error identifiers

13.4 Operational status

Following status of the USM are possible:

Operational status	Description
OK	The measurement data is reliable.
Reduced accuracy	The accuracy is reduced.
Error – non-fiscal	The specific paths are in error; only operational (non-fiscal) measurements are possible.
Error – no measurement	All paths are in error; no measurement is possible.
Error – non-fiscal high swirl	Due to high swirls, only operational (non-fiscal) measurements are possible.
Flowboard error	The flow board is defective

Table 13-4: USM – operational status

13.5 Diagnostic and alarm bits (“DiagBits”)

The USM diagnostic bits can contain the following diagnostic and/or alarm bits per acoustic path.

Legend: Abbreviations used in the table:

TA: transducer A; **TB**: transducer B; **VOS**: Velocity of Sound;
VOS: Velocity of Sound; **VOG**: Velocity of Gas;
SNR: Signal-to-Noise ratio

Dec. value	Abbr.	In short.	Description
0	OK	No error	OK
1	NP(A)	TA: no pulse	TA: received signal stat under threshold (signal too weak)
2	PC(A)	TA: pulse clip	TA: crossing clip threshold (signal too strong)
4	PR(A)	TA: pulse ratio	TA: pulse ratios error
8	SNR(A)	TA: SNR	TA: Signal-to-Noise ratio (SNR) too low
16	NP(B)	TB: no pulse	TB: received signal stat under threshold (signal too weak)
32	PC(B)	TB: pulse clip	TB: crossing clip threshold (signal too strong)
64	PR(B)	TB: pulse ratio	TB: pulse ratios error
128	SNR(B)	TB: SNR	TB: Signal-to-Noise ratio (SNR) too low
256	VOS	VOS range	Velocity of Sound (VOS) out of limits
512	VOG	VOG range	Velocity of Gas (VOG) out of limits
1,024	PD	Ping detection	Acceleration error
2,048	Prf	Performance low	Performance too low
4,096	Sub	Substitution	A per-path gas velocity value was calculated by substitution.
8,192	RVOS	VOS ratio range	Path reading invalid due to VOS ratio or VOS standard deviation out of range.

Dec. value	Abbr.	In short.	Description
16,384	RVOG	VOG ratio range	Path reading invalid due to VOG ratio out of range.
32,768	SDv(A)	TA: std. dev.	TA: standard deviation exceeds threshold.
65,536	SDv(B)	TB: std. dev.	TB: standard deviation exceeds threshold.
131,072	DSP-Param	DSP error	Error (or inconsistency) in internal (DSP) parameters
262,144	Seek	Seeking	Seeking signal.
524,288	PPE	Path pair error	Path removed from measurement due to paired partner failing.

Table 13-5: Diagnostic and alarm bits (“DiagBits”)

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