

Measuring Module M 700[®] Cond Ind 7700(X)

For Conductivity Measurement with
Electrodeless Sensors



52121224

METTLER TOLEDO



71935

Warranty

Defects occurring within 1 year from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender). Sensors, fittings, and accessories: 1 year.

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Return of Products Under Warranty

Please contact our Service Team before returning a defective device. Ship the cleaned device to the address you have been given. If the device has been in contact with process fluids, it must be decontaminated/disinfected before shipment. In that case, please attach a corresponding certificate, for the health and safety of our service personnel.

Disposal

Please observe the applicable local or national regulations concerning the disposal of "waste electrical and electronic equipment".

Trademarks

The following registered trademarks are used in this instruction manual without further marking

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is a registered trademark of Toshiba Corp., Japan

FOUNDATION FIELDBUS™

is a trademark of Fieldbus Foundation, Austin, USA

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Subject to technical changes.



**Declaration of conformity
 Konformitätserklärung
 Déclaration de conformité**



We/Wir/Nous

Mettler-Toledo GmbH, Process Analytics
 Im Hackacker 15
 8902 Urdorf
 Switzerland

declare under our sole responsibility that the product,
 erklären in alleiniger Verantwortung, dass dieses Produkt,
 déclarons sous notre seule responsabilité que le produit,

Description

Beschreibung/Description

Cond1 7700

to which this declaration relates is in conformity with the following standard(s) or other normative document(s).

auf welches sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder Richtlinie(n) übereinstimmt.

auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou au(x) document(s) normatif(s).

Low-voltage directive/Nieder-
 spannungs-Richtlinie/
 Directive basse tension

73/23/EWG

Norm/Standard/Standard

EN 61010 Teil 1 / 03.93 / VDE 0411 Teil 1: 1994-03
 EN 61010-1 / A2 / 07.95 / VDE 0411 Teil 1 / A1: 1996-05

EMC Directive/EMV-
 Richtlinie
 Directive concernant la
 CEM

89/336/EWG

Norm/Standard/Standard

EN 61326 / VDE 0843 Teil 20: 1998-01
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Mettler-Toledo GmbH, Process Analytics

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Christian Zwicky
 Head of Marketing

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Artikel Nr.: 52960334KE

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Déclaration de conformité**

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8902 Urdorf
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Description
Beschreibung/Description **Cond Ind 7700X**

to which this declaration relates is in conformity with the following standard(s) or other normative document(s).
auf welches sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder Richtlinie(n) übereinstimmt.
auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou au(x) document(s) normatif(s).

Explosion protection **94/9/EG**
Explosionsschutzrichtlinie **KEMA 04 ATEX 2056**
Prof. contre les explosions **NL-6812 AR Arnhem, KEMA 0344**

Low-voltage directive
Niederspannungs-Richtlinie
Directive basse tension **73/23/EWG**

EMC Directive
EMV-Richtlinie
Directive concernant la CEM **89/336/EWG**

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Ausstellungsort / - Datum
Lieu et date d'émission **Urdorf, July 16, 2004**

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<u>Norm/Standard/Standard</u>	94/9/EG:	EN 50014 EN 50020 EN 50281-1-1 EN 50284	
	73/23/EWG:	DIN EN 61010-1 / VDE 0411 Teil 1:	2002-08
	89/336/EWG:	DIN EN 61326 / VDE 0843 Teil 20:	2002-03

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KE Cond Ind 7700X-b.doc

Sitz der Gesellschaft Mettler-Toledo GmbH, im Langacher, CH-8606 Greifensee

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Intended Use

The module is an input module for conductivity measurement with commercially available electrodeless (toroidal) sensors.

The Cond Ind 7700X module is intended for operation in locations subject to explosion hazards which require equipment of Group II, device category 2(1), gas/dust.

Conformity with FDA 21 CFR Part 11

In their directive "Title 21 Code of Federal Regulations, 21 CFR Part 11, Electronic Records; Electronic Signatures" the US American health agency FDA (Food and Drug Administration) regulates the production and processing of electronic documents for pharmaceutical development and production. This results in requirements for measuring devices used for corresponding applications. The following features ensure that the M 700(X) modular process analysis system meets the demands of FDA 21 CFR Part 11:

Electronic Signature

Access to the device functions is regulated and limited by individually adjustable codes ("Passcodes"). This prevents unauthorized modification of device settings or manipulation of the measurement results. Appropriate use of these passcodes makes them suitable as electronic signature.

Audit Trail Log

Every change of device settings can be automatically recorded and documented in the Audit Trail Log on the SmartMedia card. The recording can be encrypted.

Safety Information

Application in Hazardous Locations

Caution!

Never try to open the module! If a repair should be required, return the module to our factory.

If the specifications in the instruction manual are not sufficient for assessing the safety of operation, please contact the manufacturer to make sure that your intended application is possible and safe.

Be sure to observe during installation:

- Switch off power supply before replacing or inserting a module.
- Protect the signal inputs of the modules against electrostatic discharge.
- Before commissioning it must be proved that the device may be connected with other equipment.
- Observe correct shielding.

Application in Hazardous Locations:

Cond Ind 7700X Module

When using the Cond Ind 7700X module, the stipulations for electrical installations in hazardous areas (EN 60079-14) must be observed.

When installing the device outside the range of applicability of the 94/9/EC directive, the appropriate standards and regulations in the country of use must be observed. The module has been developed and manufactured in compliance with the applicable European guidelines and standards.

Compliance with the European Harmonized Standards for use in hazardous locations is confirmed by the EC-Type-Examination Certificate.

Compliance with the European guidelines and standards is confirmed by the EC Declaration of Conformity.

There is no particular direct hazard caused by the operation of the device in the specified environment.

Software Version

Cond Ind 7700(X) Module

Device Software M 700(X)


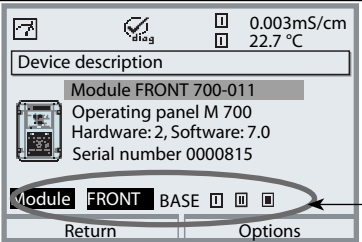
The Cond Ind 7700 module is supported by software version 3.0 or higher.
The Cond Ind 7700X module is supported by software version 4.0 or higher.

Module Software Cond Ind 7700(X)

Software version 2.0

Query Actual Device/Module Software

When the analyzer is in measuring mode:
Press **menu** key, open Diagnostics menu.

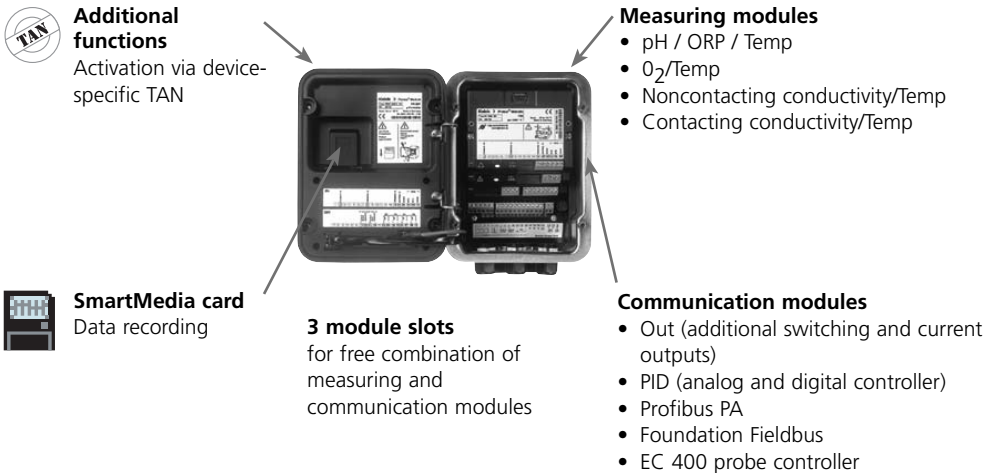
Menu	Display	Device description
 diag		Provides information about all modules installed: Module type and function, serial number, hardware and software version and device options. Select the different modules (FRONT, BASE, slots 1 - 3) using the arrow keys.

Modular Concept

Basic Unit, Measuring Module, Additional Functions

The M 700(X) is an expandable modular process analysis system. The basic unit (FRONT and BASE modules) provides three slots which can be equipped by the user with any combination of measuring or communication modules. The software capabilities can be expanded by additional functions (options). Additional functions must be ordered separately. They are supplied with a device-specific TAN for function release.

M 700(X) Modular Process Analysis System



Documentation

The basic unit is accompanied by a CD-ROM containing the complete documentation.

Latest product information as well as instruction manuals for earlier software releases are available at www.mt.com/pro.

Short Description

Short Description: FRONT Module

4 captive screws

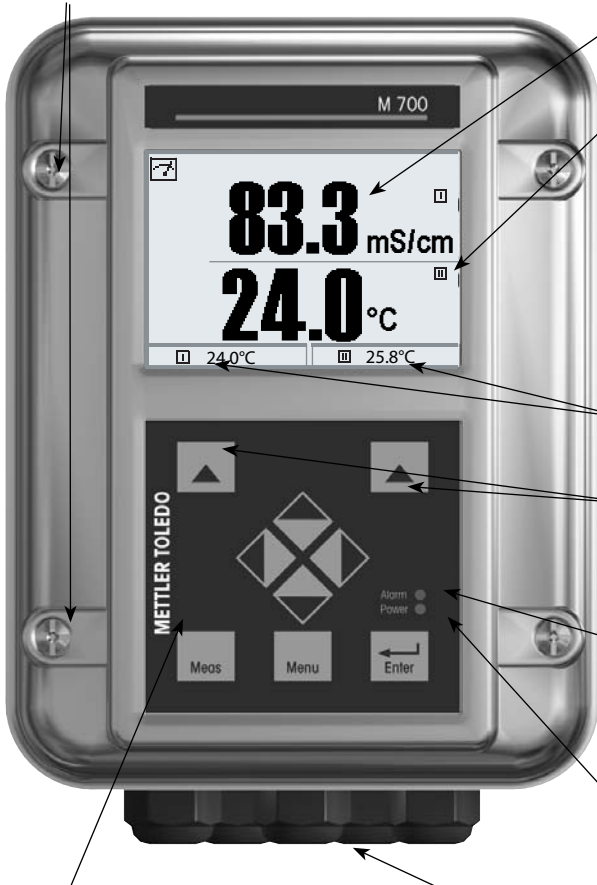
for opening the analyzer

(Caution! Make sure that the gasket between FRONT and BASE is properly seated and clean!)

Transflective LC graphic display

(240 x 160 pixels)

white backlighting, high resolution and high contrast.



Measurement display

User interface

with plaintext menus as recommended by NAMUR.

Menu texts can be switched to: German, English, French, Italian, Swedish, and Spanish.

Intuitively acquirable menu logic, based on Windows standards.

Secondary displays

2 softkeys

with context-sensitive functions.

Red LED

signals failure (On) or maintenance request/function check (flashing) according to NE 44.

Green LED

Voltage supply okay

Control panel

3 function keys

(menu, meas, enter)

and 4 arrow keys for menu selection

and data entries

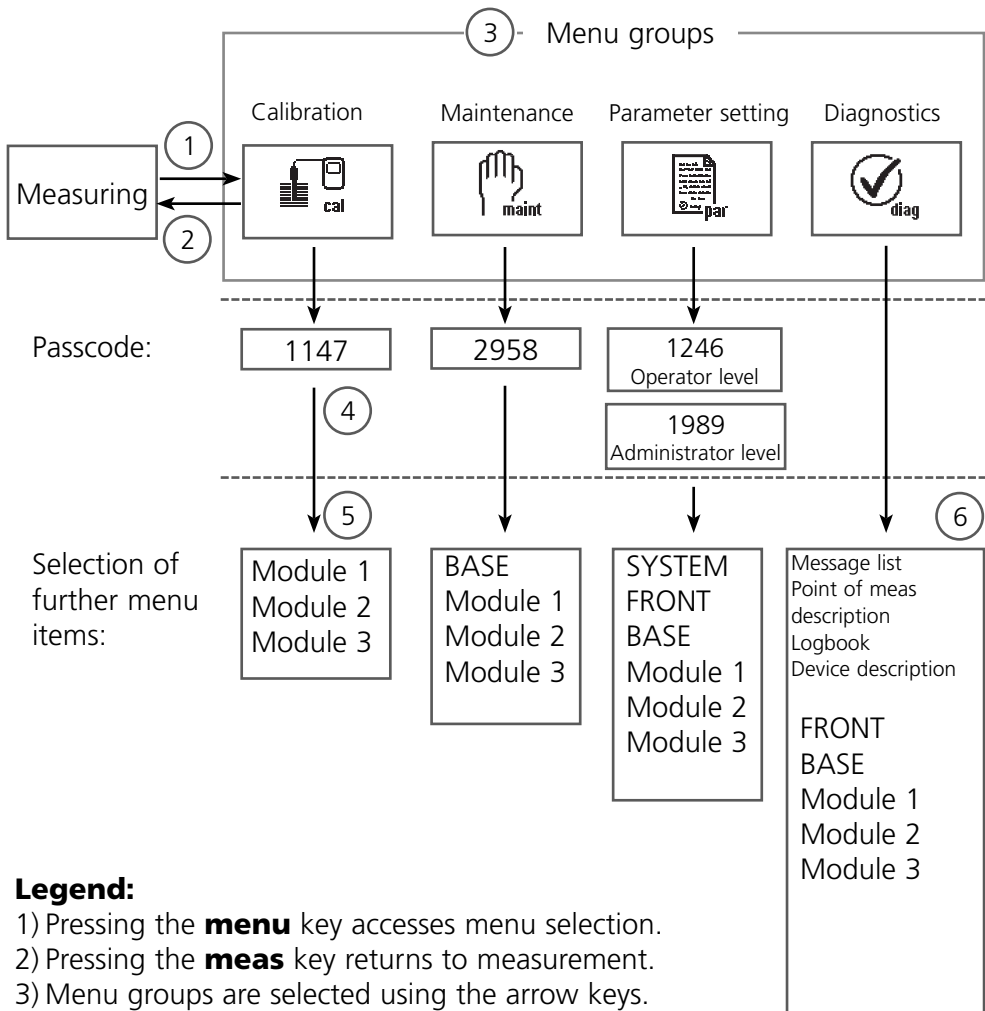
5 self-sealing cable glands

M20 x 1.5

for entry of voltage supply and signal lines

Short Description: Menu Structure

Basic Functions: Calibration, Maintenance, Parameter Setting, Diagnostics



Legend:

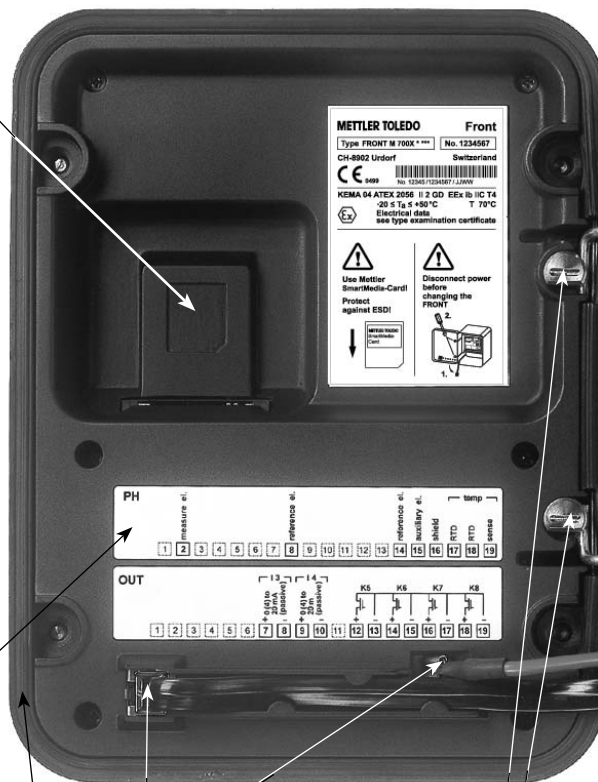
- 1) Pressing the **menu** key accesses menu selection.
- 2) Pressing the **meas** key returns to measurement.
- 3) Menu groups are selected using the arrow keys.
- 4) Press **enter** to confirm, enter passcode.
- 5) Further menu items are displayed.
- 6) Selected functions of the Diagnostics menu can be recalled via softkey even when in measuring mode.

Short Description: FRONT Module

View into the open device (FRONT module)

Slot for SmartMedia card

- Data recording
The SmartMedia card expands the measurement recorder capacity to > 50000 records.
- Exchange of parameter sets
5 parameter sets can be stored on the SmartMedia card. The 2 internal parameter sets can be switched by remote control. Configurations can be transmitted from one analyzer to the other.
- Function expansions
are possible with additional software modules, which are released using transaction numbers (TAN)
- Software updates



Terminal plates of "hidden" modules

Each module comes with an adhesive label containing the contact assignments. This label should be stuck to the inner side of the front (as shown). Then, the terminal assignments remain visible even if further modules are inserted.

Replacing the front module

Pull off power cord and ground wire. To separate the FRONT module from the BASE module, turn the retaining screws of the pivot hinge by 90°.

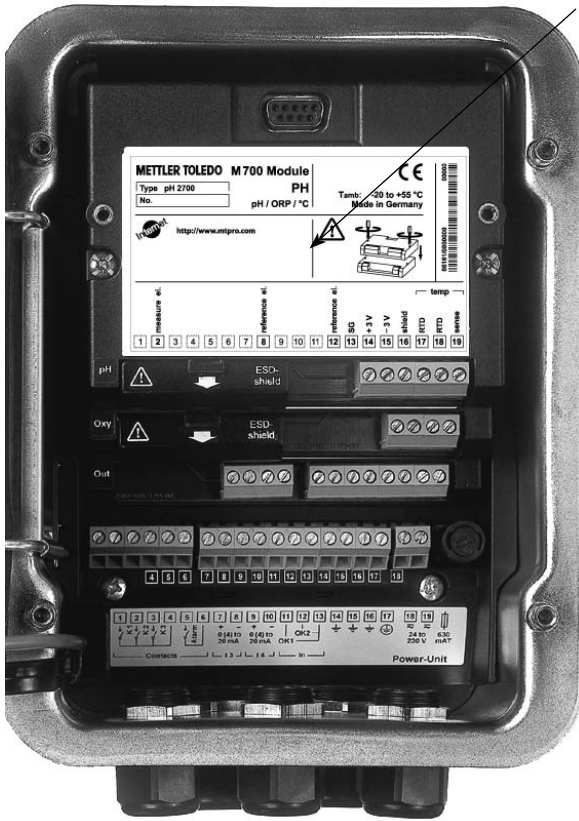
The circumferential sealing

guarantees IP 65 protection and allows spray cleaning / disinfection.

Caution! Keep clean!

Short Description: BASE Module

View into the open device (BASE module, 3 function modules installed)



Module equipment

Module identification: Plug & Play.

Up to 3 modules can be combined as desired. Several input and communication modules are available.

BASE module

2 current outputs (free assignment of process variable) and 4 relay contacts, 2 digital inputs.

VariPower broad-range power supply, 20 ... 265 V AC/DC, suitable for all public mains supplies in the world.

Power supply units, IS version:

100 ... 230 V AC or
24 V AC/DC



Warning!

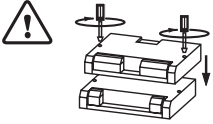
Do not touch the terminal compartment, there may be dangerous contact voltages!

Important Notice Concerning SmartMedia Card

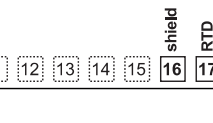
The SmartMedia card may be inserted or replaced with the power supply switched on. Before a memory card is removed, it must be "closed" in the maintenance menu. When closing the device, make sure that the sealing is properly seated and clean.

Terminal Plate Cond Ind 7700(X) Module

Terminal Plate Cond Ind 7700 Module:

METTLER TOLEDO M 700 Module												CE																																								
Type Cond Ind 7700		COND IND										Tamb: -20 to +55 °C																																								
No. _____		Conductivity / °C										Made in Germany																																								
Internet http://www.mt.com																																																				
<table border="1"> <tr> <td>receive hi</td><td>receive lo</td><td>shield</td><td>send lo</td><td>send hi</td><td>shield</td><td>SensLoop</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>shield</td><td>RTD</td><td>RTD</td><td>sense</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td> </tr> </table>												receive hi	receive lo	shield	send lo	send hi	shield	SensLoop									shield	RTD	RTD	sense	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	temp		
receive hi	receive lo	shield	send lo	send hi	shield	SensLoop									shield	RTD	RTD	sense																																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19																																		

Terminal Plate Cond Ind 7700X Module:

METTLER TOLEDO M 700X Module												CE																																								
Type Cond Ind 7700 X		CONDI										0049																																								
No. _____		inductive Conductivity / °C										Tamb: -20 to +50 °C																																								
<p>CE KEMA 04 ATEX 2056 Electr. data see type examination certificate II 2 (1) GD EEx ib [ia] IIC T4 T 70 °C CH-8902 Urdorf Switzerland</p> <p>FM IS, CLASS I, DIV1, GRP A, B, C, D, T4 Entity, Ta = 50 °C CLASS I, ZONE 1, AEx ib [ia], GRP IIC, T4 control dwg. 201.004-110</p> <p>SP NI, CI I, DIV 2, GRP A, B, C, D with IS circuits extending into DIV 1 AIS, CI I, Zone 1, Ex ib [ia] IIC T4 control dwg. 201.004-120</p>																																																				
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receive hi	receive lo	shield	send lo	send hi	shield	SensLoop									shield	RTD	RTD	sense																																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19																																		

Attaching the Terminal Plates

The terminal plates of the lower modules can be stuck to the inner side of the door. This facilitates maintenance and service.



Inserting the Module

Note: Be sure to connect the shielding properly!



Make sure that the cable glands are tightly closed to protect against humidity.

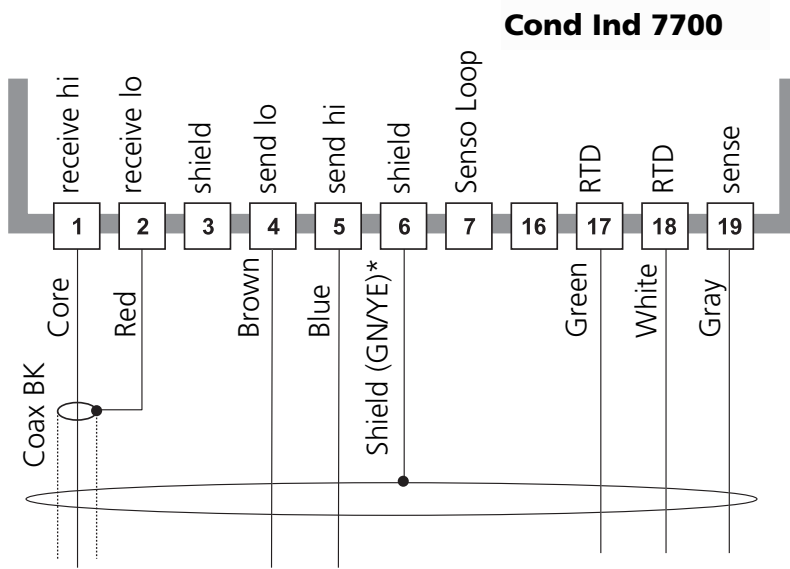
1. Switch off power supply
2. Open the device (loosen the 4 screws at the front)
3. Place module in slot (D-SUB connector)
4. Tighten fastening screws of the module
5. Connect sensor cable
6. Close device, tighten screws at the front
7. Switch on power supply
8. Set parameters

Caution!

Be sure to select the sensor type you are using in the parameter setting menu!

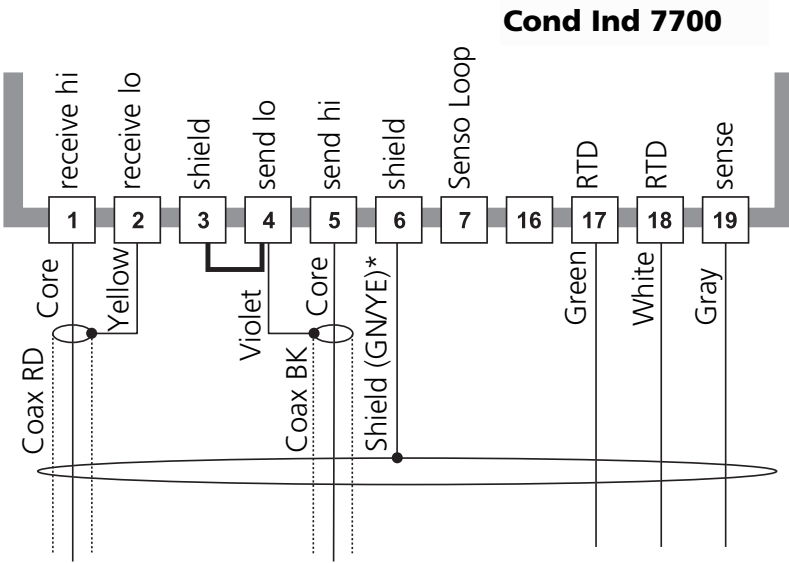
Wiring Examples

InPro7250 ST Series Sensor



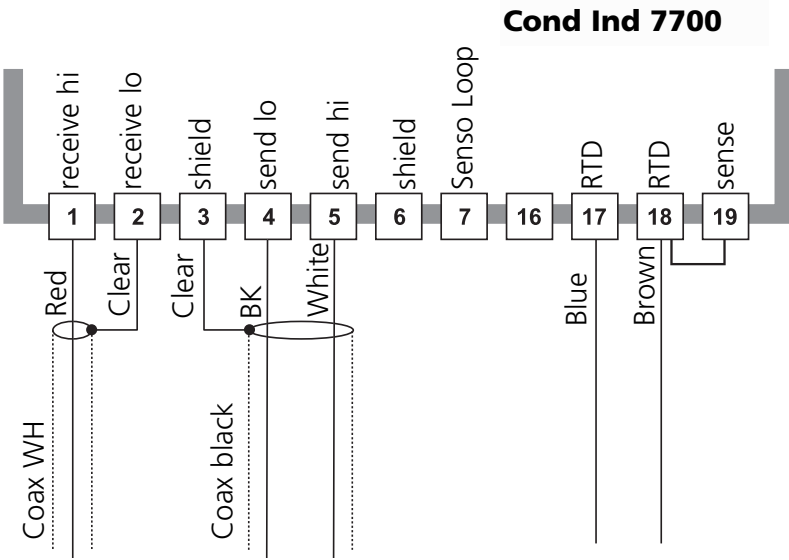
Wiring Examples

InPro7250 HT Series Sensor



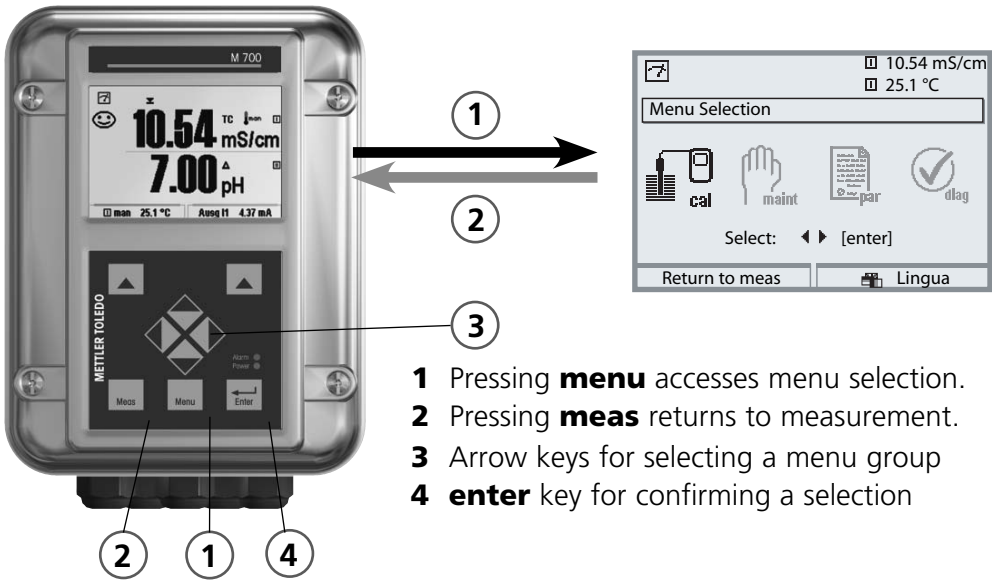
Wiring Examples

InPro7200 Series Sensor

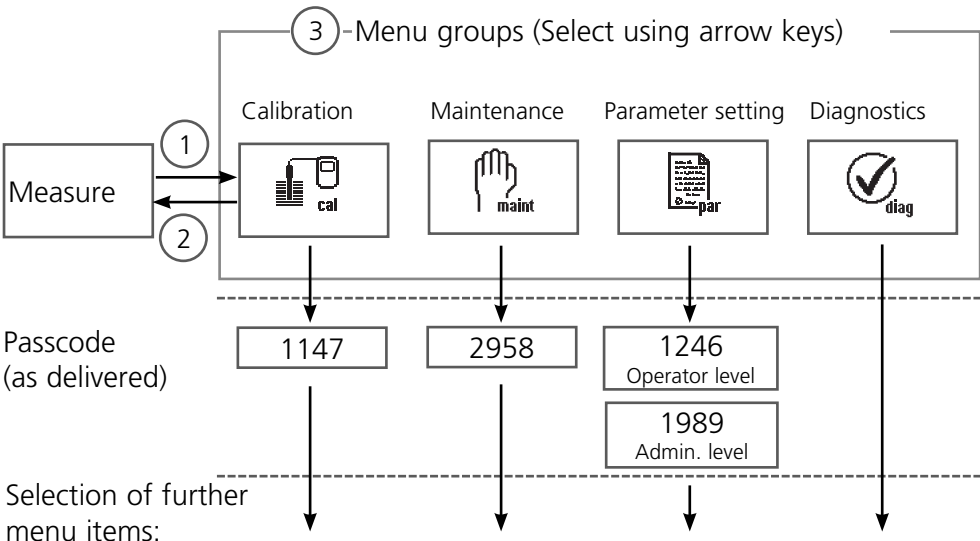


Menu Selection

After switching on, the analyzer performs an internal test routine and automatically detects the number and type of modules installed. Then, the analyzer goes to measuring mode.



Menu Structure



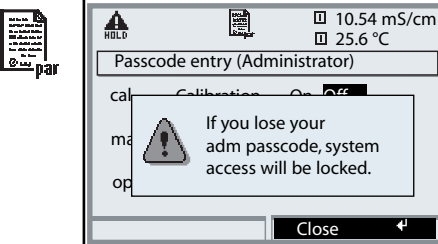
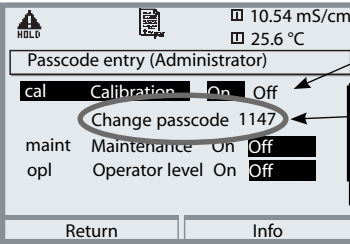
Passcode Entry

To enter a passcode

Select the position using the left/right keys, then edit the number using the up/down keys. When all numbers have been entered, confirm with **enter**.

To change a passcode

- Open the menu selection (**menu**)
- Select parameter setting
- Administrator level, enter passcode
- Select System control: Passcode entry

Menu	Display	System control: Passcode entry								
		<p>Changing a passcode</p> <p>“Passcode entry” menu</p> <p>When this menu is opened, the analyzer displays a warning (Fig.). Passcodes (factory settings):</p> <table border="0"> <tr> <td>Calibration</td> <td>1147</td> </tr> <tr> <td>Maintenance</td> <td>2958</td> </tr> <tr> <td>Operator Level</td> <td>1246</td> </tr> <tr> <td>Administrator level</td> <td>1989</td> </tr> </table> <p>If you lose the passcode</p> <p>for the Administrator level, system access will be locked! Please consult our technical support!</p> <p>To change a passcode</p> <p>Select “On” using arrow keys, confirm with enter.</p> <p>Select the position using the left/right keys, then edit the number using the up/down keys. When all numbers have been entered, confirm with enter.</p>	Calibration	1147	Maintenance	2958	Operator Level	1246	Administrator level	1989
Calibration	1147									
Maintenance	2958									
Operator Level	1246									
Administrator level	1989									

Configuring the Measurement Display

Select menu: Parameter setting/Module FRONT/Measurement display

Pressing **meas** (1) returns the analyzer to the measuring mode from any function.

All process variables coming from the modules can be displayed. The table on the next page describes how to configure the measurement display.



Measurement display

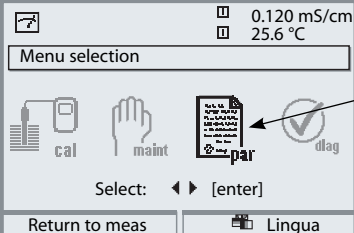

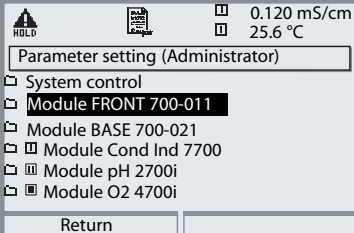
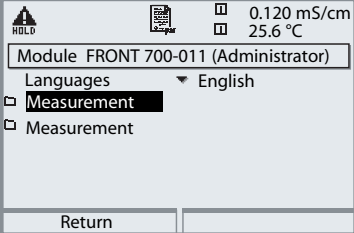
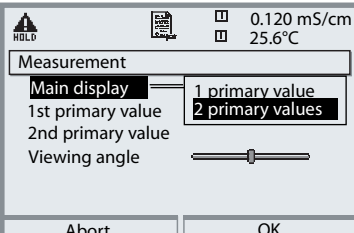
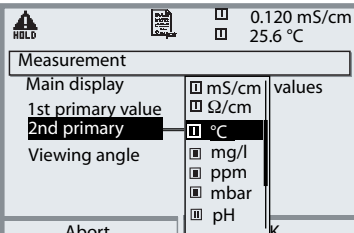
Typical display for 2 points of measurement: conductivity, pH.

Secondary displays

Additional values, also date and time, can be displayed depending on the modules installed.

Softkeys

In measuring mode, the softkeys allow selection of values for the secondary displays or control of functions (user defined).

Menu	Display	Configure measurement display
		<p>Configure measurement display Press menu key to Menu selection Select parameter setting using arrow keys, confirm with enter. Select: “Administrator level”: Passcode 1989 (default setting).</p>
		<p>Parameter setting: Select “Module FRONT”</p>
		<p>Front module: Select “Measurement display”</p>
		<p>Measurement display: Set the number of primary values (large display) to be displayed</p>
		<p>Select process variable(s) to be displayed and confirm with enter. Pressing the meas key returns to measurement.</p>

Calibration / Adjustment

Note: HOLD mode active for the currently calibrated module
Current outputs and relay contacts behave as configured

- **Calibration:** Detecting deviations without readjustment
- **Adjustment:** Detecting deviations with readjustment

Caution:

Without calibration every conductivity meter delivers an imprecise or wrong output value! Mechanical tolerances of the sensor as well as magnetic cross-talk between send and receive coils reduce the measurement accuracy. To increase accuracy, it is useful to perform an adjustment. Additional measurement errors occur when the sensor is installed in a restricted space (container wall < 4 x sensor diameter). This can be compensated for by product calibration, for example. When measuring low conductivity values, a zero correction is recommended.

Be sure to perform an adjustment after having replaced the sensor!

Procedure

Every conductivity sensor has its individual cell factor.

Depending on the sensor design, the cell factor may vary over a wide range. As the conductivity is calculated from the measured conductance and the cell factor, this must be known to the measuring system. For calibration or sensor standardization, either the known (stamped on) cell factor of the conductivity sensor used is entered in the measuring system or it is determined automatically by measuring a calibration solution with a known conductivity. The data are stored in a calibration record. By "Adjustment" the determined calibration data can be used for correction.

- Use fresh calibration solutions only!
- The calibration solution used must have been selected during parameter setting.
- Calibration accuracy decisively depends on the exact detection of the calibration solution's temperature. Using the measured or entered temperature, the measuring module determines the nominal value for the calibration solution from a stored table.
- Observe response time of temperature probe!
- For exact determination of the cell factor, wait until the temperature probe and calibration solution have the same temperature.

Adjustment


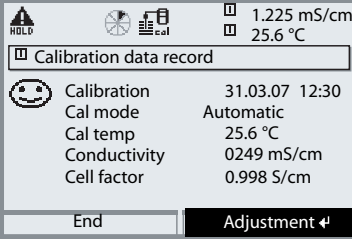
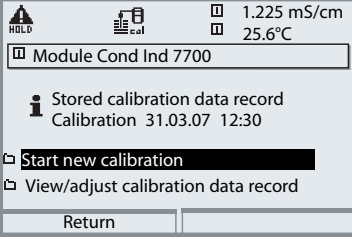
Adjustment

means that the cell factor determined by a calibration is taken over. It is entered in the calibration record. (Cal record can be called up in the Diagnostics menu for the Cond Ind 7700(X) module.) The value is only effective for calculating the measured variables when the calibration has been terminated with an adjustment.

A passcode ensures that an adjustment can only be performed by an authorized person (Administrator).

The Operator can check the current sensor data by a calibration and inform the Administrator when there are deviations.

You can use the additional function SW 700-107 for granting access rights (passcodes) and for Audit Trail (continuous data recording and backup according to FDA 21 CFR Part 11).

Menu	Display	Adjustment after calibration
	 <p>1.225 mS/cm 25.6 °C</p> <p>Calibration data record</p> <p>Calibration 31.03.07 12:30 Cal mode Automatic Cal temp 25.6 °C Conductivity 0249 mS/cm Cell factor 0.998 S/cm</p> <p>End Adjustment ←</p>	<p>Administrator</p> <p>With the corresponding access rights, the device can immediately be adjusted after calibration. The calibration values are taken over for calculating the measured variables.</p>
	 <p>1.225 mS/cm 25.6 °C</p> <p>Module Cond Ind 7700</p> <p>Stored calibration data record Calibration 31.03.07 12:30</p> <p>Start new calibration View/adjust calibration data record</p> <p>Return</p>	<p>Operator (without administrator rights)</p> <p>After calibration, change to measuring mode. Inform Administrator. When opening the menu (Calibration, respective module), the Administrator sees all data of the last calibration and can take over the values or perform a new calibration.</p>

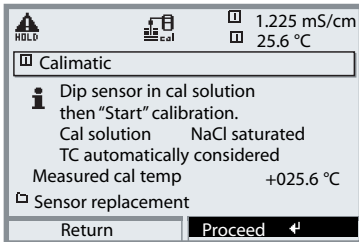
Calibration / Adjustment

Temperature Compensation

Temperature Compensation During Calibration

The conductivity value of the calibration solution is temperature-dependent. For calibration, the calibration solution temperature must therefore be known in order to choose the actual value from the conductivity table. During parameter setting you define whether cal temperature is measured automatically or must be entered manually.

Automatic Temperature Compensation

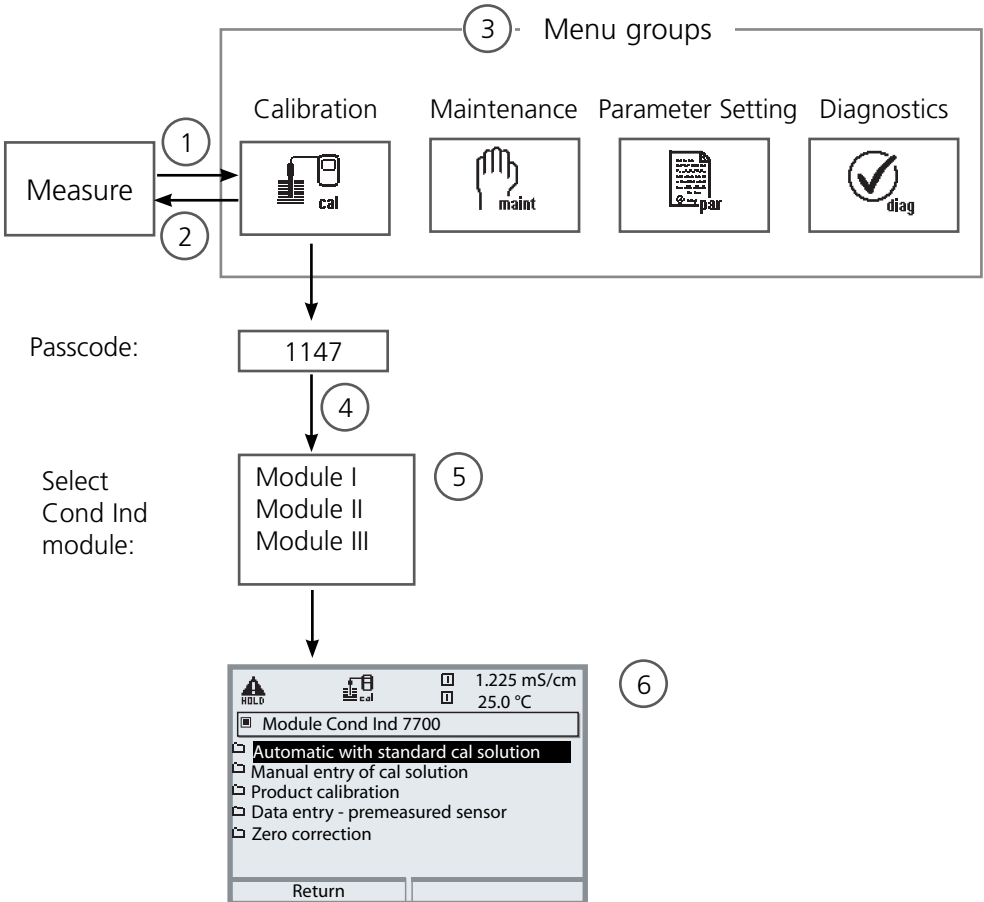


For automatic cal temp detection, the measuring module measures the temperature of the calibration solution with a temperature probe (Pt 100 / Pt 1000 / NTC 30 k Ω / NTC 100 k Ω). If you work with automatic temperature compensation during calibration, a temperature probe connected to the temperature input of the M 700 must be in the calibration solution.

When "Cal temp automatic" is set, "Measured cal temp" appears in the menu.

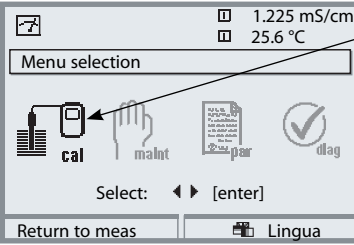

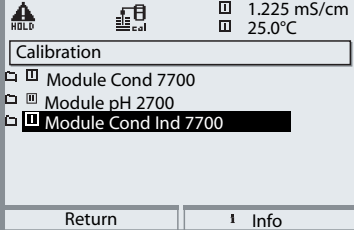
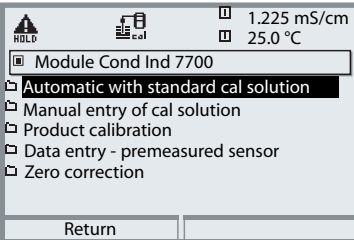
Calibration / Adjustment

Selecting a Calibration Method



To calibrate a Cond Ind module: Select a calibration method

- (1) Press **menu** key to access menu selection
- (2) Pressing the **meas** key returns to measurement
- (3) Select Calibration menu group using the arrow keys
- (4) Press **enter** to confirm, enter passcode
- (5) Select Cond Ind module, confirm with **enter**.
- (6) Select calibration method

Menu	Display	Select a calibration method
		<p>Call up calibration</p> <p>Press menu key to select menu. Select calibration using arrow keys, confirm with enter, passcode 1147 (The passcode can be edited by the administrator.)</p> <p>After passcode entry, the system is in HOLD mode: Current outputs and relay contacts of the currently calibrated module behave as configured (BASE) until the Calibration menu is exited.</p>
		<p>Calibration:</p> <p>Select “Module Cond Ind”</p>
		<p>Select calibration method:</p> <ul style="list-style-type: none"> • Automatic with standard cal solution • Manual entry of cal solution • Product calibration • Data entry - premeasured sensor • Zero correction <p>When you call up calibration, the M 700 automatically proposes the previous calibration method. If you do not want to calibrate, “Return” with the left softkey.</p>

Calibration / Adjustment

Automatic Calibration with Standard Calibration Solution

Automatic with Standard Calibration Solution

For automatic calibration, the conductivity sensor is immersed in a standard calibration solution (NaCl or KCl, selected during parameter setting). From the measured conductance and temperature, the M 700 automatically calculates the cell factor.

The temperature dependence of the calibration solution is taken into account.

During calibration the module is in HOLD mode.

Current outputs and relay contacts of the module behave as configured (Module BASE).

Caution!


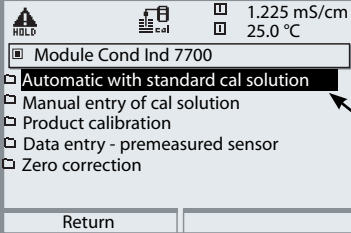
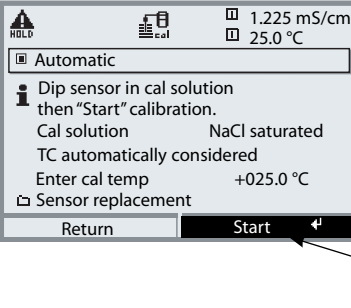
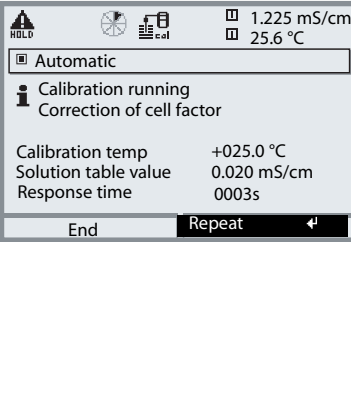
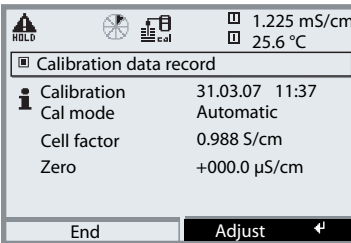
- Use fresh calibration solutions only!
- The calibration solution used must have been selected during parameter setting.
- Calibration accuracy decisively depends on the exact detection of the calibration solution's temperature. Using the measured or entered temperature, the M 700 determines the nominal value for the calibration solution from a stored table.
- Observe response time of temperature probe!
- For exact determination of the cell factor, wait until the temperature probe and calibration solution have the same temperature.

Be sure to observe during calibration:

- If the measured conductance or the measured temperature fluctuate greatly, the calibration procedure is aborted after 2 min.
- If an error message appears, you have to repeat calibration.

Adjustment: Taking over the values determined by calibration

- When the values determined by calibration are correct, they must be taken over to adjust the analyzer.

Menu	Display	Automatic calibration
		<p>Select calibration menu Select "Module Cond Ind"</p> <p>Select calibration method "Automatic with standard cal solution", confirm with enter.</p>
		<p>Display of selected calibration solution.</p> <p>Enter process temperature, if manual temperature adjustment has been selected.</p> <p>Dip sensor in calibration solution. Start calibration with softkey or enter.</p>
		<p>Calibration is running. The display shows:</p> <ul style="list-style-type: none"> • Calibration temperature • Solution table value (conductivity in dependence on process temperature) • Response time <p>Rinse sensor and replace it in the process, end calibration with softkey or enter</p>
		<p>Adjustment</p> <p>Press "Adjust" to take over the values determined during calibration for calculating the measured variables.</p>

Calibration / Adjustment

Manual Entry of Calibration Solution

Manual Entry of Calibration Solution

For calibration with manual entry of the calibration solution's conductivity, the sensor is immersed in a calibration solution. M 700 determines a conductivity/calibration temperature value pair. Then, the temperature-corrected conductivity value of the solution must be entered. To do this, read off the conductivity for the temperature displayed from the TC table of the calibration solution. Intermediate temperature values must be interpolated. M 700 automatically calculates the cell factor.

During calibration the module is in HOLD mode.

Current outputs and relay contacts of the module behave as configured (Module BASE).

Caution!


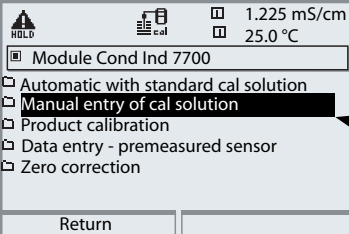
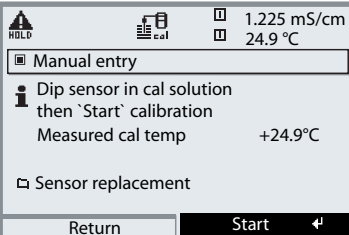
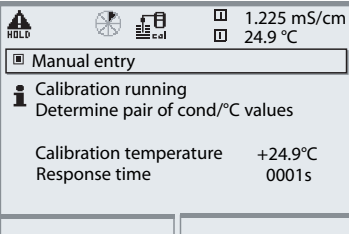
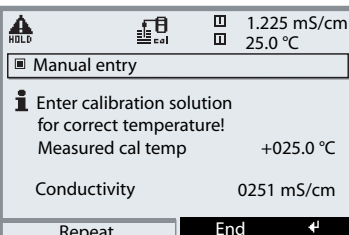
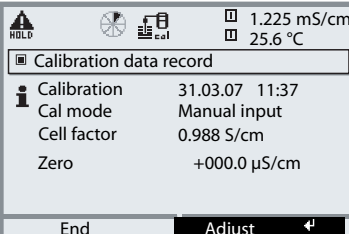
- Use fresh calibration solutions only!
- The calibration solution used must have been selected during parameter setting (Page 35).
- Calibration accuracy decisively depends on the exact detection of the calibration solution's temperature. Using the measured or entered temperature, the M 700 determines the nominal value for the calibration solution from a stored table.
- Observe response time of temperature probe!
- For exact determination of the cell factor, wait until the temperature probe and calibration solution have the same temperature.

Be sure to observe during calibration:

- If the measured conductance or the measured temperature fluctuate greatly, the calibration procedure is aborted after 2 min.
- If an error message appears, you have to repeat calibration.

Adjustment: Taking over the values determined by calibration

- When the values determined by calibration are correct, they must be taken over to adjust the analyzer.

Menu	Display	Manual entry of cal solution
		<p>Select calibration menu Select "Module Cond Ind"</p> <p>Select calibration method "Manual entry of cal solution", confirm with enter.</p>
		<p>Enter process temperature, if manual temperature adjustment has been selected. Immerse sensor in cal solution. Start calibration with softkey or enter.</p>
		<p>Calibration is running. The display shows:</p> <ul style="list-style-type: none"> • Calibration temperature • Response time
		<p>Enter conductivity. End calibration with softkey ("End").</p>
		<p>Adjustment Press "Adjust" to take over the values determined during calibration for calculating the measured variables.</p>

Calibration / Adjustment

Product Calibration

Product Calibration

When the sensor cannot be removed, e.g. for sterility reasons (for biotechnical processes), its cell factor can be determined with "sampling". To do so, the currently measured process value is stored by the M 700. Immediately afterwards, you take a sample from the process. The sample value should be measured at process conditions (same temperature!). The determined value is entered in the measuring system. From the difference between process value and sample value, the M 700 calculates the cell factor of the conductivity sensor.

During calibration the module is in HOLD mode.

Current outputs and relay contacts of the module behave as configured (Module BASE).

Product Calibration Without TC Correction


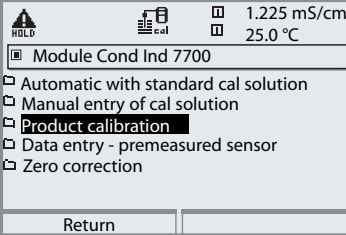
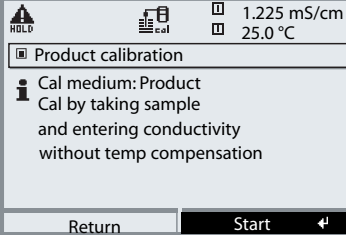
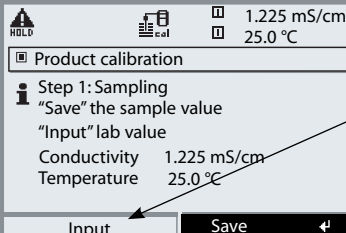
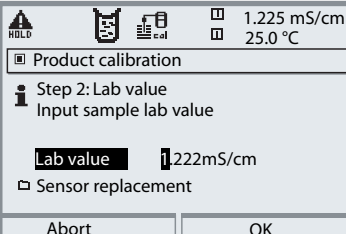
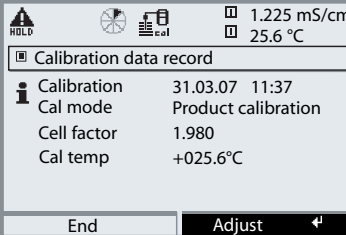
Take a sample from the process. Measure its value at the temperature at which the sample has been taken ("Sample temp", see display). To do so, it may be necessary to thermostat the sample correspondingly in the lab. Temperature compensation must be turned off at the comparison meters (TC = 0 %/K).

Product Calibration With TC Correction $T_{\text{ref}} = 25\text{ °C}$

Take a sample from the process. When measuring in the lab (TC linear), be sure that the same values are set for reference temperature and temperature coefficient in the comparison meter and in the M 700. Furthermore, the measuring temperature should correspond to the sample temperature (see display). Transport the sample in an insulated container (Dewar).

Caution!

Product calibration can only be performed if the process medium is stable. That means, for example, that there are no chemical reactions which have an effect on the process conductivity. At higher temperatures, the sample values can also be invalidated due to evaporation.

Menu	Display	Product calibration
		<p>Select calibration menu Select "Module Cond Ind"</p> <p>Calibration method "Product calibration", confirm with enter.</p>
	 	<p>Step 1 Take sample. Store measured value and temperature at the moment of sampling ("Save" softkey or enter). The analyzer automatically returns to calibration mode selection. Press meas to return to measurement.</p> <p>Exception: Sample value can be measured on the site and be entered immediately. To do so, press "Input" softkey.</p>
		<p>Step 2 Lab value has been measured. When you open the Product calibration menu again, the display shown on the left appears: Enter reference value ("Lab value"). Confirm with "OK" or repeat calibration.</p>
		<p>Adjustment Press "Adjust" to take over the values determined during calibration for calculating the measured variables.</p>

Calibration / Adjustment


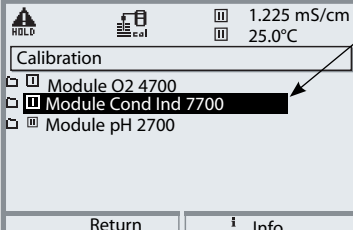
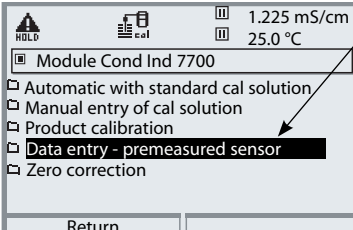
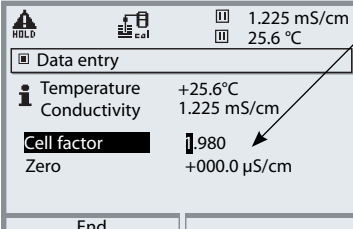
Data Entry of Premeasured Sensors

Data Entry of Premeasured Sensors

Entry of cell factor and zero point of a sensor, related to 25°C, 1013 mbars.

During calibration the module is in HOLD mode.

Current outputs and relay contacts of the module behave as configured (Module BASE).

Menu	Display	Data entry premeasured sensors
	 <p>Calibration</p> <ul style="list-style-type: none"> Module O2 4700 Module Cond Ind 7700 Module pH 2700 <p>Return Info</p>	<p>Select module: Cond Ind</p> <p>During calibration, the output currents (1 and 2), limit contacts, and controller output are in HOLD mode. Confirm with enter</p>
	 <p>Module Cond Ind 7700</p> <ul style="list-style-type: none"> Automatic with standard cal solution Manual entry of cal solution Product calibration Data entry - premeasured sensor Zero correction <p>Return</p>	<p>Select calibration method "Data entry"</p> <p>Confirm with enter</p>
	 <p>Data entry</p> <p>Temperature +25.6°C</p> <p>Conductivity 1.225 mS/cm</p> <p>Cell factor 1.980</p> <p>Zero +000.0 µS/cm</p> <p>End</p>	<p>Enter cell factor of premeasured sensor</p> <p>Confirm with "OK" or repeat calibration.</p>

Calibration / Adjustment


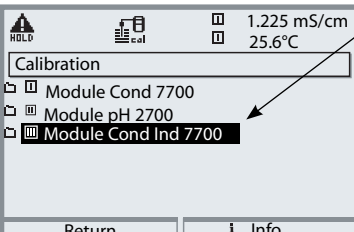
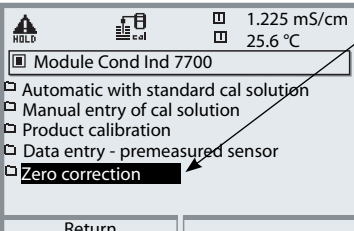
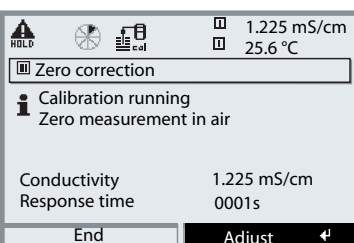
Zero Correction

Zero Correction

Adjustment of zero point / Automatic determination of the zero point in air
 Every electrodeless (toroidal) conductivity sensor has its individual zero point.
 When measuring low conductivity values, accuracy can be increased by adjusting the zero point.

During calibration the module is in HOLD mode.


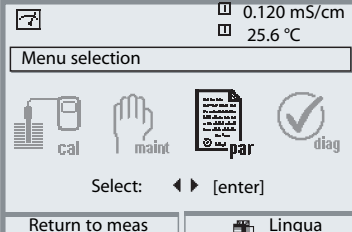
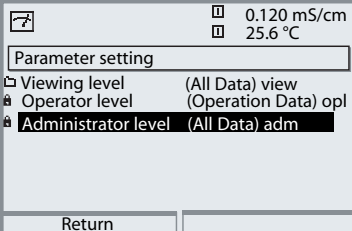
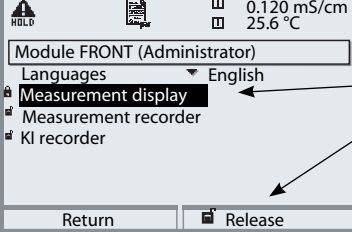
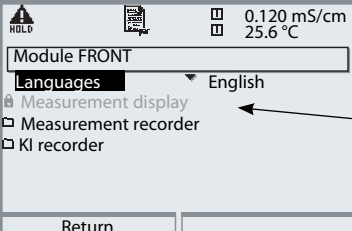
Current outputs and relay contacts of the module behave as configured (Module BASE).

Menu	Display	Zero correction
		<p>Select module: Cond Ind Confirm with enter</p>
		<p>Select calibration method "Zero correction" Remove the sensor from the process and dry it. Confirm with enter</p>
		<p>Permissible zero point deviation depends on the sensor type. For the InPro 7250, it is ± 0.050 mS/cm. Press Adjust to take over the calibration data.</p>

Parameter Setting: Operating Levels

Viewing level, Operator level, Administrator level


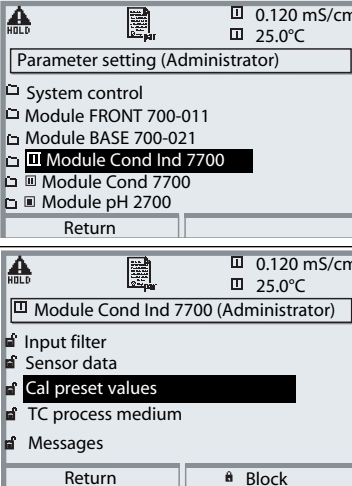

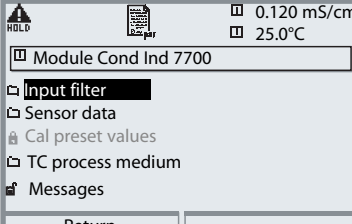
Note: HOLD mode (Setting: BASE module)

Menu	Display	Viewing level, Operator level, Administrator level
		<p>Call up parameter setting</p> <p>From the measuring mode: Press menu key to select menu. Select parameter setting using arrow keys, confirm with enter.</p>
		<p>Administrator level</p> <p>Access to all functions, also passcode setting. Releasing or blocking a function for access from the Operator level.</p>
		<p>Functions which can be blocked for the Operator level are marked with the "lock" symbol. The functions are released or blocked using the softkey.</p>
		<p>Operator level</p> <p>Access to all functions which have been released at the Administrator level. Blocked functions are displayed in gray and cannot be edited (Fig.).</p> <p>Viewing level</p> <p>Display of all settings. No editing possible!</p>

Parameter Setting: Lock Functions


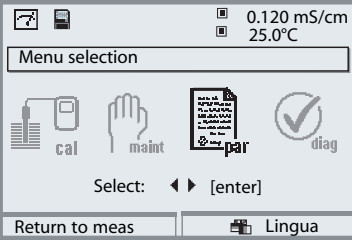
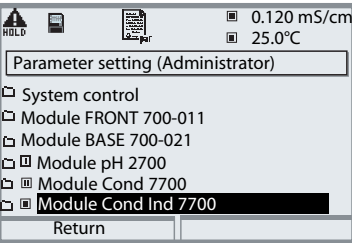
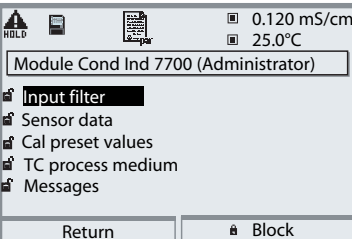
Administrator level: Enable / lock functions for Operator level

Note: HOLD mode (Setting: BASE module)

Menu	Display	Administrator level: Enable / lock functions
		<p>Example: Blocking access to the calibration adjustments from the Operator level</p> <p>Call up parameter setting Select Administrator level. Enter passcode (1989). Select "Module Cond Ind" (for example) using arrow keys, confirm with enter.</p> <p>Select "Cal preset values" using arrow keys, "Block" with softkey.</p> <p>Now, the "Cal preset values" line is marked with the "lock" icon. This function cannot be accessed from the Operator level any more. The softkey function changes to "Release".</p>
		<p>Call up parameter setting Select <u>Operator level</u>, passcode (1246). Select "Module Cond Ind" (e.g.). Now, the locked function is displayed in gray and marked with the "lock" icon.</p>

Activating Parameter Setting

Call up parameter setting

Menu	Display	Parameter setting
		<p>Call up parameter setting From the measuring mode: Press menu key to select menu. Select parameter setting using arrow keys, confirm with enter. Passcode as delivered: 1989</p>
		<p>Select module, confirm with enter.</p> <p>(In the Figure, the "Cond Ind" module is selected, for example.)</p>
		<p>Select parameter using arrow keys, confirm with enter.</p>

During parameter setting the analyzer is in HOLD mode:

Current outputs and relay contacts behave as configured (BASE module).

Documenting Parameter Setting

You must reproducibly document all parameter settings in the device to achieve a high level of system and device security according to GLP. For that purpose, an Excel file is provided (on the CD-ROM shipped with the basic device or as download at www.mt.com/pro) to enter the parameter settings.

The Excel file provides one worksheet for each module with columns for the following parameters: Factory settings, parameter set A, parameter set B. Enter your settings as parameter set A or B.


The gray cells in the parameter set B column cannot be modified since they contain sensor-specific values which cannot be changed by parameter set switchover. Here, the values listed under parameter set A apply.

Documenting Parameter Setting

	A	B	C	D	E	F
1						
2	1.	Meßstelle:				Zugriff über Menüpunkt:
3		M 700				
4	1.1.	parametrier am / von:				
5						
6						
7	2.	Gerätebeschreibung	Hardware	Software	Seriennummer	Diagnose / Gerätebeschreibung
8	2.1.	Bedienfront 700-011 :				Diagnose / Gerätebeschreibung / Front
9	2.2.	M 700 Base 700-021 :				Diagnose / Gerätebeschreibung / Base
10	2.3.	Modul Steckplatz [I] :				Diagnose / Gerätebeschreibung / I
11	2.4.	Modul Steckplatz [II] :				Diagnose / Gerätebeschreibung / II
12	2.5.	Modul Steckplatz [III] :				Diagnose / Gerätebeschreibung / III
13						
14						
15		M 700 Front				
16	3.	M 700 Front Einstellungen	Werkseinstellung	Parametersatz A	Parametersatz B	
17	3.1.	Sprache:	Deutsch			Parametrierung (Spezialist) / Modul Front ...
18						
19	3.1.1	Meßwertanzeige:				
20		Hauptanzeige	2 Hauptmeßwerte			Parametrierung (Spezialist) / Modul Front ... / Meß
21		1. Hauptmeßwert (Modul/Wert):	modulabhängig			
22		2. Hauptmeßwert (Modul/Wert):	modulabhängig			
23		Anzeigeformat (pH)	xx.xx pH			
24		Blickwinkel	Mitte			
25						
26	3.3.	Nebenanzeige				Einstellung erfolgt über Softkeys, wenn in Matrixu
27		Anzeigewert, links	-			
28		Anzeigewert, rechts	-			
29						
30	3.4	Meßwertrecorder:	Option SW700-103			Parametrierung (Spezialist) / Modul Front ... / Meß
31		Zeitbasis (t / Pixel)	1 min			
32		Zeitlupe (10x)	Aus			
33		Min / Max anzeigen	Ein			
34	3.4.1	Kanal 1: Meßgröße	modulabhängig			
35		Anfang	0.00			
36		Ende	14.00			
37	3.4.2	Kanal 2: Meßgröße	modulabhängig			
38		Anfang	-50.0			
39		Ende	150.0			

From the application window of the Excel file, select the worksheet for the module the parameter settings of which you want to document. Set the parameters of the respective module and enter the selected values in the corresponding cells of the module worksheet.

Caution!

Display	During parameter setting the "HOLD" mode is active.
	<p>HOLD. The NAMUR "function check" contact is active (factory setting: Module BASE, Contact K2, N/O contact). Current output response is user-defined:</p> <ul style="list-style-type: none"> • Current meas.: The currently measured value appears at the current output • Last usable value: The last measured value is held at the current output • Fixed 22 mA: The output current is at 22 mA

Parameter Setting

Default Settings and Selection Range


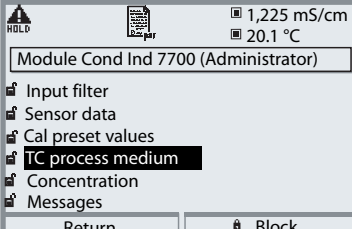
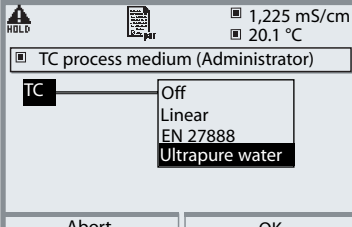
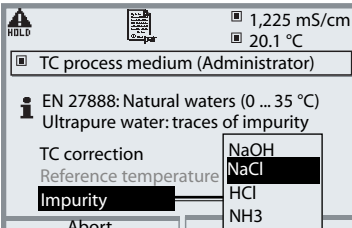
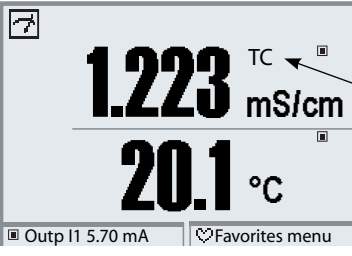
Note: HOLD mode active

Parameter	Default	Selection / Range
Input filter <ul style="list-style-type: none"> Pulse suppression 	Off	Off, On (suppression of input interferences)
Sensor data <ul style="list-style-type: none"> Sensor type Sensor coding Nom. cell factor Transfer ratio Temperature detection <ul style="list-style-type: none"> Measuring temp Cal temp Sensocheck SensoLoop 	InPro7250 F0031 02.175 120.00 Pt 1000 Auto Auto Off Off	Yokogawa 40S Foxboro E+H CLS 52 F0031 60120 F0031 01.880 02.150 01.980 125.10 048.30 120.00 Pt100, Pt1000, Pt100, NTC30kohm (sensor selection) Auto, manual: Default +25.0 °C (entry) Auto, manual: Default +25.0 °C (entry) Off, Failure, Maint. request Off, On
Cal preset values <ul style="list-style-type: none"> Calibration solution <ul style="list-style-type: none"> Product calibration 	NaCl sat without TC	NaCl 0.01 mol/l NaCl 0.1 mol/l NaCl saturated KCl 0.01 mol/l KCl 0.1 mol/l KCl 1 mol/l without TC, with TC
TC process medium <ul style="list-style-type: none"> TC correction Reference temp 	Off 25°C	Off, linear, EN 27888, ultrapure water (Linear: enter TC and reference temp)

Parameter Setting

TC Process Medium

Note: HOLD mode active

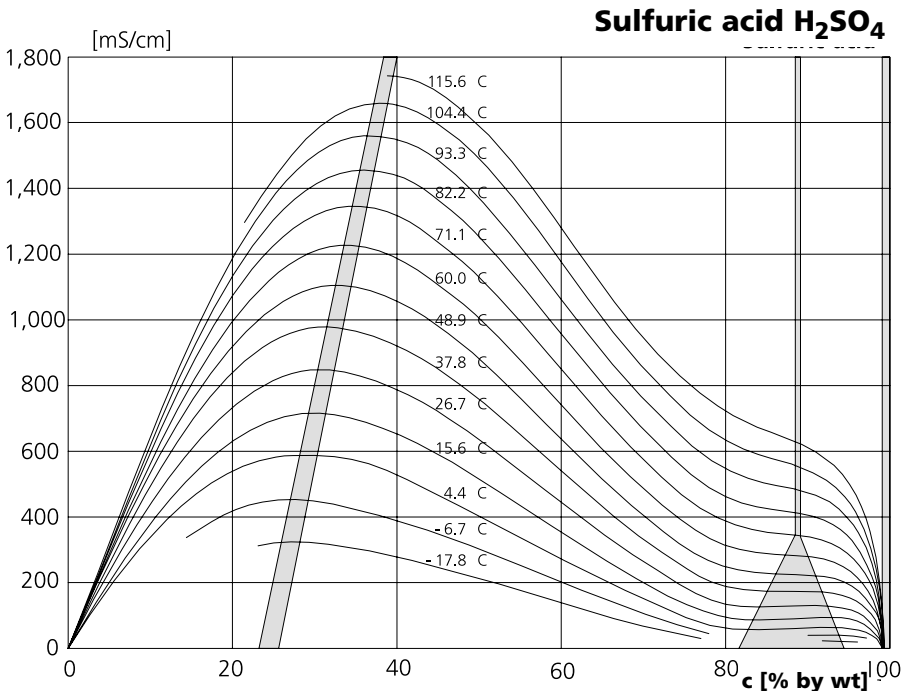
Menu	Display	TC process medium
		<p>TC process medium</p> <p>You can choose from:</p> <ul style="list-style-type: none"> • Linear (input of TC coefficient) • EN 27888 • Ultrapure water (add. function SW 700-008)
		<p>When you have selected “Ultrapure water”, you must specify the type of impurity:</p> <p>NaOH Alkaline ultrapure water</p> <p>NaCl Neutral ultrapure water, for conductivity measurement in water processing behind gravel bed filter</p>
		<p>HCl Acidic ultrapure water, for conductivity measurement behind cation filter</p> <p>NH₃ Ammoniacal ultrapure water</p>
		<p>When the TC correction for process medium is switched on, “TC” appears in the display in measuring mode.</p>

Parameter Setting: Concentration Curves

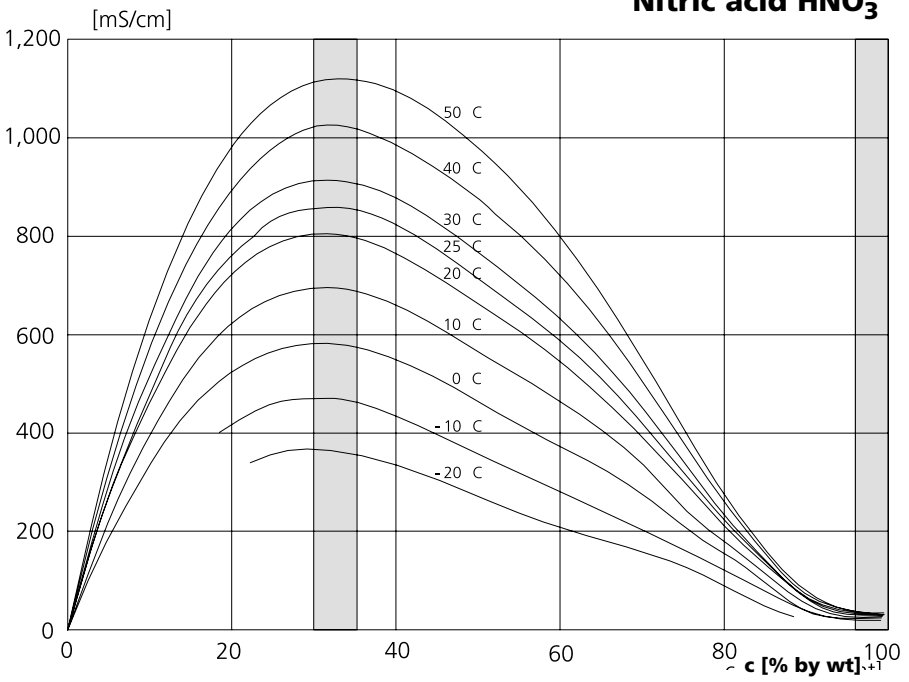
Default Settings and Selection Range

Note: HOLD mode active

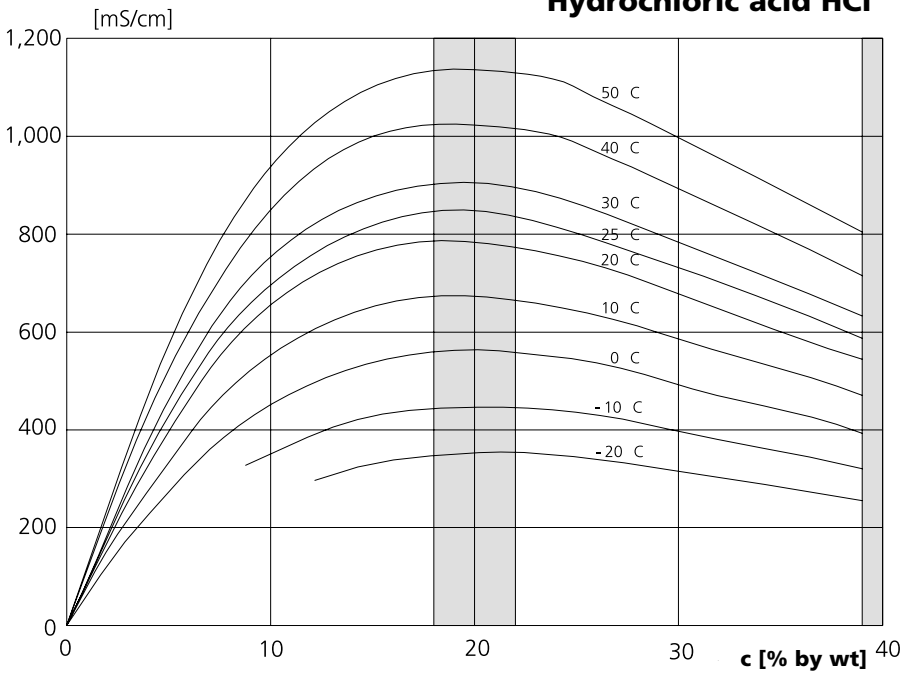
Parameter	Default	Selection / Range
Concentration • Medium ("Yes" selected)	Off H_2SO_4 (0-30%)	On, Off H_2SO_4 (0-30 %), H_2SO_4 (32-84 %), H_2SO_4 (92-99 %), HNO_3 (0-30 %), HNO_3 (35-96 %), HCl (0-18 %), HCl (22-39 %) NaOH (0-14 %), NaOH (18-50 %), NaCl (0-26 %), Table (additional function SW 700-009)



Nitric acid HNO₃



Hydrochloric acid HCl



Sodium hydroxide solution NaOH

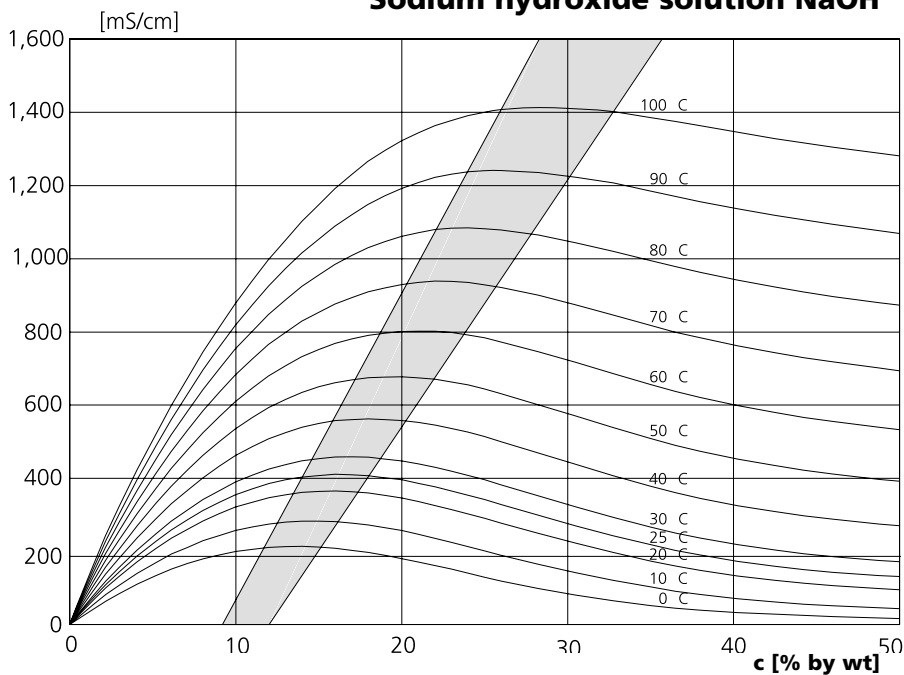
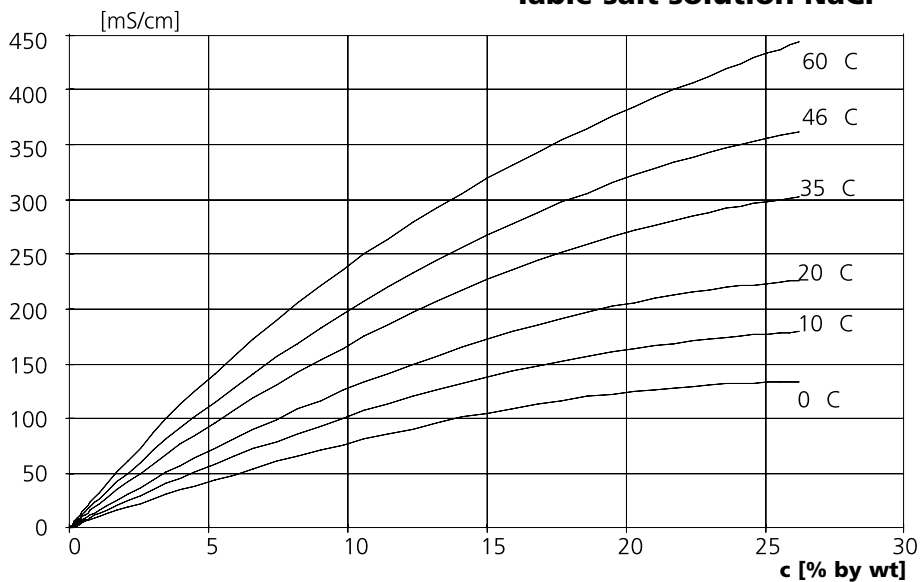


Table salt solution NaCl




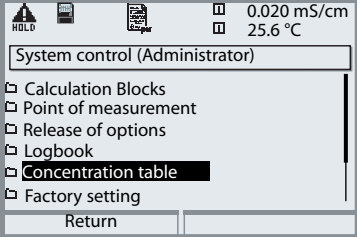
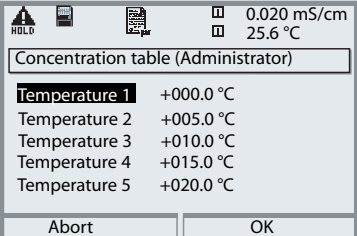
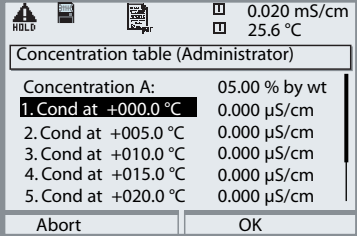
Concentration Table (Add. Function)

Select menu: Parameter setting/System control/Concentration table
Specifying a concentration solution for conductivity measurement

Concentration Table (Additional Function SW 700-009)

To specify the customer-specific solution, 5 concentration values A-E are entered in a matrix together with 5 temperature values 1-5. To do so, first enter the 5 temperature values, then enter the respective conductivity values for each concentration A-E.

These solutions will then be available in addition to the permanently stored standard solutions (select "Table").

Menu	Display	Enter concentration table
		<p>Enter values</p> <ul style="list-style-type: none"> • Call up parameter setting • System control • Select "Concentration table"
		<p>Enter 5 temperature values (right/left arrow keys to select position, up/down arrow keys to edit number, confirm with enter.)</p>
		<p>Enter values for concentrations A-E for the respective temperatures. The table values must be continuous. Maxima/minima are not permitted. Incorrect entries are marked with x.</p>

The concentration table is selected as follows:

Parameter setting/Module Cond Ind/Concentration = ON/Medium = Table.

Calculation Blocks

Select menu: Parameter setting/System control/Calculation Blocks
Calculation of new variables from measured variables

Calculation Blocks

Two measuring modules with all their measured values serve as input for the calculation block. In addition, the general device status (NAMUR signals) is taken into account. The difference between the existing values is calculated:

Current Outputs

All current outputs can be set to output the new process variables formed by the Calculation Blocks.

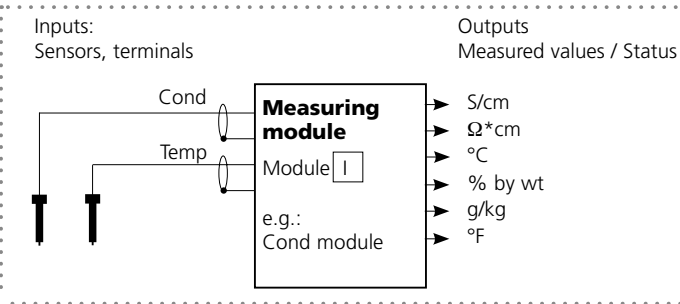
Measurement Display

All new process variables can be displayed as primary or as secondary value.

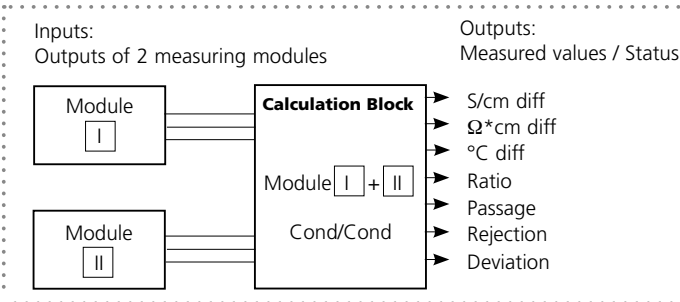
Controller

Controller functions are not supported.

Functionality of Measuring Module








Functionality of Calculation Block




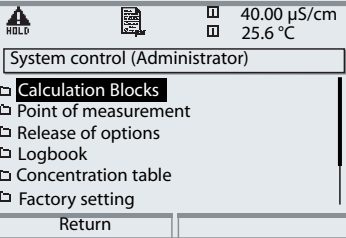
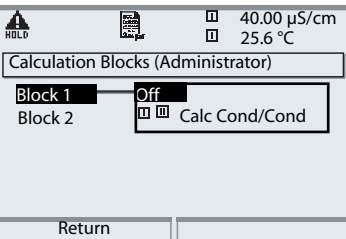
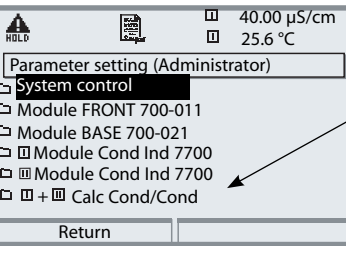
Activating Calculation Blocks

Select menu: Parameter setting/System control/Calculation Blocks
 Combining 2 Cond measuring modules to Calculation Blocks

Combination of 2 Cond Measuring Modules

With three measuring modules the following Calculation Block combinations are possible:  +  ,  +  ,  + 


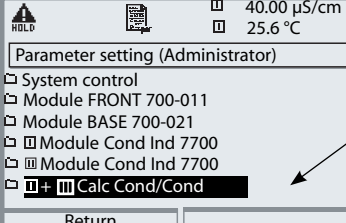
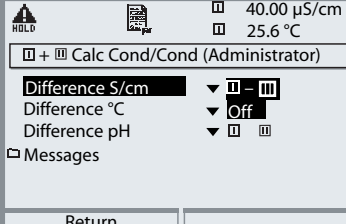
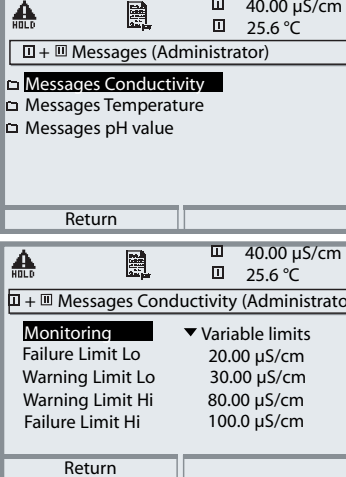
Two Calculation Blocks can be activated.

Menu	Display	Activating Calculation Blocks
		<p>Calculation Blocks</p> <ul style="list-style-type: none"> • Call up parameter setting • System control • Select "Calculation Blocks"
		<ul style="list-style-type: none"> • Depending on the modules installed, the possible combinations for Calculation Blocks are offered.
		<p>During parameter setting the Calculation Blocks are displayed like modules.</p>

Configuring a Calculation Block

Select menu: Parameter setting/System control/Calculation Blocks

Setting the process variable to be calculated

Menu	Display	Calculation Block Configure
		<h3>Select Calculation Block</h3> <ul style="list-style-type: none"> • Call up parameter setting • System control • Select module
		<p>Depending on the modules installed, the possible combinations for Calculation Blocks are offered.</p>
		<h3>Messages</h3> <p>You can activate messages for the selected variables.</p> <p>Variables which have been set as "Off" cannot be processed further.</p> <p>The measured values which shall release a message are set using the arrow keys (left/right: select position, up/down: edit number). Confirm with enter.</p>

Parameter Setting

Messages: Default Settings and Selection Range

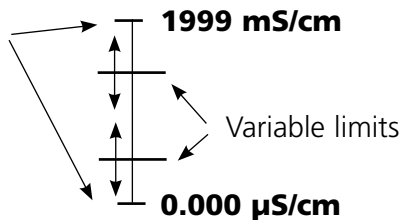
Note: HOLD mode active

Parameter	Default	Selection / Range
Messages <ul style="list-style-type: none"> • Conductivity • Resistivity • Concentration • Temperature • Salinity 	Limits max Off Off Off Off	Off, device limits max., variable limits* Off, device limits max., variable limits* Off, device limits max., variable limits* Off, device limits max., variable limits* Off, device limits max., variable limits* * With "Variable limits" selected, the following parameters can be edited: <ul style="list-style-type: none"> • Failure Limit Lo • Warning Limit Lo • Warning Limit Hi • Failure Limit Hi

Device Limits

- Device limits max. Maximum measurement range of device
- Variable limits: Range limits specified


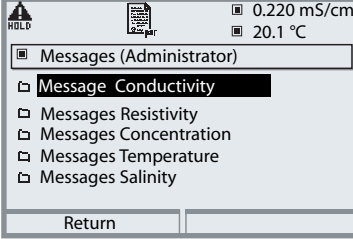
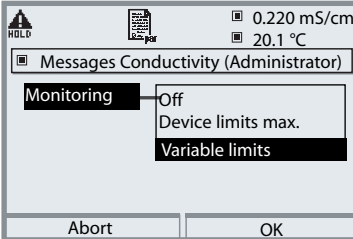
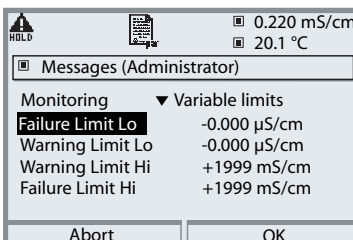



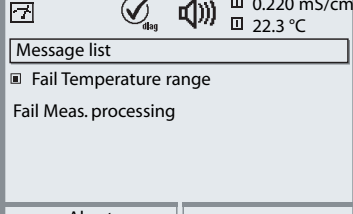
Device limits max.



Setting the Message Parameters

Messages


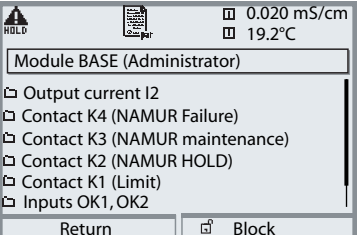
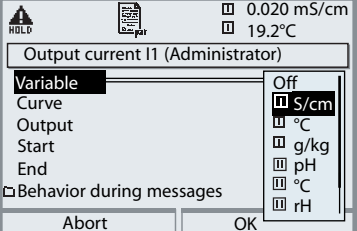
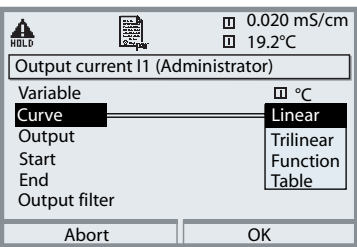
Note: HOLD mode active

Menu	Display	Messages
	 <p>Return</p>  <p>Abort OK</p>  <p>Abort OK</p>	<h2>Messages</h2> <p>All parameters determined by the measuring module can generate messages.</p> <ul style="list-style-type: none"> • Device limits max: Messages are generated when the process variable (e.g. conductivity) is outside the measurement range. The "Failure" icon is displayed, the NAMUR failure contact is activated (BASE module, factory setting: contact K4, N/C contact). The current outputs can signal a 22 mA message (user defined). • Variable limits: For the "failure" and "warning" messages you can define upper and lower limits for message generation. • Message icons: <p> Failure (Failure limit HiHi/LoLo)  Maintenance (Warning limit Hi/Lo)</p>
	 <p>Abort</p>	<h2>Diagnostics menu</h2> <p>When the "Maintenance" or "Failure" icons are flashing in the display, you should call up the Diagnostics menu. The messages are displayed in the "Message list".</p>

Current Outputs, Contacts, OK Inputs

Select menu: Parameter setting/Module BASE

Note: HOLD mode

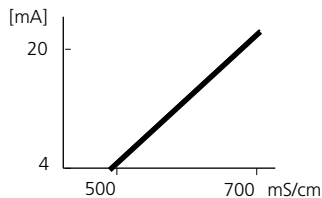
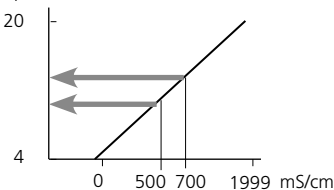
Menu	Display	Parameter setting BASE module
		<p>Configuring the Current Output</p> <ul style="list-style-type: none"> • Call up parameter setting • Enter passcode • Select "Module BASE" • Select "Output current ..."
		<ul style="list-style-type: none"> • Select process variable
		<p>Select Curve, e.g. "Linear": The measured variable is represented by a linear output current curve. The desired range of the measured variable is specified by the values for "Start" and "End". See also: "Minimum span"</p>

Assignment of Measured Values: Start (4 mA) and End (20 mA)

Example 1:
Range 0 ... 1999 mS/cm

Example 2: Range 500 ... 700 mS/cm
Advantage: Higher resolution in range of interest

Output current [mA]

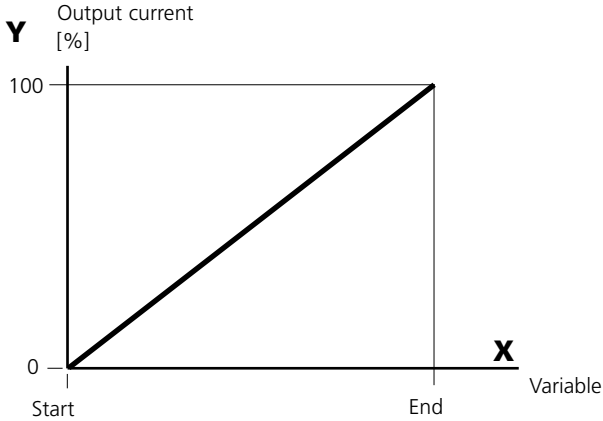


Current Outputs: Characteristics

Select menu: Parameter setting/Module BASE

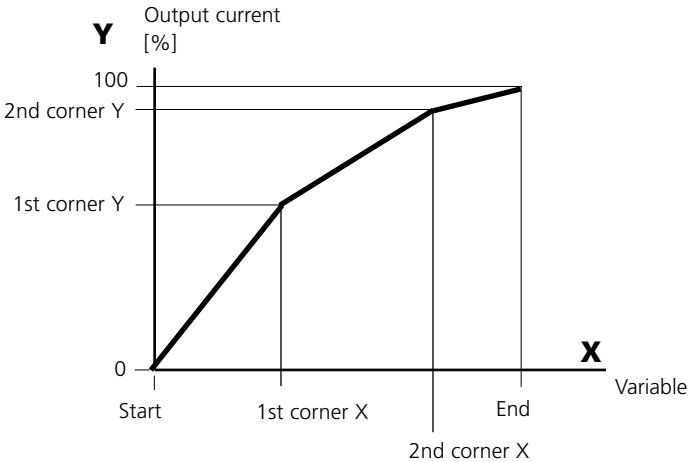
• Linear characteristic

The measured variable is represented by a linear output current curve.



• Trilinear characteristic

Two additional corner points must be entered:



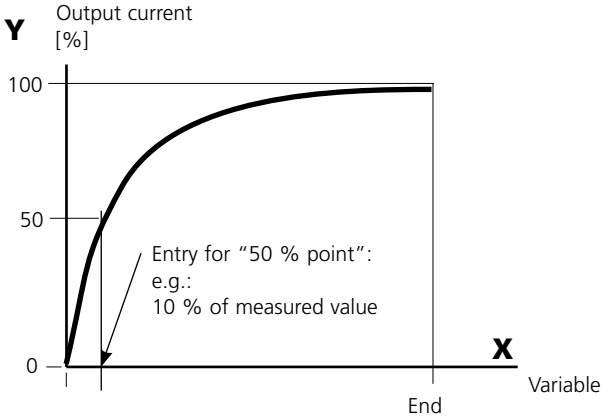
• Note: Bilinear characteristic

For a bilinear characteristic, identical parameters are entered for the two corner points (1st corner, 2nd corner).

• Function characteristic

Nonlinear output current characteristic: allows measurements over several decades, e.g. measuring very low values with a high resolution and high values with a low resolution.

Required: Entering a value for 50 % output current.



Equation

$$\text{Output current (4 ... 20 mA)} = \frac{(1+K)x}{1+Kx} \cdot 16 \text{ mA} + 4 \text{ mA}$$

$$K = \frac{E + S - 2 \cdot X50\%}{X50\% - S} \qquad x = \frac{M - S}{E - S}$$

- S: Start value at 4 mA
- X50%: 50% value at 12 mA (output current range 4 to 20 mA)
- E: End value at 20 mA
- M: Measured value

Logarithmic output curve over one decade:

- S: 10 % of maximum value
- X50%: 31.6 % of maximum value
- E: Maximum value

Logarithmic output curve over two decades:

- S: 1 % of maximum value
- X50%: 10 % of maximum value
- E: Maximum value

Output Filter

Time Constant

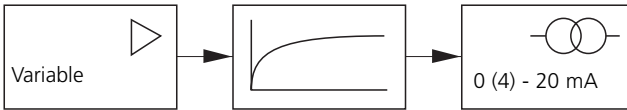
Time Constant of Output Filter

To smoothen the current output, a low-pass filter with adjustable time constant can be switched on. When there is a jump at the input (100 %), the output level is at 63 % after the time constant has been reached.

The time constant can be set from 0 to 120 sec. If the time constant is set to 0 sec, the current output follows the input.

Notice:

The filter only acts on the current output and the current value of the secondary display, not on the measurement display, the limit values, or the controller!

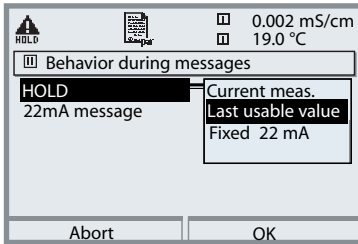


Time constant 0 to 120 sec

NAMUR Signals: Current Outputs

Behavior during messages: HOLD, 22 mA signal

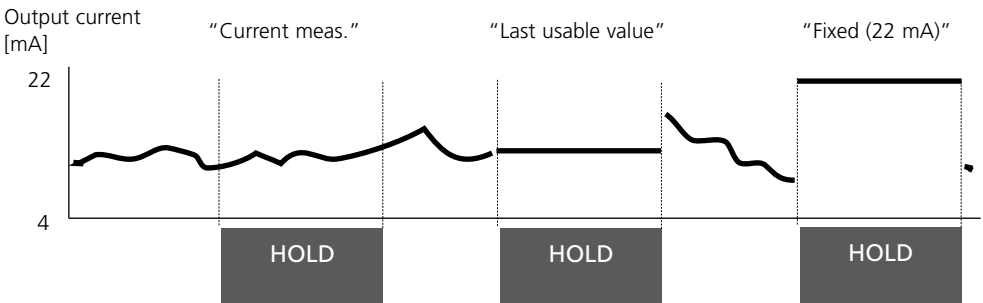
Behavior During Messages



Depending on the parameter setting ("Messages") the current outputs switch to:

- Currently measured value
- Last measured value (HOLD function)
- Fixed value (22 mA)

In the case of a fault a 22 mA signal can be generated for the selected process variable (1st primary value).



Message when the Current Range is Exceeded

As delivered, the "Maintenance request" (Warn) message is generated when the current range is exceeded (< 3.8 mA or > 20.5 mA).

This setting can be changed in the Parameter setting menu of the respective measuring module at "Messages".

To generate a "Failure" message, the limit value monitoring must be set to "Variable limits":

Parameter setting - <measuring module> - Messages - Variable limits - Failure limit ...

Enter the same values for the failure limits as for the current output:

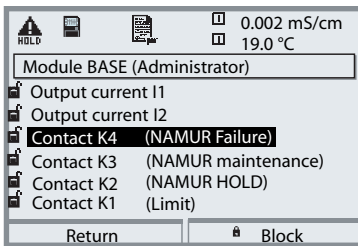
Parameter setting - Module BASE - Output current - Variable Start / End.

NAMUR Signals: Relay Contacts

Failure, Maintenance Request, HOLD (Function Check)

As delivered, the floating relay outputs of the BASE module are assigned to the NAMUR signals:

Failure	Contact K4, normally closed (signaling current failure)
Maint. request	Contact K3, normally open contact
HOLD	Contact K2, normally open contact



NAMUR signals: Factory setting of contacts

- Select parameter setting:
 - Administrator level
 - Select "Module BASE" (Fig.)
- You can define a delay time for "Maintenance request" and "Failure", resp. If an alarm message is released, the contact will only be activated after expiry of this delay time.

Failure is active

when a value has exceeded (or fallen below, resp.) a preset "Failure Limit Hi" or "Failure Limit Lo", when the measured value is out of range, or in the event of other failure messages. That means that the equipment no longer operates properly or that process parameters have reached a critical value. Failure is disabled during "HOLD" (Function check).

Maintenance request is active

when a value has exceeded (or fallen below, resp.) a preset "Warning Limit Hi" or "Warning Limit Lo", or when other warning messages have been activated. That means that the equipment is still operating properly but should be serviced, (or that process parameters have reached a value requiring intervention).

Failure is disabled during "HOLD" (function check).

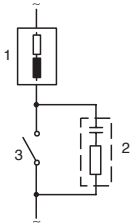
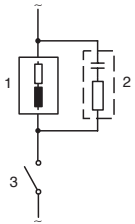
HOLD is active:

- during calibration
- during maintenance (current source, meas. point maintenance)
- during parameter setting at the Operator level and the Administrator level
- during an automatic rinsing cycle.

Relay Contacts: Protective Wiring

Protective Wiring of Relay Contacts

Relay contacts are subjected to electrical erosion. Especially with inductive and capacitive loads, the service life of the contacts will be reduced. For suppression of sparks and arcing, components such as RC combinations, nonlinear resistors, series resistors and diodes should be used.



Typical AC applications with inductive load

- 1 Load
- 2 RC combination, e.g. RIFA PMR 209
Typical RC combinations
e.g.
Capacitor 0.1 μ F,
Resistor 100 ohms / 1 W
- 3 Contact

Caution!


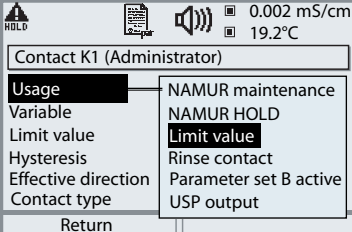
Make sure that the maximum ratings of the relay contacts are not exceeded even during switching!

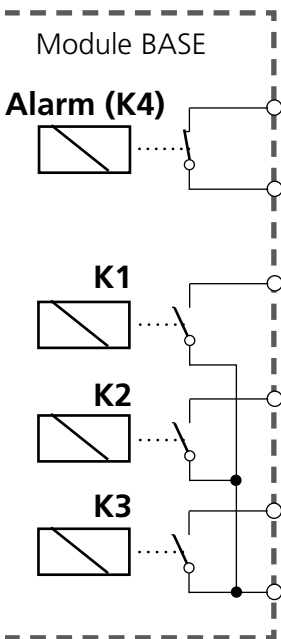
Information Concerning Relay Contacts

As delivered, the relay contacts are suitable for low signal currents (down to approx. 1 mA). If currents above approx. 100 mA are switched, the gold plating is destroyed during the switching process. After that, the contacts will not reliably switch low currents.

Relay Contacts

Parameter setting/Module BASE/Relay contacts

Menu	Display	Setting the relay contacts
		<p>Relay contacts, usage</p> <ul style="list-style-type: none"> • Call up parameter setting • Enter passcode • Select "Module BASE" • Select "Contact ..." • "Usage" (Fig.)



Contact Assignment:

See terminal plate of
BASE module

The BASE module provides 4 relay contacts (max. AC/DC rating 30 V / 3 A each). Contact K4 is provided for failure message. The switching behavior (normally open or normally closed), as well as a switch-on or switch-off delay can be defined.

Default settings of the user-definable relay contacts of the BASE module:


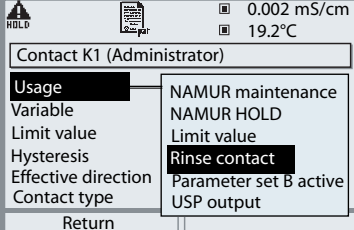
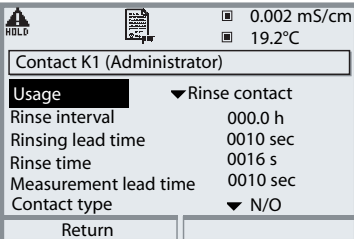
- K3: NAMUR maintenance request
- K2: NAMUR HOLD (function check)
- K1: Limit

K1-K3 are user definable ("Usage"):

- NAMUR maintenance
- NAMUR HOLD
- Limit value
- Rinse contact
- Parameter set B active
- USP output (Cond module only)
- KI rec. active
- Sensoface
- Controller alarm

Rinse Contact

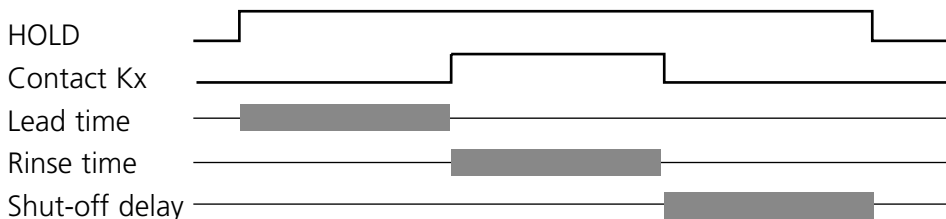
Parameter setting/Module BASE/Relay contacts/Usage/Rinse contact

Menu	Display	Configuring the rinse contact
		<p>Relay contacts, usage</p> <ul style="list-style-type: none"> • Call up parameter setting • Enter passcode • Select "Module BASE" • Select contact e.g. K1) • "Rinse contact" (Fig.)
		<p>Configuring the rinse contact</p> <ul style="list-style-type: none"> • Set rinse interval • Set rinse duration • During the defined "lead time" the "HOLD" mode is active. • Select contact type (e.g. "N/O")

Please note when configuring the "Rinse contact" function


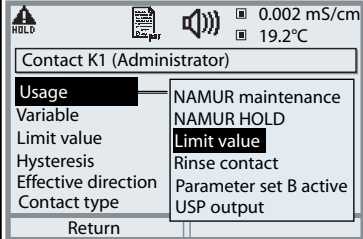
- "HOLD" mode (e.g. during parameter setting) delays the execution of the "Rinse contact" function.
- Up to 3 rinse functions (contacts K1 ... K3) can be configured independently.
- The individual rinse functions are not synchronized with each other.

Time Response



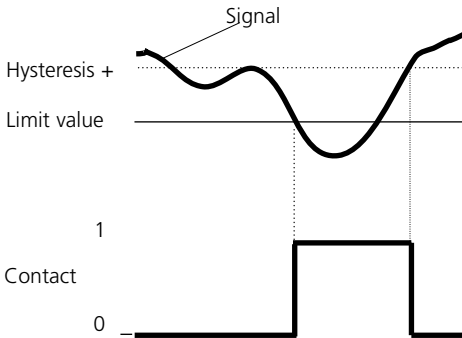
Limit Value, Hysteresis, Contact Type

Parameter setting/Module BASE/Relay contacts/Usage

Menu	Display	Usage as limit value
		Relay output: Limit <ul style="list-style-type: none"> • Call up parameter setting • Enter passcode • Select "Module BASE" • Select "Contact ..." • "Usage: Limit" (Fig.)

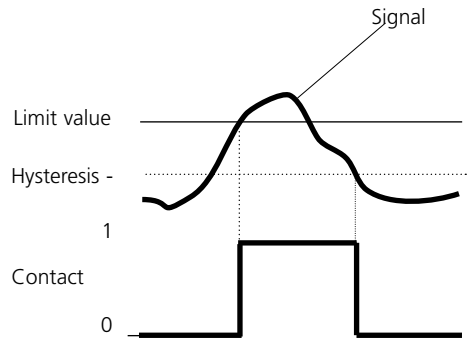
Limit value ▼

Effective direction min



Limit value ▲

Effective direction max



Icons in the Measurement Display:

Measured value exceeds limit: ▲ Measured value falls below limit: ▼

Hysteresis

Tolerance band around the limit value, within which the contact is not actuated. Serves to obtain appropriate switching behavior at the output and suppress slight fluctuations of the measured variable (Fig.)


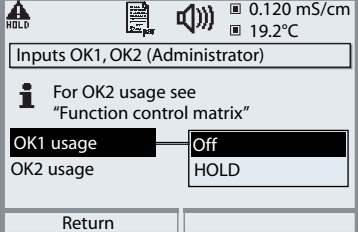
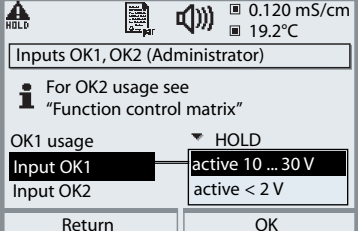
Contact Type

Specifies whether the active contact is closed (N/O) or open (N/C).

OK1, OK2 Inputs: Specify Level

Parameter setting/Module BASE/Inputs OK1, OK2

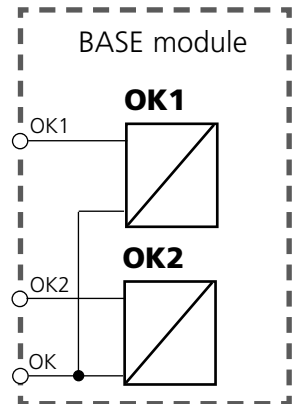
Note: HOLD mode (Setting: BASE module)

Menu	Display	Setting the OK inputs
		<p>OK1 usage</p> <ul style="list-style-type: none"> • Call up parameter setting • Enter passcode • Select "Module BASE" • Select "Inputs OK1/OK2" • Select "OK1 usage"
		<p>OK1/OK2 switching level</p> <ul style="list-style-type: none"> • Call up parameter setting • Enter passcode • Select "Module BASE" • Select "Inputs OK1/OK2" • Specify active switching level

The BASE module provides 2 digital inputs (OK1, OK2). The following functions (depending on the parameter setting) can be started via a control signal:

- OK1: "Off" or "HOLD" (Function check),
- OK2: Select: System control / Function control matrix ("Off", "Parameter set A/B", "Start KI recorder")

The switching level for the control signal must be specified:
(active 10...30 V or active < 2 V).



Switching Parameter Sets via OK2

Parameter setting / System control / Function control matrix

Note: HOLD mode (Setting: BASE module)

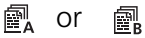
Parameter Sets


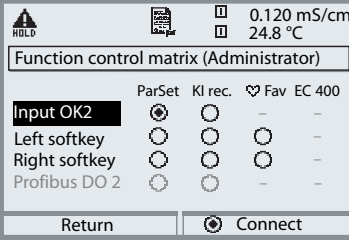
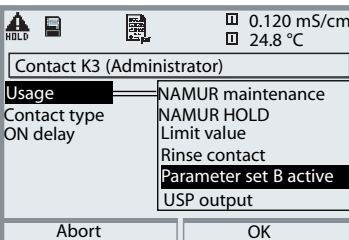
2 complete parameter sets (A, B) can be stored in the analyzer.

You can switch between the parameter sets using the OK2 input.

The currently activated set can be signaled by a relay contact.

An icon in the measurement display shows which parameter set is active:



Menu	Display	Parameter sets
		<p>Select parameter set (A, B) via OK2 input</p> <ul style="list-style-type: none"> • Call up parameter setting • System control • Function control matrix • Select "OK2" • Connect "Parameter set A/B"
		<p>Signaling active parameter set via relay contact</p> <ul style="list-style-type: none"> • Call up parameter setting • BASE module • Select contact • Usage: "Parameter set ...".


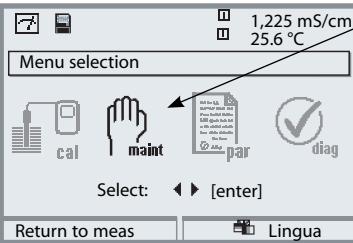
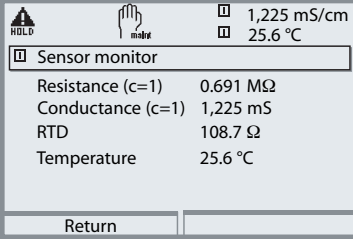
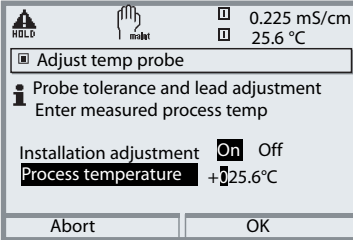
Notice

The selection has no effect when working on SmartMedia card with SW 700-102.

Maintenance

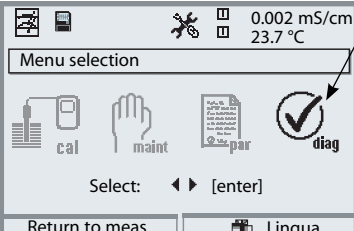

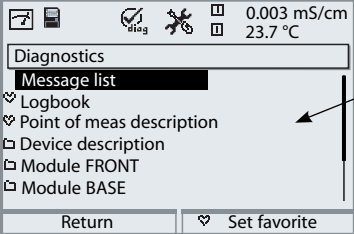
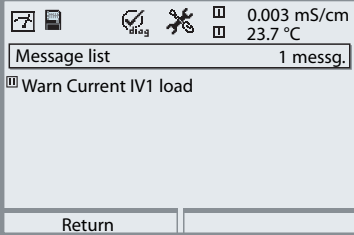
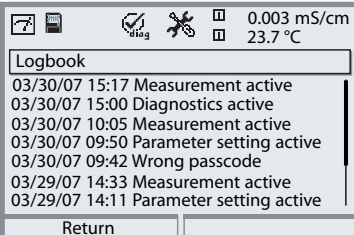
Sensor monitor, Temp probe adjustment

Note: HOLD mode active

Menu	Display	Maintenance
	  	<p>Call up Maintenance</p> <p>From the measuring mode: Press menu key to select menu. Select maintenance using arrow keys, confirm with enter. Passcode 2958 (The passcode can be edited by the administrator.) Then select Module Cond Ind.</p> <p>Sensor monitor</p> <p>During maintenance, the sensor monitor allows validation of the sen- sor by immersing it in a known solu- tion, for example, and checking the values measured.</p> <p>Adjusting the temp probe</p> <p>This function allows you to compen- sated for the individual temperature probe tolerance and the influence of the lead resistances to increase accu- racy of temperature measurement. Adjustment may only be carried out after the process temperature has been precisely measured using a cali- brated reference thermometer! The measurement error of the refer- ence thermometer should be less than 0.1 °C. Adjustment without precise measurement might result in consider- able deviations of the measured value display!</p>

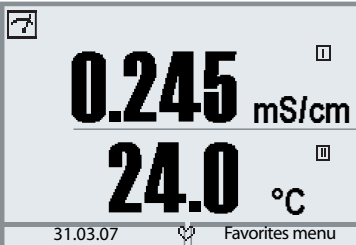

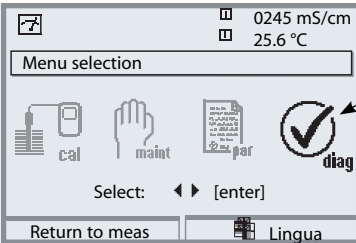
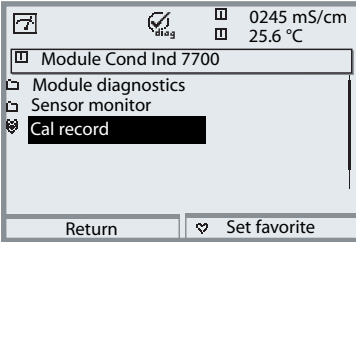
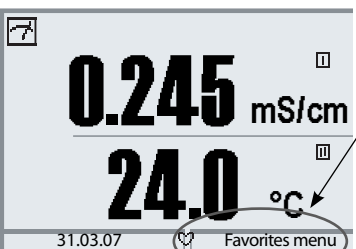
Diagnostics Functions

General status information of the measuring system
 Select menu: Diagnostics

Menu	Display	Diagnostics functions
		<p>Call up diagnostics From the measuring mode: Press menu key to select menu. Select diagnostics using arrow keys, confirm with enter.</p>
		<p>The "Diagnostics" menu gives an overview of all functions available. Functions which have been set as "Favorite" can be directly accessed from the measuring mode.</p>
		<p>Message list Shows the currently activated warning or failure messages in plain text.</p>
		<p>Logbook Shows the last 50 events with date and time, e.g. calibrations, warning and failure messages, power failure etc. This permits quality management documentation to ISO 9000. Extended logbook: SmartMedia card (SW 700-104)</p>

Setting Diagnostics Messages as Favorite

Select menu: Parameter setting/System control/Function control matrix

Menu	Display	Select favorites
		<p>Favorites menu Diagnostics functions can be called up directly from the measuring mode using a softkey. The "Favorites" are selected in the Diagnostics menu.</p>
		<p>Select favorites Press menu key to select menu. Select diagnostics using arrow keys, confirm with enter. Then select module and confirm with enter.</p>
		<p>Set/delete favorite: "Set favorite" allows activation of the selected diagnostic function directly from the measuring mode via softkey. The respective function is marked with a heart icon. See softkey function "Function control matrix".</p>
		<p>Pressing the meas key returns to measurement. When the softkey has been assigned to "Favorites", "Favorites menu" is read in the secondary display (see "Function control matrix").</p>

Setting Diagnostics Messages as Favorite

Select menu: Parameter setting/System control/Function control matrix

Secondary Displays (1)

Here, additional values are displayed in the measuring mode according to the factory setting. When the respective softkey (2) is pressed, the process variables measured by the modules plus date or time are displayed. In addition, you can use the **softkeys (2)** to control functions. To assign a function to a softkey, select

Parameter setting/System control/ Function control matrix

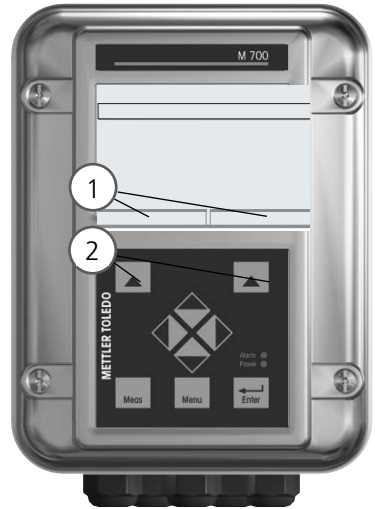
Function which can be controlled by softkeys:

- Parameter set selection
- KI recorder Start/Stop
- Favorites
- EC400 (fully automated probe controller)

Favorites

Selected Diagnostics functions can be called up directly from the measuring mode using a softkey.

The table on the next page explains how to select favorites.



			0.120 mS/cm	
			25.6 °C	
Function control matrix (Administrator)				
	ParSet	KI rec.	♥Fav	EC400
Input OK2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-
Left softkey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-
Right softkey	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	-
Profibus DO 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-
Return		Connect		

Example:

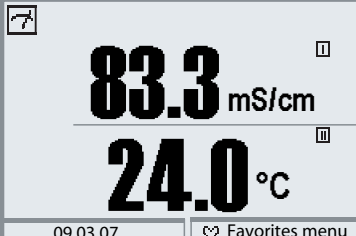

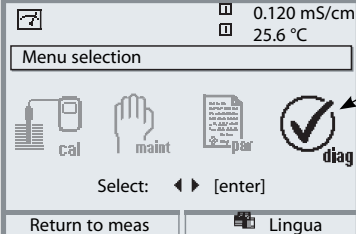
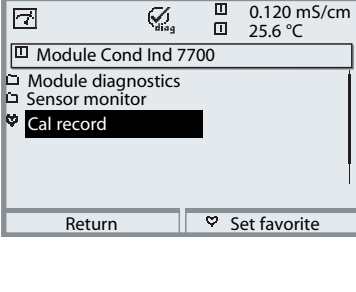
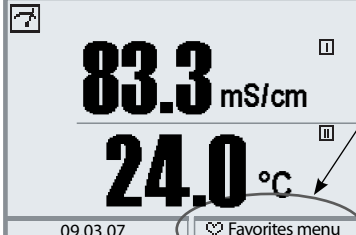
"Favorites" to be selected with "Right softkey"

To select a softkey function:

Select desired function using arrow keys, press "Connect" softkey and confirm with **enter**.

To deselect a function:

Press "Disconnect" softkey, confirm with **enter**.

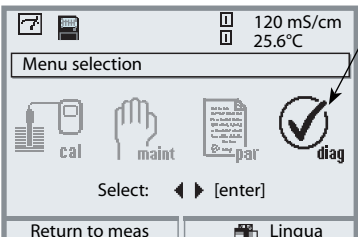

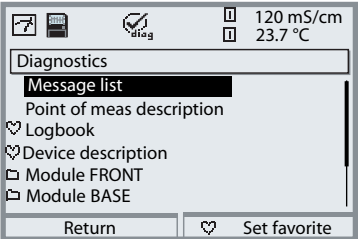
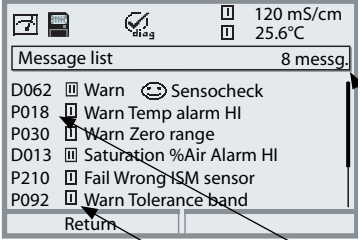
Menu	Display	Select favorites
		<p>Favorites menu</p> <p>Diagnostics functions can be called up directly from the measuring mode using a softkey. The "Favorites" are selected in the Diagnostics menu.</p>
		<p>Select favorites</p> <p>Press menu key to Menu selection. Select diagnostics using arrow keys, confirm with enter. Then select module and confirm with enter.</p>
		<p>Set/delete favorite:</p> <p>"Set favorite" allows activation of the selected diagnostic function directly from the measuring mode via softkey. The menu line is marked with a heart icon.</p>
		<p>Pressing the meas key returns to measurement. When the softkey has been assigned to "Favorites", "Favorites menu" is read in the secondary display (see "Function control matrix").</p>

Notice:

When one of the softkeys has been assigned to the "Favorites menu" function, diagnostic functions which have been set as "Favorite" can be directly called up from the measuring mode.

Diagnostics Functions

General Status Information of the Measuring System
 Select menu: Diagnostics - Message list

Menu	Display	Diagnostics functions
		<p>Call up diagnostics From the measuring mode: Press menu key to select menu. Select diagnostics using arrow keys, confirm with enter.</p>
		<p>The “Diagnostics” menu gives an overview of all functions available. Functions which have been set as “Favorite” can be directly accessed from the measuring mode.</p>
		<p>Message list Shows the currently activated warn- ing or failure messages in plain text.</p> <p>Number of messages When there are more than 7 messages, a vertical scrollbar appears. Scroll with the up/ down arrow keys.</p> <p>Message identifier See message list for description.</p> <p>Module identifier Specifies the module that has generated the message.</p>

Messages

Cond Ind 7700(X) Module

No.	Cond Ind messages	Message type
T008	Meas. processing (factory settings)	FAIL
T009	Module failure (Firmware Flash check sum)	FAIL
T010	Conductivity range	FAIL / WARN
T011	Conductivity Alarm LO_LO	FAIL
T012	Conductivity Alarm LO	WARN
T013	Conductivity Alarm HI	WARN
T014	Conductivity Alarm HI_HI	FAIL
T015	Temperature range	FAIL
T016	Temperature Alarm LO_LO	FAIL
T017	Temperature Alarm LO	WARN
T018	Temperature Alarm HI	WARN
T019	Temperature Alarm HI_HI	FAIL
T020	Resistivity range	FAIL / WARN
T021	Resistivity Alarm LO_LO	FAIL
T022	Resistivity Alarm LO	WARN
T023	Resistivity Alarm HI	WARN
T024	Resistivity Alarm HI_HI	FAIL
T025	Concentration range	FAIL / WARN
T026	Concentration Alarm LO_LO	FAIL
T027	Concentration Alarm LO	WARN
T028	Concentration Alarm HI	WARN
T029	Concentration Alarm HI_HI	FAIL
T030	Zero range	WARN
T035	Cell factor range	WARN
T040	Salinity range	FAIL / WARN
T041	Salinity Alarm LO_LO	FAIL
T042	Salinity Alarm LO	WARN
T043	Salinity Alarm HI	WARN

Messages

No.	Cond Ind messages	Message type
T044	Salinity Alarm HI_HI	FAIL
T045	Conductance range	FAIL
T050	Man. temperature range	FAIL
T060	SAD SENSOFACE: Primary coil	User-defined
T061	SAD SENSOFACE: Secondary coil	User-defined
T062	SAD SENSOFACE: SensoLoop	User-defined
C120	Wrong ISM sensor	FAIL
C121	ISM sensor	FAIL
C122	ISM sensor memory	WARN
C123	New sensor, adjustment required	WARN
C130	SIP cycle counted	Text
C131	CIP cycle counted	Text
T200	Reference temperature	WARN
T201	TC correction	WARN
T202	TC range	WARN
T203	TC range	FAIL
T204	Sensor coding	WARN
T205	Cal: Sensor unstable	Text
T254	Module reset	Text

Specifications

Specifications M700 Cond Ind 7700(X)

Cond Ind input

(EEx ia IIC)

Measurement range

Concentration

Salinity

Response time t_{90})

Measurement error***

Perm. cable length

For InPro7250 electrodeless sensors (and others)

0000 $\mu\text{S/cm}$... 1999 mS/cm , resolution 1 $\mu\text{S/cm}$

0.00 ... 100.0 % by wt

0.0 ... 45.0 g/kg (0 ... 35 °C)

< 0.5 sec

< 0,5 % meas. val. +2 $\mu\text{S/cm}$

Max. 20 m

Temp compensation *)

- Without

- Linear characteristic 00.00 ... 19.99 %/K
(reference temp user-defined)

- NLF nat. waters according to EN 27888
(reference temp 25°C)

Temperature input

(EEx ia IIC)

Temperature probe *

Measurement range (MR)

Resolution

Measurement error***

Pt 100/Pt 1000/NTC 30 $\text{k}\Omega$ /NTC 100 $\text{k}\Omega$

3-wire connection, adjustable

Pt100 / Pt1000: -50 ... +250 °C

NTC 30 $\text{k}\Omega$ / NTC 100 $\text{k}\Omega$: -10 ... +150 °C

0.1 °C

0.2 % meas.val. + 0.5 K

Concentration determination *

For the substances:

HNO_3 0 ... 28 % by wt -20 ... +50 °C

35 ... 96 % by wt -20 ... +50 °C

HCl 0 ... 18 % by wt -20 ... +50 °C

22 ... 39 % by wt -20 ... +50 °C

Specifications

H ₂ SO ₄ ****	0 ... 30	% by wt	-17.8 ... +110 °C
	32 ... 84	% by wt	-17.8 ... +115.6 °C
	92 ... 99	% by wt	-17.8 ... +115.6 °C
NaOH *****	0 ... 14	% by wt	0 ... +100 °C
	18 ... 50	% by wt	0 ... +100 °C
NaCl	0 ... 26	% by wt	0 ... +60 °C
User-defined concentration table (5x5 values)			

Sensor monitoring *

Sensocheck, monitoring of primary and its lines for short circuit and of secondary and its lines for open circuit

Sensoface

Provides information on the sensor condition

Sensor standardization *

Operating modes

- Automatic calibration with KCl or NaCl solution
- Manual: Entry of cell factor with simultaneous display of conductivity and temperature
- Product calibration / adjustment to vessel
- Data entry of premeasured sensors
- Adjustment of zero point

Adm. cell factor

0 ... 19.99 cm⁻¹

Adm transfer ratio

0.00 ... 199.9

Calibration record

Recording of:

Cell factor, transfer ratio, zero point, calibration method with date and time

Output curves *

Linear

Trilinear

Function (logarithmic)

As desired via table

* User-defined

** To IEC 746 Part 1, at nominal operating conditions, ± 1 count

*** To IEC 746 Part 1, at nominal operating conditions, ± 1 count with NTC > 100 °C: 0.2 % meas.val. + 1 K

Specifications

General Data

Explosion protection

(IS module only)

ATEX: See rating plate: KEMA 03 ATEX 2056
II 2 (1) GD EEx ib [ia] IIC T4 T 70 °C

FM: NI, Class I, Div 2, GP A, B, C, D T4
with IS circuits extending into Division 1
Class I, Zone 2, AEx nA, Group IIC, T4
Class I, Zone 1, AEx me ib [ia] IIC, T4

CSA: NI, Class I, Div 2, Group A, B, C, D
with IS circuits extending into Division 1
AIS, Class I, Zone 1, Ex ib [ia] IIC, T4
NI, Class I, Zone 2, Ex nA [ia] IIC

EMC

Emitted interference
Immunity to interference

NAMUR NE 21 and
EN 61326 VDE 0843 Part 20 /01.98
EN 61326/A1 VDE 0843 Part 20/A1 /05.99
Class B
Industry

Lightning protection

EN 61000-4-5, Installation Class 2

Nominal operating conditions

Ambient temperature:
-20 ... +55 °C (Ex: max. +50 °C)
Rel. humidity: 10 ... 95 % not condensing

Transport/Storage temperature

-20 ... +70 °C

Screw clamp connector

Single wires and flexible leads up to 2.5 mm²

Appendix:

Minimum Spans for Current Outputs

The Cond Ind 7700(X) module is a measuring module. It does not provide current outputs. Current outputs are provided by the BASE module (basic device) or by communication modules (e.g. Out module). The corresponding parameters must be set there.

The minimum current span shall prevent that the resolution limit of the measurement technology (± 1 count) is seen in the current.

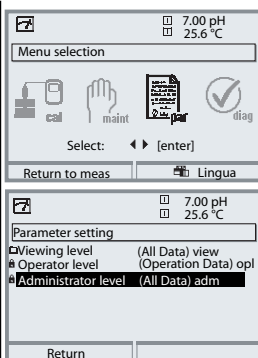
Cond Ind 7700(X) Module

S/cm	20 %, min. 100.0 μ S/cm
% by wt	1.00
°C	10.0
g/kg	1.00
Ohm*cm	20 %, min. 100.0 ohms*cm
°F	10.0

Calculation Block COND/COND

Diff S/cm	20 %, min. 100.0 μ S/cm
Diff °C	10.0
Diff Ohm*cm	20 %, min. 100.0 ohms*cm
RATIO	0.10
PASSAGE	10.0
REJECTION	10.0
DEVIATION	10.0

Overview of Parameter Setting



Parameter setting

Activated from measuring mode: Press **menu** key to select menu.

Select parameter setting using arrow keys, confirm with **enter**.

Administrator level

Access to all functions, also passcode setting.

Releasing or blocking a function for access from the Operator level.

Operator level

Access to all functions which have been released at the Administrator level. Blocked functions are displayed in gray and cannot be edited.

Viewing level

Only display, no editing possible!

System Control

Memory card (Option)

- Record logbook
- Register recorder
- Decimal separator
- Card full
- Format

Menu only appears with SmartMedia Card inserted.

Make sure that it is a memory card, not an update card.

Commercially available SmartMedia cards must be formatted before they can be used as memory card.

Copy configuration

The complete configuration of an analyzer can be written on a SmartMedia card. This allows transferring all device settings to other devices with identical equipment (exception: options and passcodes).

Parameter sets

- Load
- Save

2 parameter sets (A,B) are available in the analyzer.

The currently active parameter set is read on the display.

Parameter sets contain all settings except:

Sensor type, Options, System control settings

Up to 5 parameter sets (1, 2, 3, 4, 5) are available when a SmartMedia card (Option) is used.

Function control matrix

- Input OK2
- Left softkey
- Right softkey

Selecting the control element for the following functions:

- Parameter set selection
- KI recorder (Start/Stop)
- Favorites menu (selected diagnostics functions)
- EC 400 (fully automated probe controller)

Time/date

Selecting the display format, entry

Point of meas description

Can be called up in the diagnostics menu.

Release of options

A TAN is required to release an Option.

Software update

Software update from SmartMedia card (update card)

Logbook

Selecting events to be recorded

Buffer table

Entering own buffer set for automatic calibration

Factory setting

Resetting all parameters to factory setting

Passcode entry

Editing the passcodes

Parameter Setting Menu



Display Settings: FRONT Module

Languages

Measurement display	Representation of measured values on the display:
<ul style="list-style-type: none"> • Main display • Display format • Viewing angle 	<ul style="list-style-type: none"> - Selecting the number of primary values displayed (one or two) - Decimal places
Measurement recorder	Option: 2-channel, selection of process variable, start and end
<ul style="list-style-type: none"> • Time base • Zoom function • Min/Max display 	
KI recorder	Option: See more detailed "Options" manual

Signal Outputs and Inputs, Contacts: BASE Module

Output current I1, I2	2 current outputs, separately adjustable
<ul style="list-style-type: none"> • Variable • Curve • Output (0/4 - 20 mA) • Output filter • Behavior during messages <ul style="list-style-type: none"> - HOLD --- Current meas. --- Last meas. value --- Fixed 22 mA - 22 mA message 	<p>Behavior during messages</p> <p>Output current [mA]</p>
Contact K4	NAMUR Failure
<ul style="list-style-type: none"> • Contact type • ON delay • OFF delay 	
Contacts K3, K2, K1	Factory setting:
<ul style="list-style-type: none"> • Usage <ul style="list-style-type: none"> - Maintenance request - HOLD (function check) - Limit value (adjustable) - Rinse contact (adjustable) - Parameter set B active - USP output - KI recorder active - Sensoface • Conoller alarm (alarm output EC 400) • Contact type / ON/OFF delay 	<ul style="list-style-type: none"> K3: Maintenance request, K2: HOLD, K1: Limit - Variable, limit value, hysteresis, effective direction, ... - Rinsing interval, lead times, rinse duration, logbook entry, ...
Inputs OK1, OK2	Optocoupler - signal inputs
<ul style="list-style-type: none"> • OK1 usage <ul style="list-style-type: none"> - Signal level 	<ul style="list-style-type: none"> Off, HOLD (function check) active level switchable from 10 to 30 V or < 2 V, resp. For OK2 see System control/Function control matrix

Parameter Setting Menu



Cond Ind 7700(X) Module

Input filter

Sensor data

- Sensor type
- Sensor coding
- Nom. cell factor
- Transfer ratio
- Temperature detection
 - Measuring temp
 - Cal temp
- Sensocheck

Representation of measured values on the display:

- Select
- Selection for Measurement / Calibration

Cal preset values

- Cal solution
 - NaCl 0.01 mol/l
 - NaCl 0.1 mol/l
 - NaCl saturated
 - KCl 0.01 mol/l
 - KCl 0.1 mol/l
 - KCl 1 mol/l
- Product calibration

TC process medium

Select: Off, linear, EN 27888, ultrapure water

Concentration

Messages

- Conductivity
- Resistivity
- Temperature
- Salinity

Calibration Menu



Cond Ind 7700(X) Module

Automatic
Calibration solution input
Product calibration
Data entry
Zero correction

Maintenance Menu



BASE Module

Current source Output current definable 0 ... 22 mA

Cond Ind 7700(X) Module

Sensor monitor Resistance, conductance, RTD, temperature
Temp probe adjustment Compensating for lead length

Diagnostics Menu



Message list List of all warning and failure messages
Point of meas description
Logbook
Device description Hardware version, Serial no., (Module) Firmware, Options

FRONT Module

Module diagnostics
Display test
Keypad test

BASE Module

Module diagnostics
Input/output status

Cond Ind 7700(X) Module

Module diagnostics Internal function test
Sensor monitor Shows the values currently measured by the sensor
Cal record Data of last adjustment / calibration

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Icon	Explanation of Icons Important for this Module
	The analyzer is in measuring mode.
 	The analyzer is in calibration mode. HOLD mode active for the currently calibrated module
 	The analyzer is in maintenance mode. Operating status: HOLD.
 	The device is in parameter setting mode. Operating status: HOLD.
	The analyzer is in diagnostics mode.
NAMUR signals   	<p>HOLD. The NAMUR “function check” contact is active (factory setting: Module BASE, Contact K2, N/O contact). Current outputs as configured:</p> <ul style="list-style-type: none"> • Current meas.: The currently measured value appears at the current output • Last usable value: The last measured value is held at the current output • Fixed 22 mA: The output current is at 22 mA <p>Failure. The NAMUR “failure” contact is active (factory setting: Module BASE, Contact K4, N/C contact). To view error message, call up: Diagnostics menu/Message list</p> <p>Maintenance. The NAMUR “maintenance request” contact is active (factory setting: Module BASE, Contact K2, N/O contact). To view error message, call up: Diagnostics menu/Message list</p>
	Limit indication: Lower / upper range limit exceeded
 man	Temperature detection by manual input
	Calibration is performed
	Calibration - Step 1 of product calibration has been executed. The analyzer is waiting for the sample values.
TC	Calibration: Temperature compensation for process medium is active (Linear/Ultrapur water/Table)
	In the plaintext display in front of a menu line: Access to next menu level with enter
	In the plaintext display in front of a menu line when it has been blocked by the Administrator against access from the Operator level.
	Designates the module slot (1, 2 or 3), allowing the clear assignment of measured-value/parameter displays in the case of identical module types.
	Indicates the active parameter set. (The analyzer provides two parameter sets A and B. Up to 5 sets can be added using additional functions and SmartMedia card.)

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Cond Ind 7700(X) Module



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