Honeywell

THE POWER OF **CONNECTED**

Flow Computer
Device Series enCore FC
FC1, MC1

Manual
Configuration of Device Software

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1   About these Instructions

The manual for enCore Flow Computer (in short enCore FC) has a modular design. To get an overview of the enCore/enSuite concept, the structure of the manual, safety and risk instructions, and the text labeling, refer to the "Operating Instructions" of the enCore FC.

The present volume describes the configuration of the device software and the parameterization of the enCore device series.

> 📘 **Online help**
>
> In enSuite, you can call up the general help via the menu item **Help – ❷ Show online help**. Open the context-sensitive help directly from the desired branch in the parameterization window with **[F1]**.

This volume 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 to the measuring task
- test of all data points and commissioning

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.

2 Device Series enCore FC

2.1 Hardware

The device types of the enCore FC series are based on the enCore platform.

The enCore FC is housed in a 19" casing and is available in two different mounting widths (1/3 mounting width or 1/2 mounting width).

The operating and display elements (touchscreen, various keys for operation, status LEDs), the USB port and the security switch are all located on the front.

The rear provides several slots for process boards. The maximum number of boards depends on the casing width (maximum of four process boards for 1/3 mounting width, and maximum seven process boards for 1/2 mounting width).

The following board types are currently available:

- ExMFE5 Ex-input board
- MFE7 input board
- MFA8 output board
- MSER4 digital process board
- ESER4 digital process board

The configuration of the board equipment is variable. Each process board type can in principle be installed in as many board slots as you like. Restrictions only apply to MSER4 and ESER4 boards (there may be no more than either 1 MSER4 or 1 ESER4 board in board slot 4 for 1/3 mounting width, and up to 2 MSER4 and/or ESER4 boards in board slots 6 and 7 for 1/2 mounting width).

Further information on the process boards and additional serial interfaces on the CPU board can be found in the "Operating Instructions" of the enCore FC.

2.2   Software

The device software of each enCore product consists of the following:

- the Basic System that contains different basic functionalities
  (SFBs = System Function Blocks)

and

- a number of so-called Application Function Blocks (AFBs)

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

However, an AFB is a single application-specific functionality that can be added or removed via the parameterization. The AFB arrangement is variable; the majority of AFBs can also be used several times.

Which AFBs are necessary for a device or which AFBs can be used as an option depends on the individual device type. The following table lists the use of AFBs for each device type:

AFBs	enCore FC1	enCore MC1
Flow Conversion	✔	✘
Gas Quality	✔	✘
Liquids Flow Conversion	✔	✘
Liquid Quality	✔	✘
Table Z	✔	✘
AFB G260	✘	✔
Modbus	✔	✔
DSfG	✔	✔
Postprocessing	✔	✔
User Archives	✔	✔
Station	✔	✔

AFBs	enCore FC1	enCore MC1
▣ Notification[1]	✔	✔
🖌 Steam	(✔)	✖
🔧 Liquid Prover	✔	✖
🎛 Prover	(✔)	✖
🎚 Orifice	✔	✖
🖼 Printer	✔	(✔)
🔲 Soft PLC	✔	✔
📶 Simulation	✔	✔

Table 2-1: AFBs for enCore device types

Legend:

✔   AFB is included in the delivery status of the device software.

(✔)   AFB is not included in the delivery status of the device software, but can be added via the software configuration of enSuite.

✖   AFB is not available for this type of device.

For example:

- enCore FC1
  The most important AFBs for the FC1 flow computer are the Gas Quality and Flow Conversion AFBs. The main task of the Gas Quality AFB is to calculate the gas characteristics required for conversion purposes from the gas composition (in due consideration of the measurement conditions). The main task of the Flow Conversion AFB is the creation and management of

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[1] seit Grundsystem-Version 03-24 und enSuite 3.9.1

various counters for volume at measurement conditions, volume at
base conditions and for energy and mass.

- enCore MC1
  The main tasks of the MC1 are monitoring and control processes in
  the field of industrial gas measurement. It solves his special tasks
  with the help of AFBs. For example, one task of the G260 APB is
  monitoring the compliance with the maximum concentrations of gas
  companion substances, as classified in the DVGW work sheet
  G 260 ("DVGW Arbeitsblatt 260").

3 Configuration of Device Software

This Chapter requires both the assembly and installation of the enCore device as well as the installation of enSuite software on the computer to have been completed already.
(⇨ Operating Instructions" of the enCore FC1)

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

3.1 Starting enSuite; the First Steps

Start enSuite either via the enSuite program symbol ◤ on the desktop or via the Start menu (Elster group of programs).

The language used by enSuite can be changed via the options dialog (**Tools – Options**, tab **General**).

> 📖 **Online help**
>
> You can also activate the general online help via the menu item **Help – ❓ Show online help**. Open the context-sensitive help directly from the desired branch in the parameterization window with **[F1]**.

3.2 Establish Connection to the Device

A data connection between the computer and device can either be established directly via a USB cable or via a TCP/IP computer network.

You must connect the computer and device using the supplied USB cable (type A-B) for local connections via USB. The USB port is on the bottom left of the front of the device (🖳). If, following the installation of enSuite, an enCore device is connected via USB for the first time, you will then be prompted to install the driver for the newly detected hardware. More precise information on the installation of the driver can be found in the "Operating Instructions" of the enCore FC.

For connections established via TCP/IP, the device must be connected to an accessible computer network. The network interface is found on the back of the device in the top right (LAN).

If you wish to establish data communication between the computer and one or more devices, then you must select one of the following options in enSuite:

🔍	**Actions –** **Search device** (alternatively press the [F3] key)	Searches for all accessible devices and establishes the connection. All devices which were unknown up until now are entered in the enSuite database. This option is recommended for all initial connections established with one or more devices.
🔌	**Actions –** **Connect**	Establishes the connection to a specific device. The device must be contained already in the enSuite database and selected in the navigation window under the **Devices** branch (identification via serial number).

In both cases, a dialog to select the connection path then appears once the option is activated. For enCore devices, select **Local connection** (USB) or **Remote connection** (TCP/IP network; in this particular case it is also necessary to enter the network name or I/P address).

The connection dialog also provides additional tabs for connections to other device types. Given that this document refers exclusively to enCore, this particular topic is not dealt with here.

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).

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.

📖 **Navigation window Part 1: File manager**

The upper half of the navigation window is designed with a fixed data structure, just like an application-oriented file manager. The top hierarchy levels include the aforementioned levels **Devices** and **Connections**.

The view of the data structure in the navigation window can be changed; by default, you only see the currently selected branch. You can navigate to a lower level by double clicking, or a higher level by pressing the 📁 button.

By using **Tools – Show tree** (Ctrl + T shortcut), you can change the view so that the entire data tree becomes visible.

The navigation window is normally located on the left-hand edge of the screen. It can be hidden so that a greater working area is available.

The navigation window is then displayed once 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.

There are two further options available to disconnect data connections:

	Actions – Disconnect from all devices (alternatively press the [F4] key)	Terminates all active connections.
	Actions - Disconnect	Terminates the connection to the device which is selected in the navigation window (identification via serial number).

3.3   Parameterization: Terms

3.3.1   Product and device parameterizations

Two different types of parameterization are provided in the enSuite database:

A **Product parameterization** belongs to an enCore product class (e.g. enCore FC1) and may be used as a template when creating a parameterization for a specific device. By using **File – New** , you can then create a new product parameterization.

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.

A device parameterization may be obtained, for example, when reading an existing parameterization from a device (⇨ chapter 3.4). Alternatively you can create a completely new device parameterization (either based on a product parameterization or without a template) for a specific device in the enSuite database after selecting the action **New parameterization**.

You can save a device parameterization as a product parameterization so that it is available as a template for parameterizations for other devices.

3.3.2 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 data connection to the device).

2. Transfer of device parameterization to the device with the matching serial number.

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 is transferred to the device in a second step.	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 after installation 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 in order 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 also 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.

Offline parameterization	Online parameterization
Changes of the AFB configuration possible.	No changes of the AFB configuration possible.
In addition to changing parameter *content*, changes of the parameter *structure* are also possible (e.g. by activating functionalities or adding process boards).	Only the content of parameters which already exist may be changed.
Restarting the device after installing the parameterization.	No restarting the device.

3.4   Read-out Parameterization

There must be an active data connection to the device (⇨ chapter 0) before the parameterization can be read-out from the device.

How to proceed:

1. Highlight the device in question in the navigation window either under the **Devices** branch or under the **Connections** branch.

2. Select the action **Read out parameterization** in the lower section of the navigation window.

3. Enter a name for the file in the "Save as" dialog. The read parameterization is then stored under this name under the **Devices – <Serial Number/Name> – Parameterizations** branch.

Navigation window Part 2: Executable actions

The lower half of the navigation window shows which actions are executable in the current context. If, for example, an unconnected device is highlighted, then only the actions **New parameterization** and **Connect** are executable. If a currently connected device is highlighted, then the entries **Disconnect** and **Read out parameterization**, along with a number of other actions which are only possible in the event of an active data connection, are

> possible here instead of **Connect**. All possible actions are also provided in the context menu (right mouse click).
>
> By clicking on one of the actions, it is then started and opened in a new editing window.

3.5 Offline Parameterization

3.5.1 Select basis of device parameterization

There are two alternatives available to create a device parameterization offline:

1. Edit existing device parameterization:

   - Open an existing device parameterization by double clicking on it.

   - Edit the device parameterization (⇨ chapter 3.5.3).

   - Save the device parameterization 🔲.

     Attention: The device parameterization is saved under the old name, i.e. the original file is overwritten.

2. Create new device parameterization:

   - Highlight the device.

   - Select the action **New parameterization**. You can select a product parameterization as a template for this purpose.

   - Edit the device parameterization (⇨ chapter 3.5.3).

   - Save the device parameterization using a suitable name.

enSuite opens the parameterization window in order to edit the device parameterization.

> Several parameterization windows may also be opened in different tabs. You can distinguish them by way of the tab label – the parameterization name is stated here (saved name or identification of the device for new parameterizations and parameterizations which have not yet been saved).

3.5.2   Select approval

For devices which are intended to be used in legal metrology, the approval specifies which parameters are legally relevant. The editing of such parameters must be specifically protected or logged.

> There are two different types of access rights for legally relevant parameters:
>
> 🔒 Can only be changed if the sealable security switch is open.
>
> 📖 Can also be changed if the security switch is closed, provided the fiscal audit trail is not yet full. The change is logged in the fiscal audit trail.

If the device is operated in accordance with a valid approval, then the following conditions need to be met in the parameterization:

- The access rights for legally relevant parameters must be set in line with the approval.

- The software versions of the fiscal software components must comply with the approval.

In order to ensure compliance with these conditions, please proceed as follows:

1. Select the approval to be applied in the **Configuration** tab. All parameters and parameter branches whose official access rights (i.e. 🔒 or 📖) deviate from the selected approval are now labeled in bold **orange**. A **blue** label indicates that official access rights have been newly added.

2. Now click on **Make compliant**. By doing this, the access rights for legally relevant parameters are set in line with the selected approval. The orange labeling is replaced by a **blue** one as the changes have not yet been saved.

3. Check the listing of AFBs in the **Configuration** tab. If an AFB is still labeled in bold **orange** here, then this means that a software version was selected here which does not comply with the approval.

    Select the correct version which is in line with the approval. (Versions in line with the approval are listed in black, and versions which are not in line with the approval are listed in orange. Versions that are not compatible with the current Basic System appear in red.)

    Then click on the **Make compliant** button.

4. Save the parameterization 💾. The blue labeling of parameters and parameter paths then disappears.

📖 **Approval file within the device**

A special official approval file contained in the device's software determines which approval should apply for the device. It is possible to replace the approval file in the device via software configuration (⇨ chapter 3.7).

During operation, the device checks whether the official access rights and the fiscal software component versions match the requirements of the approval file in the device. The selection in enSuite is used solely for support purposes during parameterization.

> 📖 **Approval: Check within device**
>
> On the device itself, you can see an identifying string for the approval file in the Info display, such as *FC1_NMI_2013*. If both the official access rights of the parameterization as well as the fiscal software component versions are in line with the approval file, then this text is black; the text is red in the event of any deviations.
>
> If you activate the hyperlink Approval, a display is then evoked which contains detailed information on the approval.

Security switch and fiscal audit trail may also be used for devices that are not to be operated in accordance with an official approval. In such cases there are prepared unofficial "approval" files, including a file without any official access rights whatsoever.

3.5.3   AFB Configuration

You can see the current parameter structure tree in the **Parameter** tab in the left-hand part of the parameterization window. The root is for the device itself and the top level consists of software modules that are currently included. The Basic System is always included in the device software here; however AFBs may be added or deleted.

If the tree root (i.e. the device name) is highlighted on the left-hand side, then you will see all available AFBs for the device in the **Configuration** tab. Of each AFB, both the version and the number of instances already used by the device are stated for this purpose.

Generally speaking, the AFB composition can be freely configured. Restrictions base on the resources already in use. The majority of AFBs can be used several times.

Here's how to edit the AFB composition:

- In order to add an AFB, highlight it in the right-hand part of the window in the **Configuration** tab and click on **Add AFB**.

If a newly added AFB is labeled in bold orange in the parameter window, you then need to click on the **Make compliant** button again in the **Configuration** window (⇨ chapter 0).

Any blue labeling means therefore that the changes have not yet been saved.

- In order to delete an AFB, highlight it in the left-hand part of the window and select **Delete AFB**.

Attention: It is possible that the parameterization is no longer valid when an AFB has been deleted. In such cases all parameter branches and parameters which contain references to the deleted AFB that are no longer valid are labeled in red.

Grouping of AFBs

With respect to parameterizations with a large number of AFBs, it is recommended that functionally related AFBs are grouped together in the parameterization. This not only simplifies the parameterization, but it also means that the AFBs grouped in such a way are also shifted to a separate folder in the device display.

Example: An FC1 is used for conversion purposes in a dual-stream application. In addition to the Basic System, the device contains one **Gas quality** AFB and one **Flow Conversion** AFB for each stream. It is recommended that AFBs belonging to a stream are grouped (e.g. into *Stream 1* and *Stream 2* groups).

In order to create an AFB group, highlight one of the associated AFBs and enter the name of the group in the **Customization** tab under **Structure**.
This procedure can be repeated for all AFBs that ought to belong to this group. AFBs with the same structure name belong to the same group.
Alternatively AFBs can also be dragged into an existing group using drag & drop.

3.5.4   Restricting options available for editing in due consideration of access rights

In addition to the official access rights, a user authorization is also required to change parameters. The user must log in as a member of a user group by entering a password. An administrator can in principle make any changes, however the conditions of the applicable approval must be taken into account, e.g. it may be necessary to open the security switch (⇨ chapter 0). If the specified user configuration was not customized, then there is an administrator named admin1 and an empty password by default.

In addition to the administrator groups, individual user groups which only allow access to part of the parameters may also be set up as well. Further information on user management can be found in the Basic System description.

> **Virtual login**
>
> The parameters that a user is able to change depend on the user group that he/she belongs to and, potentially, whether it is allowed to open the security switch or not.
>
> For offline parameterization, enSuite offers the option to restrict the editing possibilities so that only changes can be made that an individual user is actually permitted to make. This is referred to as a **virtual login**.
>
> Here's how to proceed:
>
> - Highlight the parameter tree root (device name) in the parameter window.
>
> - Change to the **Configuration** tab in the right-hand part of the window.
>
> - Activate **Use virtual login** and enter the user name. Once completed, any parameters that the user in question is not permitted to edit can no longer be edited.
>
> - If you deactivate the option **Assume open security switch**, then all parameters under security switch

protection can no longer be edited either.

Non-editable parameters are listed in gray in the parameter lists and are labeled with the symbol ⊘. By using the option **Show enabled parameters only**, you can achieve that any such parameters are not displayed at all.

3.5.5   Edit parameterization: Methods

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

**Parameterization window:
Navigation in AFB and parameter structure**

The **Parameter** tab in 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 and the AFBs (possibly in groups).

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

In the **All parameters** tab, 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.

You can sometimes select operating modes or add or delete functions in the **All Parameter** tab as well.

Examples:

- Converting the operating mode of a process board channel, e.g. for changing a digital input from "not used" to HF or LF pulse input or message input.

- Adding an ultrasonic gas meter or a PGC (in the **Intelligent measurement devices** SFB of the Basic System).

New functions or changed operating modes require additional parameters which are then made available for editing in a new subordinate branch. Any such structural changes to a parameterization are only possible using offline parameterization.

The tabular listing of parameters in the parameter window has several columns.

The name of the parameter (**Parameter name** column) depends on the selected language.

You can see the current value of the parameter in the **Value** column; here, changes can be made.

You can distinguish between different types of parameters:

1. **Selection of one of several options**
   Example: Selection of one of several calculation methods

2. **Name**: Entry of character string for identification purposes
   Example: Name of a temperature sensor, e.g. serial number

3. **Constant**: Entry of numerical constant
   Example: Constant Qmax as a limit value for the monitoring of gas flow

4. **Import value**: Assignment of an export value (result of another functionality)
   Example: Assignment of conversion factor to calculate volumes at base conditions in Flow Conversion AFB

The function blocks of the enCore software provide results which can be further processed by other function blocks. These results are called **Export values**.

📖 **Value window – Export values**

There is a value window with a tab for export values in the parameterization interface of enSuite. All export values are sorted here according to function blocks and made available in a tree. The structure here is identical to the parameter tree structure in the parameterization window.

The value window is normally located on the right-hand corner of the screen. It can be hidden so that a greater working area is available. The value window is then displayed once again after clicking on the **Values** button on the right-hand corner of the enSuite window. If you simply move over the button using the cursor, the value window is temporarily displayed.

The export value name is derived from the tree structure.
Example:
The measurement of a pressure sensor, which is connected to the current input of the first process board, is provided by the Basic system I/O SFB. This export value is called **Basic System.I/O.board 1.P+P-.Measured value.**

The export values in the value window are identified by a symbol. This symbol shows at a glance to which physical quantity the value belongs.

Examples:

Symbol	Physical quantity
	temperature
	pressure (absolute or gauge)
	volume (volume at base conditions, volume at measurement conditions)
	energy
	heating value

If a parameter is an import value, i.e. the assignment of an export value is expected, then, within the corresponding **Value** field, the symbol for the

physical quantity is shown on the left-hand side and the drag & drop sign
on the right-hand side.

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 & drop. A stop sign appears if any such assignment is not possible (e.g. because the physical quantity is not matching).

Alternatively you can also open up the selection list directly at the parameter value and select the desired value. However this list contains all export values that match the physical quantity. As a result, the drag & drop method is clearer for more complex parameterizations.

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 in order to disable a monitoring routine (by choosing **Not used** for a limit value).

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 up 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 *.

> 📖 **Change units**
>
> If you click on the unit of a parameter in the **Unit** column, a list then opens up 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.

3.5.6   Edit parameterization: Practical tips

This chapter describes briefly an appropriate order of steps for creating or editing a device parameterization for the enCore FC.

1. **Configure AFB composition or grouping of AFBs**
   ⇨ Chapter 3.5.3

2. **Set up process board equipment**
   Specify in the **Basic System – I/O – I/O boards** parameter branch which process boards are placed in the individual board slots. You have to ensure that the process board arrangement in the parameterization precisely matches the process board equipment in the device.

3. **Process boards: Parameterization of input channels**
   Parameterize the measurement devices that are connected to the analog and digital channels of the input boards.
   The operating mode typically needs to be selected initially for the respective channel of the input board (under **Basic System – I/O – I/O boards – <Board name> – <Channel name>**). The associated parameters can then be edited.

4. **Process boards: Define protocol channels**
   Both the CPU and certain process boards provide digital protocol channels. These are intended for the connection of measurement devices via digital protocol or for communication via Modbus

(in conjunction with the Modbus AFB).

There are also analog input boards that support the connection of measurement devices via HART protocol as an alternative to the current input operating mode.

Only the basic communication parameters are specified when defining a protocol channel.

5. **Parameterization of intelligent measurement devices**

    The term "Intelligent measurement devices" refers to all measurement devices that are connected via digital protocol. Typical examples include PGCs, measurement devices via HART protocol or ultrasonic gas meters.

    The **Basic System – Intelligent measurement devices** parameter branch is used to select which intelligent measurement devices are to be connected to the enCore device. You can then edit the associated parameters. The parameter **Port** is of particular importance here; the protocol channel to which the measurement device is connected has to be assigned here (⇨ step 4).

6. **Parameterization of AFBs/SFBs**

    - In certain AFBs and SFBs there is an option to define **Pre-processing** operations in order to implement a multi-level substitute value strategy in the event of errors, either for redundant measurements and/or for fixed substitute values.

      The **Pre-processings** parameter branch is found, for example, in the **Gas quality** AFB. It is recommended here that a pre-processing operation is defined both for pressure and temperature (as well as for gas quality if this is measured).

    - Assign the desired export value to each required input value of the AFB or SFB. This export value is typically provided by another SFB or AFB. You must take care to ensure that the source of the value is correct.

- Check or edit all options and constants. For certain constants, such usage can also be switched off via the context menu by choosing **Not used**.

- Activate and parameterize any desired additional functions (e.g.: gas meter correction in **Flow Conversion** AFB).

Context-specific online help

You can activate the associated online help in order to find out information regarding the importance/meaning of individual functionalities and parameters. Simply highlight the parameter or parameter tree and press F1.

3.5.7   Save the edited parameterization

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

During editing, the program makes use of color-based signs in order to identify the status. If the parameter label is **blue**, this means that the parameter was edited but the change has not yet been saved. Any superordinate branches are also blue at the same time.

A **red** parameter label indicates that changes have been made and the parameterization is not yet valid. The parameterization can be saved, but it cannot be transferred to a device.

3.5.8   Transfer parameterization to device

Only saved device parameterizations can be transferred, and only to the device with the matching serial number.

1. Establish the data connection to the device.

2. Highlight the desired device parameterization in the data structure of the navigation window.

3. Select the action **Transfer parameterization to device**.

4. Log in using the login dialog that appears.

> A standard login as an administrator (user name admin1 and an empty password) typically works here.
> If this does not work, then you need more information about the individual user configuration for the device in order to log in.
> Further information on user management can be found in the Basic System description.

5. There are typically a number of parameters which are protected by the security switch (e.g. in order to meet the requirements of an approval). If the new device parameterization is likely to bring about changes to such parameters, but the security switch is closed, then the message **Device could not be parameterized** appears following the transfer. The device does not restart however; the old parameterization is still used.

3.6   Online Parameterization

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

1. Establish the data connection to the device.

2. Highlight the device in question in the navigation window either under the **Devices** branch or under the **Connections** branch.

3. Select the entry **Online parameterization** in the lower section of the navigation window.

4. Log in with your user name and password using the login dialog that appears.

5. The parameterization is read; the parameterization window then opens up for editing purposes.
    The editing methods are in principle the same as for the offline editing of a parameterization, albeit with the following restrictions:

- No changes may be made to the AFB composition.

- No changes may be made to the parameter structure.

- Only parameter changes that the logged in user is permitted to carry out may be made.
  The following applies additionally in the event the security switch is closed:
  Parameters labeled as 🔒 cannot be changed, parameters labeled as 📖 may only be changed provided the fiscal audit trail is not full.
  Non-editable parameters are listed in gray in the parameter lists and are labeled with the symbol ⊘.

6. Activate the **Transfer parameterization to device** button 📲.

> 📖 A parameter label highlighted in **green** indicates that the parameter was edited but the change has not yet been transferred to the device. Any superordinate branches are also green at the same time.
>
> Once the transfer is completed, the parameter label is then **blue**. This indicates that the transfer was completed but the edited parameterization has not yet been saved in enSuite.

7. You can save 💾 the edited parameterization in enSuite in order to back up the current status.

3.7   Software Configuration/Software Update

The device software contains different software components (software modules) that can be individually replaced with other software versions. These software modules include the Basic System, all available AFBs and the approval file that defines the official access rights.

Version number for software modules

The version number for software modules consists of a major version number, a minor version number and a version letter (e.g.: 02-08-B).

The first number is the major version number; this must match for all software modules within a device.

The second number is the minor version number. This is incremented if the parameter structure is different but the module version is still compatible with other software modules with the same major version.

The version letter is the third part of the version number. A differing version letter indicates that the software changes are minor and the parameter structure has not changed.

In order to replace software modules in a device (e.g. for a software update), please proceed as follows:

1. Establish the data connection to the device.

2. Highlight the device in question in the navigation window either under the **Devices** branch or under the **Connections** branch.

3. Read the current parameterization and save it.

4. Select the action **Software configuration**.
   The **Software configuration** window shows a table for all software modules that are currently included in the device (along with version number in the **Current** column).
   It is also indicated whether a module is fiscal or not. Legally relevant (fiscal) modules are intended for official measurements in accordance with a valid approval.
   The replacement of fiscal and non-fiscal software modules can be separately restricted by way of special access rights.

5. In order to search for other versions and software modules which may be installed as well, select the directory in which the new firmware versions are located under **Search in...**.

6. Now click on the **[Search software modules...]** button. A search is now conducted in the specified directory for other software versions.

7. If newer versions of the searched software modules are found, then these are displayed in the **Replace by...** column and highlighted in bold green. The text "Don't change" then appears.
You can exclude individual software modules from the update by explicitly selecting **do not replace**.

   Attention: Approval files do not have any particular versions, but rather they are identified by their name instead. Thus, if a current approval with a new approval file needs to be taken into account, then you must explicitly select the related file.

8. Provided the old and new software modules only differ in terms of their version *letters*, then the original parameterization can continue to be used, even after the software download. If the version *numbers* differ as well, this means that the old parameterization is no longer compatible, although it can be easily converted.

Converting the original parameterization

Open up the original parameterization that you have read from the device in step 3 for editing.
Highlight the root of the parameter tree (labeled by the device name) in the parameter window. The various software modules which can be parameterized can then be seen in the **Configuration** window, i.e. the Basic System as well as all included AFBs along with their version number. Select the new version for all modules to be replaced under **Version**. Click on **Commit changes**. Then check the parameterization for the changed modules on new parameters. Edit the parameterization if necessary.

Save the device parameterization and close the parameterization window. The device parameterization is now available for any subsequent transfer to the device.

9. Once you have selected all desired replacement actions, click on the **[Perform software changes]** button at the bottom of the window.

10. The condition of the security switch is then examined. If this is closed, and if changes to the software configuration are prohibited in that case, then the procedure is terminated.

The replacement of fiscal and non-fiscal software modules may be protected by the security switch. These settings can be found in the parameterization in the branch **Basic system – Users**, on tab **Special user rights**.

11. Provided the action is permitted, the login dialog then appears. Log in with your user name and password.

Checks are then made as to whether you belong to a user group that allows the chosen software changes to be made. If this is not the case, then the procedure is terminated.
Otherwise the parameterization with which the device should be started is then selected in the next step.

- **No parameterization** means that a basic parameterization without AFBs is used. This always works, but the device still needs to be parameterized at a later point.

- The option **Current parameterization** can only be used if the current parameterization is still compatible following the chosen software changes. The existing parameterization is read from the device in order to check this.

- In addition all parameterizations contained in the enSuite database for the device in question are made available for selection. It is also the case here that the selected parameterization needs to be compatible with the new software.
If you have already converted the read-out parameterization (⇨ step 8), simply select this here.

12. The device checks whether the selected parameterization is in line with the planned new software configuration for the device. If this is not the case, then the procedure is terminated.

    In such a situation, you should create a compatible device parameterization first of all (where necessary) before activating **[Perform software changes]** again. Another possibility is to use the option **No parameterization**.

13. The device restarts once the software download is complete.

14. If necessary, you can check the Info display on the device as to whether the parameterization is in line with the approval file contained in the device (⇨ Info box on page18).

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