

BEDIENUNGSANLEITUNG

MULTICON
Multichannel Sensor
Controller



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1 About this documentation

1.1 Foreword

Read this document carefully and familiarize yourself with the operation of the product before using it. Keep this document handy and ready to read, preferably in the immediate vicinity of the product, so that you or your staff/users can refer to it at any time in case of doubt.

The product has been developed in accordance with the current state of the art and meets the requirements of the applicable European and national directives. All relevant documents are available from the manufacturer.

Installation, commissioning, operation, maintenance, and decommissioning may only be carried out by qualified personnel. Qualified personnel must have carefully read and understood the operating instructions before starting any work.

1.2 Purpose of the document

- This document describes the assembly, installation, operation, and maintenance of the product.
- This document provides important information for the safe and efficient use of the product.
- This document serves as detailed reference work for the product.

1.3 Legal information

The manufacturer's liability and warranty for damage and consequential damage shall lapse in the event of improper use, failure to observe this document, failure to observe safety instructions, general safety regulations, use of insufficiently qualified personnel, and unauthorized modifications to the product.

Only perform maintenance and repair work on this product as described in this documentation. Follow the specified steps when doing so. For your own safety, only use original spare parts and accessories from the manufacturer. We accept no liability for the use of other products and any damage resulting from this.

This document is entrusted to the recipient for personal use only. Any unauthorized transfer, reproduction, translation into other languages, or excerpts from this operating manual are prohibited.

The manufacturer accepts no liability for printing errors.

1.4 Accuracy of content

The content of this document has been checked for accuracy and is subject to a continuous correction and maintenance process. This does not exclude the possibility of errors. If you nevertheless find any errors or have any suggestions for improvement, please inform us immediately using the contact information provided so that we can make this document even more user-friendly.

1.5 Further information

Note

The complete documentation for the device and connectable sensors is available for download on our website www.senseca.com.

The following information can be downloaded from this page:

- This operating manual in German and English
- Data sheets
- Dimensional drawings, 3D PDF, and 3D CAD models
- Interface description Modbus RTU "digital sensor technology"
- Interface description MULTICON-Profinet
- CONDIX conductivity converter, operating manual
- PHIX PH/ORP converter, operating instructions
- CE declaration of conformity

2 Safety

2.1 Explanation of safety symbols

Danger

This symbol warns of imminent danger, death, serious injury, or serious property damage if ignored.

Caution

This symbol warns of possible dangers or harmful situations that could cause damage to the device or the environment if ignored.

Note

Blue background indicates procedures that, if not followed, may indirectly affect operation or cause an unforeseen reaction.

2.2 Foreseeable misuse

The proper functioning and operational safety of the product can only be guaranteed if the generally accepted safety precautions and the device-specific safety instructions in this document are observed during use. Failure to observe any of these instructions may result in injury or death to persons and damage to property.

Danger! Incorrect application!

To prevent product malfunction, personal injury, and property damage, the product must only be used as described in the chapters *2.4 Intended use* and *3.1 Product* of the operating instructions.

- ▶ The product is not suitable for use in potentially explosive atmospheres!
- ▶ The product must not be used for diagnostic or other medical purposes on humans or animals!
- ▶ The product is not suitable for use with functional safety requirements!

2.3 Safety instructions

The product must be used in accordance with the technical data and the instructions in this operating manual.

Caution! Functional impairment!

Errors in the installation, assembly, or configuration of Senseca products can impair the proper functioning of the subsequent process or lead to damage. However, our products do not necessarily pose any immediate serious hazards.

- ▶ Ensure that the product is installed, assembled, programmed, and configured correctly and properly!
- ▶ Provide independent safety devices!
- ▶ Only allow qualified personnel to make adjustments!

Caution! Malfunction!

If it can be assumed that the product can no longer be operated safely, it must be taken out of service and secured with a label before further use. The safety of the user may be compromised by the device if, for example, it shows visible damage, no longer operates as specified, or has been stored for a long period of time under unsuitable conditions.

- ▶ Visual inspection!
- ▶ If in doubt, send the product to the manufacturer for repair or maintenance!

Caution! Temperature damage!

If the product is exposed to a temperature that is not specified in [Chapter 10 Technical data](#), errors, defects, or heat/frost damage may occur.

- ▶ Observe the temperature range!

Caution! Overuse!

If the product is not installed and operated correctly, this will lead to defects.

- ▶ Observe the tightening torque!
- ▶ Do not use as a fixed point!

**Caution! Profinet**

The device should not be connected directly to an internal company network via the Ethernet socket.

This can result in duplicate IP addresses being assigned, which can lead to lasting malfunctions. Please inform the IT department in case of prolonged contact.

The device is only suitable for connection to a defined Profinet.

Before connecting a configured MULTICONS to another Profinet, the device name and IP address should first be deleted.

2.4 Intended use

For safety and warranty reasons, any interventions beyond the handling described in the operating instructions may only be carried out by personnel authorized by the manufacturer. Unauthorized modifications or alterations are expressly prohibited.

Improper or unintended use of this product may result in application-specific hazards.

2.5 Qualified personnel

For commissioning, operation, and maintenance, the personnel involved must have sufficient knowledge of the measurement procedure and the significance of the measured values. This document makes a valuable contribution to this. The instructions in this document must be understood, observed, and followed.

To ensure that no risks arise from the interpretation of the measured values in the specific application, the user must have further expertise in case of doubt. The user is liable for damage/hazards resulting from misinterpretation due to insufficient expertise.

This document contains the information required for the intended use of the product described herein. It is intended for technically qualified personnel who have received special training or have relevant knowledge in the field of automation technology or measurement and control technology. Knowledge and technically correct implementation of the safety instructions and warnings contained in this manual are prerequisites for safe assembly, installation, and commissioning, as well as for safety during operation of the device described.

Only qualified personnel have the necessary expertise to correctly interpret and implement the safety instructions and warnings used in this manual in specific individual cases.

3 Description

3.1 Product

MULTICON is a multi-channel, measurement-independent display, control unit, and measurement data gateway.

The system can evaluate up to 6 connected sensors. These can be up to 6 digital sensors - with RS485 / Modbus RTU - or 5 digital sensors and one pulse-generating sensor (flow sensor).

The primary and secondary measurement data are clearly displayed on the convenient TFT display, either in total or as a single-channel view.

In addition to the process values, identification data and the sensor status can also be made available to higher automation levels via fieldbus (Profinet).

The sensors can be arranged in any order in the system; sensor types are permanently assigned to a channel to prevent mix-ups.

The range of functions depends on the connected digital sensor. MULTICON and the connected sensors can be configured and parameterized using SENSware via the integrated USB-C PC interface or the device control.

The universal housing design allows for installation in the field as well as in a control panel.

3.2 Scope of delivery

Please check that your product is complete after opening the packaging. You should find the following components:

- Operating instructions according to order code
- MULTICON according to order code
- Gasket for panel mounting
- 2 x mounting brackets

3.3 Functional principle

MULTICON has digital input, power supply, and communication module.

The digital input module converts an RS485 interface to the internal TTL interface and has additional input for frequency-generating flow sensors.

The sensor type and address are preconfigured in MULTICON and then automatically identified. Communication takes place via Modbus RTU protocol.

Addressing is done via a definable base address, which can be set using the SENSware configuration tool. The sensors from Senseca also have 3 address lines that can be wired, the coding of which is added to the base address.

The measured values, identification data, and parameters read out are made available in the MULTICON for further processing via the HMI and/or the fieldbus.

3.4 Interior view

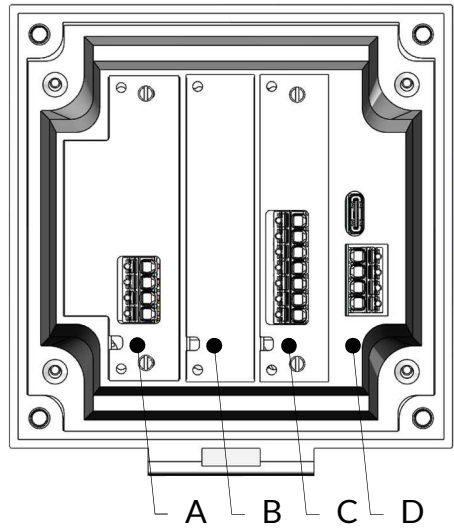


Figure 3-1 : MULTICON interior view (hinge at bottom)

The MULTICON has four slots for input, output, and power supply (slots A to D).

Item	Designation
A	Supply voltage
B	Not assigned
C	RS485 digital, flow input, and sensor power supply
D	USB-C configuration interface; Ethernet connection

Table 3-1 : Legend MULTICON interior view

3.5 Exterior view

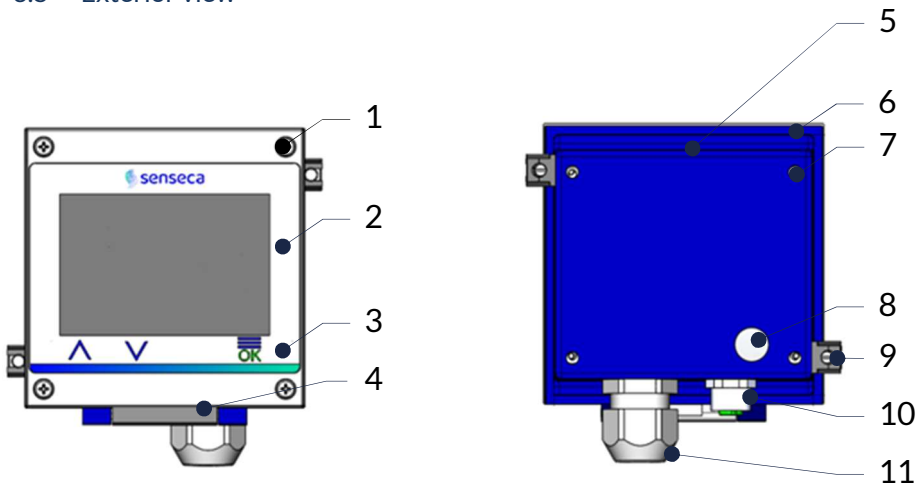


Figure 3-2 : MULTICON front and rear view

Item	Description	Item	Description
1	Closing screw, cover, 4x	5	Type plate
2	TFT display	6	Gasket, panel mounting
3	Control panel, 3 buttons	7	Mounting hole, 4x
4	Housing hinge	8	Pressure equalization element
		9	Mounting bracket, 2 x
		10	M12x1 socket, 4-pin
		11	Cable gland, 2x

Table 3-2 : Legend MULTICON exterior view

3.6 Type plate

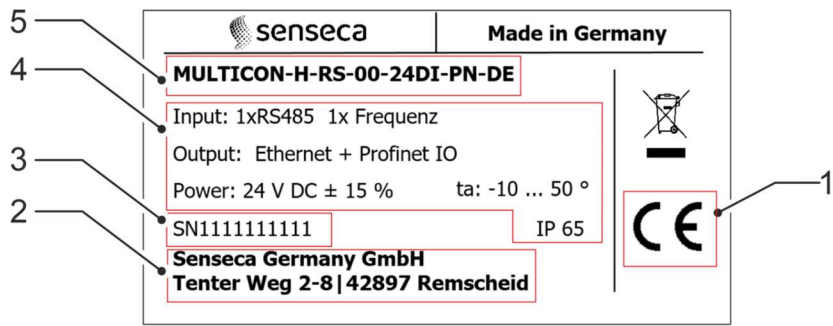


Figure 3-3 : Type plate

Item	Designation
1	CE marking
2	Manufacturer
3	Serial number
4	Technical data
5	Product Type

Table 3-3 : Legend for type plate

4 Installation

4.1 Assembly

4.1.1 Field assembly

1. Mount the device on a flat surface, e.g., wall, switch cabinet rear panel, mounting plate, or similar, using the **four internal mounting holes**.
2. Ensure that the **cable feed is unobstructed** and that there is sufficient space to open the housing cover for installation or service purposes.
3. Avoid **direct sunlight** on the TFT display.
4. During installation, ensure that the **maximum operating temperature** is not exceeded or fallen below during operation.

4.1.2 Panel installation

1. Insert the device, including **the profile gasket**, from the front through the prepared panel cutout. Note the installation dimensions at *10 Technical data*.
2. Ensure that there is **sufficient cable feed** and clearance to open the housing cover for installation or service purposes.
3. Check that the **gasket is seated evenly** and that the panel cutout is covered on all sides.
4. Attach the two **clamping clips** to the housing and secure the device by evenly tightening the two **threaded rods**.
5. Avoid **direct sunlight** on the TFT display.
6. During installation, ensure that the **maximum operating temperature** is not exceeded or fallen below during operation.

4.2 Connection assignment

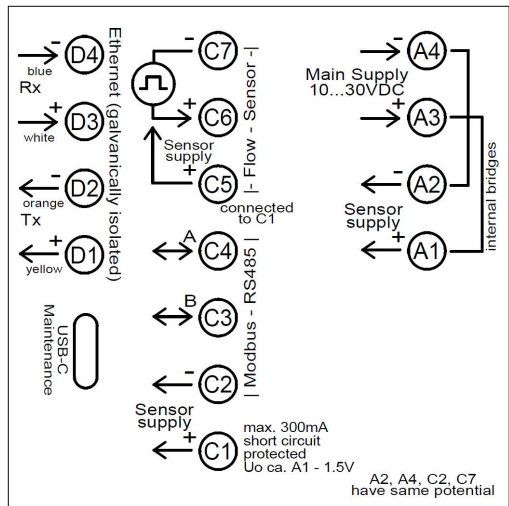


Figure 4-1 : Connection diagram for terminal strip A...D (hinge at top)

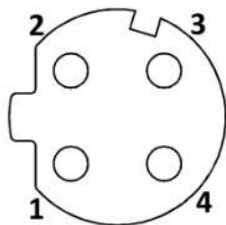


Figure 4-2 : Connection diagram for M12x1 socket, 4-pin (D-coded)

Terminal	Assignment	Description
Terminal strip A: Power supply board		
A1 / A3	Ub+	DC supply voltage +
A2 / A4	Ub-	DC supply voltage -
Terminal strip B: No assignment		
Terminal strip C: Digital circuit board		
C1 / C5	U0+	Encoder supply 300 mA, short-circuit proof (UB-1.5 V)
C2 / C7	GND	Ground (UB-; sensor supply, RS485)
C3	RS485 - B	Bus line B
C4	RS485 - A	Bus line A
C6	Freq.In	Frequency input (max. 30 V)
Terminal strip D or connection socket M12 (external): Ethernet connection		
D1 / Pin 1	Tx+ (yellow)	Transceive Data +
D2 / Pin 2	Tx- (orange)	Transceive Data -
D3 / Pin 4	Rx+ (white)	Receive Data +
D4 / Pin 3	Rx- (blue)	Receive Data -

Table 4-1 : Terminal Assignment

4.3 Electrical connection

Note Proper installation

The product may only be installed by a qualified electrician.

The national and international regulations for the installation of electrical systems in the respective country of operation apply.

The connection data specified in the chapter [10 Technical data](#) must be observed in order to avoid damage to the product.

Note Connected USB-C cable

When the USB-C cable is connected, the MULTICON continues to be supplied with power. Connected sensors can **only** be used **with an additional power supply**.

The following steps describe how to connect the device to the power supply:

1. Open the housing cover to access the electrical connections.
2. Insert the supply cables through the cable glands into the housing and lay the wires according to the pin assignment.
3. Lock the cable glands to enable strain-free installation.

4.4 Connection of sensors

Sensors are connected to terminal strip C. Branches for the network structure must be provided outside the device. For example, in the form of distribution terminals or by means of plug-in connectors on the sensor.

4.5 Sensor network architecture

A maximum of 6 digital sensors can be connected to the MULTICON.

If more than 5 sensors are connected, the flow sensor integrated in the MULTICON must be deactivated.

The sensors are connected to each other via an RS485 interface (EIA-485). The data is transmitted via Modbus protocol. Communication takes place according to the master-slave procedure.

The individual Modbus slaves must be arranged in line or bus topologies.

Example:

Connection of 5 digital sensors in bus topology with addressing (address 80...84).

On the left are the connections to the MULTICON, at the bottom are the connections to the sensors.

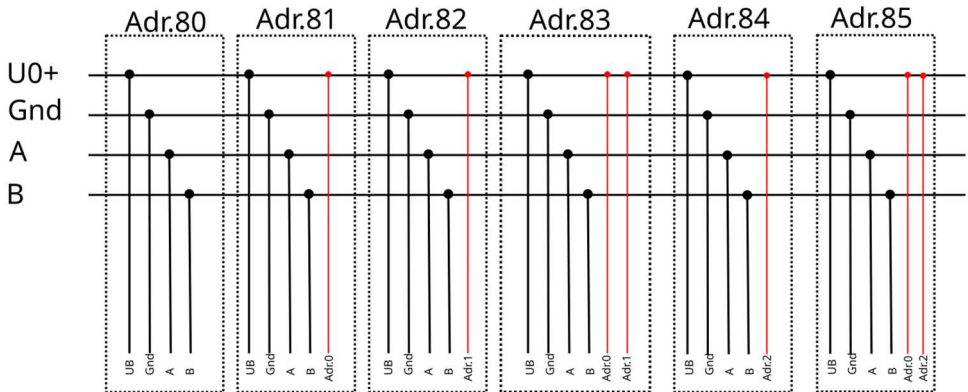


Figure 4-3 : Digital sensors in bus topology

Note Automatic addressing

- If the sensors are supplied externally, the ground wire must still be wired. It must then be connected directly to the ground wire of the external sensor supply at the sensor. If the ground wire is not wired, significant transmission interference may occur.
- For longer bus lines, 2 end positions must be terminated with 120 ohm resistors.
- Digital sensors are delivered from the factory with address 80. Connecting the sensor address line 0/1/2 to the supply voltage U0+ creates an offset to address 80. This allows sensors to be connected immediately without address parameterization.
- Addressing can also be set statically using SENSware. The address lines are then obsolete.

For more information, refer to the **interface descriptions for digital Modbus sensors** and the **operating instructions** for the respective digital sensors.

4.6 Connection of a flow sensor

The MULTICON supports pulse-generating flow meters in PNP and push-pull circuits. A push-pull output should be used for higher frequencies (>10Hz). Connect the supply voltage, ground, and signal output to the frequency-generating sensor. The flow sensor is configured via the parameters (K factor; refresh time, and unit) of the FLOW sensor type.

Compatible sensors from our portfolio

Flow sensor	Circuit
RRH, RT, RRI	Push-pull, or PNP
LABOPLUS, OMNIPLUS	Push-pull

Table 4 -2 : Messwertgeber Senseca

Electrical connection of the sensors

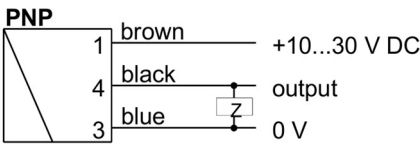


Figure 4 -5 Connection example for encoder with PNP output

Connection to MULTICON

Terminal	MULTICON	Flow sensor	PIN
C7	GND	0V (blue)	3
C6	Freq.In	Signal output (black)	4
C5	U0+	UB+ (brown)	1

Table 4-3 : PNP & push-pull circuit

Note Transmitters with frequency

For flow transmitters with frequency output, the K factor must be calculated from the maximum frequency and the measuring range end value: $K=f/Q$

5 Commissioning

Before installation, ensure that the following conditions are met:

1. Ensure that the product is installed correctly
2. Ensure that the wiring is securely fastened.
3. Switch on your system.
 - a. The product starts up and runs a self-test.
 - b. The process data overview is displayed
4. Ensure that the sensor type and address for the slots used have been set in the bus configuration and that each sensor has been parameterized according to the application. See 6.4.4 *Bus configuration*
5. Make sure that the sensor data is displayed correctly in the operation level.

6 Operation

6.1 Control elements

The MULTICON has three hardware buttons that are used to navigate through the menus and confirm entries. The following table describes the various functions of the operating elements.

Symbol	Designation	Description
	Increment	Navigate between entries, upward direction. Increase variable values.
	Decrement	Navigate between entries, downward direction. Decrease variable values.
	Enter	<u>Short:</u> Selecting selections or confirming variable values. <u>Long (2 sec.):</u> Call up the context menu .

Table 6-1 : Legend Control elements

6.2 Symbols on the display

6.2.1 Profinet symbol

The MULTICON displays a Profinet symbol in the top left corner of each operating page. The symbol provides information about the current connection status of the device. In the event of an error, the symbol is highlighted in color.



Figure 6-1 : Profinet symbol

Symbol	Color	Meaning
	white / not filled	No active Ethernet connection
	Orange	Ethernet connection active
	Orange flashing	Ethernet connection active with LED flashing request via Profinet DCP
	Green	Profinet connection with active cyclic data exchange
	Flashing green	Same as green with LED flashing request via Profinet DCP
	Red / Red flashing	Communication or parameterization error

Table 6-2 : Legend Profinet symbol

6.2.2 User profile icon

MULTICON has a three-level access restriction via user profiles. The active profile is shown on the display.

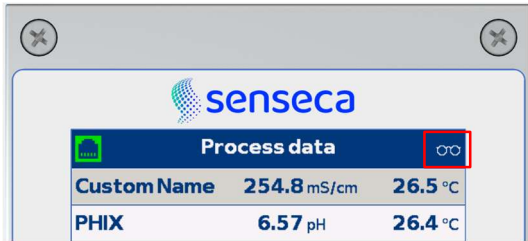


Figure 6-2 : User profile icon

Icon	Profile name	Description
	Observer	Exclusive read access to selected parameters.
	Maintenance	Read and modify selected parameters.
	Specialist	Can view and change all variable values.

Table 6-2 : Legend User profile

6.2.3 Sensor status

The following statuses are available for digital sensors:

Symbol	Meaning	Remedy
	Interrupted A sensor with which data was previously exchanged successfully is no longer accessible. - Sensor disconnected for maintenance - Electrical connection interrupted	Reconnect the sensor or check the electrical connection. The sensor will be detected and initialized again within the internal search interval.
	Incorrect sensor Sensor does not match the configured sensor type	Check which sensor is connected and replace the sensor or the sensor type in the bus configuration
	No sensor A sensor has been configured for this slot. However, it is not detected. There is no connection to the sensor.	Check the parameters of the sensor interface/bus configuration for consistency (MULTICON and sensor). - Sensor address - Parity - Baud rate - Stop bits

Table 6-3 : Sensor status

6.2.4 Activating and deactivating user profiles

MULTICON has a three-level access restriction via user profiles: **Observer**, **Maintenance**, and **Specialist**. The active profile is shown on the display.

The **Maintenance** and **Specialist** profiles require their own passwords.

The active user profile restricts the following accesses:

1. Ability to read or (write) change parameters
2. Performing actions in the device

Activate

A profile is activated when entering an access-restricted level or performing an action on the device.

The user is prompted to enter a password.

If a password is assigned to a profile, it is activated and a corresponding confirmation is given via the dialog box.

If the password does not correspond to any profile, the basic **observer** profile remains active.

Deactivate

You can log out of the authorization profiles manually via the **context menu**.

For security reasons, access to password-protected authorization levels is automatically deactivated after 2 minutes.

Note Passwords

The passwords for activating the authorization levels can be set individually in the configuration menu of the **MULTICON** entry in the **Access** submenu.

- For information on the effects on the visibility and modifiability of parameters and the executability of actions, see 6.5 *Parameterization*.

6.3 Menu structure

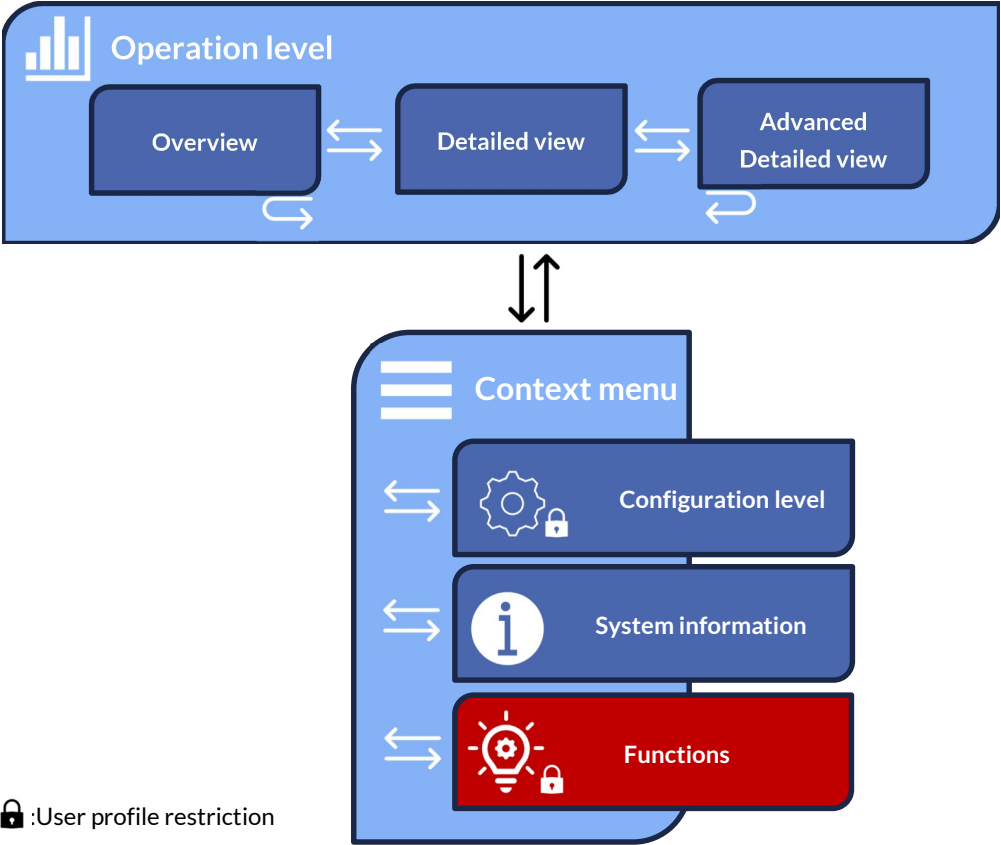
The menu structure of MULTICON is divided into three operating levels:

- Operation level (display of process data and execution of functions)
- Configuration level (parameters of the devices/sensor network)
- System information

For simplified operation, the device also features a context menu.

The context menu can be accessed from any level (press and hold the Enter key for 2 seconds); its content depends on the type of sensor selected (measuring point) and the active user profile.

It controls entry and exit between levels and enables, among other things, the execution of functions of the MULTICON or the sensors directly from the operation level.



:User profile restriction

Figure 6-3 : Menu structure

6.3.1 Operation level

The user interfaces provide the user with an overview of the process values of the connected sensor network. Information on individual measurements can be displayed in detailed view. The extended sensor data provides an overview of additional continuous measurement data available for the respective measuring points.

The work level is divided into three operating pages:

- Process data (overview)
- Process data (detailed view)
- Process data – Advanced (Additional sensor data)

6.3.1.1 Process data – Overview

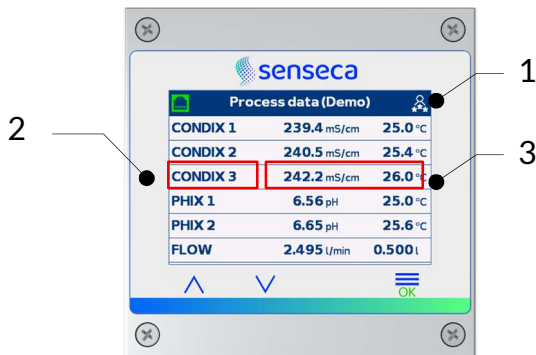


Figure 6-4 : Process data – Overview

Item	Designation	Description
1	Title	Name of the operating side
2	Measurement 1-6	Name of the sensor and serial number
3	Primary/secondary measured value	Main and additional measured value of the measuring point

Table 6-4 : Legend Process data overview

6.3.1.2 Process data detail view

The process data detail view provides the user with additional information about the measuring points. For example, the sensor status is displayed in plain text. The scope of the display is sensor specific. To select a measuring point, see 6.4.1 *Selecting a measurement for the detailed view*

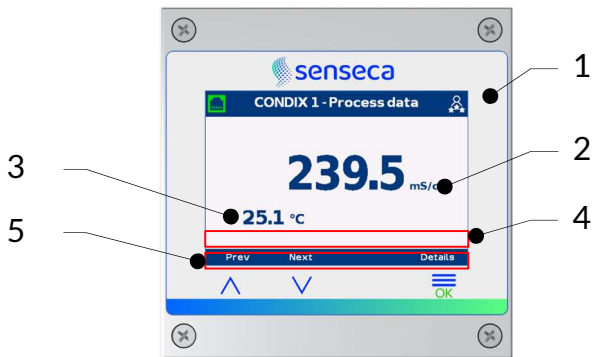


Figure 6-5 : Process data – detailed view

Item	Designation	Description
1	Measurement + title	Name of the sensor and serial no. / designation of the operating side
2	Primary measured value	Main measured value
3	Secondary measured value	Additional measured value
4	Status field	Plain text Display of active status messages
5	Key function • Increment/decrement • Enter key (short) • Enter key (long)	Describes the button functions on this page. Previous/Next: Switch between measuring points Detail: Continue to "Process data detail view (advanced)" Menu (2s): Open context menu

Table 6-5 : Legend Process data detail view

6.3.1.3 Process data detail view (advanced)

The advanced process data detail page displays measured values from the measuring point that go beyond the process measured values. The scope of the display is sensor specific.

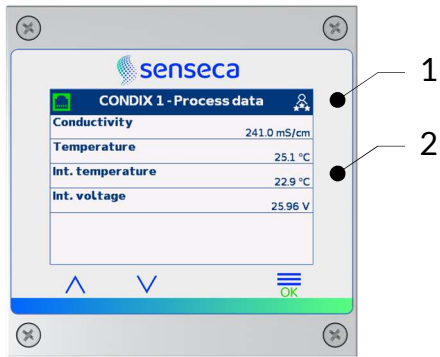


Figure 6-6 : Process data detail view (extended)

Item	Designation	Description
1	Measurement + title	Name of the sensor and serial number Designation of the extended operating page
2	Measured value	Designation and current value of the measurement data

Table 6-6 : Legend Process data detail view

6.3.2 Context menu

The context menu is available at any point during operation. Hold down the **Enter** key for more than **2 seconds** to open the context menu. The content of the context menu depends on the available device and active user profile. The device is selected in the work level by selecting it in the overview or entering it from the detailed view.

It is used to directly call up and exit operating levels and to execute functions at the operation level.



Figure 6-7 Context menu (shown here in the logged-in role "Specialist")

Available selection depending on the active user profile and sensor type.

Available function	Description	Observer	Maintenance	Specialist
Log in / Log out	Activate / Deactivate a user profile	●		
Configuration	Calling up the configuration level	-	Read-only	●
Restart Multicon	Restarting the MULTICON	-	●	●
Activate demo mode	Activates demo mode	-	-	●
System information	General	●		
<<<	Back to the work level	●		
Other sensor-specific functions such as calibration, reset, etc., if applicable.		-	●	●

Table 6-7 : Menu contents Context menu

6.3.3 Configuration level

The **configuration level** is used to view/set parameters or execute functions (such as calibration).

This level includes:

- MULTICON basic device
- Sensor type CONDIX, PHIX, or FLOW

The configuration level can be accessed via the context menu after logging in with a user profile. To view parameters, at least the **Maintenance** profile is required; to make changes, the **Specialist** profile is required.

Note Visualized Sensors

The content and range of parameters depend on the configured sensor type. Once these have been successfully detected, the display content is adjusted.

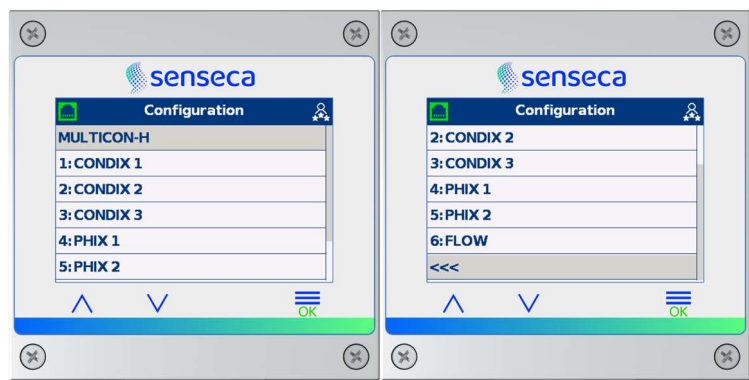


Figure 6-8 : Configuration level

Line	Designation	Description
1	MULTICON	Device parameters MULTICON
2-7	Channel 1-6	Device parameters of the configured sensor type
8	<<<	Back to context menu

Table 6-8 : Legend Configuration level

6.3.4 System information

The system information can be accessed via the System Information entry. The system information displays basic data about the MULTICON. The system information provides important data in the event of a support case or troubleshooting.

The system information can be accessed via the context menu.

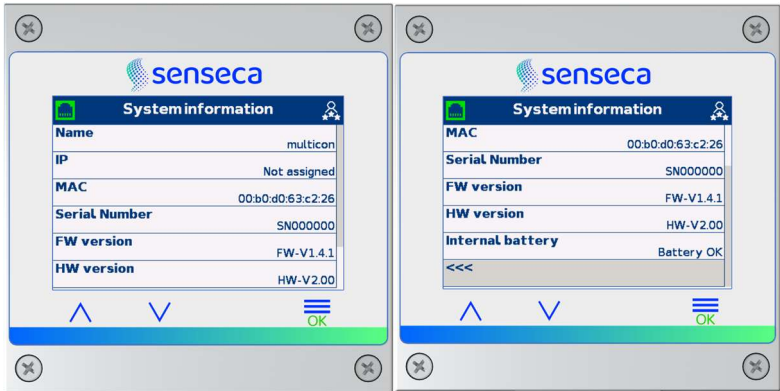


Figure 6-9 : System information

Line	Designation	Description
1	Name	Profinet device name of the MULTICON* Name of the measuring point
2	IP	IP address (Ethernet port)
3	MAC	MAC address of the measuring point (Ethernet port)
4	Serial	Serial number of the MULTICON
5	FW version	Firmware version of the MULTICON
6	HW version	Hardware version of the MULTICON
7	Internal battery	Status of the internal battery
8	<<<	Back to context menu

Table 6-9: Legend System information

* are assigned by the TIA Portal application. See separate **interface description Profinet**

6.3.4.1 Measurement designation

The **measurement designation** in the process data overview, the detail view, and the configuration can be set via SENSware (Parameter, Device / Function Tag).

In the factory default setting, the sensor name is supplemented by a sequential number. This allows individual system identifications to be customized on the display.

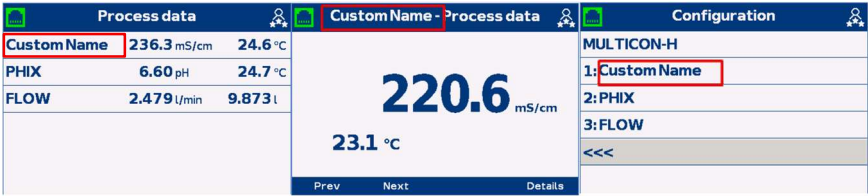


Figure 6-10 : Process data overview (left), detail view (center), configuration (right)

6.4 Basic operating procedures

6.4.1 Selecting a measurement for the detailed view

The following example illustrates how to select sensors.

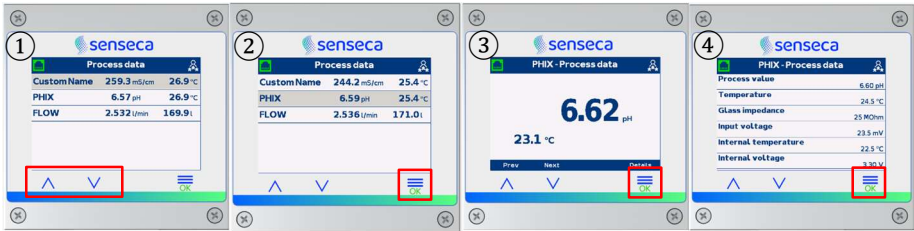


Figure 6-11 : Selecting sensors

1. Select a sensor in the process data overview using the **increment** and **decrement** buttons.
2. Confirm with the **Enter** button.
3. The detailed process data view for the sensor is displayed.
4. Press the **Enter** key to call up the advanced settings for the sensor.
5. Press the **Enter** key again to close the advanced settings.

6.4.2 Display of an active status message

If an error message is generated by the sensor, the faulty sensor is marked in red (2) in the process data overview (1). After selecting the faulty sensor (3), the error is displayed in plain text in the process data detail view (4).

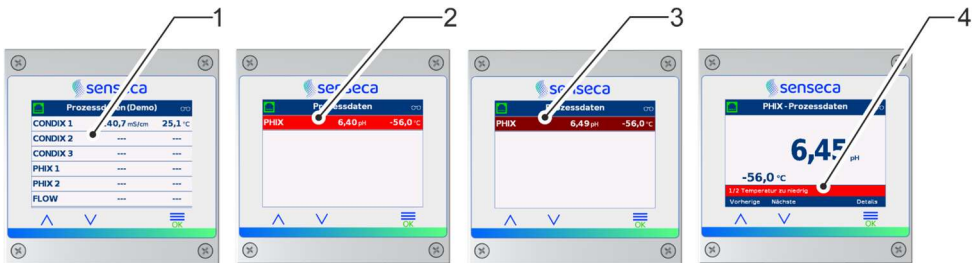


Figure 6-12 : Process data-sensor status

6.4.3 Changing parameter values

The parameters of the MULTICON can be adjusted in the active **Specialist** profile. Some values can be adjusted as numerical values within the range defined for them, while others can be selected from a list. The following explains how to change the brightness value in the MULTICON as an example.

Procedure for changing parameter values (starting in the Configuration menu):

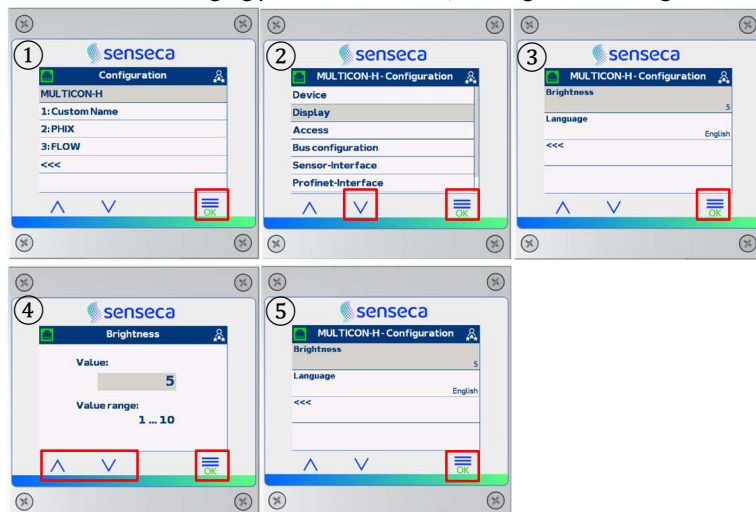


Figure 6-13 : MULTICON parameterization

1. Select the **MULTICON** configuration item and confirm with **Enter**.
2. Use the **increment/decrement** keys to select the parameter group whose parameters are to be configured. Confirm your selection with **Enter**.
 - a. Parameters from the class " " cannot be changed.
 - b. Parameters **from the Display, Access, Bus Configuration, Sensor, and Interface classes** can be changed.
3. Select the parameter and confirm with **Enter**.
4. Configure the parameters using the **increment/decrement** keys and confirm with **Enter**.
 - a. Configure by adjusting the value range in the corresponding step size.
 - b. Configure by selecting a list item.
5. Use the arrow symbols <<< to return to the higher level(s) if necessary.

6.4.4 Bus configuration

Digital sensors are assigned to channels (slots) via the **bus configuration**. The bus configuration consists of 6 value pairs for the 6 available slots. Each value pair consists of the sensor type and the sensor address. The following sensor types are available:

- " - - " **No function or unassigned**
- **FLOW** (for flow input)
- **CONDIR, PHIX** (connected digital sensors)

The sensor address is the Modbus address of the sensor in the range 1...247, to be set via SENSware on the digital sensor or by wiring the address lines.

Bus configuration procedure (starting in the *Configuration* menu):

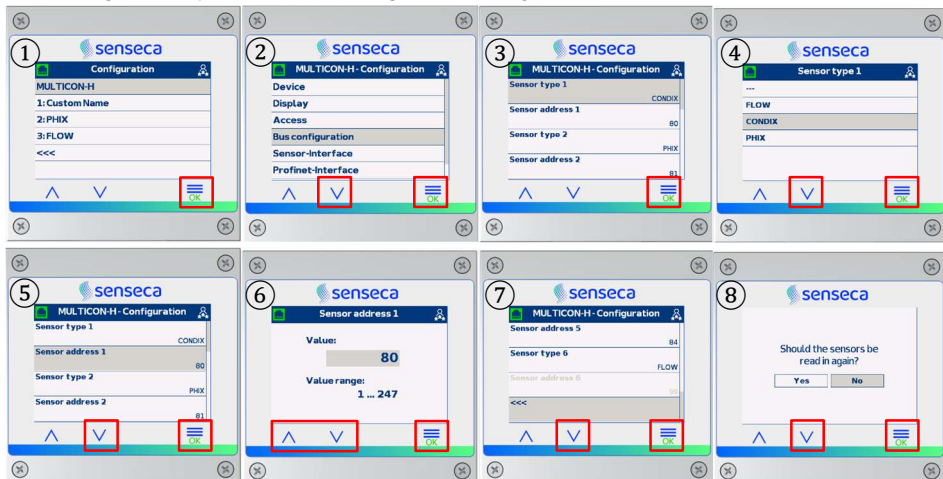


Figure 6-14 Bus configuration

1. Select the **MULTICON** configuration item and confirm with **Enter**.
2. Use the **increment/decrement** keys to select the **bus configuration** parameter group. Confirm your selection with **Enter**.
3. Select parameter **Sensor type 1...6** and confirm with **Enter**.
4. Use the **increment/decrement** keys to select the desired sensor type and confirm with **Enter**.
5. Use the **increment/decrement** keys to select the **Sensor address 1...6** parameter group. Confirm your selection with **Enter**.
6. Use the **Increment/Decrement** keys to enter the address of the sensor and confirm with **Enter**.
7. Return to the operation level using the arrow symbols <<< or the **context menu**.
8. Confirm the dialog for re-reading the sensors. The device will then restart.

Note Restriction for bus configurations

- When connecting 6 sensors, the **flow** "sensor" must be deactivated.
- Each **address** may only be assigned **once on the bus**.
- If a channel setting has been changed, the sensors must be reinitialized.

This is done by:

- Confirming the dialog "Should the sensors be read in again" at the end of the configuration
- Executing the "Restart device" command from the *context menu*
- Switching the power supply off and on again

6.4.5 Restart MULTICON

Restarts MULTICON without disconnecting the device from the power supply.



Caution! Impairment of system function

- Restarting the device will deactivate the output process data.
- This can impair the function of the system and lead to damage.

6.4.6 Executing functions

MULTICON and some digital sensors have executable functions. These functions are available in the context menu and can also be found in the device configuration .

Menu	Function
Context menu	Restart Multicon
	Activate demo mode
Context menu (Depending on sensor)	Delete totalizer, calibration, process, or temperature log
	Calibration
Configuration - MULTICON - Profinet interface	Profinet Factory reset

Table 6-10 : Permissions to perform actions

6.5 Parameterization

The configuration level consists of the parameters of the MULTICON and the parameters of the configured sensors. Similar parameters are grouped together into **parameter classes**. These represent the submenus of the devices at the configuration level.

The configuration level always contains the entry MULTICON as a minimum.

Further explanations of the specific sensor parameters (CONDIX and PHIX) can be found in the respective sensor-specific operating instructions.

Visibility and modifiability depend on the active user profile.

Device	Submenu
MULTICON + Sensor	Device
	Sensor interface
MULTICON	Display
	Access
	Bus configuration
	Profinet interface
Sensor type Slot 1...6	Sensor
	Calibration
	Clock*
	Logbook*

*Depending on sensor

Table 6-11 : Permissions for changing parameters

6.5.1 Parameter classes MULTICON

Device

Contains the factory-specific **identification data** of the device as well as customizable application, function, and **location identification** for the **MULTICON**.

Display

Contains the settings for **brightness** and **language**.

Access

Sets the access **passwords** for the user roles Maintenance or Specialist.

Bus configuration

The **channel settings** for **sensor type** and **address** are made in the bus configuration.

Sensor interface

Defines the interface parameters for the sensor interface **baud rate**, **parity**, and **stop bits**. This data must match the sensor settings.

Profinet interface

Enables the **IP** and **Profinet** device name to be reset to factory settings.

The assignment is made via the control system.

6.5.2 MULTICON parameters

The parameters available in MULTICON are explained below. They are organized according to parameter classes.

Submenu	Name	Default	Value range
MULTICON			
Device	Manufacturer	Senseca Germany GmbH	Fixed / ex works
	Manufacturer text	www.senseca.com	
	Product	MULTICON	
	Product ID	Item no.	
	Product	Control panel	
	Serial	SNxxxxx	
	Hardware version	HW-Vx.xx	
	Firmware version	FW-Vx.xx	
	Application identifier	***	31 characters, max.
	Function identifier (Display name MULTICON)	***	31 characters, max.
	Location identifier	***	31 characters, max.
Display	Brightness	5	0 ... 10
	Language	German	German, English, Chinese
Access	Maintenance	13	0 ... 9999
	Specialist	27	0 ... 9999
Bus configuration	Sensor type 1...6	---	CONDIX, PHIX, FLOW
	Sensor address 1...6	80	1 ... 247
Sensor interface	Baud rate	1920	600; 1200; 2400; 4800; 9600; 19200
	Parity	None	None, odd, even
	Stop bits	1	1; 2
Profinet interface	Reset to factory settings		Dialog: Yes/No

Table 6-12 : Parameter overview

6.5.3 Parameter classes Sensor type FLOW

Device

Contains the factory-specific **identification data** of the device as well as customizable application, function, and **location identification** for the **FLOW** sensor type.

Sensor

Contains the parameters that influence flow measurement and the optional totalizer function:

K factor

The calibration factor (KF) expresses the **pulse rate** of a sensor in pulses/liter and is determined by the sensor manufacturer. The flow rate is calculated using the following formula:

$$Q = KF * \frac{n}{t} = \frac{[l]}{[s]}; \quad KF = \frac{n}{V} = \frac{[pulses]}{[l]}$$

Example for transducers with frequency output, such as OMNI(PLUS) or LABO(PLUS): Let the flow rate Q be 5 l/s at a frequency of 10 Hz (10 pulses/s). After converting the above formula, the result is: $KF = 2 \frac{[impulse]}{[l]}$

Note Conversation of Units

- The unit of the K factor is given in liters. If the display is desired in m³, for example, the conversion must be made accordingly.

Refresh time

Defines the refresh time (**display interval**). When selecting this, it must be considered that at least one input pulse must occur within the display interval at regular intervals.

In other words, the refresh time determines the minimum measurement frequency.

The refresh time also determines the resolution of the measured value: the shorter the refresh time, the higher the resolution. This is particularly relevant at higher frequencies.

Flow unit

Defines the **unit** for displaying the **flow measurement value** and the related parameters.

Unit totalizer

Defines the unit in which the total volume flow is displayed.

Clear totalizer

Resets the value of the measured total volume flow.

- Yes** The value of the total volume flow is reset.
- No** The value of the total volume flow is not reset.

6.5.4 Parameter Sensor type FLOW

Submenu	Name	Default	Value range
FLOW - Sensor type			
Device	Manufacturer	Senseca Germany GmbH	Fixed / ex works
	Manufacturer text	www.senseca.com	
	Product	Flow	
	Product ID	Item no.	
	Product text	Flow input	
	Serial	SNxxxxx	
	Hardware version	HW-Vx.xx	
	Firmware version	FW-Vx.xx	
	Application identifier	***	31 characters, max.
	Function identifier (Display name flow sensor)	***	31 characters, max.
	Location identifier	***	31 characters, max.
Sensor	K factor	1.0 pulses/l	0.0 ... 99999.0
	Refresh time	1.00 s	0.10 ... 10.00
	Totalizer		Inactive, active
	Flow unit	l/min	l/sec; l/min; l/h; m ³ /h
	Unit Totalizer	l	L; m ³
	Clear totalizer		Dialog: Yes/No

Table 6-13: Parameter Sensor type FLOW

6.5.5 PC configuration

As an alternative to front operation, the product can also be parameterized via the USB-C interface using the SENSware configuration software, and the sensor names of the connected sensors can be customized.

Access is via the internal USB-C interface:

1. Open the housing cover by loosening the four Philips screws on the front.
2. Connect your PC with a standard USB-X to USB-C cable.
3. Start SENSware on your PC.

Note USB-C powering

The device can also be supplied with auxiliary power via the USB interface, although this is limited. The externally connected sensors are then switched off.

The USB interface must meet at least the USB2 standard (supply up to 500mA).

Note Configuration tool

Further information on software and programming adapters can be found on our homepage at <https://www.senseca.com/> and in the operating instructions for the SENSware configuration software.

6.6 Fieldbus integration

Data can be transferred to the higher-level control or management system via the Ethernet interface. The electrical connection is made via the M12 connector on the underside of the device.

Further information can be found in the corresponding Profinet interface description Profinet.

6.7 Demo mode

The demo mode allows the MULTICON to be demonstrated for training purposes, for example, without external sensors being connected. In demo mode, the message "**Demo**" is displayed in the title bar. In this mode, simulated sensor readings are displayed, and the sensors can be configured as usual.

The setting is made in the configuration level in the **MULTICON** menu item in the **Specialist** authorization level in the **Access** parameter class or from the **context menu**.

After setting the value, MULTICON must be restarted.

Warning! Simulated measured values

This mode can affect the operation of the system. If the device is operated via Profinet, no message is displayed to indicate that the measured values are simulated.

- The demo mode must be deactivated again after the demonstration.

7 Maintenance

7.1 Operating and maintenance instructions

No cleaning or maintenance is required during normal operation.

7.2 Repair

On-site repair is not possible for this product.

Note

Enclose the completed return form with the product, which you can find under Downloads on the website <https://www.senseca.com/>.

8 Troubleshooting

8.1 Errors and troubleshooting

Display	Meaning	Remedy
Display remains dark	The power supply to the MULTICON is interrupted or there is a technical defect.	▶ Check the power supply to the MULTICON.
Parameters are not displayed	- There is a problem with the exchange of parameters. - Missing authorization in the active user profile	▶ Check the connection ▶ Check the bus configuration. ▶ Restart the MULTICON. ▶ Check the connected sensors for functionality. ▶ Activate the necessary user profile
Sensor data is displayed as dashes; a status icon is displayed instead of the sensor designation. See also: <u>Fehler! Verweisquelle konnte nicht gefunden werden.Fehler! Verweisquelle konnte nicht gefunden werden.</u>	The sensor data cannot be retrieved because communication between the sensor and the MULTICON is disrupted.	▶ Check the connection ▶ Check the bus configuration. ▶ Check that the connected sensors are working properly. ▶ Restart the MULTICON.
Parameters cannot be changed	- This is a read-only parameter. - Missing authorization in the active user profile	▶ Adjust parameterization via SENSware, Profinet, or mode. ▶ Activate the necessary user profile
Sensor data in the process data overview is highlighted with a red bar.	The red bar indicates existing sensor errors. For details on the error messages, please refer to the sensor manual.	▶ Check the number and type of error messages in the process data detail view. ▶ Check the affected sensors for functionality. ▶ Restart the MULTICON.

Display	Meaning	Remedy
No transmission of values via the Profinet interface See also: 6.2.1Profinet symbol .	• Communication not active. • Profinet symbol does not light up/flash green.	▶ LED white: Check the physical connection and any active filters or firewalls. ▶ Yellow LED: Error in the application. Check the device settings in your TIA application. ▶ Red LED: Error in the parameterization. Check the parameterization in your TIA application.
No USB connection to the PC possible	• Required USB VCP driver not installed or deactivated • Cable defective. • USB interface overloaded.	▶ See the separate documentation for the SENSware PC software ▶ Replace cable ▶ Connect an external auxiliary power supply to the MULTICON.

Table 8-1 : Troubleshooting

8.2 Replacing sensors

It may be necessary to disconnect the sensor from the bus for calibration in the laboratory, cleaning, or replacement.

If a sensor is disconnected from the bus, it is marked as "inactive" in the sensor overview. Once the sensor is reconnected, it is automatically reactivated.

When changing sensors within the system or replacing them with a spare sensor, care must be taken to ensure that the sensor type and sensor address match the previous measuring point (see bus configuration).

The replacement is particularly efficient if the parameters of the sensor interface are used in their factory settings and the addresses are assigned via the address lines.

When replacing sensors, note any application-specific adjustments to the sensor parameters that may differ from the factory settings.

9 Disposal



When disposing of the product, ensure that the product components and packaging are separated and recycled. The legal regulations and guidelines valid at the time must be observed.

Note

The product must not be disposed of in the residual waste bin. If disposing of the product, take it to a municipal collection point where it will be transported safely to the disposal company in accordance with the requirements of hazardous goods legislation. Otherwise, return it to us with sufficient postage. We will then ensure that it is disposed of properly, professionally, and in an environmentally friendly manner.

10 Technical data

Category	Description
Power supply	
Auxiliary voltage	10...30V DC
Power consumption	<5VA
Insulation coordinates	Auxiliary voltage + input / interface
Compliance	CE
Ambient conditions	
Ambient/storage temperature	-10 °... +60°C
Max. operating altitude	≤2000 m
Flow input	
Type	TTL (PNP / push-pull)
Input frequency	0.1/10...1000 Hz
Voltage range	10...30V
Input resistance	40 kOhm
Switching thresholds:	Low <0.9 V High >2.1 V
Input for digital sensors	
Transmitter power supply	24V DC, max. 300 mA (short-circuit proof)
Interface	RS485
Protocol	Modbus RTU
Topology	Line architecture
Number of sensors	Max. 6 in any combination
Profinet	
Connection	Ethernet 1 (M12x1), 4-pin Single wire max. 100 Mb/s
Protocol	Profinet IO (RT)
Available values	Process values, diagnostic data
Topology	Terminal device (1 port)

Category	Description
Display	
Type	TFT color display
Resolution	480 x 320 p
Housing	
Installation	
- Field installation	Via flush-mounted holes
- Panel installation	Cutout, DIN 96 ² (seal and clamping screws included)
Material	
- Housing	Glass fiber reinforced polyamide (PA6-GF/GK 15/15)
- Front foil	Front foil Polyester
Dimensions, WxHxD	98x98x66mm (external dimensions) 92x92x42mm (installation dimensions)
Weight	max. 360g
Protection class	IP65
Electrical connection	
Connection	Spring-loaded terminals 2.5 mm ² flexible, 4.0 mm ² wire or pluggable connection cable
Cable entry	1xM12x1 plug (bus) 1xM20 cable gland (clamping range 6 - 12mm) with multiple sealing insert 2x6mm (sensors, auxiliary voltage)

Table 10-1 : Technical data – MULTICON

10.1 Dimensions

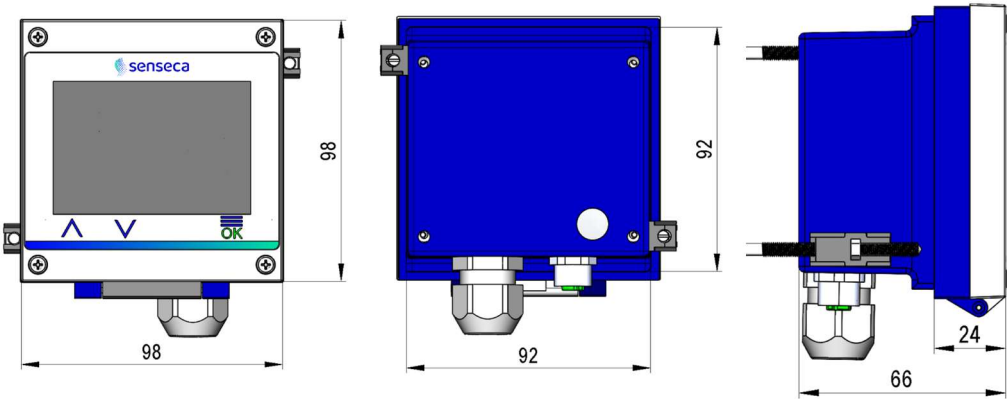


Figure 10-1 : Dimensions

11 Order code

MULTICON	1.	2.	3.	4.	5.	6.	7.	
1. Execution								
	H							6-channel evaluation device
2. Slot C								
		RS						Connection for digital sensors or a flow sensor
3. Slot B								
			00					Not assigned
4. Power supply								
				24DI				24V DC (10...30V DC)
5. Fieldbus								
					PN			Profinet
6. Options								
						00		None
7. Documentation included in delivery								
							00	Not included
							DE	German operating instructions
							EN	English operating instructions

Table 11-1: Order code

11.1 Digital sensors

Type	Description
CONDIX4613	Digital conductivity measuring cell, compact design
CONDIX4213	Digital conductivity measuring cell, for PVC-U fittings
CONDIX4623	Digital conductivity measuring cell, for increased process requirements
PHIX-S8	Digital head transmitter for pH/redox electrodes with S8 plug-in head
PHIX-VP	Digital head transmitter for pH electrodes with VP plug-in head and integrated temperature measurement

Table 11-2 : Digital sensors

Note
Digital sensors from other manufacturers with RS485, Modbus RTU interface can be integrated into the system on request.

11.2 Spare parts and accessories

Below you will find a selection of spare parts and accessories for this product.

Type	Description
SENSware	Configuration software

Table 11-3 : Spare parts and accessories

12 Service

12.1 Manufacturer

If you have any questions, please do not hesitate to contact us: www.senseca.com.

12.2 Repair

Defective products are repaired quickly and competently in our service center.

Note

Please enclose the completed return form with the product, which you can find in the information center on the website www.senseca.com.

Notes

senseca.com



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