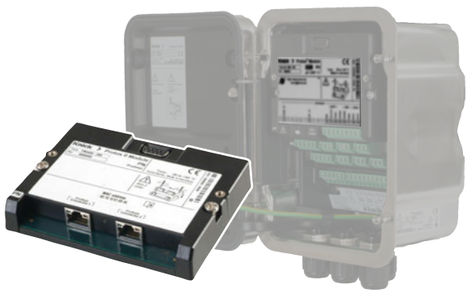
Knick

Installation Guide
English

Protos II 4400
PN4400-095 Module



Read before installation.
Keep for future use.

www.knick.de

Module Compatibility

	Protos II 4400[1)]	Protos II 4400X
Protos II PN4400-095 module	x	-

1) FRONT firmware version 01.01.xx or higher

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

Safety

Read the user manuals 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 included with the Protos II 4400 basic unit).

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

Intended Use

The module is a PROFINET communication unit for Protos II 4400.
It features two RJ45 Ethernet sockets and can therefore be connected in a ring or star topology.

The module is only intended for operation in ordinary (non-hazardous) locations.

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.

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

Package Contents

- Communication module
- Installation Guide
- Test Report 2.2 acc. to EN 10204
- Adhesive label with terminal assignments and MAC address

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

Accessories	Order No.
Cable gland (RJ45)	ZU1072
Adapter cable RJ45/M12 D-type	ZU1073

System Integration

A PROFINET device master file (GSDML file) is required for system integration.
The latest version of the GSDML file is available in the downloads section of the Knick website.

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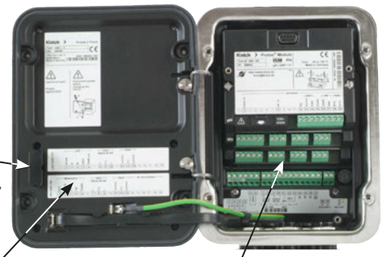
Version: 1
This document was published on November 13, 2020
The latest documents are available for download on the website under the corresponding product description.

097204

TI-201.095-KNEN01

Device Overview/Module Concept

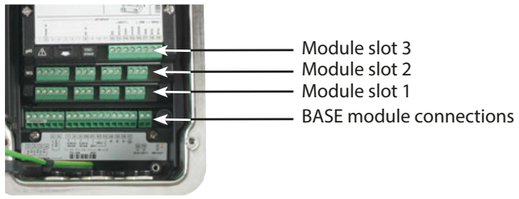
⚠ **WARNING** Shock potential.
Make sure the device is de-energized before reaching into the terminal compartment.



Memory card slot
Observe installation guide for the memory card.

Terminal plate adhesive label ("concealed" modules)
The adhesive labels (package contents) for the modules in slots 1 or 2 can be affixed here.
This simplifies maintenance and service.

Module configuration
Up to 3 measuring and communication modules.
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.

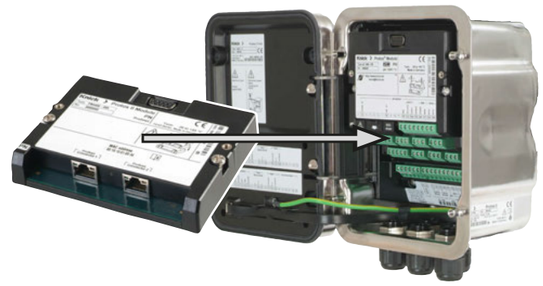
Note: The PN4400-095 module must be installed in slot 2.

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 2 (D-SUB socket).
4. Tighten the module's fastening screws.
5. Connect the signal lines (see next page).
6. Check whether all connections are correctly wired.
7. Close the device and tighten the screws on the front.
8. Switch on the power supply.

Notes on Initial Commissioning

- IP address on delivery: 0.0.0.0
- For the MAC address, see the terminal plate.
- Carry out IP configuration and set the device name with a suitable engineering tool.

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

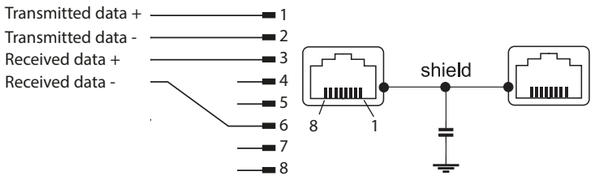


⚠ **CAUTION!** Risk of losing the specified ingress protection.
Fasten the cable glands and screw together the housing correctly.
Observe the permissible cable diameters and tightening torques.
Insert blanking plugs or sealing inserts if necessary.

Wiring

RJ45 Ethernet Sockets 1 and 2

Pin	Name	Description
1	TD+	Transmitted data +
2	TD-	Transmitted data -
3	RD+	Received data +
6	RD-	Received data -



PN4400-095 Module Protos Menu Overview

(For detailed information on parameter setting, see the user manual)

Parameter Setting ▸ PN4400-095 Module	
Alarms/Diagnostics	Enable/disable PROFINET diagnostic information in the Protos device menu.
Measured Values	AI 1 ... AI 20: Selection based on installed modules

Diagnostics ▸ PN4400-095 Module	
Module Diagnostics	Internal function test
Network Information	
Name of Station	-
IP Address	0.0.0.0 [1]
IPv4 Subnet Mask	000.000.000.000 [1]
IPv4 Standard Gateway	000.000.000.000 [1]
MAC Address	00:19:10:xx:xx:xx [2]
PROFINET Diagnostics	
The values below indicate functioning PROFINET communication:	
Stack State	0x000000FB
Last Error	0x00000000
Phy Link State	OK
Config State	Application
Comm State	Operate
Comm Error	0x00000000
PROFINET Monitor	Analog Input Analog Output

1) Factory setting
2) Unique address assigned to the device (cannot be changed).

DCP Signaling (Ping)

When using ping for network diagnostics, the display of the addressed device is inverted, i.e., the background switches from white to black and the text from black to white once every second.

Abbreviations

DCP	Discovery and basic configuration protocol: DCP is part of the PROFINET protocol and makes it possible to find and configure a device. If the device's MAC address and name of station are recognized by a process control system (PCS), the PCS can allocate the IP address to the device using DCP.
GSDML	General Station Description (Markup Language): GSDML file = PROFINET device master file in XML format for configuring PLC systems
MAC	Media access control: The MAC address is a unique address assigned to the device that is set by the manufacturer. It comprises three bytes to identify the manufacturer and three bytes to identify the device.
PLC	Programmable logic controller

Operating States

Protos II 4400 Basic Unit

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, see the user manual of the basic unit (FRONT and BASE modules).

Module

The module's operating states are shown in the Protos menu: Diagnostics ▸ PN4400-095 Module ▸ PROFINET Diagnostics

LED (at Ethernet socket)	**Name**	**Meaning**
Yellow	TX/RX	Transmit/Receive
Green	LINK	Connection

For detailed information, see the PN4400-095 module user manual.

Messages/Troubleshooting

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). Disable display switch-off.
No measurement, no error message	Module not plugged in correctly.	Install the module correctly, check the measurement display in Parameter Setting ▸ Administrator Level ▸ FRONT Module
No PROFINET connection	PROFINET cable not connected or connected incorrectly. Protos menu Diagnostics ▸ PN4400-095 Module ▸ PROFINET Diagnostics**:** Phy Link State: No Link	Check the connection, connect the cable correctly.
	Incorrect IP address. Protos menu: Diagnostics ▸ PN4400-095 Module ▸ PROFINET Diagnostics: Comm State: Stop	Check and correct the address.
	Incorrect or non-unique name of station Protos menu Diagnostics ▸ PN4400-095 Module ▸ PROFINET Diagnostics: Comm State: Stop	Check and correct the name of station.
	Incorrect GSDML used. Protos menu Diagnostics ▸ PN4400-095 Module ▸ PROFINET Diagnostics: Comm State: Stop	Check GSDML, select correct GSDML.
Device does not respond to key presses. F234 Key Lock is Active	Key lock is active.	Disable key lock via PCS: (See user manual.)
N008 EEPROM Error N009 Firmware Error	Error in EEPROM/ error in the firmware:	Switch off device. Wait around 10 s and turn back on. For N009: Reload the firmware. If the message persists, send in the device.
F232 Module Configuration Ex/Non Ex	Ex and Non Ex modules have been inserted.	Use the same types of modules appropriate to the basic unit (either Ex or Non Ex).

Specifications

PN4400-095 Module	
PROFINET	
IO specification	V2.34
Conformance class	B (CC-B)
Network load class	2
Vendor ID	0x61 (= Knick)
Device ID	0x0020
Min. cycle times	1 ms
Identification & maintenance	I&M1-3, 0
Serial interface standard	100BASE-TX (IEEE 802.3, IEC 61158, IEC 61784)
Number of AIs	20
Number of AOs	1
100BASE-TX Communication Interface	
Connection socket type (1 and 2)	RJ45
Input and output impedance	100 Ω
Serial data rate	125 Mbits/s
Data encoding	4B/5B
Cable encoding	MLT-3 (Multi Level Transmission – 3 levels)
Galvanic isolations, RJ45 port	MDI and cable shield to ground potential (device housing)
Insulation strength	
MDI (all 8 internal RJ45 ports)	2250 V DC /1.5 kV AC (50/60 Hz) for 60 s
Cable shield	1000 V DC /700 V AC (50/60 Hz) for 60 s
Current consumption	≤ 146 mA

Protos II 4400 Basic Unit	
Rated operating conditions (module installed)	
Ambient temperature	-20 ... 55 °C / -4 ... 131 °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
RoHS conformity	According to EU directive 2011/65/EU
EMC	EN 61326-1, EN 61326-2-3 NAMUR NE 21
Emitted interference	Industrial applications[1] (EN 55011 Group 1 Class A)
Interference immunity	Industrial applications
Lightning protection	to EN 61000-4-5, Installation class 2

1) This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.