Knick ›

Installation Guide
English

Protos II 4400(X) / Protos 3400(X) OXY 3400(X)-067 Module

Read before installation.
Keep for future use.

www.knick.de

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 measuring oxygen in liquids and gases. It measures the partial pressure of oxygen, air pressure, and temperature simultaneously with analog amperometric oxygen sensors or amperometric ISM oxygen sensors. It is also able to calculate and display the oxygen saturation index and concentration as well as volume concentration in gases.

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 OXY 3400X-067:
• Attachment 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 for the basic unit (FRONT and BASE modules).

TI-201.067-KNEN02

097754

Device Overview/Module Concept

OXY 3400(X)-067 module

O2, %
µg/l, ppb
mg/l, ppm

Temp

Interface

Oxygen sensor
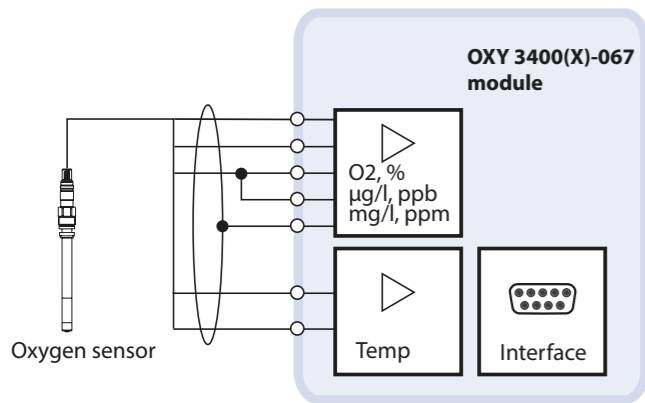
Module Compatibility

	Protos 3400	Protos 3400X	Protos II 4400	Protos II 4400X
Protos OXY 3400-067 module	x		x	
Protos OXY 3400X-067 module		x		x

Information on the firmware version history can be found at www.knick.de.

⚠ **WARNING!** Shock potential.
Make sure the device is de-energized before reaching into the terminal compartment.
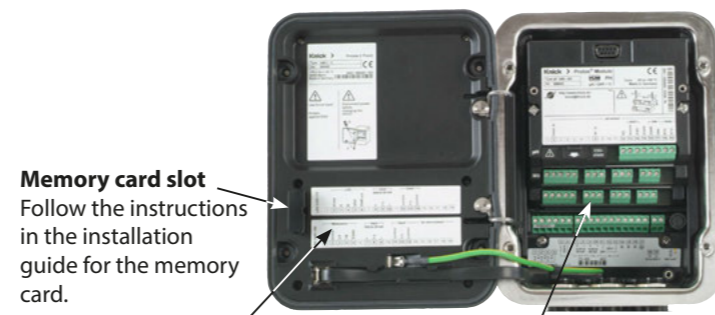
Memory card slot
Follow the instructions in the installation guide for the memory card.

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.

NOTICE! 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 the figure on the right.
4. Tighten the module's fastening screws.
5. Open the ESD shield (covering terminals 2 and 8).
6. Connect the sensor and separate temperature probe if necessary, see "Wiring" on the next page.
   Note: To avoid interference, the cable shielding must be completely covered by the ESD shield.
7. Fit the ESD shield back into place (covering terminals 2 and 8).
8. Check whether all connections are correctly wired.
9. Close the device by tightening the screws on the front.
10. 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)

Sensor type:		Standard SE 7*6 … VP6-ST cable	Traces 01 SE 7*7 … VP6-ST cable	ISM
2	cathode	Coax core Transparent	Coax core Transparent	
8	anode	Coax shield Red	Coax shield Red	
12	reference		n.c.	
13	guard/RTD	Gray + Green	Gray + Green	
14	RTD	White	White	
15	shield	Cable shield Yellow/green	Cable shield Yellow/green	
16	ISM data			Connection K8S: Coax core (transparent)
17	ISM DGND			Connection K8S: Coax shield (black)
18	- I-input			
19	+ I-input			
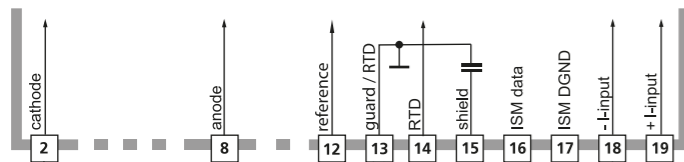
The signal from an external pressure transmitter can be fed in through the external current input (18, 19).
This enables automatic pressure correction for oxygen measurement.

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"
	Sensoface ☹	Sensor not calibrated/adjusted	Calibrate and adjust
		Sensor cable defective	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)
D010	Saturation %air range	No sensor connected, sensor cable defective, sensor connected incorrectly, wrong operating mode selected	Connect the sensor, check the sensor cable, and replace if necessary Check the sensor connection Adjust the operating mode
D015	Temperature range		
D120	Wrong sensor	Sensor does not match the selected process variable	Replace the sensor, change the process variable
D121	Sensor error	Error in default/specific data, sensor is defective.	Replace the sensor

Menu Overview for the OXY 3400(X)-067 Module

Parameter Setting

Input filter	Pulse suppression
Sensor data	Measurement in liquids/gases, sensor type, temperature probe, membrane correction, sensor polarization, Sensoface, sensor monitoring
Cal presettings	Product calibration saturation/concentration/ partial pressure, calibration timer
Pressure correction	Pressure transmitter, current input, pressure during measurement/calibration
Salinity correction	Salinity, chlorinity, conductivity
Messages (gas)	Concentration, partial pressure, air pressure
Messages (liquid)	Saturation %air, saturation %O_2, concentration, partial pressure, air pressure
Devaluate ISM sensor[1]	

Calibration/Adjustment

Automatic – Water
Automatic – Air
Product calibration/adjustment
Data entry
Zero correction
Temperature probe adjustment (with Protos II 4400(X))

Specifications (Excerpt)

Input for sensors	SE 7*6… , SE 7*7 … or "other"		
Explosion protection (OXY 3400X-067)	For entity parameters, see attachment to certificates or control drawings.		
Automatic range selection:			
Input range 1	Measuring current 0…600 nA, resolution 10 pA		
Measurement error[1]	< 0.5% measured value + 0.05 nA + 0.005 nA/K		
Input range 2	Measuring current 0…10000 nA, resolution 166 pA		
Measurement error[1]	< 0.5% measured value + 0.8 nA + 0.08 nA/K		

Display ranges	Standard sensor	Trace sensor 01	Other
Saturation (-10 … 80 °C / 14 … 176 °F)	000.0…999.9 %air	0.000…9.999 %air 00.00…99.99 %air 000.0…999.9 %air	0.000…9.999 %air 00.00…99.99 %air 000.0…999.9 %air
	00.00 … 99.99 %O_2 000.0 … 999.9 %O_2	0.000 … 9.999 %O_2 00.00 … 99.99 %O_2 000.0 … 999.9 %O_2	0.000 … 9.999 %O_2 00.00 … 99.99 %O_2 000.0 … 999.9 %O_2
Concentration (-10…80 °C/ 14…176 °F) (dissolved oxygen)	00.00…99.99 mg/l 000.0…999.9 mg/l	0000 …9999 μg/l 00.00…99.99 mg/l 000.0…999.9 mg/l	0000 …9999 μg/l 00.00…99.99 mg/l 000.0…999.9 mg/l
	00.00…99.99 ppm 000.0…999.9 ppm	0000 …9999 ppb 00.00…99.99 ppm 000.0…999.9 ppm	0000 …9999 ppb 00.00…99.99 ppm 000.0…999.9 ppm
Volume concentration in gas	00.00…99.99 vol% 000.0…999.9 vol%	0000 …9,999 ppm 0.000…9.999 vol% 00.00…99.99 vol%	0000 …9999 ppm 0.000…9.999 vol% 00.00…99.99 vol% 000.0…999.9 vol%
Partial pressure	0000…9999 mbar	00.00…00.00 mbar 000.0…000.0 mbar 0000…9999 mbar	00.00…00.00 mbar 000.0…000.0 mbar 0000…9999 mbar
	0000…9999 mmHg	00.00…00.00 mmHg 000.0…000.0 mmHg 0000…9999 mmHg	00.00…00.00 mmHg 000.0…000.0 mmHg 0000…9999 mmHg

Perm. guard current	≤ 20 μA
Polarization voltage[2]	0…–1000 mV, default –675 mV (resolution < 5 mV)

Maintenance

Sensor monitor	For validation of sensor and complete signal processing
Temperature probe adjustment	(with Protos 3400(X))
Autoclaving counter[1]	Input/display of autoclaving cycles, display of maximum permissible cycles, if the corresponding parameter has been set
Changing the membrane body[1]	Input/display of change of membrane body, display of maximum permissible changes, if the corresponding parameter has been set
Changing the inner body[1]	Input/display of change of inner body, display of maximum permissible changes, if the corresponding parameter has been set

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
Sensor diagram	Graphic display of the current sensor parameters
Statistics	Shows the first adjustment and difference of the last 3 adjustments
Sensor wear monitor, load matrix[1]	

1) For ISM only

Pressure correction[2]		
Air pressure		
Manual	0…9999 mbar	
External	0…9999 mbar (via 0(4)…20 mA input)	
Salinity correction[2]	0.0…45.0 g/kg	
Temperature input[2]	NTC 22 kΩ / NTC 30 kΩ, 2-wire connection, adjustable	
Measuring range	-20 … 150 °C / -4 … 302 °F	
Resolution	0.1 °C/°F	
Measurement error[1]	0.2 % meas. value + 0.5 K (< 1 K with T > 100 °C / 212 °F)	
Current input[2]	0(4)…20 mA for absolute or differential pressure transmitter	
Pressure range	0…9999 mbar	
Current range	0(4)…20 mA / 50 Ω, start/end can be defined by the user within the pressure range	
Resolution	< 1 %	
RoHS conformity	According to EU directive 2011/65/EU	
EMC	EN 61326-1, EN 61326-2-3, NAMUR NE 21	
Emitted interference	Industrial applications[3] (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 temp	-20 … 70 °C / -4 … 158 °F	
Screw clamp connector	Tightening torque 0.5 … 0.6 Nm Single or stranded wires 0.2 … 2.5 mm²	
Wiring	Stripping length max. 7 mm Temperature resistance > 75 °C / 167 °F	

1) At rated operating conditions, ± 1 count, plus sensor error
2) User-definable
3) This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.