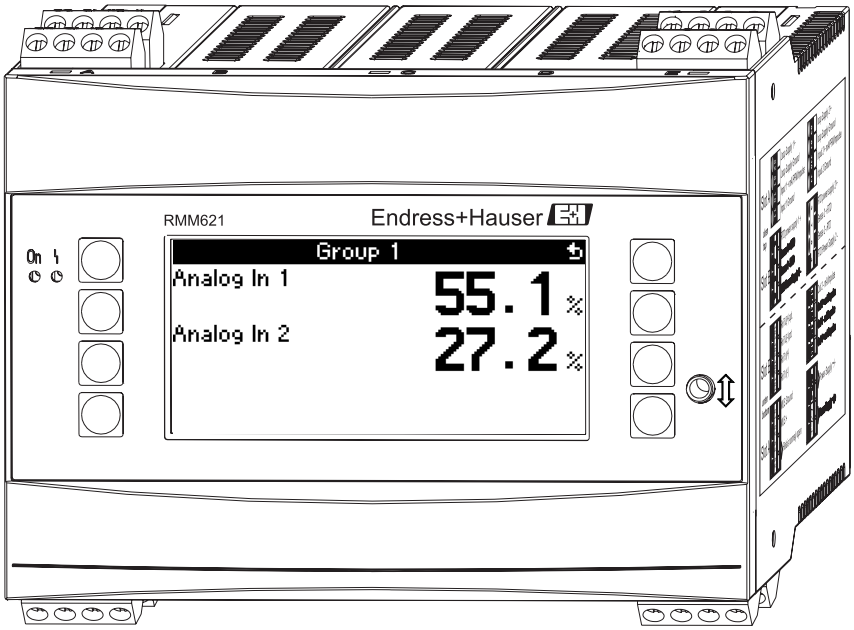
Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Operating Instructions

RMM621

Pump Manager



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SW version
1.00.00

Endress+Hauser
People for Process Automation

Brief operating instructions

For quick and easy commissioning:

Safety instructions	→ Page 4
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Quick start via the navigator to device configuration for standard operation. Device configuration – explanation and use of all configurable device functions with the associated value ranges and settings. Application example – configuration of the device.	

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1 Safety instructions

Safe operation of the Pump Manager is only guaranteed if these Operating Instructions have been read and the safety instructions have been observed.

1.1 Designated use

The Pump Manager is used to control pumps. The input values and calculated values can be stored in the device and evaluated at a later time either at the device or by means of an external system. There are various ways of establishing the connection to this external system: RS232/485, connection via Ethernet, OPC, M-Bus or Mod-Bus.

- The device is seen as accessory equipment and may not be installed in hazardous areas.
- The manufacturer does not accept liability for damage caused by improper or non-designated use. The device may not be converted or modified in any way.
- The device is designed for use in industrial environments and may only be operated in an installed state.

1.2 Installation, commissioning and operation

This device has been safely built with state-of-the-art technology and meets the applicable requirements and EU Directives. The device can be a source of application-related danger if used improperly or other than intended. Installation, wiring, commissioning and maintenance of the device must only be carried out by trained technical personnel. Technical personnel must have read and understood these Operating Instructions and must adhere to them. The information in the electrical wiring diagrams (see Section 4 'Wiring') must be observed closely.

1.3 Operational safety

Technical improvement
The manufacturer reserves the right to adapt technical details to the most up-to-date technical developments without any special announcement. Contact your local sales center for information about the current state of and possible extensions to the Operating Instructions.

1.4 Return

For a return, e.g. in case of repair, the device must be sent in protective packaging. The original packaging offers the best protection. Repairs must only be carried out by your supplier's service organization.

Note!
When sending for repair, please enclose a note with a description of the error and the application.

1.5 Notes on safety conventions and icons

The safety instructions in these Operating Instructions are labeled with the following safety icons and symbols:

Warning!
This symbol draws attention to activities or procedures that can lead to injuries to persons, to a safety risk or to destruction of the device if not carried out properly.

Caution!
This symbol draws attention to activities or procedures that can lead to defective operation or to destruction of the device if not carried out properly.

Note!
This symbol draws attention to activities or procedures that have an indirect effect on operation, or can trigger an unforeseen device reaction if not carried out properly.

2 Identification

2.1 Device designation

2.1.1 Nameplate

The correct device?
Please compare the order code on the nameplate of the device to the code on the delivery note.

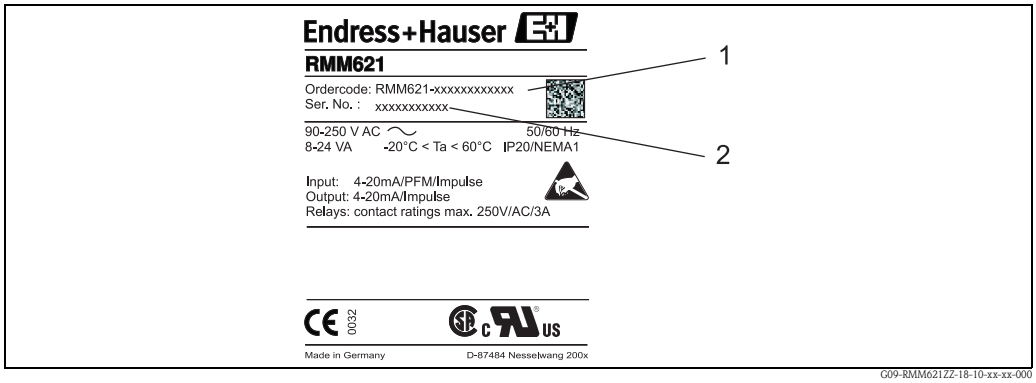


Fig. 1: RMM621 nameplate

1) Order code
2) Serial number

2.2 Scope of delivery

The scope of delivery of the device comprises:
- Pump Manager for top-hat rail mounting
- Brief Operating Instructions in numerous languages in paper form
- Operating Instructions on CD-ROM
- Delivery note
- CD-ROM with PC configuration software and interface cable RS232 (optional)
- Remote display for panel mounting (optional)
- Extension cards (optional)

Note!
Please note the device accessories in the 'Accessories' Section.

2.3 Certificates and approvals

CE mark, declaration of conformity

The device has been constructed and tested to state-of-the-art operational safety standards and left the factory in perfect condition as regards technical safety.
The device meets the relevant standards and directives as per IEC 61010 "Safety requirements for electrical equipment for measurement, control and laboratory use".
Thus, the device described in these Operating Instructions meets the legal requirements of the EU Directives. The manufacturer confirms successful testing of the device by affixing to it the CE mark.

3 Installation

3.1 Installation conditions

The permitted ambient temperature (see "Technical Data" Section) must be observed when installing and operating. The device must be protected against the effects of heat.

3.1.1 Dimensions

Observe the device length of 135 mm (5.31 in) (corresponds to 8TE). More dimensions can be found in the "Technical Data" Section.

3.1.2 Mounting location

Top-hat rail mounting as per IEC 60715 in the cabinet. The mounting location must be free from vibrations.

3.1.3 Orientation

No restrictions.

3.2 Installation instructions

First remove the plug-in terminals from the device slots. Now snap the housing onto the top-hat rail by first hanging the device on the top-hat rail and then pressing it down gently until it engages (→ Fig. 2, items 1 and 2).

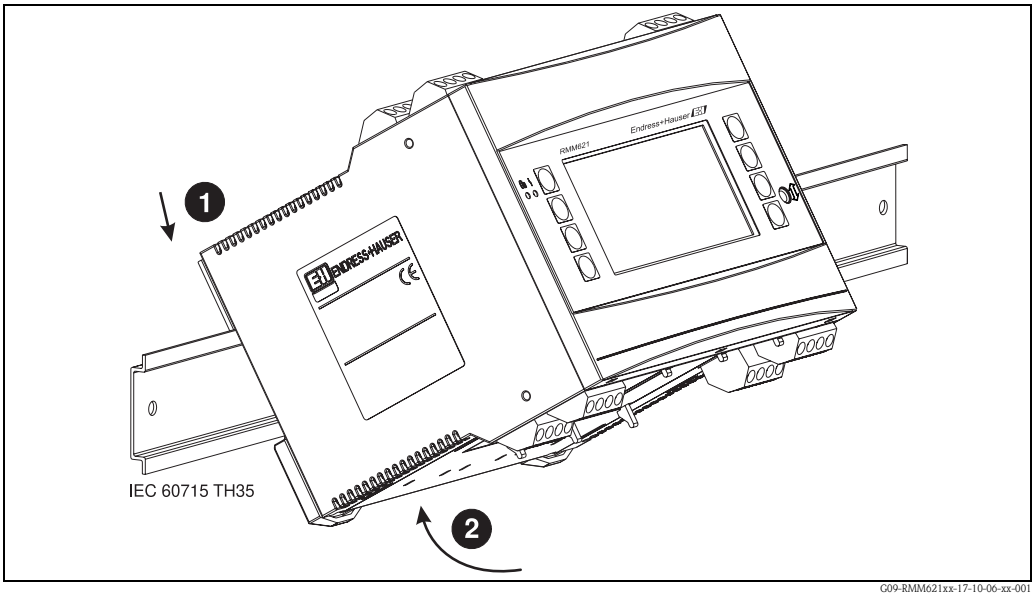


Fig. 2: Mounting device on top-hat rail

3.2.1 Installing extension cards

You can equip the device with various extension cards. A maximum of three slots are available in the device for this. The slots for the extension cards are marked with B, C and D (→ Fig. 3) on the device.

1. Make sure that the device is not connected to the power supply when installing and removing an extension card.
2. Remove the blanking cover from the slot (B, C or D) of the basic unit by pressing together the catches on the bottom of the energy manager (see Fig. 3, item 2), while at the same time pressing in the catch on the rear of the housing (e.g. with a screwdriver) (see Fig. 3, item 1). Now you can pull the blanking cover up out of the basic unit.
3. Insert the extension card into the basic unit from above. The extension card is not correctly installed until the catches on the bottom and rear of the device (see Fig. 3, items 1 and 2) lock into place. Ensure that the input terminals of the extension card are on top and the connection terminals are pointing to the front, as with the basic unit.
4. The device automatically recognizes the new extension card once the device has been correctly wired and has been commissioned (see 'Commissioning' Section).

Note!
If you remove an extension card and do not replace it with another card, you must seal the empty slot with a blanking cover.

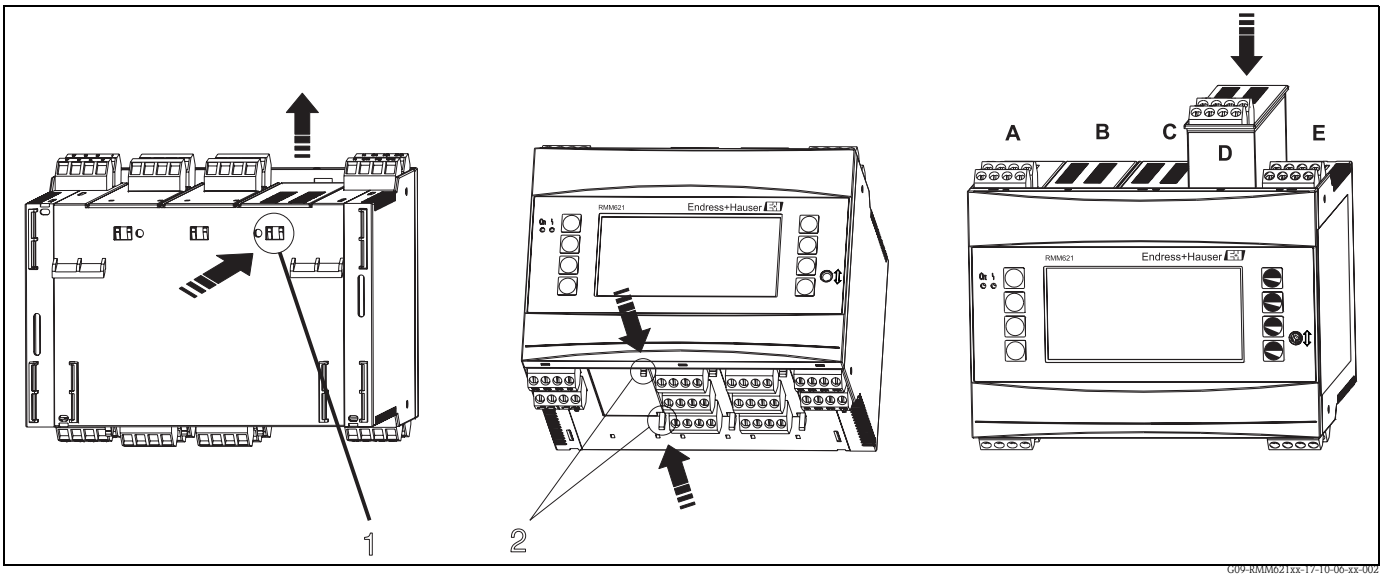


Fig. 3: Installing an extension card (example)

Item 1: catch on the rear of the device
Item 2: catches on the bottom of the device
Items A - E: identifier for slot assignment

3.3 Post-installation check

When using extension cards, ensure that the cards are sitting correctly in the device slots.

4 Wiring

4.1 Quick wiring guide

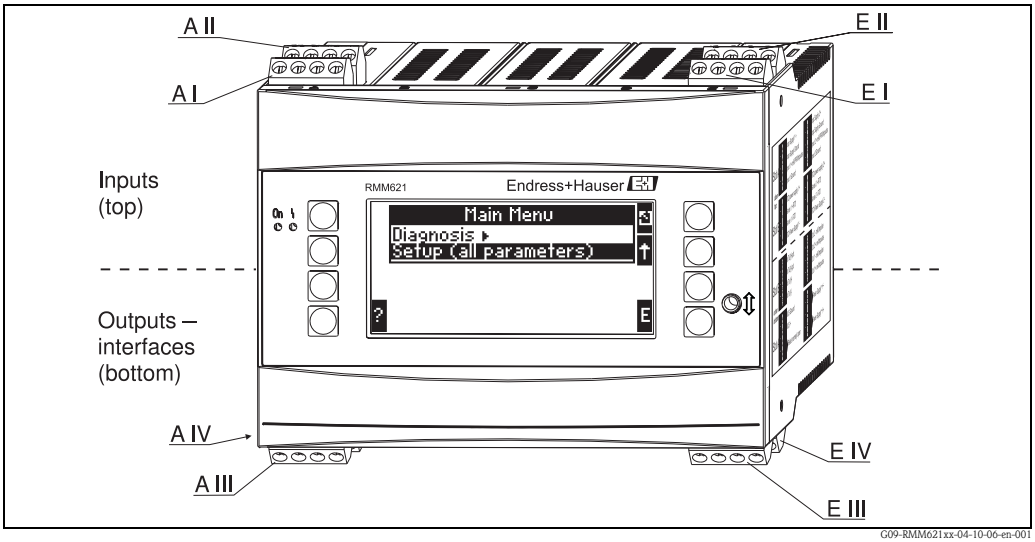


Fig. 4: Slot assignment (basic unit)

Terminal assignment

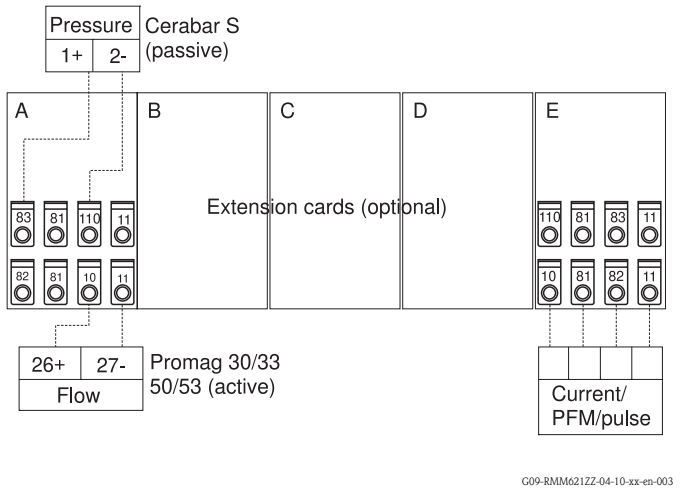
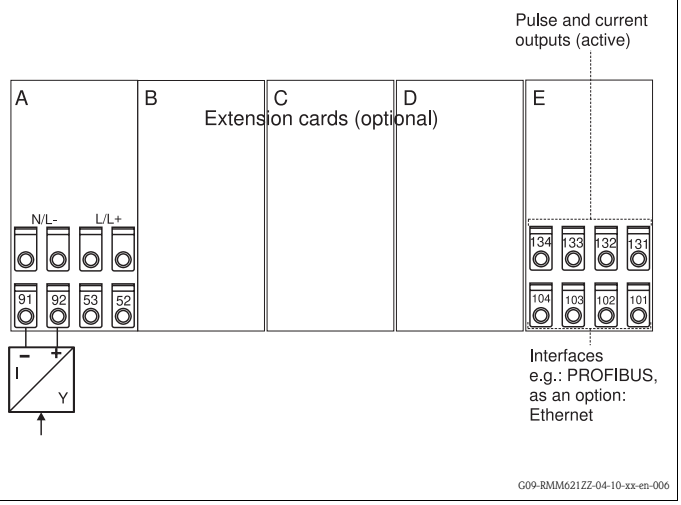
Terminal (item no.)	Terminal assignment	Slot	Input
10	+ 0/4 to 20 mA/PFM/pulse input 1	A top, front (**A I**)	Current/PFM/pulse input 1
11	Ground for 0/4 to 20 mA/PFM/pulse input		
81	Sensor power supply ground 1		
82	24 V sensor power supply 1		
110	+ 0/4 to 20 mA/PFM/pulse input 2	A top, rear (**A II**)	Current/PFM/pulse input 2
11	Ground for 0/4 to 20 mA/PFM/pulse input		
81	Sensor power supply ground 2		
83	24 V sensor power supply 2		
10	+ 0/4 to 20 mA/PFM/pulse input 1	E top, front (**E I**)	Current/PFM/pulse input 1
11	Ground for 0/4 to 20 mA/PFM/pulse input		
81	Sensor power supply ground 1		
82	24 V sensor power supply 1		
110	+ 0/4 to 20 mA/PFM/pulse input 2	E top, rear (**E II**)	Current/PFM/pulse input 2
11	Ground for 0/4 to 20 mA/PFM/pulse input		
81	Sensor power supply ground 2		
83	24 V sensor power supply 2		
Terminal (item no.)	**Terminal assignment**	**Slot**	**Output - interface**
101	+ RxTx 1	E bottom, front (**E III**)	RS485
102	- RxTx 1		
103	+ RxTx 2		RS485 (optional)
104	- RxTx 2		

Terminal (item no.)	Terminal assignment	Slot	Input
131	+ 0/4 to 20 mA/pulse output 1	E bottom, rear (**E IV**)	Current/pulse output 1
132	- 0/4 to 20 mA/pulse output 1		
133	+ 0/4 to 20 mA/pulse output 2		Current/pulse output 2 Note! Ethernet, if the Ethernet option has been ordered.
134	- 0/4 to 20 mA/pulse output 2		
52	Relay Common (COM)	A bottom, front (**A III**)	Relay 1
53	Relay Normally Open (NO)		
91	Sensor power supply ground		Additional sensor power supply
92	+ 24 V sensor power supply		
L/L+	L for AC L+ for DC	A bottom, rear (**A IV**) Power supply	
N/L-	N for AC L- for DC		

Note!
The inputs in the same slot are not galvanically isolated. There is a separation voltage of 500 V between the inputs and outputs mentioned above in different slots. Terminals of the same name are jumpered internally (terminals 11 and 81).

4.2 Connecting the measuring unit

Caution!
Do not install or wire the device when it is connected to the power supply. Not conforming with this can lead to the destruction of electronic components.

Connection overview, top (inputs)	Connection overview, bottom (outputs, interfaces)
	

4.2.1 Power supply connection

Caution!
- Before wiring the device, ensure that the supply voltage corresponds to the specification on the nameplate.
- For the 90 to 250 V AC version (power supply connection), a switch marked as a separator, as well as an overvoltage organ (rated current = 10 A), must be fitted in the supply line near the device (easy to reach).

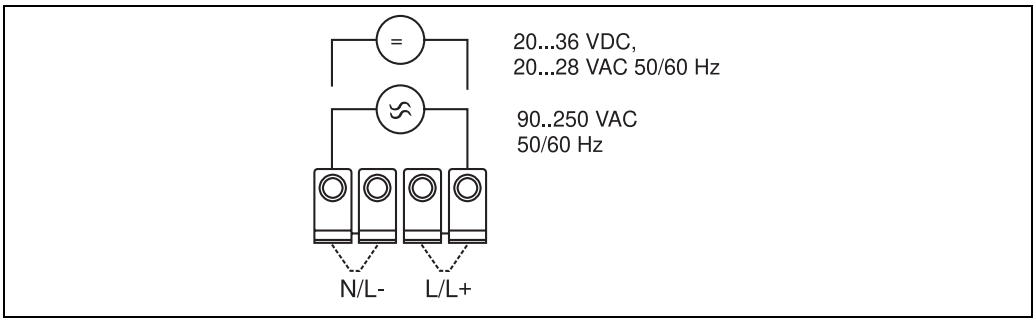


Fig. 5: Power supply connection

4.2.2 Connecting external sensors

Note!
Active and passive sensors with analog, PFM or pulse signal can be connected to the device.

Active sensors

Connection method for an active sensor (i.e. external power supply).

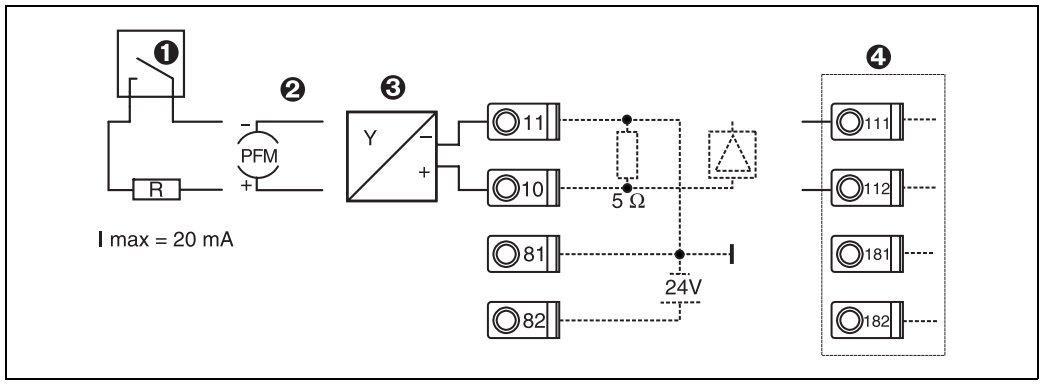


Fig. 6: Connecting an active sensor, e.g. to input 1 (Slot A I).

Item 1: pulse signal
Item 2: PFM signal
Item 3: 2-wire transmitter (4 to 20 mA)
Item 4: active sensor connection, e.g. optional Universal extension card in slot B (slot B I, → Fig. 10)

Passive sensors

Connection method for sensors which are supplied with power by means of the sensor power supply integrated in the device.

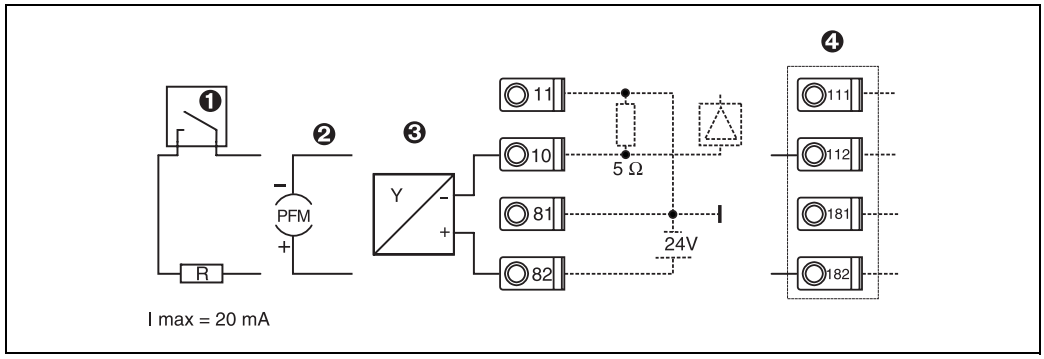


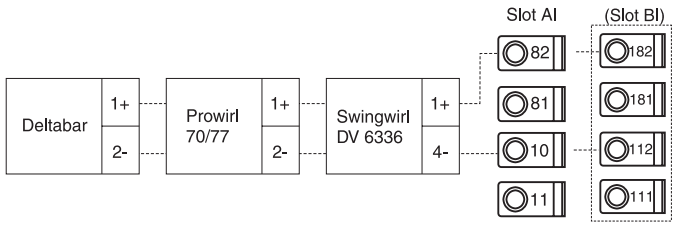
Fig. 7: Connecting a passive sensor, e.g. to input 1 (slot A I).

Item 1: pulse signal
Item 2: PFM signal
Item 3: 2-wire transmitter (4-20 mA)
Item 4: passive sensor connection, e.g. optional Universal extension card in slot B (slot B I, → Fig. 10)

E+H-specific devices

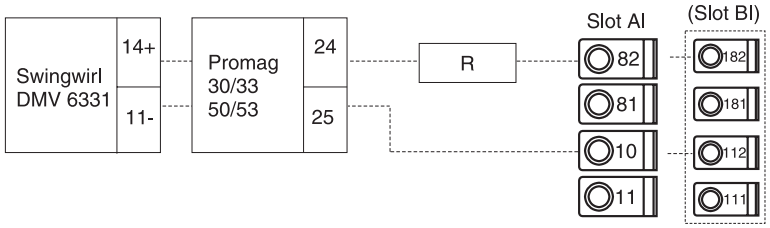
Flow sensors with PFM output

Note!
Set the Prowirl measuring device to PFM output (→ FU 20: ON, PF)

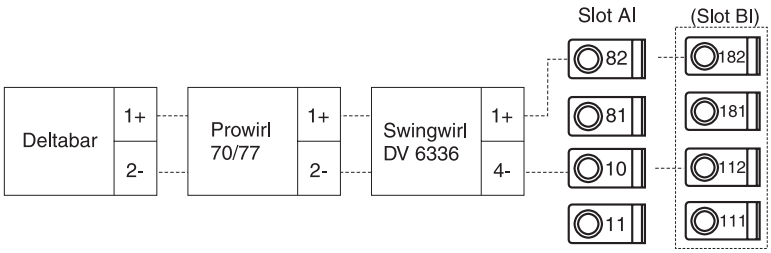


Flow sensor with open collector output

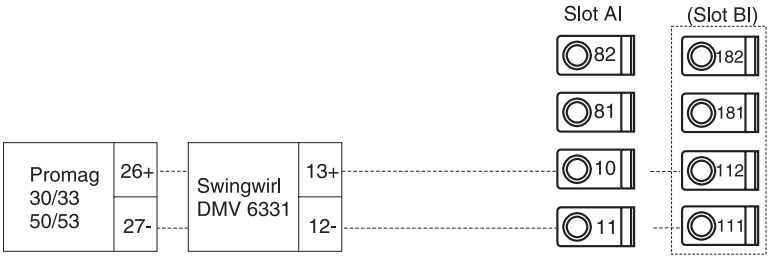
Note!
Select an appropriate dropping resistor R, so that I_{max} = 20 mA is not exceeded.



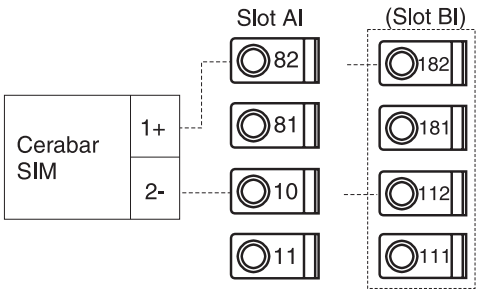
Flow sensor with passive current output (4 to 20 mA)



Flow sensor with active current output (0/4 to 20 mA)



Pressure sensor with passive current output (4 to 20 mA)



4.2.3 Connection of outputs

The device has two galvanically isolated outputs (or Ethernet connection), which can be configured as an analog output or active pulse output. In addition, an output for connecting a relay and transmitter power supply are available. The number of outputs increases accordingly when the extension cards are installed (see 'Extension card connection').

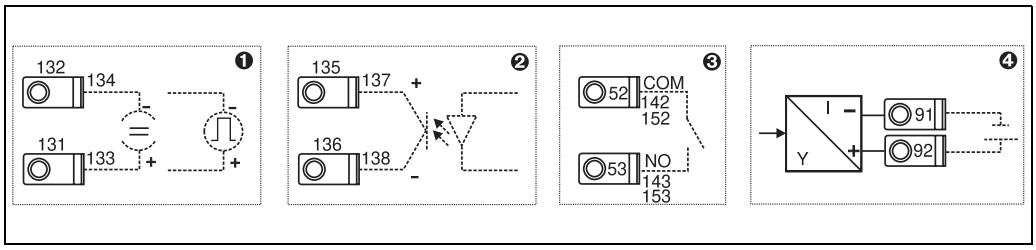


Fig. 8: Connection of outputs

Item 1: pulse and current outputs (active)
Item 2: passive pulse output (open collector)
Item 3: relay output (NO), e.g. slot A III (slot BIII, CIII, DIII on optional extension card)
Item 4: transmitter power supply (transmitter power supply unit) output

Interface connection

- **RS232 connection:** The RS232 is contacted by means of the interface cable and the jack socket on the front of the housing.
- **RS485 connection**
- **Optional: additional RS485 interface**
- **Plug-in terminals 103/104:** The interface is only active as long as the RS232 interface is not used.
- **PROFIBUS connection:** Optional connection of Pump Manager to PROFIBUS DP via the serial RS485 interface with the external module HMS AnyBus Communicator for Profibus (see 'Accessories').
- **Optional: Ethernet connection**
- **M-Bus connection:** Connection of the RMM621 Pump Manager with an M-Bus system.

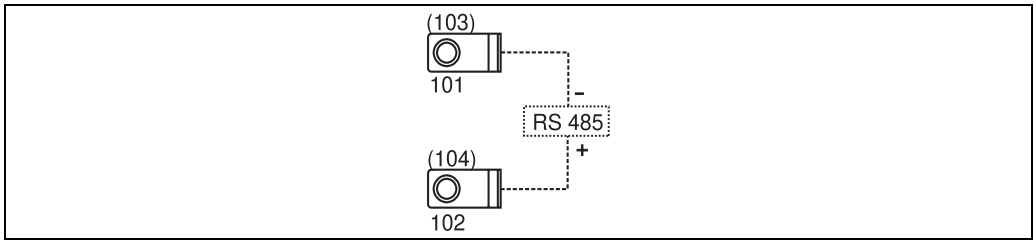


Fig. 9: Interface connection

4.2.4 Extension card connection

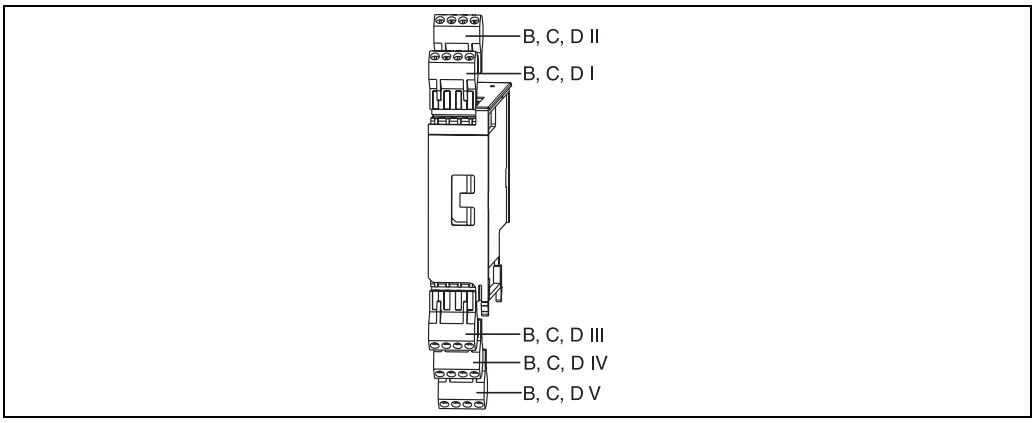


Fig. 10: Extension card with terminals

Terminal assignment of Universal extension card (RMM621A-UA); with intrinsically safe inputs (RMM621A-UB)

Terminal (item no.)	Terminal assignment	Slot	Input and output
182	24 V sensor power supply 1	B, C, D top, front (**B I, C I, D I**)	Current/PFM/pulse input 1
181	Sensor power supply ground 1		
112	+ 0/4 to 20 mA/PFM/pulse input 1		
111	Ground for 0/4 to 20 mA/PFM/pulse input		
183	24 V sensor power supply 2	B, C, D top, rear (**B II, C II, D II**)	Current/PFM/pulse input 2
181	Sensor power supply ground 2		
113	+ 0/4 to 20 mA/PFM/pulse input 2		
111	Ground for 0/4 to 20 mA/PFM/pulse input		
142	Relay 1 Common (COM)	B, C, D bottom, front (**B III, C III, D III**)	Relay 1
143	Relay 1 Normally Open (NO)		
152	Relay 2 Common (COM)		Relay 2
153	Relay 2 Normally Open (NO)		
131	+ 0/4 to 20 mA/pulse output 1	B, C, D bottom, center (**B IV, C IV, D IV**)	Current/pulse output 1 active
132	- 0/4 to 20 mA/pulse output 1		
133	+ 0/4 to 20 mA/pulse output 2		Current/pulse output 2 active
134	- 0/4 to 20 mA/pulse output 2		
135	+ pulse output 3 (open collector)	B, C, D bottom, rear (**B V, C V, D V**)	Passive pulse output
136	- pulse output 3		
137	+ pulse output 4 (open collector)		Passive pulse output
138	- pulse output 4		

Terminal assignment of Digital extension card (RMM621A-DA); with intrinsically safe inputs (RMM621A-DB)

Terminal (item no.)	Terminal assignment	Slot	Input and output
81	E1	B, C, D top, front (**B I, C I, D I**)	Digital inputs E1 to 3
83	E2		
85	E3		
82	Signal ground E1 to 3		
91	E4	B, C, D top, rear (**B II, C II, D II**)	Digital inputs E4 to 6
93	E5		
95	E6		
92	Signal ground E4 to 6		
142	Relay 1 Common (COM)	B, C, D bottom, front (**B III, C III, D III**)	Relay 1
143	Relay 1 Normally Open (NO)		
152	Relay 2 Common (COM)		Relay 2
153	Relay 2 Normally Open (NO)		
145	Relay 3 Common (COM)	B, C, D bottom, center (**B IV, C IV, D IV**)	Relay 3
146	Relay 3 Normally Open (NO)		
155	Relay 4 Common (COM)		Relay 4
156	Relay 4 Normally Open (NO)		
242	Relay 5 Common (COM)	B, C, D bottom, rear (**B V, C V, D V**)	Relay 5
243	Relay 5 Normally Open (NO)		
252	Relay 6 Common (COM)		Relay 6
253	Relay 6 Normally Open (NO)		

Note!
The current/PFM/pulse inputs or the RTD inputs in the same slot are not galvanically isolated. There is a separation voltage of 500 V between the inputs and outputs mentioned above in different slots. Terminals of the same name are jumpered internally. (Terminals 111 and 181)

4.2.5 Connecting remote display/operating unit

Functional description

The remote display is an innovative addition to the powerful RMx621 top-hat rail devices. The user has the opportunity to optimally install the arithmetic unit to suit the installation and mount the display and operating unit in a user-friendly way at easily accessible locations. The display can be connected to both a top-hat rail device without, as well as a top-hat rail device with, an installed display/operating unit. A 4-pin cable is supplied to connect the remote display with the basic unit; other components are not necessary.

Note!
Only one display/operating element can be attached to a top-hat rail device and vice versa (point-to-point).

Installation/dimensions

Mounting instructions:
- The mounting location must be free from vibrations.
- The permitted ambient temperature during operation is –20 to +60°C.
- Protect the device against the effects of heat.

Procedure for panel mounting:
1. Provide a panel cutout of 138+1.0 x 68+0.7 mm (as per DIN 43700), the installation depth is 45 mm.
2. Push the device with the sealing ring through the panel cutout from the front.
3. Hold the device horizontal and, applying uniform pressure, push the securing frame over the rear of the housing against the panel until the retaining clips engage. Make sure the securing frame is seated symmetrically.

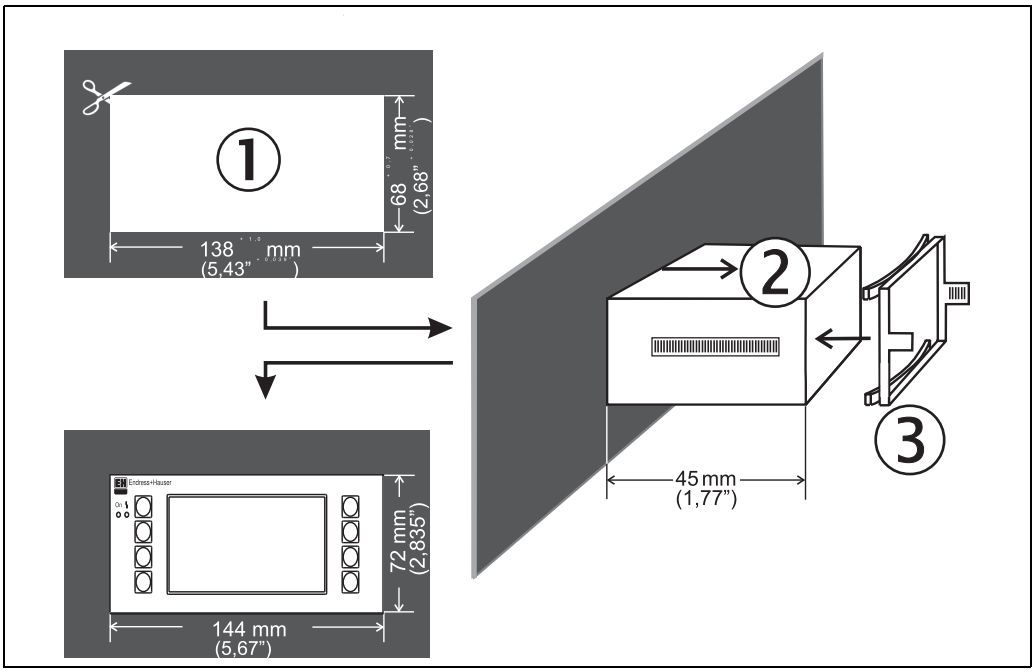


Fig. 11: Panel mounting

Wiring

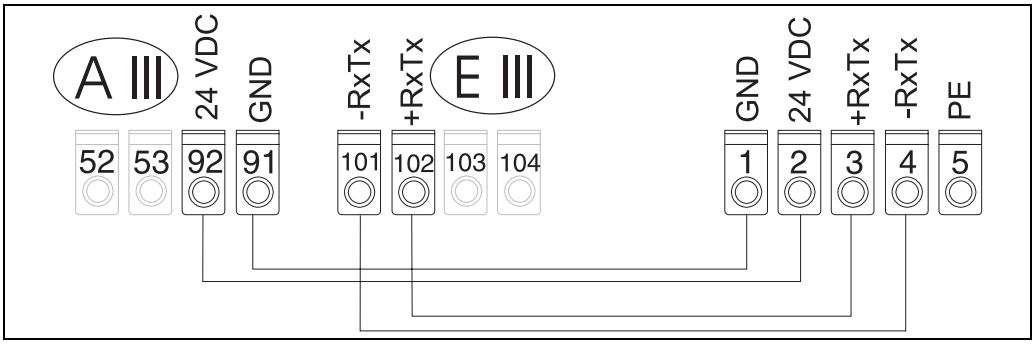


Fig. 12: Terminal plan of remote display/operating unit

The remote display/operating unit is connected directly to the basic unit with the cable supplied.

4.3 Post-connection check

After completing the device's electrical installation, carry out the following checks:

Device status and specifications	**Notes**
Is the device or cable damaged (visual inspection)?	-
Electrical connection	**Notes**
Does the supply voltage match the information on the nameplate?	90 to 250 V AC (50/60 Hz) 20 to 36 V DC 20 to 28 V AC (50/60 Hz)
Are all of the terminals firmly engaged in their correct slots? Is the coding on the individual terminals correct?	-
Are the mounted cables relieved of tension?	-
Are the power supply and signal cables connected correctly?	See wiring diagram on the housing
Are all of the screw terminals well-tightened?	-

5 Operation

5.1 Display and operating elements

Depending on the application and version, the Pump Manager offers a wide range of configuration options and software functions. Help text is available for nearly every operating item to assist when programming the device. This help text can be called up by pressing the "?" button. (The help text can be called up in every menu). Please note that the configuration options described below refer to a basic unit (without extension cards).

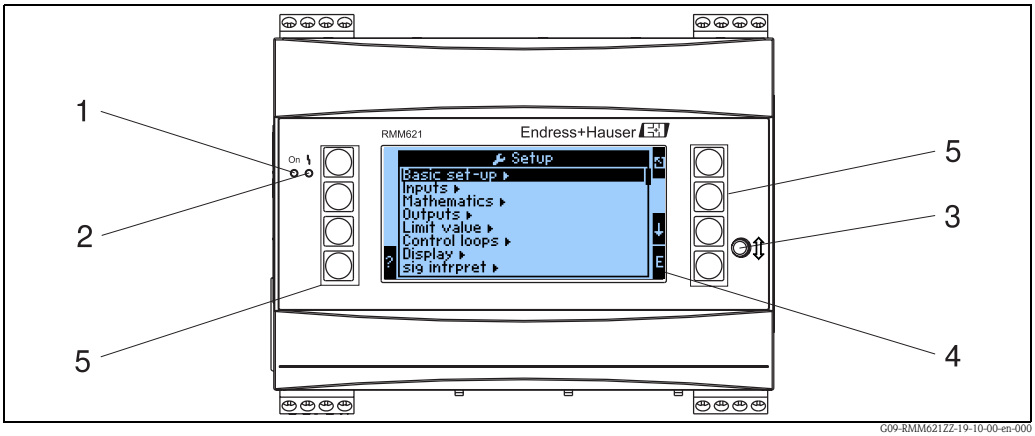


Fig. 13: Display and operating elements

Item 1:operating display: LED green, lights up when supply voltage applied.
Item 2:fault indicator: LED red, operating status as per NAMUR NE 44
Item 3:serial interface connection: jack socket for PC connection for device configuration and measured value read-out with the PC software
Item 4: display 160x80 dot-matrix display with dialog text for configuring as well as measured value, limit value and fault message display. Should a fault occur, the background lighting changes from blue to red. The size of the characters displayed depends on the number of measured values to be displayed (see Section 6.3.3 'Display configuration').
Item 5:input keys; eight soft keys which have different functions, depending on the menu item. The current function of the keys is indicated on the display. Only the keys which are required in the operating menu in question are assigned with functions or can be used.

5.1.1 Display

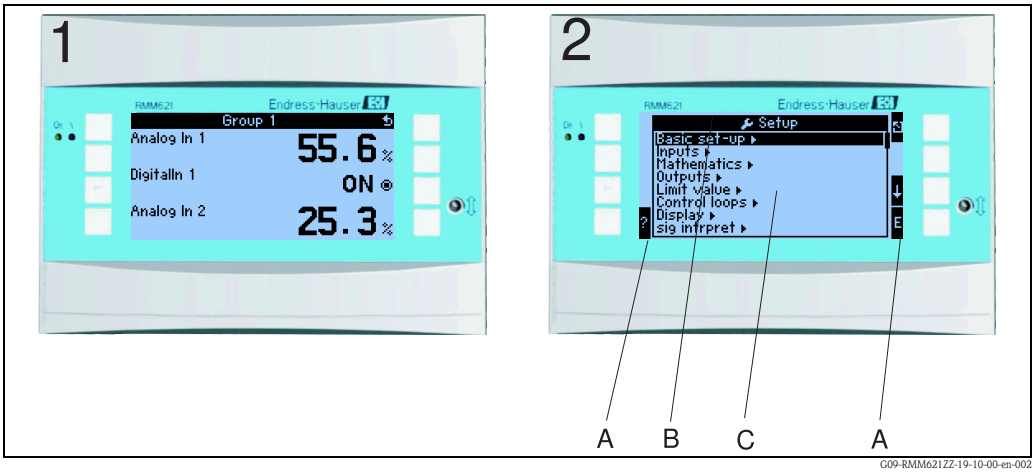


Fig. 14: Display

Item: 1:measured value display
Item 2:Display of configuration menu item
- *A: Row of key icons*
- *B: Current configuration menu*
- *C: Configuration menu activated for selection (highlighted in black).*

5.1.2 Key icons

Key icon	Function
E	Change to submenus and select operating items. Edit and confirm configured values.
⎋	Exit the current editing mask or the menu item currently active without saving any changes.
↑	Move the cursor up a line or a character.
↓	Move the cursor down a line or a character.
→	Move the cursor a character to the right.
←	Move the cursor a character to the left.
?	If Help text is available on an operating item, this is indicated with the question mark. The Help is called up by actuating this function key.
AB	Change to the editing mode of the Palm keyboard
ij/IJ	Key field for upper case/lower case (only with Palm)
1/2	Key field for numerical entries (only with Palm)
F_x	This key can be used to display the various available functions in the formula editor.

5.2 Local operation

5.2.1 Entering text

There are two ways of entering text in the operating items (see: **Setup → Basic setup→ Text input**):

a) Standard: individual characters (letters, numbers, etc.) in the text field are defined by scrolling through the entire row of characters with the up/down cursor until the desired character is displayed.
b) Palm: a visual key field appears for entering text. The characters on this keyboard are selected with the cursors. (see "Setup → Basic setup")

Using the Palm keyboard

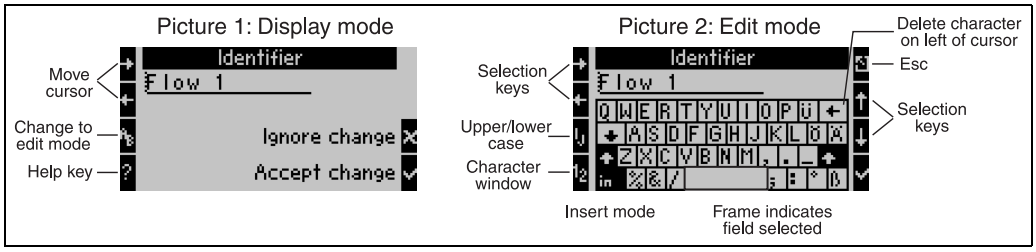


Fig. 15: Example: editing an identifier with the Palm keyboard

1. Using the cursor keys, place the cursor in front of the character before which another character should be entered. If the entire text should be deleted and rewritten, move the cursor completely to the right. (see Fig. 15, graphic 1)
2. Press the AB key to enter the editing mode
3. Use the ij/IJ and ½ key to select upper/lower case or numerals. (see Fig. 15, graphic 2)
4. Use the cursors to select the key required and use the tick sign to confirm. If you want to delete text, select the key in the top right. (see Fig. 15, graphic 2)
5. Edit other characters in this way until the desired text has been entered.
6. Press the Esc key to switch from the editing mode to the display mode and accept changes with the 'tick' key. (see Fig. 15, graphic 1)

Notes
- The cursor cannot be moved in the editing mode (see Fig. 15, graphic 2)! Use the Esc key to go to the previous window (see Fig. 15, graphic 1) to move the cursor to the character which should be changed. Then confirm the AB key again.
- Special key functions:
  in key: change to overwrite mode
  key (top right): delete character

5.2.2 Lock configuration

The entire configuration can be protected against unintentional access by means of a four-digit code. This code is assigned in the submenu: **Basic setup ➔ Code**. All the parameters remain visible. If the value of a parameter should be changed, you are first asked for the user code.

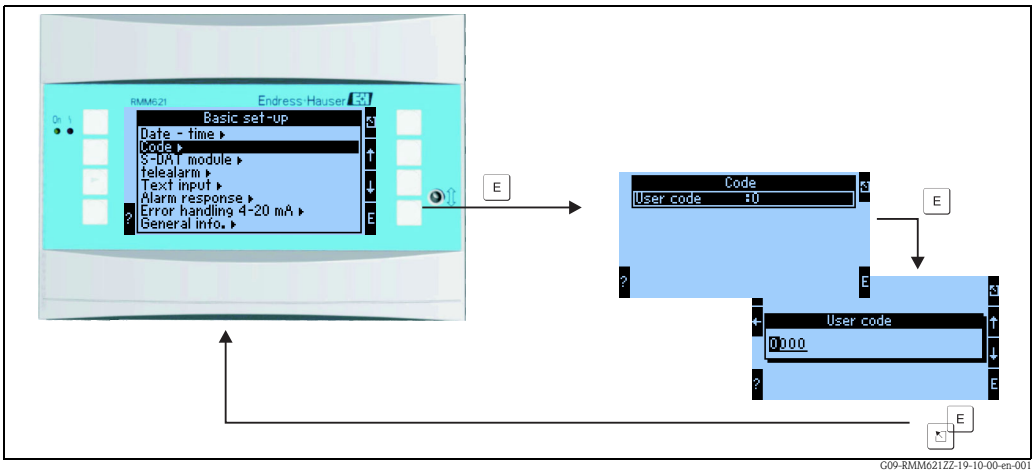


Fig. 16: Configuring the user code

5.2.3 Operating example

A detailed description of onsite operation with an application as an example can be found in Section 6.4 'User-specific applications'.

5.3 Error message display

The device differentiates between two types of errors:
- **System error:** this group comprises all the device errors, e.g. communication errors, hardware errors, etc. System errors are always signaled by fault messages.
- **Process error:** this group comprises all application error, e.g. "range overshoot", including limit value alarms, etc.

For process errors, you can configure how the device reacts in the event of an error, i.e. whether a fault message or a notice message is displayed. On leaving the factory, all process errors are preset as notice messages with a color change.

5.3.1 Fault messages

A fault is signaled by the display changing color from blue to red and by an **exclamation mark (!)** along the top edge of the display. The error is displayed as plain text. The fault is acknowledged by actuating any key. Via the Navigator menu, you can get to the error list and to the Main menu to rectify the error if necessary. When a fault message occurs, it is possible to stop the affected counters or to allow them to continue running. This can be set by the user. The input signals behave as per their configured failsafe mode (see Section 6.3.3 'Main menu - Setup'). Only once all faults have been rectified does the device resume normal operation and the color changes from red to blue.

5.3.2 Notice messages

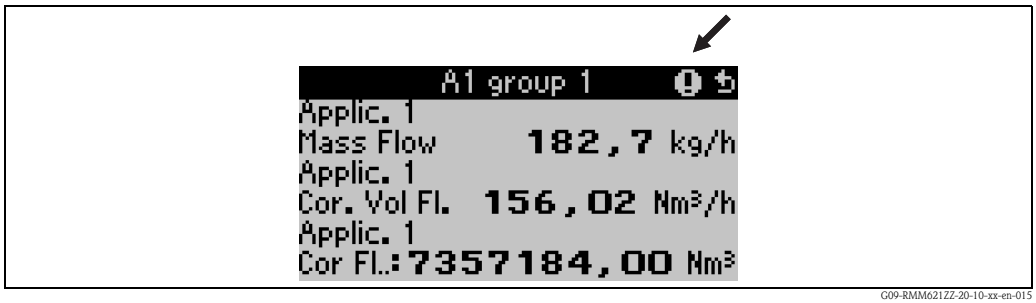


Fig. 17: Display of notice messages

A notice is signaled by an **exclamation mark (!)** in the display. It can also be signaled (as an option) by a color change and by displaying an alarm on the display. The exclamation mark is along the top edge of the display. In addition, some errors are signaled by an icon beside the corresponding measured values. Notices do not have any affect on the operation and counters but rather merely indicate that a certain event has arisen (e.g. range has been overshot).
Faults also result in an **exclamation mark (!)** in the display: If the error message window has been acknowledged by the user with OK, then the **exclamation mark (!)** still remains in the header until the reason for the fault is rectified.

Icons appear along the top edge of the display next to the display parameter affected by the error which has occurred.	
	Signal overshooting (e.g. x > 20.5 mA) or undershooting (e.g. x < 3.8 mA)
	Error: fault or notice pending; → error list

5.4 Communication

In all devices and device versions, the parameters can be configured, altered and read out via the standard interface with the aid of PC operating software and an interface cable (see 'Accessories' Section). This is recommended in particular if extensive settings are to be made (e.g. when commissioning). There is the additional option of reading out all the process and display values via the RS485 interface with an external PROFIBUS module (HMS AnyBus Communicator for PROFIBUS-DP) (see 'Accessories' Section). When the device has the appropriate hardware configuration, an M-Bus interface is available, with which process and display values can be transferred to an M-Bus system. In addition to this, there is also the option of establishing a connection via MOD-Bus. Communication with the device can also be achieved via modem (landline and mobile network): In combination with ReadWin the device can be configured, if an alarm occurs it can be transferred, for example, by SMS to a cellular phone, or a counter reading can be transmitted.

Note!
Detailed information for configuring the device using the PC operating software can be found in the accompanying Operating Instructions which are also located on the data carrier.

6 Commissioning

6.1 Function check

Make sure that all post-connection checks have been carried out before you commission your device:
- See Section 3.3 'Post-installation check'
- Checklist Section 4.3 'Post-connection check'

6.2 Switching on the measuring device

6.2.1 Basic unit

Once the operating voltage is applied, the green LED (= device operating) lights up if no fault is present.
- When the device is first commissioned, the prompt "Please set up device" appears on the display. Program the device as per description → Section 6.3.
- When commissioning a device already configured or preset, measuring is immediately started as per the settings. The values of the display group currently set appear on the display. By pressing any key, you get to the navigator (quick start) and from there back to the Main menu (see Section 6.3).

6.2.2 Extension cards

When the operating voltage is applied, the device automatically recognizes the installed and wired extension cards. You can now follow the prompt to configure the new connections or perform the configuration at a later date.

6.2.3 Remote operating unit

The remote display/operating unit is preconfigured at the factory – unit address 01, baudrate 56.7k, RS485-Master. Once the supply voltage has been applied and after a short initialization period, the display unit automatically starts communication to the connected basic unit. Make sure that the unit address of the basic unit and of the remote display match.

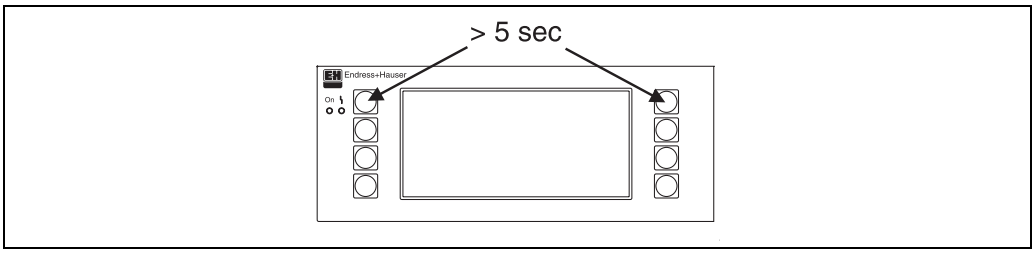


Fig. 18: Start Setup menu

You can get to the Setup menu of the display/operating unit by pressing the left and right top key at the same time for 5 seconds. Here, the baudrate and unit address for communication, as well as the contrast and display viewing angle can be configured. Press ESC to exit the Setup menu of the display/operating unit and to get to the display window and the Main menu to configure the device.

Note!
The Setup menu for configuring the basic settings of the display/operating unit is only available in English.

Error messages

After switching on or configuring the device, the message **"Communication problem"** appears briefly on the remote display/operating unit until a stable connection has been established.
If this error message is displayed during operation, please check the wiring and ensure that the baudrate and the unit address match the device.

6.3 Device configuration

This section describes all the configurable device parameters with the associated value ranges and factory settings (default values).
Please note that the parameters available for selection, e.g. the number of terminals, depend on the device version (see "Extension cards").

Function matrix

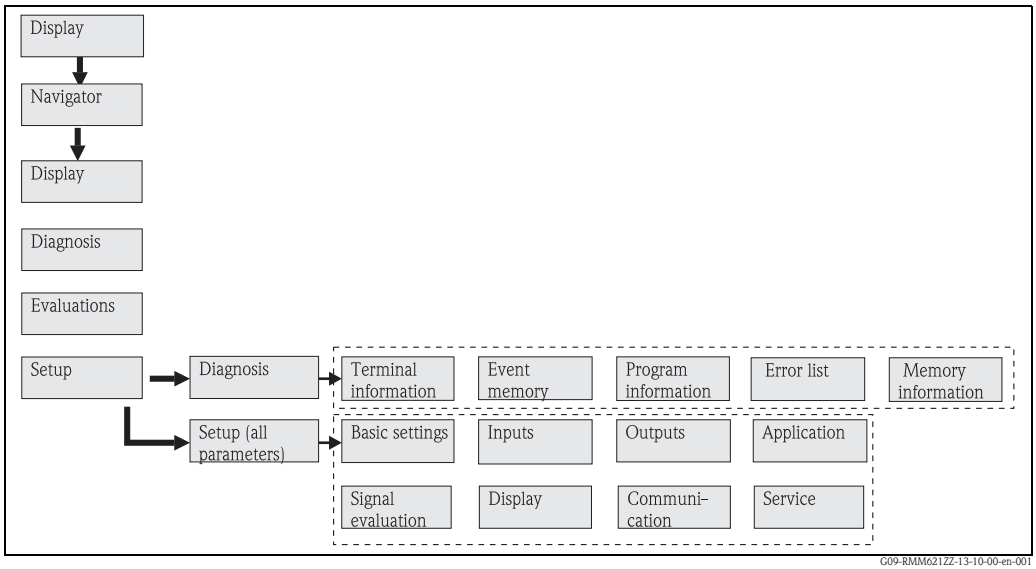


Fig. 19: Function matrix (extract) for onsite configuration.

6.3.1 Navigator (quick start)

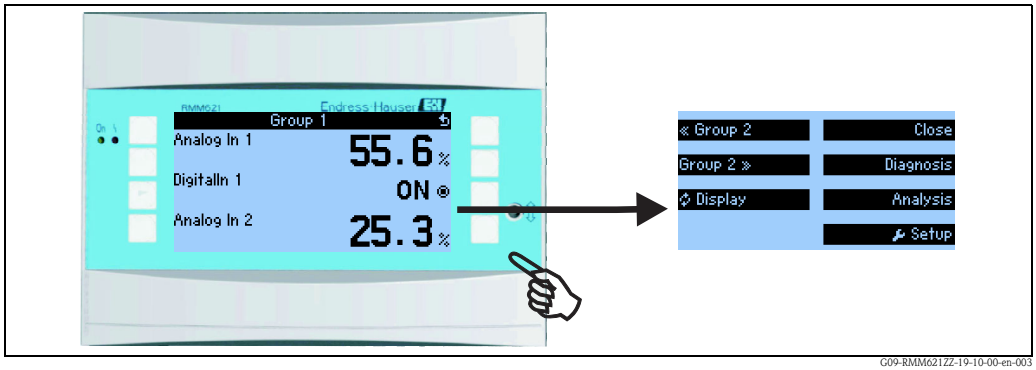


Fig. 20: Quick start to configuration via the Navigator menu.

In the operating mode of the Pump Manager (measured value displayed), the operating window "**Navigator**" opens up by pressing any key: the Navigator menu offers quick access to important information and parameters. Pressing one of the keys available takes you directly to the following items:

Function (menu item)	Description
Group	For selecting individual groups with display values.
Display	For alternating the group display, setting in the Setup menu "**Display**".
Error list	For quickly finding current device errors.
Counter val	For reading and resetting all totalizers.
Menu	Main menu for configuring the device.

The contents of the group with display values can only be defined in the **Setup ➔ Display** menu. A group comprises a maximum of eight process variables which are displayed in a window in the display.
The settings for the display functionalities, e.g. contrast, scrolling display, special groups with display values, etc. are also made in the **Setup ➔ Display** menu.

Note!
When commissioning, the prompt "**Please set up device**" is displayed. Confirming this message takes you to the Navigator menu. Select '**Menu**' here to get to the main menu.
A device already configured is in the display mode as standard. The device changes to the Navigator menu as soon as one of the eight operating keys is pressed. From here, you get to the Main menu by selecting '**Menu**'.

Note!
If you continue navigating through the Main menu, the message "**If you change the application, the respective counters will be reset**" is displayed. Confirming this message takes you to the Main menu.

6.3.2 Main menu - Diagnosis

The Diagnosis menu is used to analyze the device functionality, such as locating device malfunctions.

Function (menu item)	Parameter setting	Description
Terminal info	A10	List of all the terminals of the device and the connected sensors. The signal values present are displayed (in mA, Hz, Ohm) by pressing the **i key**.
Event buffer		List of all the events, e.g. error messages, parameter changes, etc. in chronological order. (Ring buffer with approx. 100 values, cannot be cleared!)
Program info		Displays the device data such as the program, name, software version, date and time.
Pump error		For putting failed pumps back into operation

6.3.3 Main menu - Setup

The Setup menu is used for configuring the device.
Menu items displayed in bold indicate functions that have submenus.
Parameters displayed in bold indicate default values.

Setup ➔ Basic setup

Function (menu item)	Parameter setting	Description
Date-Time		
Date	**DD.MM.YY** DD.MM.YY	For configuring the current date (country-specific). ✎ Note! Important for summertime/wintertime changeover
Time	SS:MM	Current time for the real time clock of the device.
Summertime/normal time changeover		
Changeover	Off - Manual - **Auto.**	Kind of time changeover.
Region	**Europe** - USA	Displays the changeover date from normal time (NT) to summertime (ST) and vice versa. This function depends on the region selected.
NT→ST ST→NT - Date - Time	**31.03** (Europe) 07.04 (USA) **27.10** (Europe) 27.10 (USA) 02:00	Takes into consideration the summertime/normal time changeover in Europe and USA at different times. This can only be selected if summertime/normal time changeover is not set to 'Off'. Time of changeover. This can only be selected if summertime/normal time changeover is not set to 'Off'.
System eng. unit	**Metric** User defined	Selects the unit of ■ Flow ■ Pressure ■ Level ✎ Note! If "Metric" is selected, the display is restricted to metric units. US units are hidden. If "User defined" is selected, all the units (both metric and US) are displayed.
Code		
User	0000 - 9999	Device operation is only enabled once the previously defined code has been entered.
S-DAT module		
End setup	Automatic On request	Saves the settings automatically when you exit the setup or confirm a prompt/question.
Save	Press the E-key	Write counter readings and operating data to the S-DAT module.
Op. data		
Date	Editing field for entering the date	Date of last save
Time	Editing field for entering the time	Time of last save
Read in	Press the E-key	Transfer counter readings and operating data from the module to the device
Counter val		
Date	Editing field for entering the date	Date of last save
Time	Editing field for entering the time	Time of last save
Read in	Press the E-key	Transfer counter readings from the module to the device
S-DAT data		
Prog. name		Program name of the S-DAT module.
Prog. version		Program version of the S-DAT module.
CPU number		CPU number of the S-DAT module.

Function (menu item)	Parameter setting	Description
Telealarm		
Active	Active **Not active**	Telealarm activated / not activated: If activated, then enabled (in the appropriate operating positions) messages are transmitted via telealarm to the specified receiver
Modem	**Modem (tone dialing)** Modem (pulse) GSM terminal	Landline modem has been connected either in tone dialing method or in pulse dialing method, or a GSM modem is connected
Port	**RS232** RS485 Front	Which interface of the RMM621 the modem is connected to, a 2nd RS485 is optionally available regardless of the device configuration
Baudrate	9600 19200 38400 57600	Configuration of the baudrate for the selected port
Signal display	Active **Not active**	Should the GSM signal strength be displayed? ✎ Note! Only available for GSM terminal.
GSM signal		The GSM signal strength appears on the display. ✎ Note! Only available for GSM terminal.
GSM PIN	0000 to 9999	✎ Note! Only available for GSM terminal.
Dial prefix	0 to 999 **Not active**	✎ Note! Not for GSM terminal.
SMS Service-No.	20-digit service number	
Delay	0 to 999	Telealarm activated / not activated: If activated, then enabled (in the appropriate operating positions) messages are transmitted via telealarm to the specified receiver
Sel. all no.	Yes **No**	Telealarm activated / not activated: If activated, then enabled (in the appropriate operating positions) messages are transmitted via telealarm to the specified receiver
SMS err. term.	**None** List of available relays	Telealarm activated / not activated: If activated, then enabled (in the appropriate operating positions) messages are transmitted via telealarm to the specified receiver
Receiver 1	**None** PC Software Cellular phone D1 (D) D2 (D) E-plus (D)	Should the SMS be sent to a receiver with a mobile network number or should the SMS be forwarded to the receiver via a service exchange ✎ Note! "Cellular phone" is only available for GSM terminal. "D1", "D2" and "E-plus" are not available for GSM terminal.
Phone no. 1	12-digit telephone number	Telephone number to which a telealarm message should be sent.
Redials 1	1-9	Number of attempts until the system switches to the next specified receiver
Receiver 2	**None** PC Software Cellular phone D1 (D) D2 (D) E-plus (D)	Should the SMS be sent to a receiver with mobile network number or should the SMS be forwarded to the receiver via a service exchange ✎ Note! "Cellular phone" is only available for GSM terminal. "D1", "D2" and "E-plus" are not available for GSM terminal.
Phone no. 2	12-digit telephone number	Telephone number to which a telealarm message should be sent.
Redials 2	1-9	Number of attempts until the system switches to the next specified receiver
Receiver 3	**None** PC Software Cellular phone D1 (D) D2 (D) E-plus (D)	Should the SMS be sent to a receiver with mobile network number or should the SMS be forwarded to the receiver via a service exchange ✎ Note! "Cellular phone" is only available for GSM terminal. "D1", "D2" and "E-plus" are not available for GSM terminal.
Phone no. 3	12-digit telephone number	Telephone number to which a telealarm message should be sent.
Redials 3	1-9	Number of attempts until the system switches to the next specified receiver

Function (menu item)	Parameter setting	Description
Alarm response		
Fault category	**Default setup** – User defined	Alarm response when process errors occur. As per the factory setting, all process errors are signaled by a warning message. By selecting "User defined", additional operating items appear in the inputs and the application to assign a different fault category (fault message) to the individual process errors (see Section 5.3 'Error message display').
Text input		
Text input	Standard **Palm**	Selects the way of entering text: ■ Standard: Per parameter item, runs up or down the row of characters until the desired character appears. ■ Palm: The desired character can be selected from the visual key field with the cursors.
General info		
Unit ID		Assigns a device name (max. 12 characters long).
Tag number		Assigns a TAG number, as in wiring diagrams for example (max. 12 characters long).
Prog. name		Name which is saved in the PC operating software along with all the settings.
SW version		Software version of your device.
SW options		Information as to which extension cards are installed.
CPU No.:		The CPU number of the device is used as an identifier. It is saved with all the parameters.
Serial No.:		This is the serial number of the device.
Run time		
Unit		Run time of the unit
LCD		Run time of the LCD display

Setup ➔ Inputs

Note!
Depending on the version, there are 4 (basic device, always available) to 10 (device extended with 3 analog cards) current, PFM and pulse inputs available in the Pump Manager for recording sensor signals.
The number of possible digital inputs is dependent on the number of extension cards used: there are 6 additional digital inputs available per extension card used.

Analog inputs

Function (menu item)	Parameter setting	Description
AnalogIn 1 to 8		Configuration of individual analog inputs
Identifier	Text	Name of the analog input (max. 12 characters).
Signal	**Unused** 4-20 mA 0-20 mA PFM Pulse	Selects the signal of the analog input.
Terminals	**None** A-10; A-110; B-112; B-113; C-112; C-113; D-112; D-113; E-112; E-113 B-34 (fast) B-37 (fast) C-34 (fast) C-37 (fast) D-34 (fast) D-37 (fast)	Defines the terminal to which the analog input in question is connected. It is possible to use one sensor for several applications. For this, in the application in question, select the terminal where the transmitter is located (multiple selection possible).
Meas. var.	Level Flow Pressure User defined	
Device type	**Volumetric** Mass	Measuring principle of the flow transmitter; what physical variable is the flow signal referring to? Note! Can only be selected for the flow measured variable.
Units	Text	Note! Only active if 'User defined' has been selected as the measured variable. Free text field in which the unit of the set, user-defined measured variable can be defined
	l/time unit dm^3/time unit hl/time unit m^3/time unit kg/time unit t/time unit	Note! Only active if flow has been selected as the measured variable. Unit in which the volume flow/mass flow (depending on the flow transmitter) is displayed e.g. m^3 (plus defined time unit).
	bar Pa kg/cm^2 psi	Note! Only active if pressure has been selected as the measured variable. Unit in which the pressure is displayed
	m dm cm	Note! Only active if level has been selected as the measured variable. Unit in which the level is displayed
Time base	s min h	Note! Only active if flow has been selected as the measured variable. Time basis for the flow unit e.g. XX per hour

Function (menu item)	Parameter setting	Description
Start value	-999999.9 to 999999.99	Start value for the beginning of the measuring interval ✎ Note! Can only be selected for the current/voltage signal type.
End value	-999999.9 to 999999.99	End value for the end of the measuring interval ✎ Note! Can only be selected for the current/voltage signal type.
Offset		Entering an offset causes the scaling to be shifted, e.g. for adjusting or calibrating the sensors
Damping	0 to 99 s	Time constant of the first order low pass for the input signal. This function is used to reduce display fluctuations in the event of severely fluctuating signals. ✎ Note! This can only be selected for the 0/4 to 20 mA signal.
Term pulse	Pulse value k-factor	✎ Note! This can only be selected for the flow measured variable and the PFM signal type. Principle based on which the pulses are evaluated or how the pulses are converted to the flow: k-factor (pulse/unit) Pulse value (unit/pulse)
Impulse unit	l dm^3 hl m^3 kg t	✎ Note! This can only be selected for the flow measured variable and the PFM or pulse signal type. Unit for the pulse value
Pulse value	0.001 - 99999	✎ Note! This can only be selected for the flow measured variable and the PFM or pulse signal type. Pulse value, i.e. what volume flow does a pulse corresponds to (the reciprocal value of the pulse value is the K-factor, see pulses/flow unit.)
k-factor	0.001 - 99999	✎ Note! This can only be selected if 'k-factor' was selected for term pulse.
Integration	No l dm^3 hl m^3 kg t	✎ Note! Can only be selected for the flow measured variable.
Fl. cutoff	Value in volume/mass per time unit	Low flow cutoff: the flow is no longer evaluated or is set to zero below this value (e.g. fluctuating liquid column at standstill). ✎ Note! Can only be selected for pulse input.
Format	9 9.9 9.99 9.999	Number of places after the decimal point ✎ Note! Only visible if the "User defined" system unit has been selected.
Table	Use Not used	Correction table for describing the individual characteristic of your sensor, e.g. if this deviates from the ideal linear pattern. ✎ Note! Only visible if 0/4 to 20 mA is selected
No. of rows	2 to 32	Number of rows or sampling points of the correction table. At least two rows must be entered. ✎ Note! Only visible if 0/4 to 20 mA and "Use" table have been selected.

Function (menu item)	Parameter setting	Description
Correction table		
Sampling point 1..x		Where x is the number of rows in the table as specified in the "Number of rows" parameter.
Points	Used Delete	Please define your linearization point by entering a current value/measured value value pair. Select "Not used" if the linearization point is to be removed from the table at a later stage. ✎ Note! Only active if the 'Notice' alarm type has been selected.
Current	0.000-999999	Current value of the measuring signal ✎ Note! Only active if 'Use' has been selected under points.
Output value	0.000-999999	Measured value (e.g. flow) which corresponds to the aforementioned current value ✎ Note! Only active if 'Use' has been selected under points.
Alarm response		✎ Note! Only active if User defined has been selected in the 'Alarm response' menu item in **Setup** → **Basic setup**.
Fault condition	Last value Minimum Maximum Value Stop of calculation	Fault condition: Response of the output in the event of a fault in the value that is to be output, or specification of the value with which the system continues calculation in an alarm condition.
Fault condition value	-999999.9 to 999999.99	✎ Note! Only visible if "Value" has been selected under **Fault condition**.
Range error		
Alarm type	**Fault** Hint	Define individually for this input which alarms should be displayed when errors occur: range violation (as per NAMUR43) or cable open circuit). Fault message, counter stop, color change (red) and message in plain text.
Color change	**Yes** No	Select whether the alarm should be signaled by a color change from blue to red. ✎ Note! Only active if the 'Hint' alarm type has been selected.
Fault text	Do not display **Display+acknowledge** SMS Disp.+ackn.+SMS	Select whether in the event of an error an alarm should be shown to describe the error, which is hidden (acknowledged) by pressing a button or/and whether an SMS should be sent to the telealarm receiver. ✎ Note! Only active if the 'Hint' alarm type has been selected.
Open circuit		
Alarm type	**Fault** Hint	Define individually for this input which alarms should be displayed when errors occur: range violation (as per NAMUR43) or cable open circuit).
Color change	**Yes** No	Select whether the alarm should be signaled by a color change from blue to red. ✎ Note! Only active if the 'Hint' alarm type has been selected.
Fault text		Select whether in the event of an error an alarm should be shown to describe the error, which is hidden (acknowledged) by pressing a button or/and whether an SMS should be sent to the telealarm receiver. ✎ Note! Only active if the 'Hint' alarm type has been selected.

Digital inputs

Function (menu item)	Parameter setting	Description
DigitalIn 1 to 18		
Identifier	DigitalIn 1-18	Name of the digital input, e.g. 'Pump on' (max. 12 characters).
Terminals	**None** A-10; A-110; B-112; B-113; C-112; C-113; D-112; D-113	Defines the terminal for connecting the digital signal.
	B-94 (fast), B-95, B-96, B-97 (fast), B-98, B-99, C-94 (fast), C-95, C-96, C-97 (fast), C-98, C-99, D-94 (fast), D-95, D-96, D-97 (fast), D-98, D-99	Determines the terminal for connecting the digital signal for digital cards (fast: digital pulses to 20 kHz, otherwise to 4 Hz)
Type of i/p	**Pump on** Pump not available Pump blocked Pump alarm Free configurable Reset counters Pulse ctr Time synch (s=0) Set time	Type of digital input: Should the input be used as the feedback signal of the pump for time synchronization, as a counter or freely configurable.
Pump ref.	Picklist of pumps available	Pump which returns the signal: choice of all the pumps already configured
Delay	Text	Pump on: time after which the signal has to be present after pump startup. Freely configurable: delay time of the digital input.
Description		
High state	Text	Text which should be output when the state is high
Low state	Text	Text which should be output when the state is low
Event text		
Low→High	Text	Text which should be output as a message in the event of a change in state from low to high (should be sent in a message box or by means of a telealarm)
High→Low	Text	Text which should be output as a message in the event of a change in state from high to low (should be sent in a message box or by means of a telealarm)
Event msg.	**Do not display** Display+acknowledge SMS Disp.+ackn.+SMS	What should happen when an event occurs? ✎ Note! Not available unless a text was entered for the event text.
Telealarm	**Inactive** With priority	Configuration of the telealarm: – "Inactive": do not send event text(s). – "With priority": only send event text(s) to SMS receiver 1. Texts only sent to receiver 2 in the event of problems in transmission.
TA receiver	**All** Receiver 1 Receiver 2 Receiver 3	Receiver of the telealarm message

Setup ➔ Outputs

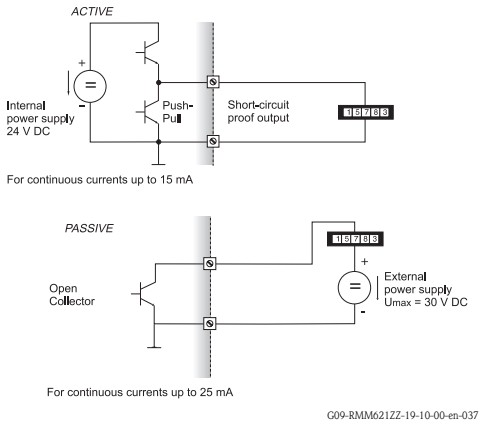
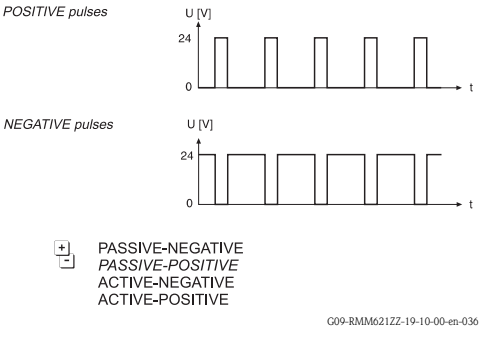
Analog outputs

Please note that these outputs can be used as both analog and pulse outputs; the desired signal type can be selected for each setting. Depending on the version (extension cards), 2 to 8 outputs are available.

Function (menu item)	Parameter setting	Description
Anal. outp. 1 to 8		
Identifier	Anal. outp. 1 to 8	An identifier can be given to the analog output in question for a better overview (max. 12 characters).
Terminals	B-131, B-133 C-131, C-133 D-131, D-133 E-131, E-133 **Select**	Defines the terminal at which the analog signal should be output.
Sig. source	List of the values that can be output as an analog signal (inputs, calculated values) **Select**	Setting as to which calculated or measured variable should be output at the analog output. The number of signal sources depends on the number of configured applications and inputs.
Signal	**4 to 20 mA** 0 to 20 mA	Specifies the mode of operation of the analog output.
Start value	-999999 to 999999 **0.0**	Smallest output value of the analog output.
End value	-999999 to 999999 **100**	Largest output value of the analog output.
Time const.	0 to 99 s **0 s**	Time constant of the first order low pass for the input signal. This is used to prevent large fluctuations in the output signal (can only be selected for the signal type 0/4 and 20 mA).
Simulation	**Off** 0.0 3.6 4.0 10.0 12.0 20.0 21.0	The function of the current output is simulated. Simulation is active if the setting is not 'off'. Simulation ends as soon as you leave this item.
Alarm response		
Fault condition	**Last value** Minimum Maximum Value	Defines the behavior of the output in the event of a fault, e.g. if a sensor in the measurement fails.
Value	-999999 to 999999 **0.0**	Fixed value which should be output at the analog output in the event of a fault. ✎ Note! Only for the fault condition setting; value can be selected.
Range violation		
Type	Fault **Hint**	Depending on the configuration of the fault ('fault message, counter stop, color change (red) and message in plain text) or hint (here the user can determine the response of the device according to his requirements), the device reacts to exceptional behavior of this output
Color change	**Yes** No	✎ Note! Only visible if "Hint" has been selected for the alarm type.
Fault text	**Display+acknowledge** Do not display	✎ Note! Only visible if "Hint" has been selected for the alarm type.

Pulse outputs

The pulse output function can be configured with active, passive output or relay. Depending on the version, 2 to 8 pulse outputs are available.

Function (menu item)	Parameter setting	Description
Pulse outp 1 to 8		
Identifier	Pulse 1 to 8	An identifier can be assigned to the pulse output in question for a better overview (max. 12 characters).
Signal	**Select** Active Passive Relay	Assign the pulse output. **Active:** Active voltage pulses are output. Power is supplied from the device. **Passive:** Passive open collectors are available in this operating mode. Power must be supplied externally. **Relay:** The pulses are output on a relay. (The frequency is max. 5Hz)  Note! "Passive" can only be selected when analog extension cards are used.
Terminals	B-131, B-133, C-131, C-133, D-131, D-133, E-131, E-133, B-135, B-137, C-135, C-137, D-135, D-137, A-52, B-142, B-152, C-142, C-152, D-142, D-152 **None**	Defines the terminal at which pulses should be output.
Sig. source	Operation hours 1 Flow sum 1 Total oper. hours 1 Tot. flow 2 **Select**	Setting as to which variable should be output at the pulse output.
Pulse type	Negative **Positive**	 Note! Pulse unit depends on the signal source selected.

Function (menu item)	Parameter setting	Description
Pulse value	0.001 to 10000.0 **1.0**	Setting as to which value a pulse corresponds to (unit/pulse). ✎ Note! The maximum possible output frequency is 50 Hz. The suitable pulse value can be determined as follows: $\text{Pulse value} > \frac{\text{Estimated max. flow (end value)}}{\text{Desired max. output frequency}}$
Pulse width	User-defined **Dynamic (max. 100 ms)**	The pulse width limits the max. possible output frequency of the pulse output. Yes = pulse width fixed, i.e. always 100 ms. No = pulse width freely configurable.
Pulse width/pulse value	0.04 to 1000.00 s	Configuration of the pulse width suiting the external totalizer. The maximum permitted pulse width can be calculated as follows: $\text{Pulse width} < \frac{1}{2 \times \text{max. output frequency [Hz]}}$
Simulation	Off 0.1 Hz 1.0 Hz 5.0 Hz 10 Hz 50 Hz 100 Hz 200 Hz 500 Hz 1000 Hz 2000 Hz	The function of the pulse output is simulated with this setting. Simulation is active if the setting is not "off". Simulation ends if you leave this item.

Digital outputs

Depending on the version, 1 to 18 set points are available in the device.

Function (menu item)	Parameter setting	Description
Set point 1 to 18		
Identifier	Set point 1 to 18	An identifier can be assigned to the set point in question for a better overview (max. 12 characters).
Kind of o/p	**Select** Pump Swirl jet Backup pump Limits	Type of digital output: how is the digital output used: to control a pump, for use in a swirl jet control system, as a backup pump or as a classic limit value
Output on	Unused Active Passive Relay	Digital output signal should be output on an active/passive/relay output
Terminals	**Unused** B-242, B-252, B-262, B-272, B-282, B-292, C-242, C-252, C-262, C-272, C-282, C-292, D-242, D-252, D-262, D-272, D-282, D-292 *) A-52, B-142, B152, C-142, C-152, D-142, D-152 *) B-131, B-133, C-131, C-133, D-131, D-133, E-131, E-133 #) B-135, B-137, C-135, C-137, D-135, D-137 +)	*) If output on relay has been selected #) If output on active has been selected +) If output on passive has been selected Different terminals are to be selected depending on the type of the output to be used.
Relay oper.	Normally open Normally closed	Relay operating mode – Normally open – Normally closed
P. flow	**Not used** Pump curve Pump flow	For calculating the pump flow (flow total) via the pump curve or a constant factor
Device type	**Volumetric** Mass	What physical variable does the flow signal refer to?
Pump flow	0.001-9999.9	Pump flow performance (flow per time) ✎ Note! Only if pump flow = pump flow
Integration	**No** kg m^3	✎ Note! "kg" is only available if "mass" has been selected for the **device type**. "m^3" is only available if "volumetric" has been selected for the **device type**.
No. of rows	2-32	Number of rows or sampling points of the pump curve. At least two rows have to be entered. ✎ Note! Only if pump flow = pump curve
Unit	**l** dm^3 hl m^3 kg t	Unit in which the volume flow is displayed e.g. m (plus time unit defined below).
Time base	s min **h** Day	Time base for the flow unit e.g. XX per hour

Function (menu item)	Parameter setting	Description
Sig. source	List of the analog inputs, flow inputs, flow totals, pressure inputs, level inputs	Signal sources for the selected set point. ✎ Note! Menu item only visible if (type of digital output = backup pump or set point), or (type of digital output = pump and pump flow = curve simultaneously). In the case of pump and pump curve, only the analog inputs that are configured as pressure inputs can be selected. The number of signal sources depends on the number of configured applications and inputs.
Switch point type 1	**Lesser than** Greater than Gradient	If a gradient is output, the poll is in accordance with the sign of the switch point: > 0 ' gradient > switch point, < 0 ' gradient < switch point
Delta x1	-19999 - 99999	Signal value as of which the switch point is regarded as violated (for gradients): change over time is observed
Delta t1	-19999 - 99999	Time span that is used as the basis for determining the gradient
Reset val 1	-19999 - 99999	Value that has to be undershot to deactivate the switch point again
Switch point 1	-19999 - 99999	Signal value as of which the switch point is regarded as violated
Hysteresis 1	-19999 - 99999	Hysteresis for the switch point
Linkage	**None** AND OR NAND XOR	Logic operation between the two switch points
Switch point type 2	**Lesser than** Greater than Gradient	If a gradient is output, the poll is in accordance with the sign of the switch point: > 0 ' gradient > switch point, < 0 ' gradient < switch point
Delta x2	-19999 - 99999	Signal value as of which the switch point is regarded as violated (for gradients): change over time is observed
Delta t2	-19999 - 99999	Time span that is used as the basis for determining the gradient
Reset val 2	-19999 - 99999	Value that has to be undershot to deactivate the switch point again
Switch point 2	-19999 - 99999	Signal value as of which the switch point is regarded as violated
Hysteresis 2	-19999 - 99999	Hysteresis for the switch point
Delay	0-99s Default 0.0	Minimum amount of time the signal has to be present in order to be acknowledged as a switch-over signal. Pump on: the time after pump startup the digital signal has to be present at the very latest
"On" state message text	Text	Text which should be output when the status is On
"Off" state message text	Text	Text which should be output when the status is Off
Event text Low→High	Text	Text which should be output as a message in the event of a change in state from low to high (should be sent in a message box or by means of a telealarm)
Event text High→Low	Text	Text which should be output as a message in the event of a change in state from high to low (should be sent in a message box or by means of a telealarm)
Event msg.	**Do not display** Display+acknowledge SMS Disp.+ackn.+SMS	What should happen when an event occurs?
Telealarm	**Inactive** With priority	Configuration of the telealarm: – "Inactive": do not send event text(s). – "With priority": only send event text(s) to SMS receiver 1. Texts only sent to receiver 2 in the event of problems in transmission.
Telealarm receiver	**All** Receiver 1 Receiver 2 Receiver 3	Receiver of the telealarm message

Function (menu item)	Parameter setting	Description
T b. 2 starts	0 to 99 Default 0 min	What time has to elapse before a restart to avoid damage to the connected device (e.g. bearing damage by restarting in the no-load phase).
Maintenance	**None** 1 h 12 h 24 h Weekly	Time between 2 startups of a connected device to avoid a pump jamming for example
Start time	hh:mm	Start time for the maintenance interval
Oper time	hh:mm	Duration of the maintenance cycle in hours and minutes
Simulation	**Off** On	With this function you can output a specified value at the digital output, e.g. to test connected devices.
Pump curve		
Sampling point 1..x		
Point	Used Delete	Please define your linearization point by entering a current value/measured value value pair. Select "Not used" if the linearization point is to be removed from the table at a later stage. ✎ Note! Only active if pump flow = pump curve
p	0.000-999999	Pressure value of the measuring signal ✎ Note! Only active if pump flow = pump curve
Q	0.000-999999	Assigned measured value (flow) which corresponds to the aforementioned current value ✎ Note! Only active if pump flow = pump curve
Elapsed hour counter		
Activate	Yes **No**	
Run time	0 to 999.9h 100h default	Run time of the elapsed hours counter after which an action should take place
Action	**None** Relay output SMS Pump deact. switch. Relay + SMS Relay + pump deact. switch. SMS + pump deact. Rel. + SMS + pump deact.	Action executed once the run time is achieved (relay switched, SMS sent, pump (i.e. digital output) switched to inactive, or combination of same)
Terminals	B-242, B-252, B-262, B-272, B-282, B-292, C-242, C-252, C-262, C-272, C-282, C-292, D-242, D-252, D-262, D-272, D-282, D-292 A-52, B-142, B152, C-142, C-152, D-142, D-152	Terminal for the elapsed hours counter alarm relay
Relay type	Normally open Normally closed	Relay operating mode – Normally open – Normally closed
Message	**Display+acknowledge** Do not display	Should the message be displayed?
Ctr. intrpret.	Yes **No**	Operation time counter to which intermediate, daily, monthly and annual evaluations can be applied (see "Signal evaluation"). ✎ Note! Only if output is configured as pump.

Setup ➔ Application

The device contains up to 3 pump controls which can be configured independently of one another. Here, 3 completely different control types can be selected.

Function (menu item)	Parameter setting	Description
Pump controls		
Pump control 1 to 3		
Control type	**Unused** Pump altern. (seq.) Pump altern. (time) Swirl jet	Type of pump control: sequence-alternating (the pumps are used in sequence), alternating by run time (pump with lowest run time is the next to be used) swirl jet (for emptying/ cleaning a basin)
Manual mode	List of the available digital inputs	The control can be blocked by means of a digital input if manual operation, for example, is required
Start delay	0 to 99	Interval between starting two different pumps
Gradient Delta x	-19999 to 99999	✎ Note! Only applies to "swirl jet" type of control Gradient needed to activate swirl jet control.
Gradient Delta T	-19999 to 99999	Gradient needed to activate swirl jet control.
Flow cntr	No l dm^3 hl m^3 kg t	Measure total flow of the pump control system on the basis of the pump curves (must be configured in the digital output which is assigned to the pumps)
Time base	s min h Day	Time basis for flow measurement (for determining the total flow of the pump control system observed)
Ctr. intrpret.	**Yes** No	Should counter interpretation be activated for this channel?
Failsafe mode	**All pumps off** Last valid status	How should the pumps respond in the event of an error?
No. of pumps	1 to 6	Number of pumps that should be used
No. of setpts.	1 to 6	Number of setpoints that should be used
Set point 1 to 6		
Set point 1 to 6	For selecting all the limit values (digital outputs) that are configured as a pump	Digital output to which the pump is connected
Setpoint x		
Sig. source	List of all the analog inputs	Process variable (measured or calculated variable) which should be used for the switch point.
Swit. point		
Type 1	**Lesser than** Greater than Gradient	Type of switch point If a gradient is output, the poll is in accordance with the sign of the switch point: > 0 ' gradient > switch point, < 0 ' gradient < switch point
Delta x1	-19999 - 99999	Signal value as of which the switch point is regarded as violated (for gradients): change over time is observed

Function (menu item)			Parameter setting	Description
		Delta t1	-19999 - 99999	Time span that is used as the basis for determining the gradient
		Res. point 1	-19999 - 99999	Value that has to be undershot to deactivate the switch point again Not for gradient.
		Point 1	-19999 - 99999	Signal value as of which the switch point is regarded as violated
		Hysteresis 1	-19999 - 99999	Hysteresis for the switch point
		Linkage	**None** AND OR NAND XOR	Logic operation between the two switch points
		Switch point type 2	**Lesser than** Greater than Gradient	Type of switch point If a gradient is output, the poll is in accordance with the sign of the switch point: > 0 ' gradient > switch point, < 0 ' gradient < switch point
		Delta x2	-19999 - 99999	Signal value as of which the switch point is regarded as violated (for gradients): change over time is observed
		Delta t2	-19999 - 99999	Time span that is used as the basis for determining the gradient
		Res. point 2	-19999 - 99999	Value that has to be undershot to deactivate the switch point again Not for gradient.
		Point 2	-19999 - 99999	Signal value as of which the switch point is regarded as violated
		Hysteresis 2	-19999 - 99999	Hysteresis for the switch point
		Chang. setp.	**Not used** Use	Switch point changes its value within a specified range after every switching cycle, e.g. to avoid buildup on the basin wall
		Range	0-19999	Range that applies for the changing switch point
		No. of steps	0-99	Number of steps that are possible for a switch point change
		Delay	0 to 99s	Time for which the setpoint has to be violated without interruption in order to be active
		Run time	0-9999min	Run time after which the pump is automatically switched off although the set point is violated.
	Swirl jet intervals			
		Grad. delta x	-19999 to +99999	Parameter that causes the swirl jet control system to switch.
		Grad. delta t	-19999 to +99999	Parameter that causes the swirl jet control system to switch.
		I1 on	0 to 99	Time the pumps are switched on in interval 1
		I1 off	0 to 99	Time the pumps are switched off in interval 1
		I2 on	0 to 99	Time the pumps are switched on in interval 2
		I2 off	0 to 99	Time the pumps are switched off in interval 2
		I3 on	0 to 99	Time the pumps are switched on in interval 3
		I3 off	0 to 99	Time the pumps are switched off in interval 3
	Swirl jet setpoints			
		Sig. source	List of all the flow inputs, flow sums, pressure inputs, level inputs and general analog inputs configured to date	Signal source for the swirl jet switch points
		Off lower LV	-19999 to 99999	Switch point for lower limit value: if this limit value is undershot, the swirl jet control system is switched off
		Continuous operation	-19999 to 99999	Switch point for continuous operation
		Interval I1	-19999 to 99999	Switch point for interval 1
		Interval I2	-19999 to 99999	Switch point for interval 2
		Interval I3	-19999 to 99999	Switch point for interval 3
		Off upper LV	-19999 to 99999	Switch point for upper limit value: if this limit value is overshot, the swirl jet control system is switched off

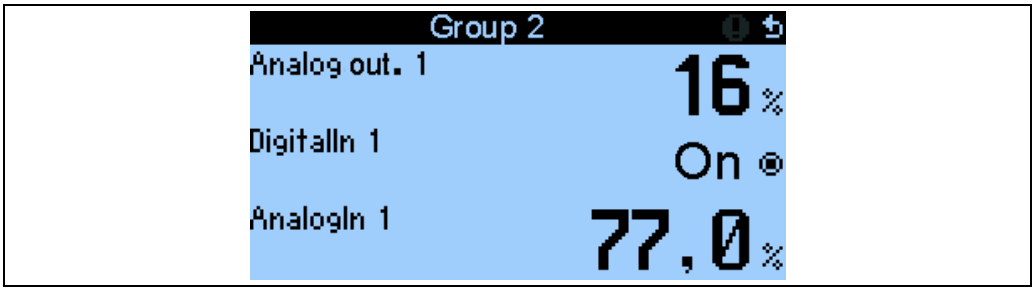
Function (menu item)		Parameter setting	Description
Start conditions			
Sig. source		List of all the analog inputs	Condition that has to be met to start the pump control
Start cond. - type 1		**Lesser than** Greater than Gradient	Type of switch point
Start cond. - Delta x1		-19999 to 99999	Signal difference for calculating the gradient
Start cond. - Delta t1		-19999 to 99999	Scan time and time for calculating the gradient
Start cond. - point 1		-19999 to 99999	Signal value as of which the switch point is regarded as violated
Start cond. - linkage 1		**None** AND OR NAND XOR	Logic operation between the two switch points, e.g. switch point must be within a value range as it has no effect otherwise
Start cond. - type 2		**Lesser than** Greater than Gradient	Type of switch point
Delta x2		-19999 to 99999	Signal difference for calculating the gradient
Delta t2		-19999 to 99999	Scan time and time for calculating the gradient
Start cond. - point 2		-19999 to 99999	Signal value as of which the switch point is regarded as violated I1 on in min; 0 to 99; time the pumps are switched on in interval 1
Start cond. - type 2		**Lesser than** Greater than Gradient	Type of switch point
Delta x2		-19999 to 99999	Signal difference for calculating the gradient
Delta t2		-19999 to 99999	Scan time and time for calculating the gradient
Start cond. - point 2		-19999 to 99999	Signal value as of which the switch point is regarded as violated

Setup ➔ Sig. intrpret

Function (menu item)	Parameter setting	Description
Interm. stat.	**No** 1 min 2 min 3 min 4 min 5 min 10 min 15 min 30 min 1 h 2 h 3 h 4 h 6 h 8 h 12 h	Determines at the time intervals specified here the Min., Max., Mean values (applies to the entire device) for those channels whose storage has been set to "Yes"
Day	**No** Yes	Determines once a day the Min., Max., Mean values (applies to the entire device) for those channels whose storage has been set to "Yes"
Month	**No** Yes	Determines once a month the Min., Max., Mean values (applies to the entire device) for those channels whose storage has been set to "Yes"
Year	**No** (= total) Yes	Determines once a year the Min., Max., Mean values (applies to the entire device) for those channels whose storage has been set to "Yes"
Synch. time	00:00	✎ Note! Only available if intermediate interpretation is activated and day or month or yearly counter is set to yes.
Reset	No Intermediate stat. Daily counter Monthly counter Yearly counter All	✎ Note! Only available if intermediate interpretation is activated and day or month or yearly counter is set to yes.

Setup ➔ Display

The device display can be freely configured. Up to 6 groups, each with 1 to 8 freely definable process values, can be displayed individually or alternately.



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When displaying one to three values in a group, all the values are displayed with the name of the application and designation (e.g. heat sum) and the associated physical unit.
When four values or more are displayed, then only the values and the physical unit are displayed.

Note!
In Setup "**Display**", the display functionality is configured. In "**Navigator**" then select which group(s) appear(s) with process values on the display.

Function (menu item)	Parameter setting	Description
Groups		
Group 1 to 10		
Identifier	Free text	A name (max. 12 characters) can be given to the groups for a better overview.
Display mask	1 value to 8 values **Select**	Here, set the number of process values which should be displayed beside one another in a window (as a group). The way the value is displayed depends on the number of selected values. The more values in a group, the smaller the display.
Value type 1-8	All Inputs Counter Outputs States Miscellaneous	The display values can be selected from 4 categories (types).
Value 1-8	List of all the inputs, counters, limit values; date and time	Selects which process values should be displayed.
Scrolling display		Alternating display of individual groups on the display.
Swit. time	0 to 99 s **0**	Seconds until the next group is displayed.
Group X	Yes **No**	Select the groups that should be displayed alternately. The alternating display is activated in the "**Navigator**" / "**Display**" (see 6.3.1).
Counter display		
Disp. sums	Counter mode **Exponential**	Sum display **Counter mode:** sums are displayed with max. 10 positions up to overflow. **Exponential:** exponential display is used for large values.
Contrast		
Main unit	2 to 63 **46**	For configuring the display contrast. This setting has an immediate affect. The contrast value is not saved until the setup is exited.

Setup ➔ Communication

An RS232 interface at the front and an RS485-interface at terminals 101/102 can be selected as standard. In addition, all process values can be read out via the PROFIBUS DP protocol.

Function (menu item)	Parameter setting	Description
RS232		
Unit addr.	0 to 99 **00**	Unit address for communicating via the interface.
Baudrate	9600, 19200, 38400 **57600**	Baudrate for the RS232 interface
RS485		
Unit addr.	0 to 99 **00**	Unit address for communicating via the interface.
Baudrate	9600, 19200, 38400 **57600**	Baudrate for the RS485 interface
RS485 (2) (optional)		
Unit addr.	0 to 99	✎ Note! Only available if "Use RS485" has been selected.
Baudrate	9600 19200 38400 57600	Baudrate for the RS485 interface. ✎ Note! Only available if "Use RS485" has been selected.
PROFIBUS-DP		
Number	0 to 48 **0**	Number of values which should be read out via the PROFIBUS-DP protocol (max. 49 values).
Addr. 0 to 4	e.g. flow x	Assigns the values to be read out to the addresses.
Addr. 5 to 9 to Addr. 235 to 239	e.g. pressure x	49 values can be read out via an address. Addresses in bytes (0...4, ... 235…239) in numerical order.

✎ Note!
A detailed description about integrating the device into a PROFIBUS system can be found in the Operating Instructions of the accessory (see Section 8 'Accessories'): **PROFIBUS interface module HMS AnyBus Communicator for PROFIBUS**

Setup ➔ Service

Service menu: **Setup (all parameters) ➔ Service**.

Function (menu item)	Parameter setting	Description
Service code		
Preset	Yes **No**	Resets the device to the delivery status with the factory default settings (protected by service code). ✎ Note! This resets all the parameters you configured.
Counter halt	Yes **No**	Should the counters (all counters) be stopped? Yes/No
Reset counter	Press the E-key	The day counter is reset by pressing the E-key.
Reset data st.	Press the E-key	The data storage unit is reset by pressing the E-key.
Total sums		
Pump flow counters (1-18)		✎ Note! Can only be activated if an option other than "Do not use" is selected for "Pump flow" in the digital output.
Flow counter	-999999.9 to 999999.9	
Pulse counter	-999999.9 to 999999.9	Total sum since pump flow configuration began (a pump flow based on the value of the pump flow parameter in the set point menu (digital output))
Elapsed hours counter	-999999.9 to 999999.9	
Pump flow counter	-999999.9 to 999999.9	Total sum since application configuration began – a totalizer to totalize all the flows combined in the pump control system can be configured in the application.
PC control flow counter	-999999.9 to 999999.9	Pump control flow counter: totalizes the flow sums of all the pumps of a pump control system. ✎ Note! Can only be activated if: ■ The "Pump flow" parameter is set to any option other than "Do not use" for all the pumps used in the control system ■ If an option other than "No" is set for the flow counter in the "Pump control x" application ■ Valid limit values (i.e. digital outputs configured as "pumps") and ■ Setpoints are available => Sum and total sum -999999.9 to 999999.9

6.4 User-specific applications

6.4.1 Configuration of the inputs

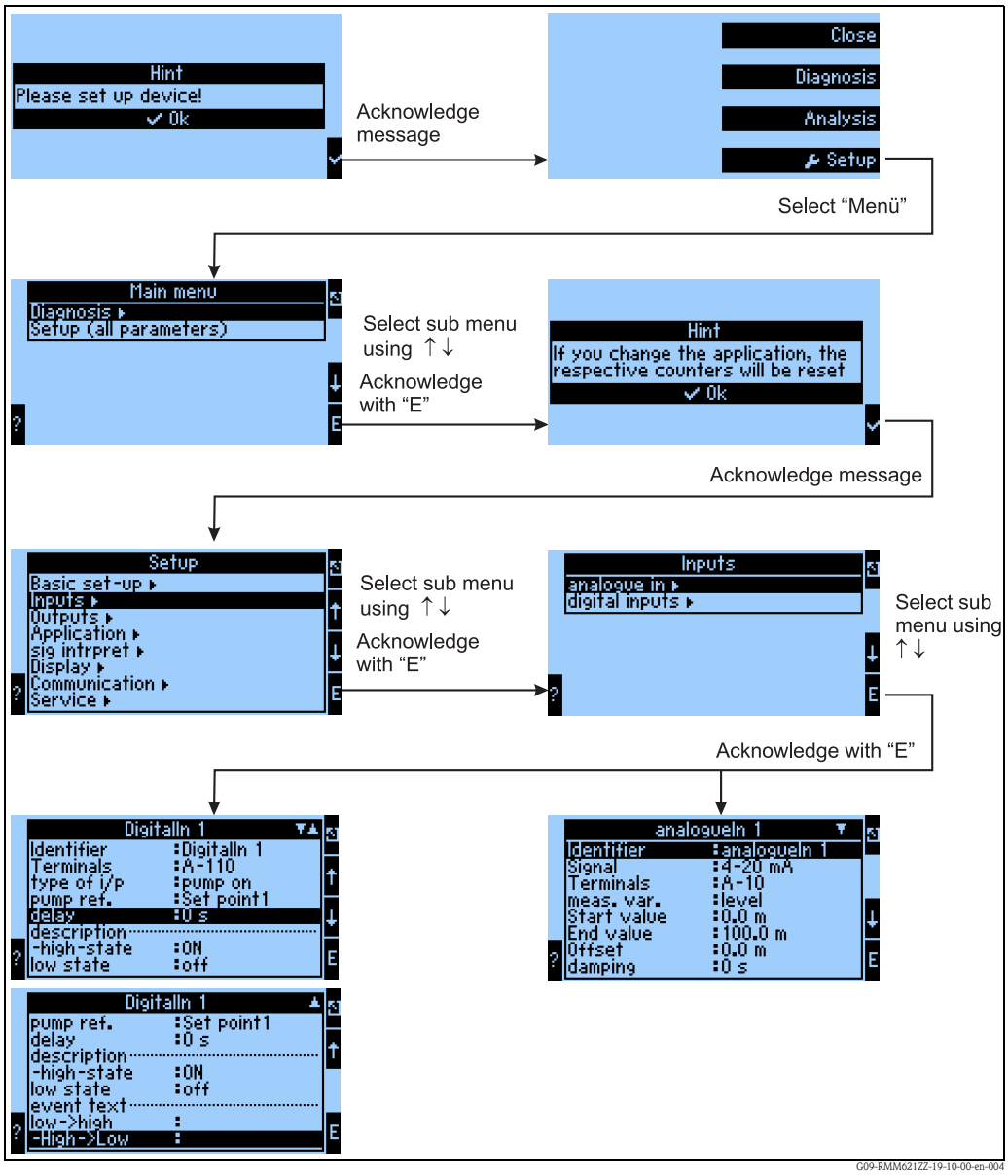


Fig. 21: Configuration of the inputs

Exit setup by repeatedly pressing the ESC ⎋ key and confirming ✔ the changes.

Configuration of the analog input

- Select the signal type of the terminal to which the sensor is connected.
  Terminal: select A10(+) and connect transmitter to terminal A10(-)/A83(+)
- Measured variable: choice between level, flow, pressure, user-defined (depends on selection, var. functions possible)
- Start value/end value: at 0/4 to 20mA: entry of the scaling, upper and lower limits of the physical value range
- Pulse value (only for flow input signal and pulse signal type): value of a (electrical) pulse in relation to the measured variable
- Offset:
- Damping: entry of the time constants for the integrated low-pass filter; this filters out undesired, high-frequency interferences.
- Table: entry of value pairs: current value – physical measured value
- Special case for flow:
  Configure integration, if this is required (determine the flow sum)
  Please note that for reasons of transparency, operating items that are not relevant are not displayed, e.g. if integration is only important for flow signals, the integration menu item is not displayed for all other physical variables such as pressure, level etc.

For further configuration options, see the "Function matrix" section on Page 29.

Configuration of the digital input

- Terminal = selection of the terminal that is to be used for the digital input
- Type of i/p: e.g. pump on – "feedback" input of the pump, depending on the option selected here, the signal present is evaluated
- Pump reference: which digital output (limit value=pump) was this digital input assigned to?
- Delay: 0s – reaction to change in digital input is triggered immediately
- Description of High stat.: On – displayed text in the measured value display (display group) when digital input is set to High
- Description of Low stat.: Off – displayed text in the measured value display (display group) when digital input is set to Low
- Event text –Low -> High: text that is to be output in the event of a state change from low to high in a message window or in the event buffer
- Event text – High -> Low: text that is to be output in the event of a state change from high to low in a message window or in the event buffer

Configuration of the digital output

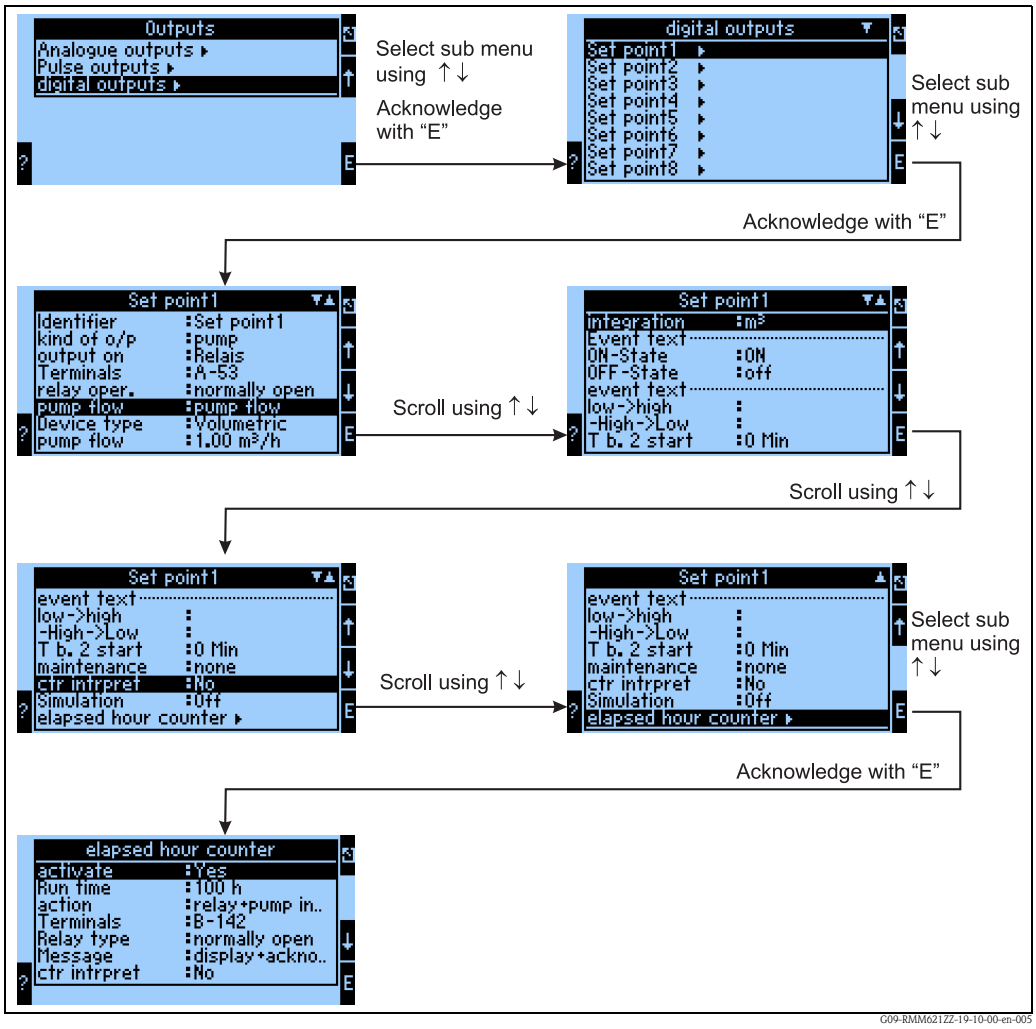


Fig. 22: Configuration of the digital output

Select

- The kind of output (how should the device be used, e.g. as control output for a pump, as limit value, etc.)
- Output on: relay (e.g. if a pump is to be switched via a relay)
- The terminal the pump is connected to: e.g. select A-52 and connect pump to terminal A-52 (relay COM)/A-53 (NO)
- How the selected relay is used (if a relay is used): normally open if the relay should be open in normal operation (limit value not violated)
- Pump flow: pump flow is determined by means of the run time of the pump and a constant factor, for example
- Pump flow: pump performance of the connected pump (e.g. constant value)
- Device type: volumetric or mass
- Integration: related unit of the calculated flow
- Entry of text for message texts (status) and event texts (status transition)
- Event mess. (only visible if event text has been entered) display and ack.: if an event occurs, a message window is displayed with the message configured/entry in event buffer
- T b. 2 start: what time has to elapse between 2 attempts to start the connected pump (to prevent damage to the pump)
- Maintenance: how often should the maintenance interval be activated, i.e. at what intervals should the pump be activated if it was not in operation for the time set under "Maintenance"
- Oper. time: how long should the pump be activated for maintenance purposes?

- Counter intrpret.: yes = counter reading should be saved and be available for later evaluations, no = counter reading should not be saved
- Simulation: off = digital output is not used for simulation

Configuration of an elapsed hours counter

- Elapsed hours counter
- Activate = yes, i.e. the elapsed hours counter is evaluated for switching off the pump
- Run time = 100h, i.e. the pump is switched off after 100 h operation, whereby
- "Action = rel. + SMS + pum..." the pump is switched inactively (-> digital output), a relay is switched to active and an SMS is sent to the receivers configured
- Terminal=A-52 – the relay is output at this terminal where necessary
- Out operation A: normally open – the relay acts as a normally open contact
- Message: display + ack. – messages output are displayed in a message window and then acknowledged
- SMS text: text that is sent as an SMS
- Telealarm: inactive – is the telealarm sent? Yes/No

Configuration of the pump control application

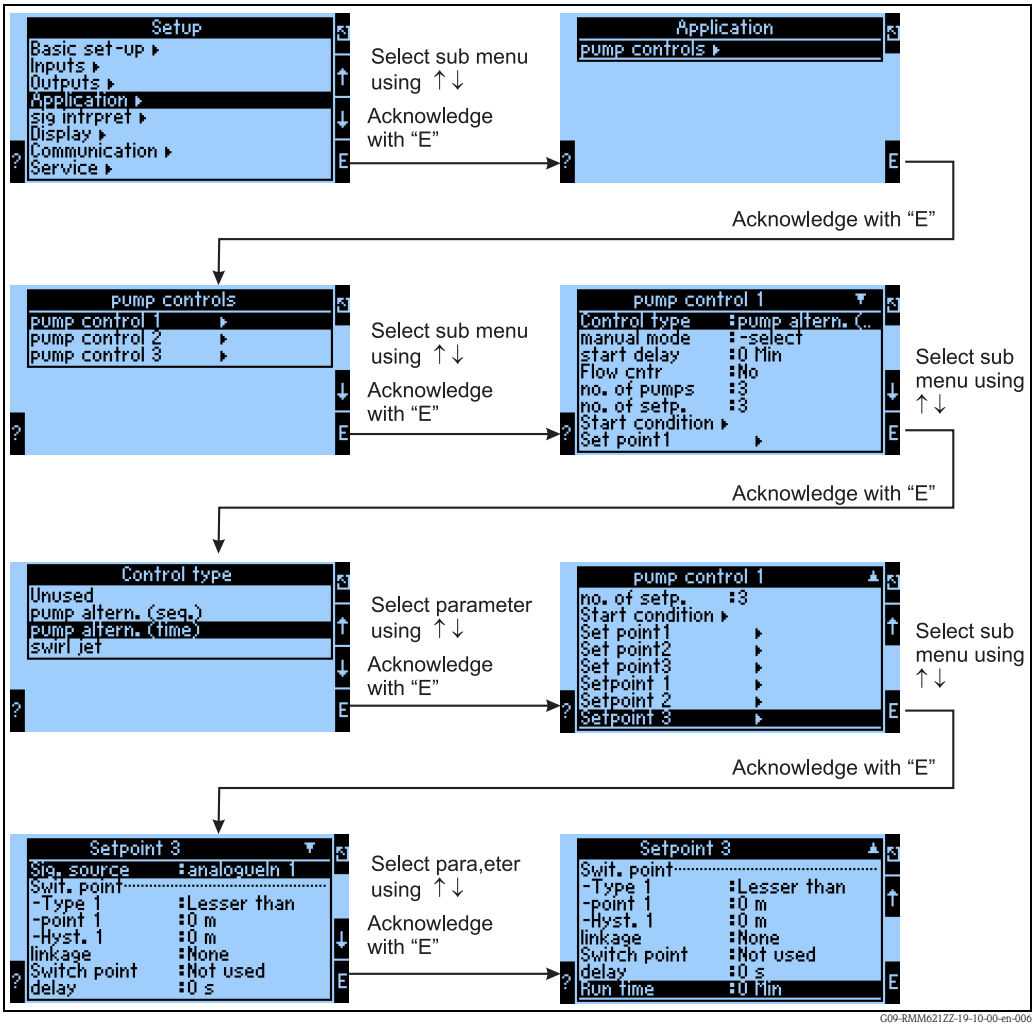


Fig. 23: Configuration of the pump control application

In the Setup menu, the Application menu option is selected. One of the 3 applications is selected in the Pump control submenu.
In this instance, time-controlled alternating pump is selected. The following settings are made in this submenu:

- Control type: pump altern. (time), depending on the run time of the pumps, the pump with the lowest run time is the next to be activated
- Manual mode: - select (=not active): a digital input can be selected here (if available) with which the entire application can be deactivated if, for example, repair work is carried out on all the pumps.
- Start delay: 0 min – the time between two pump startups (if the value equals 0, the necessary number of pumps can be switched on at the same time. Otherwise they are activated at different times)
- Flow cntr: no – the flow sum of the entire application is (not) calculated
- No. of pumps: 3 – the application has 3 pumps which should be used alternately
- No. of setp.: 3 – there are 3 points at which an additional pump should be switched on (3 setpoints)
- Start condition: - configuration of an input that can be used to activate the control system
- Set point 1 – 3: digital output (=pump) that is included in the control system
- Setpoint 1 – 3: values where an action to be configured is to be carried out when the value is achieved:
  - Sig source: analogIn. 1: value that is monitored and whose violation causes an action to take place
  - Switch point – type 1: lesser than – pump is switched on if the switch point is undershot
  - Switch point – point 1: 10m
  - Switch point – hysteresis1: 0m
  - Switch point – linkage: none (optional NAND, OR, XOR, AND) – 2 conditions that have to be met to activate a pump can be logically linked with this option
  - Alt. setp.: do not use – with this option, the buildup of algae on a basin can be prevented through different switch points
  - Delay: 0s - how long must a switch point be violated until an action is started (0s means that the pump is activated immediately)
  - Run time: 0min – how long does a pump run in a cycle until it is switched off even if the condition is still active (0min means that the run time is not monitored)

Configuration of the signal evaluation (saving and displaying saved values and events)

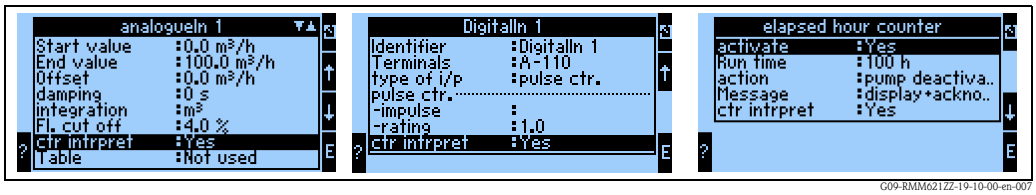


Fig. 24: Signal evaluation for analog inputs, digital inputs and elapsed hours counters

The "counter intrpret" option can be activated for analog inputs (flow), digital inputs (pulse counters) and elapsed hours counters such that counter values can be saved and interpreted. The counter values are stored in the storage media of the RMM621 Pump Manager and can then be called up (current counter and precounter directly at the device, saved values with ReadWin® 2000).
In the "Signal evaluation" menu item, interval-based intermediate evaluations, daily, monthly, yearly evaluations can then be activated:

- Intermediate evaluation: here you can specify at what interval the values are to be stored (no=no intermediate evaluation, 1, 2, 3, 4, 5, 10, 15, 30 min, 1, 2, 3, 4, 6, 8, 12h)
- Day: no, yes: daily values of the counters
- Month: no, yes: monthly values of the counters
- Year: no, yes: yearly values of the counters
- Synch. time: hh:mm: daily evaluation at the time of synchronization (applies to intermediate evaluation, day, month, year)

- Reset: no, intermediate evaluation, day, month, year, all counters are reset when ENTER is actuated

Fig. 25: Configuration of the signal evaluation

The configured signal evaluation can then be displayed at the device and via ReadWin® 2000.

At the device:

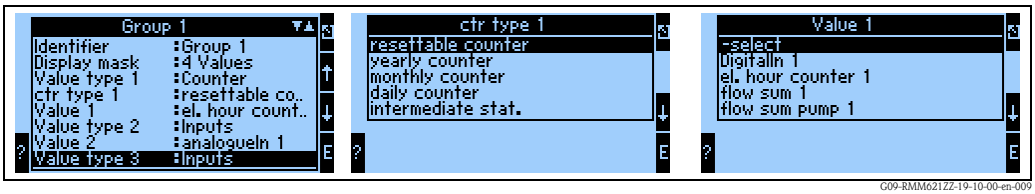
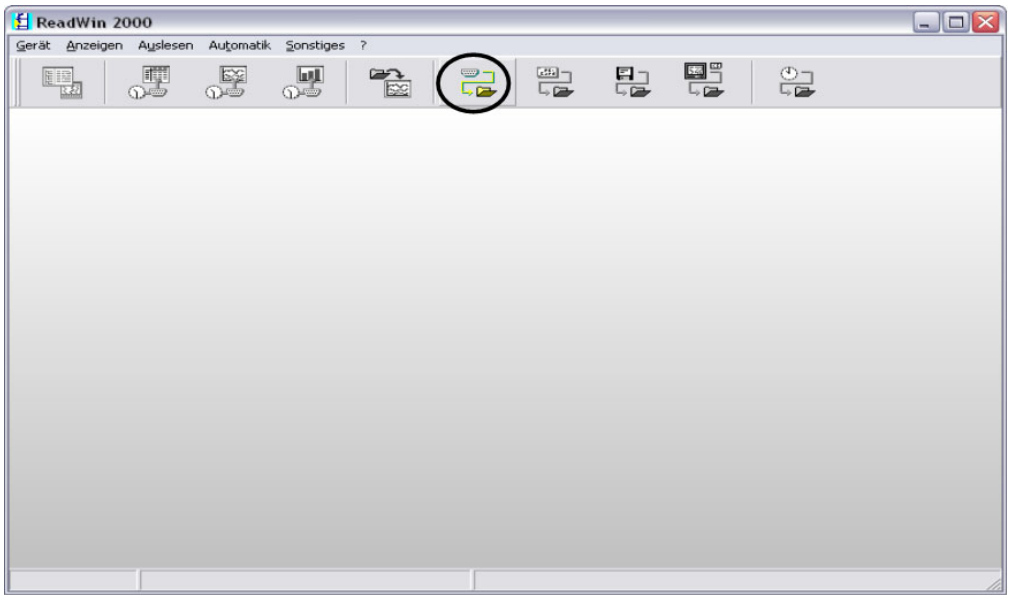


Fig. 26: Display of the signal evaluation at the device

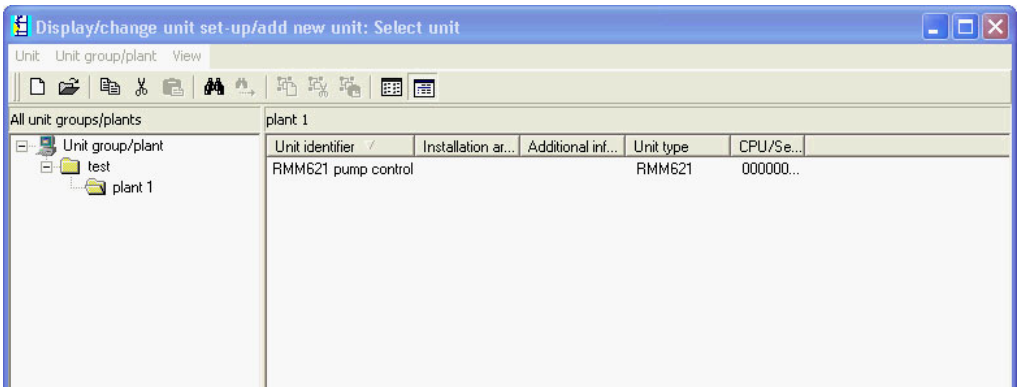
With ReadWin® 2000:

Read out measured values per interface/modem

Step 1: Start action



Step 2: selection of the configuration, whose archived measured values are to be read out



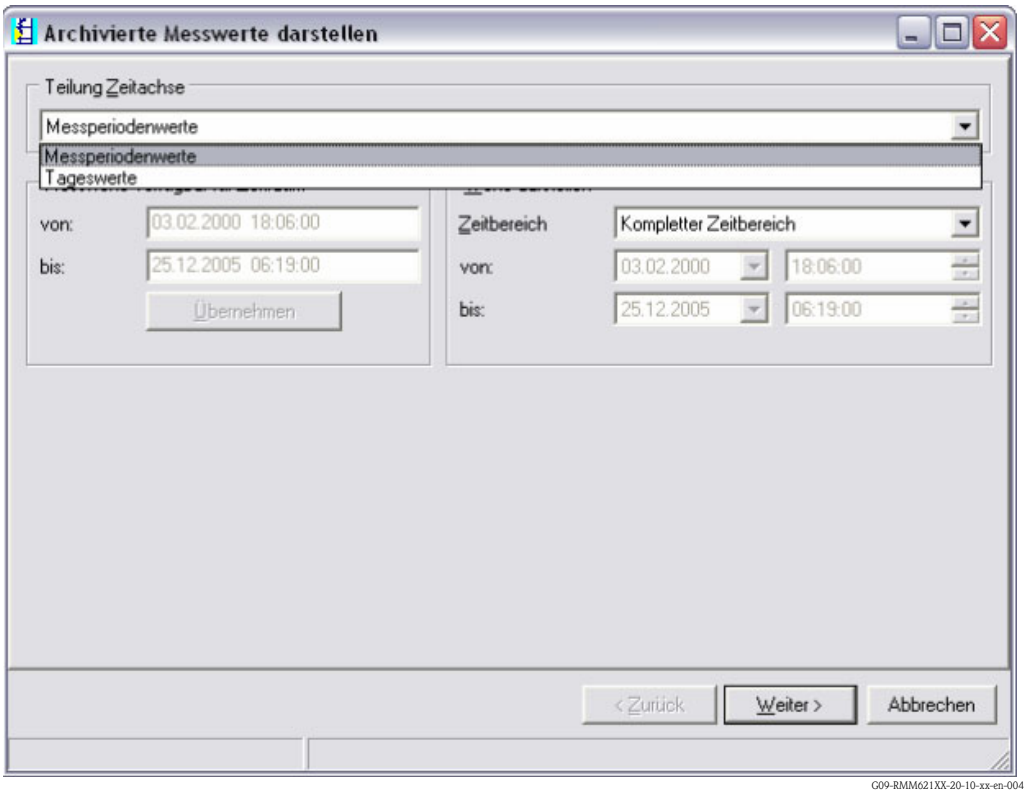
G09-RMM621XX-20-10-xx-en-001

Step 3: display read-out measured values

G09-RMM621XX-20-10-xx-en-002

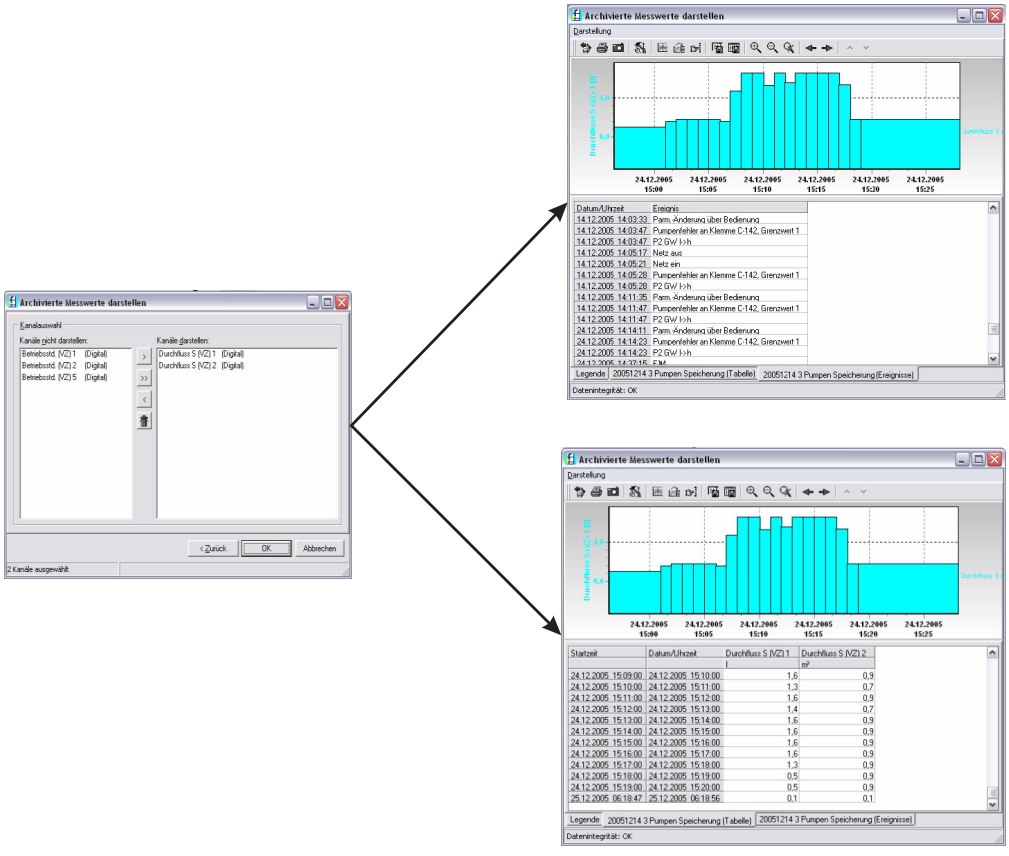
Step 4: configuration of the output and selection of the desired values

G09-RMM621XX-20-10-xx-en-002



G09-RMM621XX-20-10-xx-en-004

Step 5: display of the read-out values as bar graph, measured value table and the accumulated events



G09-RMM621XX-20-10-xx-en-008

Display configuration

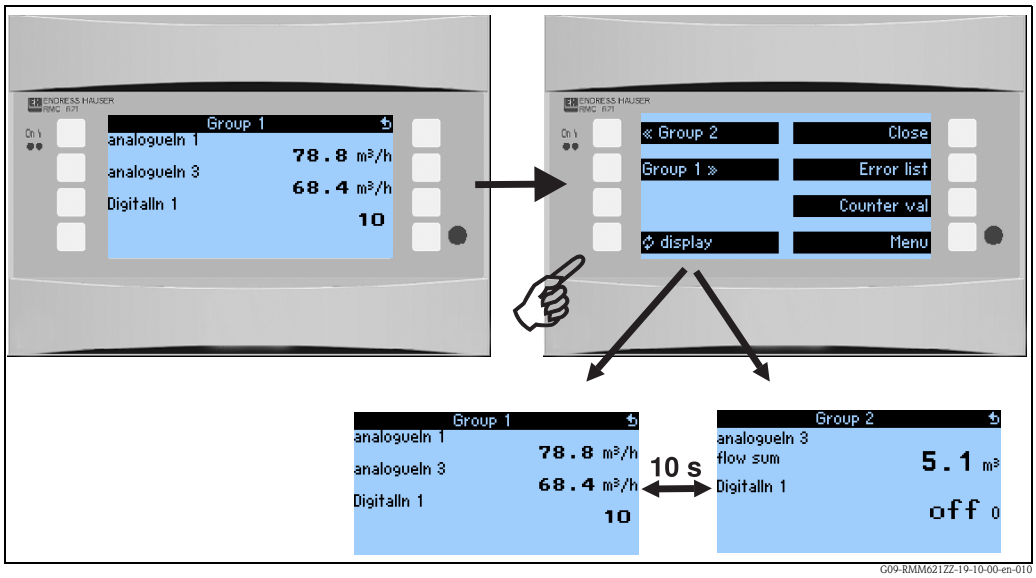


Fig. 27: Configuration of alternating display

Telealarm configuration

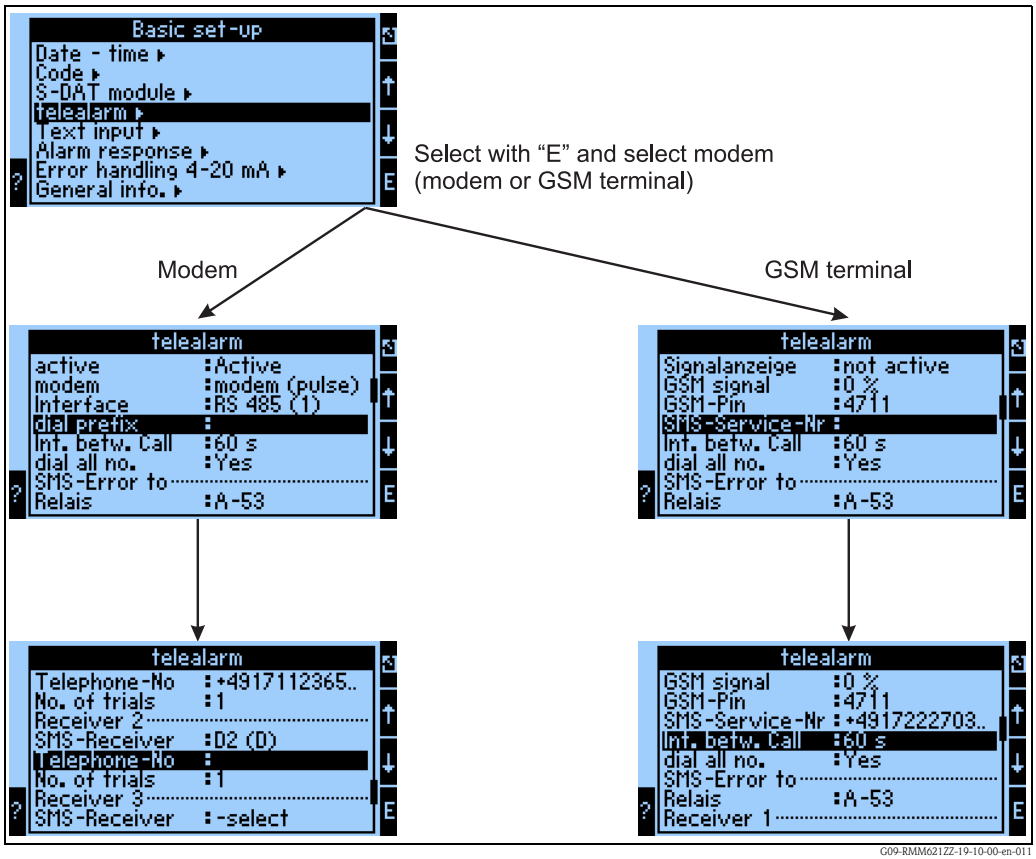


Fig. 28: Telealarm configuration at the RMM621 onsite

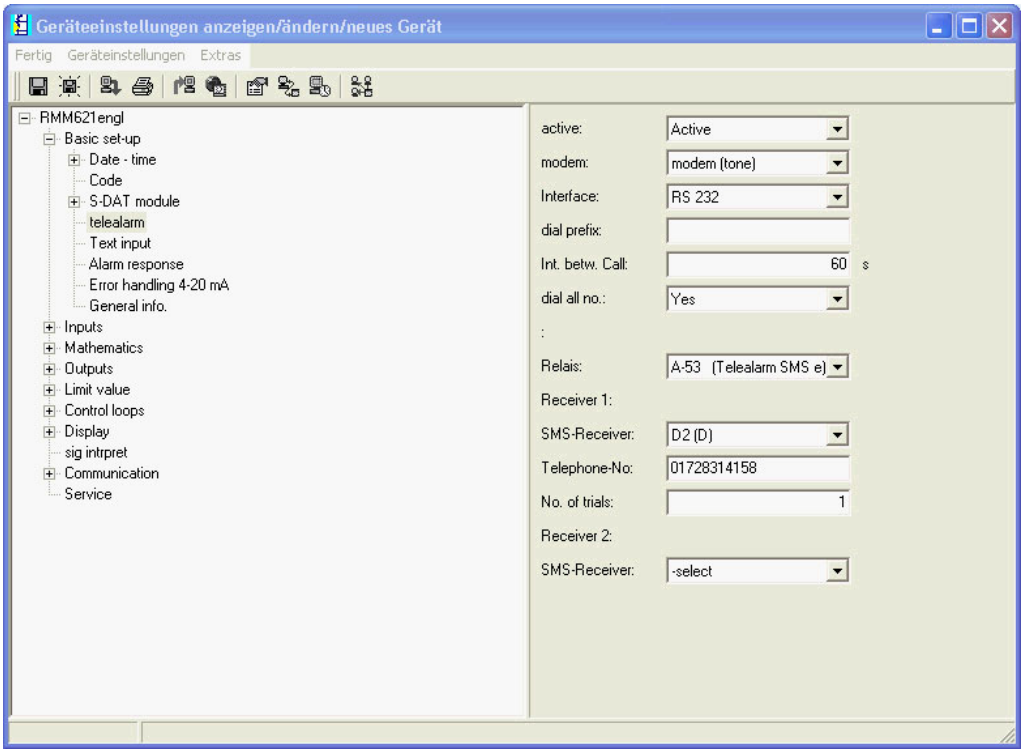
The "Telealarm" function is used for forwarding alarms, e.g. to a cellular phone or to a PC; this function is configured in the basic setup. For example, the following are configured here:

- Which modem type
  - – GSM terminal,
  - – Modem (pulse dialing method) or
  - – Modem (tone dialing method)

  is used,
- Which interface with which baudrate is used
- Whether dial prefix is necessary (not for GSM)
- Signal dis.: display of the signal strength – above all for testing in the event of transmission difficulties (only for GSM)
- SMS Service No.: number of the SMS gateway of the mobile network operator (only for GSM)
- Delay: a defined waiting time is maintained between 2 transmission attempts
- Should all numbers defined in the sequence be dialed? i.e. if it was not possible to reach the first defined number, then the second number is used, etc.
- SMS err.terminal: if it was not possible to transfer an SMS correctly to the modem, then a relay can be switched to activate an external system to display the problem.
- Receiver 1: cellular phone or PC software (for GSM), or D1 (D) or cellular phone (for modem)
- Telephone no. 1: "+"country code, followed by the telephone number of the desired participant
- Number of attempts before the next participant is to be dialed.

The same configuration using ReadWin® 2000 is displayed below; the individual steps correspond to those of the "Telealarm configuration: at RMM621 on site" (→ Fig. 28)

Telealarm configuration in ReadWin® 2000



G09-RMM621XX-20-10-xx-en-009

Fig. 29: Configuration of Telealarm for modem with tone dialing in ReadWin® 2000

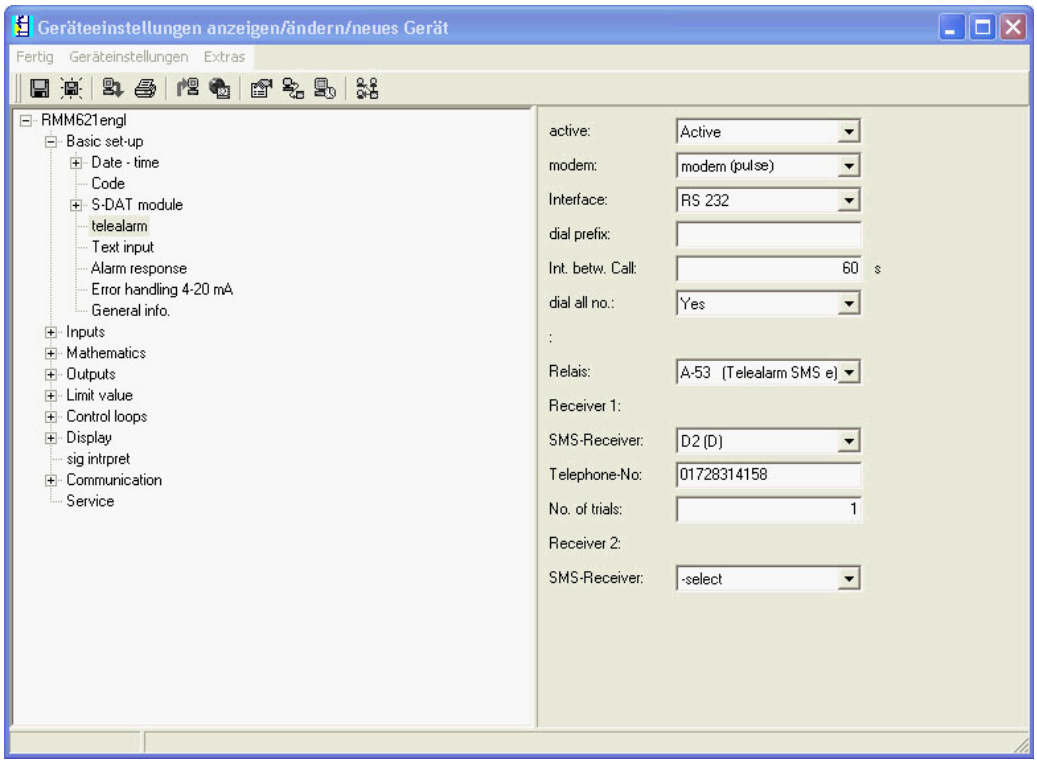


Fig. 30: Configuration of Telealarm for modem with pulse dialing in ReadWin® 2000

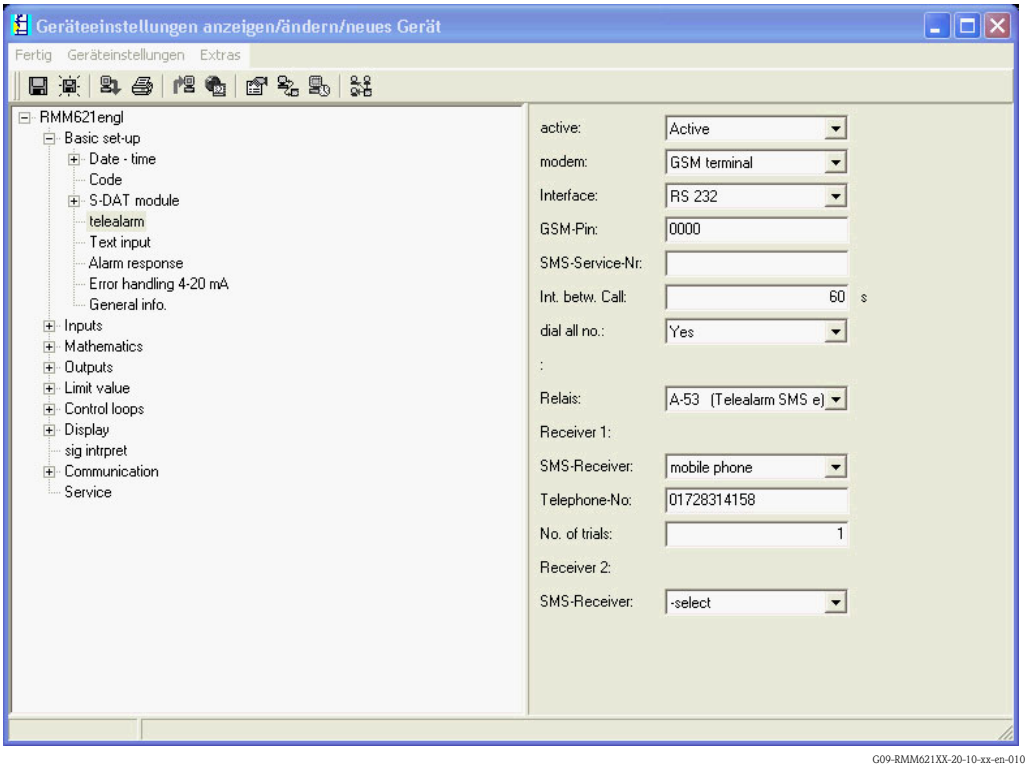


Fig. 31: Configuration of Telealarm for GSM terminal in ReadWin® 2000

The following illustrations describe how the connection is established:

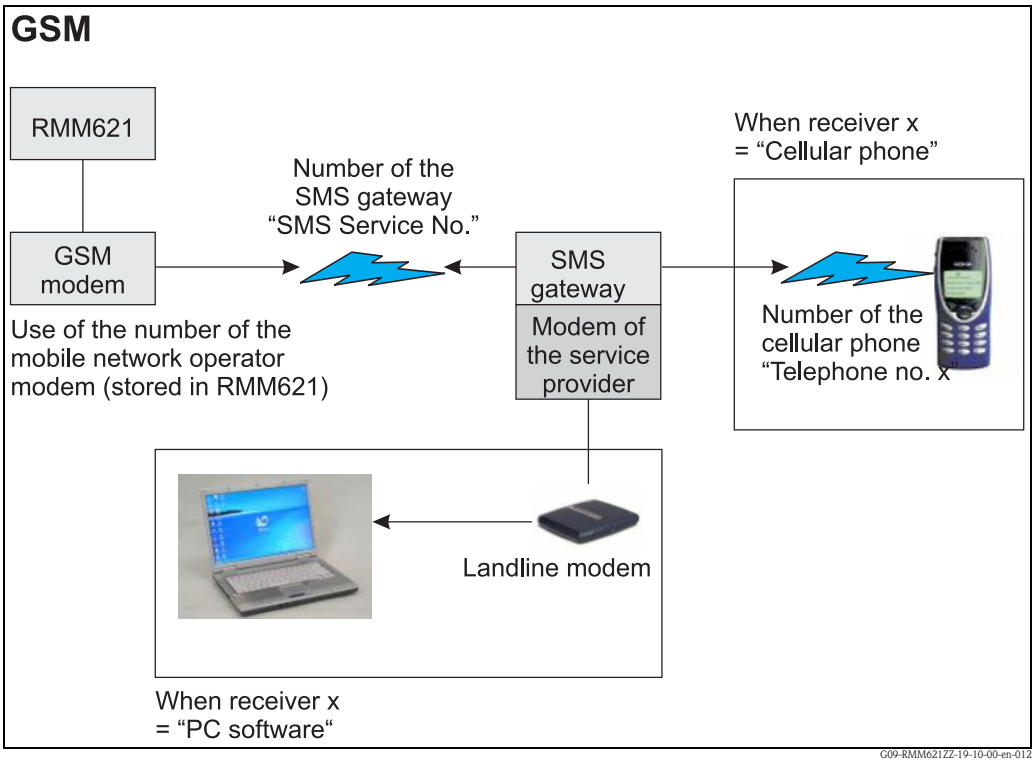


Fig. 32: Communication with cellular phone (SMS) via GSM modem (at RMM621) and SMS gateway, or modem of the service provider

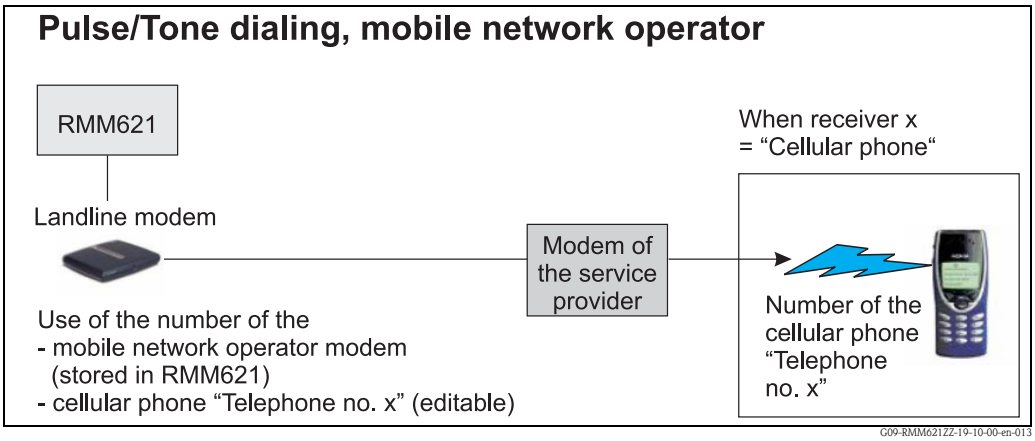


Fig. 33: Communication with cellular phone (SMS) via modem of the service provider

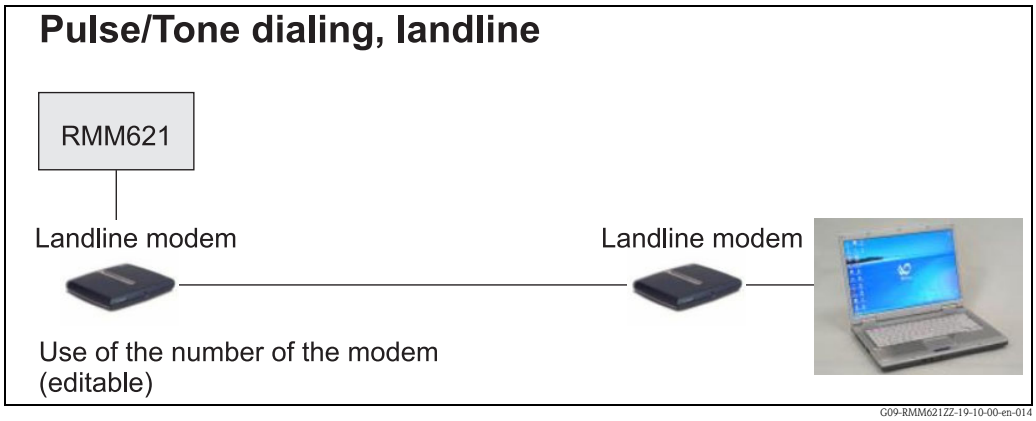


Fig. 34: Communication with PC (e.g. ReadWin® 2000)

7 Maintenance

The device does not require any special maintenance and servicing work.

8 Accessories

Identifier	Order code
PC configuration software ReadWin® 2000 and serial configuration cable with 3.5 mm jack plug.	RMM621A-VK
Remote display for panel mounting 144 x 72 x 43 mm	RMM621A-AA
Protective housing IP 66 for top-hat rail devices	52010132
Profibus Interface	RMM621A-P1
Digital extension card Inputs: 2 x digital up to 20 kHz, 4x digital up to 4 Hz Outputs: 6 x SPST relays	RMM621A-DA
Power extension card Inputs: 2 x 0/4 up to 20 mA/PFM/pulse with transmitter power supply unit Outputs: 2 x 0/4 up to 20 mA/pulse, 2 x digital, 2 x relays	RMM621A-UA

9 Troubleshooting

9.1 Troubleshooting instructions

Always begin troubleshooting using the following checklists if faults occur after commissioning or during operation. Different questions will guide you to the cause of the error and will suggest appropriate remedial action.

9.2 System error messages

Shown on display	Cause	Remedy
Counter data error	■ Data acquisition fault in the counter ■ Data in the counter faulty	■ Reset counter (→ Section 6.3.3 Main menu - Setup) ■ Notify E+H-Service if the error cannot be rectified.
Calibration data error, slot "xx"	Calibration data set at the factory faulty/cannot be read.	Remove card and insert it again (→ Section 3.2.1 Installing extension cards). Contact E+H Service if error message appears again.
Card not recognized, slot "xx"	■ Plug-in card defective ■ Plug-in card not inserted correctly	Remove card and insert it again (→ Section 3.2.1 Installing extension cards). Contact E+H Service if error message appears again.
Device software error: ■ Error reading out the curr. read item ■ Error reading out the curr. write item ■ Error reading out the curr. oldest value ■ adr "address" ■ DRV_INVALID_FUNCTION ■ DRV_INVALID_CHANNEL ■ DRV_INVALID_PARAMETER ■ I2C-bus error ■ Checksum error – Pressure outside steam range! – Calculation not possible! – Temp. outside steam range! – Max. saturated steam temperature overshot!	Error in the program	Contact your E+H Service organization.
S-Dat module error (var. messages)	Error when reading data into or out of the S-Dat module	Detach S-Dat module and attach it again. If necessary, contact your local E+H Service organization.
"Communication problem"	No communication between the separate display/ operating unit and the basic unit	Check wiring; the baudrate and device address in the basic unit and the separate display/operating unit must be set the same.

9.3 Process error messages

Shown on display	Cause	Remedy
Config error: ■ Pressure ■ Analog flow! ■ PFM pulse flow! ■ Applications! ■ Limit values! ■ Analog outputs! ■ Pulse outputs! ■ No pump start as control system blocked! ■ No pump start as start condition not met!	■ Faulty or incomplete programming or loss of calibration data ■ Contradictory assignment of terminals ■ Error in calculation! ■ There is no calculation due to incorrect configuration The status of an assigned digital input (e.g. manual control) results in the deactivation of the pump control system or the pump control system is not enabled as the start condition is not met	■ Check whether all the necessary items are defined with plausible values. (→ Section 6.3.3 Main menu - Setup) ■ Check whether inputs have been assigned in a contradictory manner. (→ Section 6.3.3 Main menu - Setup) Correct the digital input or meet the condition that results in the pump control system starting, e.g. a limit value is overshot
Signal range violation "channel name" "signal name"	Current output signal below 3.6 mA or above 21 mA.	■ Check whether the current output is scaled correctly. ■ Change the start and/or end value of the scaling
Cable open circuit: "channel name" "signal name"	Input current at current input smaller than 3.6 mA (with setting 4 to 20 mA) or larger than 21 mA. ■ Incorrect wiring ■ Sensor not set to 4-20 mA range. ■ Sensor malfunction ■ Incorrectly configured end value for flow transmitter	■ Check sensor configuration. ■ Check function of the sensor. ■ Check end value of the connected flowmeter. ■ Check wiring.
Range violation	3.6 mA < x < 3.8 mA (with setting 4 to 20 mA) or 20.5 mA < x < 21 mA ■ Incorrect wiring ■ Sensor not set to 4-20 mA range. ■ Sensor malfunction ■ Incorrectly configured end value for flow transmitter	■ Check sensor configuration. ■ Check function of the sensor. ■ Check measuring range/scaling of the connected flowmeter. ■ Check wiring.
Cable open circuit: "channel name" "signal name"	Resistance too high at PT100 input, e.g. due to short-circuit or cable breakage ■ Incorrect wiring ■ PT100 sensor defective	■ Check wiring. ■ Check function of the PT100 sensor.
Limit value violation Limit value violation 'number' rectified (blue) ■ "Limit value designation" < "threshold value" "unit" ■ "Limit value designation" > "threshold value" "unit" ■ "Limit value designation" > "gradient" "unit" ■ "Limit value designation" < "gradient" "unit" ■ "User defined message"	Limit value overshot or undershot (→ Limit value setting, Section 6.3.3)	■ Confirm alarm if the "Limit value/message text/display and acknowledge" function is configured (→ Limit value setting, Section 6.3.3). ■ Check the application where necessary ■ Adjust the limit value where necessary
■ Pulse width between 0.04 and 1000 ms! ■ Pulse width between 100 and 1000 ms!	Active/passive pulse output: set pulse width not within valid range.	Change the pulse width to the value range indicated.
Number between 1 and 15!	Number of support points incorrect.	Value correction to a value from this value range.
Pulse buffer overflow	Too many pulses accumulated so the pulse counter overflows: pulses lost.	Increase pulse factor
You should assign a terminal to the flow signal (pressure signal/level signal)	In the configuration of the input signal	
Not all the inputs are correctly configured for application 1. Check the settings	No/not enough switch points/limit values assigned	Limit values and switch points must be assigned to the pump control system

Shown on display	Cause	Remedy
Pump error at terminal xx	Pump has assigned error digital input ("Pump alarm", "Pump not available" etc.). This input goes to "Active", i.e. configured error occurred	Rectify error situation at the pump, i.e. ensure that the condition for "Active" is reset again. Pump error must be confirmed by means of the Pump error menu (in the "Diagnosis" main menu).
Analog output x is not configured correctly. Check the settings.	The configuration of the input/output is incorrect, e.g. no start end value, no pulse value, no useful limit value	Correction of the settings
Pulse output x is not configured correctly. Check the settings.		
Digital output x is not configured correctly. Check the settings.		
One of the digital inputs is not configured correctly. Check the settings		
One of the Profibus signals is not configured correctly. Check the settings	The configuration of the output is incorrect, e.g. no start/end value, no pulse value, no useful limit value	Addressing for the Profibus telegram not correct: too many parameters to be transmitted
Several digital inputs with the same type of input and pump reference	Several of the same alarm signals or "Pump on" feedback signals are assigned to a pump	Check the alarm signals, max. one "Pump alarm", "Pump blocked" permitted; reduce number if necessary
Display screen %d is not configured correctly. Check the settings	The number of the values to be displayed was not configured completely	Reduce the number of the values to be displayed or configure precisely the number of values to be displayed
One of the display screens is not configured correctly. Check the settings.		
Other messages/events (only appear in the event buffer)		
Low flow cutoff: undershot!	Set low flow cutoff of flow measurement undershot, i.e. flow is evaluated with zero.	Reduce low flow cutoff where necessary. (→ Section. 6.3.3)

9.4 Telealarm error messages

Shown on display	Cause	Remedy
TeleAlarm not active	SMS was configured for the digital output/elapsed hours counter etc. even though it is not possible to relay a telealarm since the telealarm is not present	Configure telealarm in the basic settings
Message was not accepted by "network operator" service exchange	Telephone number of the cellular phone rang not correct (plausibility check not successful)	Correct the telephone number (e.g. remove erroneous special characters etc.)
No connection to "network operator" service exchange No connection to SMS service exchange	**Modem connection** Telephone connection could not be established as ■ Line not available ■ Own modem not working ■ Receiver not answering	■ Check your own modem ■ Check the connection to your own modem ■ Please contact the receiver: is the connection correctly wired at their end, can the modem at their end be reached?
Message was not accepted by SMS service exchange	**Mobile communications systems** ■ Invalid telephone number for addressee ■ No mobile communications connection	■ Check the telephone number of the addressee in the configuration of the pump control system: was this entered correctly? ■ Check the signal strength of the mobile communications terminal: can the mobile communications network be reached?
Message was not accepted by PC	Connection to PC not correct, no contact with modem at receiver's end	Check the settings at the modem and PC: are both configured correctly?
No connection to PC	Modem of receiver does not reach the PC, modem itself can be reached	Are the devices wired correctly, are the terminating resistors correct (e.g. when wiring via RS485 with the modem)
Message was not sent	Message was not relayed as none of the n receivers could be reached even though the maximum number of attempts was made	Message is taken out of the loop. If a relay was configured for SMS faults, then this fault relay goes to active
Check signal quality		Signal quality not sufficient, correct location of antenna

9.5 Spare parts

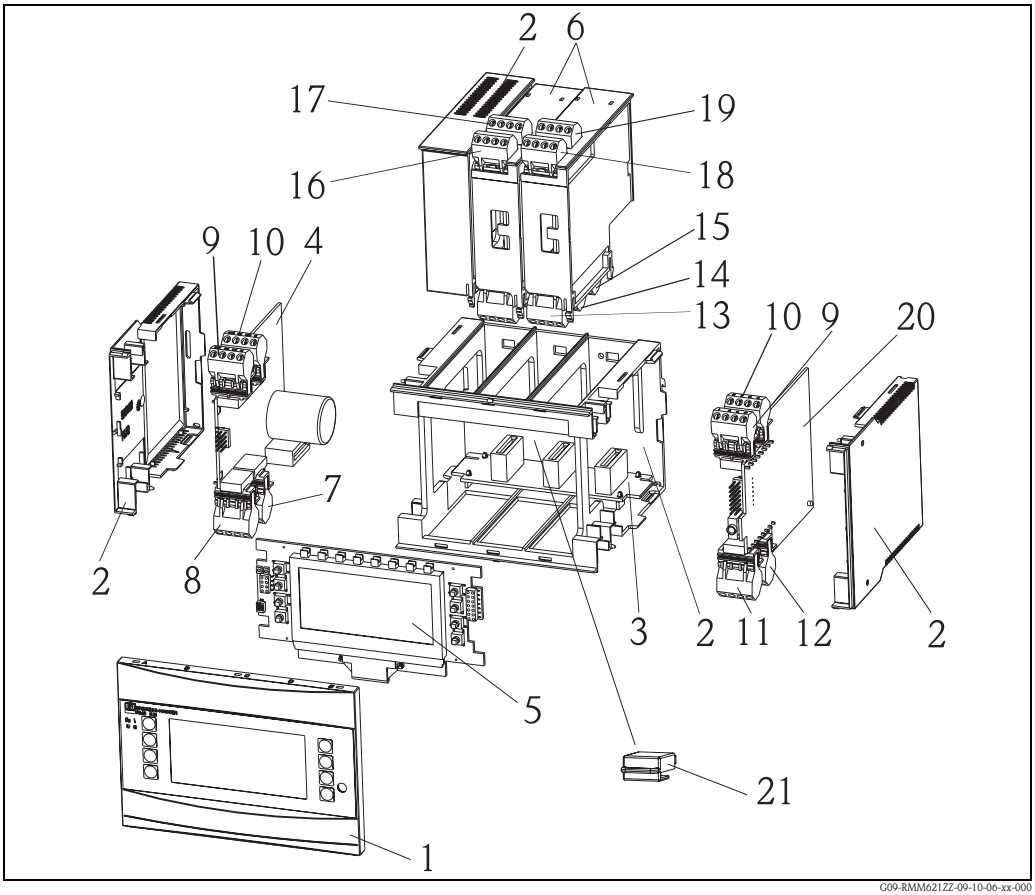


Fig. 35: RMM621 spare parts

Pos.-no.	Designation	Description	Order code
1	Front	Front cover for version without display	RMM621X-HA
		Front cover for version with display	RMM621X-HB
2	Housing	Housing cpl.without front+3x dummy plug-in+3x plug-in frame for board	RMM621X-HC
3	Bus board	Bus board	RMM621X-BA
4	Power supply	Power supply 90-253VAC	RMM621X-NA
		Power supply 20-36VDC/20-28VAC	RMM621X-NB
		Power supply 90-253VAC/ATEX version	RMM621X-NC
		Power supply 20-36VDC/20-28VAC/ATEX ver.	RMM621X-ND
5	Display	Display cpl. non Ex	RMM621X-DA
		Front board,version without display,non Ex	RMM621X-DB
		Display + front cover, non Ex	RMM621X-DC
		Display + front cover, neutral, non Ex	RMM621X-DD
		Display cpl. Ex	RMM621X-DE
		Front board, version without display, Ex	RMM621X-DF
		Display + front cover, Ex	RMM621X-DG
		Display + front cover, neutral, Ex	RMM621X-DH

Pos.-no.	Designation	Description	Order code
6	Extension boards	Extension board universal(PFM/pulse/analog/loop power)cpl.incl.connector and fixing frame	RMM621A-UA
		Extention card univ.ATEX approval (PFM/pulse/analog./ LPS)cpl.incl.terminal	RMM621A-UB
		Extension card digital, 6x dig. In, 6x Rel. Out, cpl. incl. terminal + fixing frame	RMM621A-DA
		Extension card digital ATEX approval, 6x dig. In, 6x Rel. Out, cpl. incl. terminal + fixing frame	RMM621A-DB
7	Supply terminal	Supply terminal 4 pole	51000780
8	Relay terminal/loop power	Terminal plug-in 4pol.SMSTB2,5 91/92/53 Relay terminal/loop power	51004062
9, 10	Analog terminal	Terminal plug-in 4pol.SMSTB2,5 82/81/10 Analog terminal 1 (PFM/pulse/analog/loop power) gray	51004063
		Terminal plug-in 4pol.SMSTB2,5 82/81/10/11 Analog terminal 1 (PFM/pulse/analog/loop power) blue	51005957
		Terminal plug-in 4pol.SMSTB2,5 83/81/110 Analog terminal 2 (PFM/pulse/analog/loop power) gray	51004064
		Terminal plug-in 4pol.SMSTB2,5 82/81/10 Analog terminal 2 (PFM/pulse/analog/loop power) blue	51005954
11	Terminal RS485	Terminal plug-in 4pol.SMSTB2,5 104..101 Terminal RS485	51004065
12	Output terminal	Terminal plug-in 4pol.SMSTB2,5 134..131 Output terminal (analog/pulse)	51004066
13	Relay terminal/ extension board	Terminal plug-in RMx621 relay	51004912
14, 15	Extension board / terminal output	Terminal RMX621 digital/open collector	51004911
		Terminal plug-in 4pol.SMSTB2,5 134..131 Output terminal (analog/pulse)	51004066
		Connector 4pin RMM621 digital output I	51010524
		Connector 4pin RMM621 digital output II	51010525
		Connector 4pin RMM621 digital output III	51010519
16, 17, 18, 19	Extension board / terminal input	Terminal plug-in RMx621,Input 1,4-20mA, PFM, pulse, loop power; gray	51004910
		Terminal plug-in Ex RMx621,Input1,4-20mA PFM, pulse, loop power; blue	51005959
		Terminal plug-in RMx621,Input 2,4-20mA, PFM, pulse, loop power; gray	51004909
		Terminal plug-in Ex RMx621,Input2,4-20mA PFM, pulse, loop power; blue	51005953
		Connector 4pin RMM621 dig. input blue	51010521
		Connector 4pin RMM621 dig. input gray	51010520
		Connector 4pin RMM621 dig. input II blue	51010523
		Connector 4pin RMM621 dig. input II gray	51010522

Pos. no. 20	CPU board	RMM621C-

	Version:	
	A	Non-hazardous area
	B	ATEX version
	C	FM ASI I, II, III/1/ABCDEFG
	D	CSA (Ex ia) I, II, III/1/ABCDEFG

		Operating language:	
		A	German
		B	English
		C	French
		D	Italian
		E	Spanish
		F	Dutch

			Unit software:	
			PA	Pump control package
			PB	Pump control + Telealarm
			YY	Special version to be specified

				Communication:	
				1	1x RS232+1x RS485
				5	1xRS232+2xRS485
				A	1x RS232+1x RS485+Ethernet For retrofitting of Ethernet, pls. contact service
				E	1xRS232+2xRS485+Ethernet For retrofitting of Ethernet, pls. contact service

					Version:	
					A	Standard

RMM621C-						⇐ Order code(complete)

Pos.-Nr. 21	S-Dat module	RMM621S-

	Software	
	1	Standard software

		Version	
		A	Standard version

RMM621S-	1	A	⇐ Order code

9.6 Return

For a return, e.g. in case of repair, the device must be sent in protective packaging. The original packaging offers the best protection. Repairs must only be carried out by your supplier's service organization. An overview of the service network can be found on the address page of these Operating Instructions.

Note!
When sending for repair, please enclose a note with a description of the error and the application.

9.7 Disposal

The device contains electronic components and must, therefore, be disposed of as electronic waste in the event of disposal. Please also observe local regulations governing disposal.

10 Technical data

10.0.1 Input

Measured variable	Voltage (analog input), current (analog input), PFM, pulse, voltage (digital input)
Input signal	Any measured variables (e.g. flow, level, pressure, density), implemented as analog signal

Measuring range

Measured variable	Input
Current	■ 0/4 to 20 mA +10% overreach ■ Max. input current 150 mA ■ Input impedance < 10 Ω ■ Accuracy 0.1% of full scale value ■ Temperature drift 0.04% / K (0.022%/ °F) ■ Signal damping low filter 1st order, filter constant adjustable 0 to 99 s ■ Resolution 13 bit
PFM	■ Frequency range 0.01 Hz to 18 kHz ■ Signal level – low: 2 to 7 mA; – high: 13 to 19 mA ■ Measurement method: period length/frequency measurement ■ Accuracy 0.01% of measured value ■ Temperature drift 0.01% over entire temperature range
Pulse	■ Frequency range 0.01 Hz to 18 kHz ■ Signal level 2 to 7 mA low; 13 to 19 mA high with approx. 1.3 kΩ dropping resistor at max. 24 V voltage level
Voltage (digital input)	■ Voltage level – low: -3 to 5 V – high: 12 to 30V (as per DIN 19240) ■ Input current typically 3 mA with overload and reverse polarity protection ■ Sampling frequency: 4 x 4 Hz (terminal 83, 85, 93, 95) ■ 2 x 20kHz (terminal 81, 91)

Galvanic isolation

The inputs are galvanically isolated between the individual extension cards and the basic unit (see also 'Galvanic isolation' under Output.)

Note!
With digital inputs, every pair of terminals is galvanically isolated from each other.

10.0.2 Output

Output signal	Current, pulse, transmitter power supply (TPS) and switching output

Galvanic isolation

Basic unit:

Connection with terminal designation	Power supply (L/N)	Input 1/2 0/4 to 20 mA/ PFM/pulse (10/11) or (110/11)	Input 1/2 TPS unit (82/81) or (83/81)	Output 1/2 0 to 20 mA/pulse (132/131) or (134/133)	Interface RS232/485 housing front or (102/101)	TPS unit, external (92/91)	Digital input (94/95/96)
Power supply		2.3 kV	2.3 kV	2.3 kV	2.3 kV	2.3 kV	2.3 kV
Input 1/2 0/4-20 mA/PFM/pulse	2.3 kV			500 V	500 V	500 V	500 V
Input 1/2 TPS unit	2.3 kV			500 V	500 V	500 V	500 V

Connection with terminal designation	Power supply (L/N)	Input 1/2 0/4 to 20 mA/ PFM/pulse (10/11) or (110/11)	Input 1/2 TPS unit (82/81) or (83/81)	Output 1/2 0 to 20 mA/pulse (132/131) or (134/133)	Interface RS232/485 housing front or (102/101)	TPS unit, external (92/91)	Digital input (94/95/96)
Output 1/2 0-20 mA/pulse	2.3 kV	500 V	500 V		500 V	500 V	500 V
Interface RS232/RS485	2.3 kV	500 V	500 V	500 V		500 V	500 V
TPS unit, external	2.3 kV	500 V	500 V	500 V	500 V		500 V
Digital input (81/83/85 and 91/93/95)	2.3 kV	500 V	500 V	500 V	500 V	500 V	500 V
Input 1/2 U/I/TC	2.3 kV	500 V	500 V	500 V	500 V	500 V	500 V

Note!
The specified insulation voltage is the AC testing voltage U_{eff}, which is applied between the connections.
Basis for assessment: IEC 61010-1, protection class II, overvoltage category II

10.0.3 Output variable current - pulse

Current

- 0/4 to 20 mA, can be inverted
- Load max. 500 Ω at 20 mA
- Accuracy 0.1% of full scale value
- Temperature drift: 0.01% / K (0.0056% / °F)
- Output ripple < 10 mV at 500 Ω for frequencies < 50 kHz
- Resolution 13 bit
- Error signals 3.6 mA or 21 mA limit adjustable as per NAMUR NE43

Pulse

Basic unit:
- Frequency range up to 12.5 kHz
- Voltage level 0 to 1 V low, 12 to 28 V high
- Load min. 1 kΩ
- Pulse width 0.04 to 1000 ms

Extension cards (digital passive, open collector):
- Frequency range up to 12.5 kHz
- $I_{max.}$ = 200 mA
- $U_{max.}$ = 24 V ± 15%
- $U_{low/max.}$ = 1.3 V at 200 mA
- Pulse width 0.04 to 1000 ms

Number

Number:
- 2 x 0/4 to 20 mA/pulse (in basic unit)

Max. number:
- 10 x 0/4 to 20 mA/pulse (depends on the number of extension cards)
- 6 x digital passive (depends on the number of extension cards)

Signal sources

All available multifunctional inputs (current, PFM or pulse inputs) and results can be freely allocated to the outputs.

10.0.4 Switching output

Function

Limit relay switches in the operating modes: minimum/maximum safety, gradient, alarm, frequency/pulse, device error

Switch behavior	Binary, switches when the limit value is reached (potential-free NO contact)
Relay switching capacity	Max. 250 V AC, 3 A / 30 V DC, 3 A
	Note! A mixture of low voltage and extra-low voltage is not permitted for the relays of the extension cards.
Switching frequency	Max. 5 Hz
Threshold	freely programmable
Hysteresis	0 to 99%
Sig. source	All available inputs and calculated variables can be allocated freely to the switching outputs.
No of output states	> 100,000
Scan rate	500 ms
Number	1 (in the basic unit) Max. number: 19 (depends on the number and type of extension cards)

10.0.5 Transmitter power supply and external power supply

- Transmitter power supply unit (TPS), terminals 81/82 or 81/83 (optional power extension cards 181/182 or 181/183):
  Max. output voltage 24 V DC ± 15%
  Impedance < 345 Ω
  Max. loop current 22 mA (at U_{out} > 16 V)
- RMM621 Technical Data:
  HART® communication is not impaired
  Number: 4 TPS in the basic device
  Max. number: 10 (depends on the number and type of extension cards)
- Additional power supply (e.g. external display), terminals 91/92:
  Supply voltage 24 V DC ± 5%
  Current max. 80 mA, short-circuit proof
  Number 1
  Source resistance < 10 Ω

10.0.6 Power supply

Supply voltage	■ Low voltage power unit: 90 to 250 V AC 50/60 Hz ■ Extra-low voltage power unit: 20 to 36 V DC or 20 to 28 V AC 50/60 Hz
Power consumption	8 to 38 VA (depending on version and wiring)
Connection data interface	**RS232** ■ Connection: jack socket 3.5 mm, front ■ Transmission protocol: ReadWin® 2000 ■ Transmission rate: max. 57,600 baud

RS485
- Connection: plug-in terminals 101/102 (in the basic unit)
- Transmission protocol: (serial: ReadWin® 2000; parallel: open standard)
- Transmission rate: max. 57,600 baud

Optional: additional RS485 interface
- Connection: plug-in terminals 103/104
- Transmission protocol and transmission rate as standard interface RS485

10.0.7 Performance characteristics

Reference operating conditions
- Power supply 230 V AC ± 10%; 50 Hz ± 0.5 Hz
- Warm-up period > 30 min
- Ambient temperature 25 °C ± 5 °C (77 °F ± 9 °F)
- Air humidity 39% ± 10% r. h.

10.0.8 Installation conditions

Installation instructions

Mounting location

In cabinet on top-hat rail IEC 60715

Orientation

No restrictions

10.0.9 Environment

Ambient temperature range: -20 to 50 °C (-4 to 122 °F)

Storage temperature: -30 to 70 °C (-22 to 158 °F)

Climate class: as per IEC 60 654-1 Class B2 / EN 1434 Class 'C' (no condensation permitted)

Electr. safety: as per IEC 61010-1: environment < 2000 m (6560 ft) height above sea level

Degree of protection
- Basic unit: IP 20
- Remote operating and display unit: Front IP 65

Electromagnetic compatibility

Interference emission

IEC 61326 Class A

Interference immunity
- Power failure: 20 ms, no influence
- Starting current limitation: $I_{max}/I_n \leq 50\%$ (T50% ≤ 50 ms)
- Electromagnetic fields: 10 V/m as per IEC 61000-4-3
- Conducted HF: 0.15 to 80 MHz, 10 V as per IEC 61000-4-3
- Electrostatic discharge: 6 kV contact, indirect as per IEC 61000-4-2
  - Burst (power supply): 2 kV as per IEC 61000-4-4
  - Burst (signal): 1 kV/2 kV as per IEC 61000-4-4
  - Surge (power supply AC): 1 kV/2 kV as per IEC 61000-4-5
  - Surge (power supply DC): 1 kV/2 kV as per IEC 61000-4-5
  - Surge (signal): 500 V/1 kV as per IEC 61000-4-5

10.0.10 Mechanical construction

Design, dimensions

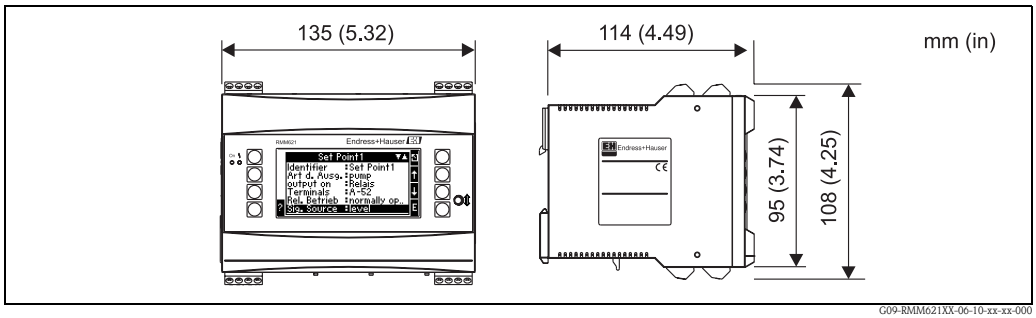


Fig. 36: Housing for top-hat rail as per IEC 60715

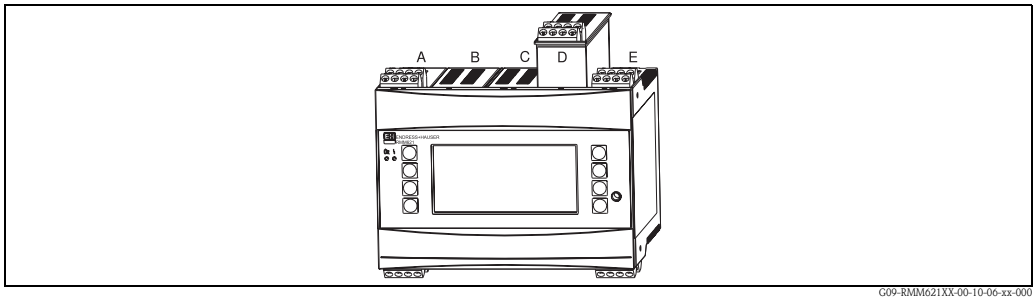


Fig. 37: Device with extension cards (available optionally or as accessory)
– Slots A and E are integral components of the basic device
– Slots B, C and D can be expanded with extension cards

Weight

- Basic device: 500 g (17.6 oz) (in maximum configuration with extension cards)
- Remote operating unit: 300 g (10.6 oz)

Material

Housing: polycarbonate plastic, UL 94V0

Terminals

Coded, pluggable screw terminals; clamping area 1.5 mm^2 (16 AWG) solid, 1.0 mm^2 (18 AWG) flexible with ferrules (applies to all connections).

10.0.11 Display and operating elements

Display elements

- Display (optional):
  160 x 80 DOT-Matrix LCD with blue background lighting, color change to red in event of error (configurable)
- LED status display:
  Operation: 1 x green (2 mm (0.08"))
  Fault message: 1 x red (2 mm (0.08"))
- Operating and display unit (optional or as accessory):
  An operating and display unit can be additionally connected to the device in the panel mounting housing (dimensions WxHxD = 144 x 72 x 43 mm (5.67" x 2.83" x 1.69")). The connection to the integrated RS484 interface is made using the connecting cable (l = 3 m (9.8 ft)), which is included in the accessories kit. Parallel operation of the operating and display unit with a device-internal display in the RMM621 is possible.

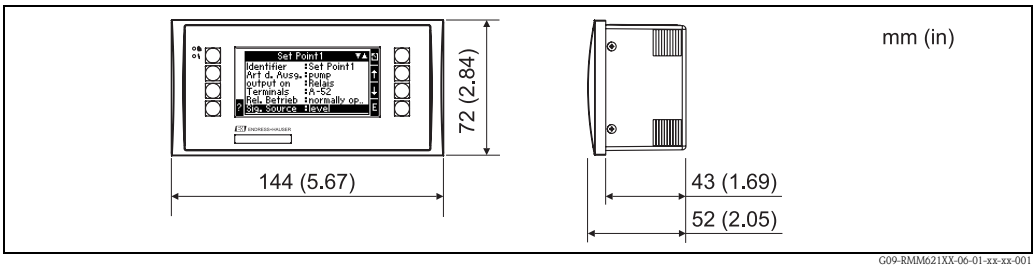


Fig. 38: Operating and display unit for panel mounting (available optionally or as accessory)

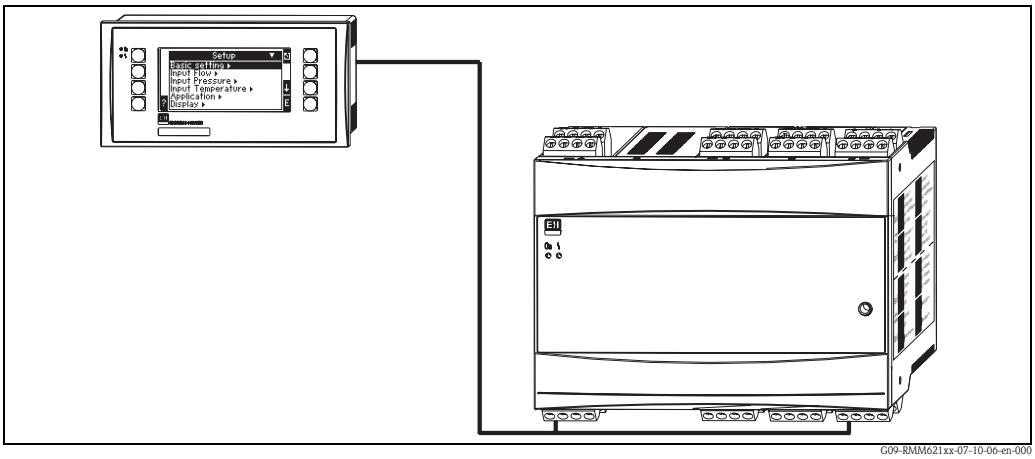


Fig. 39: Operating and display unit in panel mounting housing

Operating elements	Eight front-panel soft keys interact with the display (key functions are shown on the display).
Remote operation	RS232 interface (jack socket on front panel 3.5 mm (0.14 in)): configuration via PC with ReadWin® 2000 PC operating software. RS485 interface
Real time clock	■ Deviation: 30 min per year ■ Power reserve: 14 days

10.0.12 Certificates and approvals

CE mark

The measuring system meets the legal requirements of the EC Directives. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.

Ex approval

Information about currently available Ex versions (ATEX, FM, CSA, etc.) can be supplied by your E+H Sales Center on request. All explosion protection data are given in a separate documentation which is available upon request.

Other standards and guidelines

- IEC 60529:
  Degrees of protection through housing (IP code)
- IEC 61010:
  Protection measures for electrical equipment for measurement, control, regulation and laboratory procedures
- EN 61326 (IEC 1326):
  Electromagnetic compatibility (EMC requirements)
- NAMUR NE21, NE43
  Association for Standards for Control and Regulation in the Chemical Industry

10.0.13 Documentation

- Technical Information for RMM621 Pump Manager (TI121R/09)
- System components brochure (FA016K/09)

11 Appendix

11.1 List of abbreviations

Abbreviation	Meaning
… temp.	…temperature
curr.	current
Gen.	General
Ch. Speed	Change speed
disp.+ackn.	Display and acknowledge
Event mess.	Event message
Unit adr.	Unit address
Unit ID	Device designation
High stat.	High status
horz.	horizontal
Circuit br. det.	Circuit break detection
Low stat.	Low status
No.	Number
Prog.	Program
Res. value	Reset value
Pnts	Points
Resp.	Response
vert.	vertical
Time del.	Time delay
betw. calls	between calls
Int. evaluation	Intermediate evaluation

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