



Read before installation.
 Keep for future use.

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Safety

Read the user manual for the basic unit (FRONT and BASE modules) and the corresponding measuring and communication modules, observe the technical specifications and follow the safety instructions in the safety guide (Package Contents for the basic unit Protos II 4400(X)) – for Ex versions, additionally the information provided in the documents in the Package Contents.

The user manual, safety guide and other product information can be downloaded from www.knick.de.

Maintenance

Protos modules cannot be repaired by the user. For inquiries regarding module repair, please contact Knick Elektronische Messgeräte GmbH & Co. KG at www.knick.de.

Intended Use

The module is an input module for conductivity measurement with standard analog inductive sensors.

Note: The specifications on the module's rating plate take precedence.

Package Contents

- Measuring module
- Installation Guide
- Test Report 2.2 acc. to EN 10204
- Adhesive label with terminal assignments
- For Ex version CONDI 3400X-051:
 - Appendix to certificates (KEMA 03ATEX2530, IECEx DEK 11.0054)
 - EU Declaration of Conformity
 - Control Drawings

Check all components for damage upon receipt.
 Do not use damaged parts.

Operating States

The function check (HOLD) operating state is active:

- During calibration (only the corresponding channel)
- During maintenance
- During parameter setting
- During the automatic rinse cycle (use of the rinse contact)

The behavior of the current outputs depends on the parameter setting, i.e., they may be frozen at the last measurement or set to a fixed value.

For detailed information, refer to the user manual of the basic unit (FRONT and BASE modules).

Headquarters

Beuckestr. 22 • 14163 Berlin
 Germany
 Phone: +49 30 80191-0
 Fax: +49 30 80191-200
info@knick.de
www.knick.de

Local Contacts

www.knick-international.com

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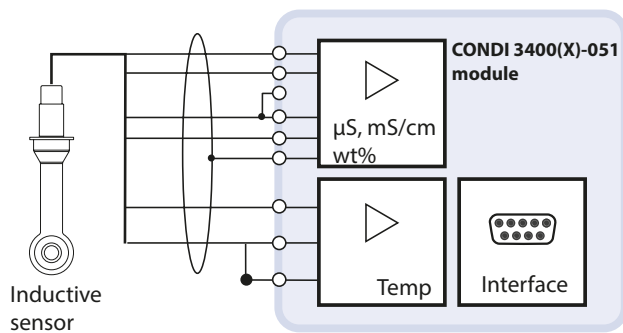
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 The latest documents are available for download on the website under the corresponding product description.



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TI-201.051-KNEN02

Device Overview/Module Concept



WARNING! Shock potential.
 Make sure the device is de-energized before reaching into the terminal compartment.

Memory card slot

Follow the instructions in the installation guide for the memory card.

Terminal plate adhesive label ("concealed" modules)

The adhesive labels (Package Contents) for the modules at slot 1 or slot 2 can be affixed here. This simplifies maintenance and service.

Module configuration

Any combination of up to 3 measuring and communication modules is possible. Module identification: Plug & Play

Inserting the Module

CAUTION! Electrostatic discharge (ESD).
 The modules' signal inputs are sensitive to electrostatic discharge. Take measures to protect against ESD before inserting the module and wiring the inputs.

Note: Strip the insulation from the wires using a suitable tool to prevent damage.

1. Switch off the power supply to the device.
2. Open the device (loosen the 4 screws on the front).
3. Plug the module into the slot (D-SUB connector), see figure on the right.
4. Tighten the module's fastening screws.
5. Connect the sensor and separate temperature probe if necessary, see "Wiring" on the next page.
6. Check whether all connections are correctly wired.
7. Close the device by tightening the screws on the front.
8. Switch on the power supply.

CAUTION! Incorrect parameter settings or adjustments can result in incorrect outputs. Protos II 4400(X) must therefore be commissioned by a system specialist, all its parameters must be set, and it must be fully adjusted.



CAUTION! Risk of losing the specified ingress protection. Fasten the cable glands and screw together the housing correctly. Observe the permissible cable diameters and tightening torques (see the specifications of the basic unit). Insert blanking plugs or sealing inserts if necessary.

Wiring

(for detailed diagrams, see the user manual)

	SE 655 / SE 656	SE 660
1 receive hi	Coax red, core (blue)	Coax red, core
2 receive lo	Coax red, shield (red)	Coax red, shield
3 shield] Coax white, shield (red)] Coax black, shield
4 send lo		
5 send hi	Coax white, core (blue)	Coax black, core
6 shield	Cable shield (green/yellow) ¹⁾	Cable shield
7 Senso-Loop		
17 RTD	Green	Green
18 RTD ²⁾	White	White
19 sense ²⁾	Yellow	Yellow
		Brown ³⁾

] = Insert jumper

- 1) The shield wire (green/yellow) must be connected to the shielding mesh of the special cable using a crimp ring.
- 2) Remove the pre-mounted jumper between terminals 18 and 19!
- 3) Do not connect



Messages/Troubleshooting

(for detailed tables, see the user manual)

Error	Message (Diagnostics menu: Message list)	Possible causes	Remedy
	Display is blank	FRONT or BASE power supply interrupted Input fuse has tripped Display switch-off is active	Check the power supply Replace the fuse (500 mA T) Deactivate the display switch-off
	No measurement, no error message	Module not plugged in correctly	Install the module correctly Check the measurement display under "Parameter setting > Administrator level > FRONT Module"
	Measured value does not match expected value.	Wrong sensor selected, wrong cell factor	Adjust the sensor parameter setting
	Sensoface 😞	Sensor not calibrated/adjusted Sensor cable defective	Calibrate and adjust Check the sensor connection Clean and replace the sensor if necessary Replace the sensor cable
B073/ B078	Current I1/I2, load error	Open current output I1/I2: Current loop not closed, cable interrupted	Check the current loop Deactivate the current outputs
F232	Module configuration Ex/safe area	Ex and safe area modules have been inserted.	Select a uniform configuration (either Ex or safe area)
T010	Conductivity range	No sensor connected, sensor cable defective, sensor connected incorrectly	Connect the sensor, check the sensor cable, and replace if necessary Check the sensor connection
T015	Temperature range		
	Displayed measured value: 0.00 µS		

Menu Overview for the CONDI 3400(X)-051 Module

Parameter Setting

Input filter	Pulse suppression
Sensor data	Select sensor type, sensor coding, cell factor, transfer ratio, temperature detection, Sensocheck
Cal presettings	Select calibration solution (NaCl/KCl), product calibration via conductivity/concentration ¹⁾
TC process medium	Set the temperature compensation (off, linear, EN 27888, ultrapure water ²⁾)
Concentration	With add-on function SW3400-009/FW4400-009
Messages	Conductivity, resistivity, concentration, temperature, salinity: off, max. device limits, variable limits

Calibration/Adjustment

- Automatic with standard calibration solution
- Manual entry of calibration solution
- Product calibration/adjustment
- Data entry – premeasured sensor
- Zero correction
- Temperature probe adjustment (with Protos II 4400(X))

- 1) With Protos II 4400(X) and add-on function FW4400-009
- 2) With add-on function SW3400-008/FW4400-008

Specifications (Excerpt)

CONDI input	For SE 655/SE 656 toroidal sensors (and others)
Explosion protection (CONDI 3400X-051)	For entity parameters, see attachment to certificates or control drawings.
Measuring range (SE 655 / SE 656)	0000 µS/cm ... 1999 mS/cm, resolution 1 µS/cm
Concentration	0.00 ... 100.0 wt%
Salinity	0.0 ... 45.0 g/kg (0 ... 35 °C / 32 ... 95 °F)
Response time (T ₉₀)	< 0.5 s
Measurement error ²⁾	< 0.5 % meas. value + 2 µS/cm
Permissible cable length	Max. 20 m
Temperature input	Pt 100/Pt 1000/NTC 30 kΩ/NTC 100 kΩ 3-wire connection, adjustable
Measuring range	-50...250 °C/-58...482 °F (Pt100/Pt1000) -10...150 °C/14...302 °F (NTC 30 kΩ/NTC 100 kΩ)
Resolution	0.1 °C/°F
Measurement error ³⁾	0.2 % meas. value + 0.5 K
Temperature compensation ¹⁾	Without Linear characteristic 00.00 ... 19.99 %/K (reference temperature user-defined) NLF natural waters according to EN 27888 (reference temperature 25 °C/77 °F)
Permissible cell factor	0.000 ... 19.99 cm ⁻¹
Permissible transfer ratio	0.00 ... 199.9
Output curves ¹⁾	Linear Trilinear Function (logarithmic) As desired via table

Maintenance

Sensor monitor	For validation of sensor and complete signal processing
Temperature probe adjustment	(with Protos 3400(X))

Diagnostics

Message list	List of all messages
Logbook	Shows the last 50 events with date and time
Meas. point description	Shows the tag number and annotation (input in system control)
Device description	Hardware version, serial number, (module) firmware, options
Module diagnostics	Internal function test
Sensor monitor	Shows the values currently measured by the sensor
Cal/adj record	Dates of the last adjustment/calibration

RoHS conformity	According to EU directive 2011/65/EU
EMC	EN 61326-1, EN 61326-2-3 NAMUR NE 21
Emitted interference	Industrial applications ⁴⁾ (EN 55011 Group 1 Class A)
Interference immunity	Industrial applications
Lightning protection	to EN 61000-4-5, Installation class 2
Rated operating conditions (module installed)	
Ambient temperature	Safe area: -20 ... 55 °C / -4 ... 131 °F Ex: -20 ... 50 °C / -4 ... 122 °F
Relative humidity	5 ... 95 %
Climatic class	3K5 according to EN 60721-3-3
Location class	C1 according to EN 60654-1
Transport/storage temperature	-20 ... 70 °C / -4 ... 158 °F
Screw clamp connector	Tightening torque 0.5 ... 0.6 Nm Single or stranded wires 0.2 ... 2.5 mm ² Stripping length max. 7 mm Temperature resistance > 75 °C / 167 °F
Wiring	

- 1) User-definable
- 2) At rated operating conditions, ± 1 count
- 3) At rated operating conditions, ± 1 count, with NTC > 100 °C/212 °F: 0.2 % meas. value + 1 K
- 4) This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.