ALMEMO® NETWORK TECHNOLOGY

Decentralized data acquisition consistently realized with the ALMEMO® system

The ALMEMO® system provides optimal support for networked, decentralized data acquisition. Measured data can be acquired locally on site using short sensor signal lines and small modular measuring instruments and can then be evaluated all together on a central computer. This not only minimizes the wiring requirements but also largely suppresses EMC problems (especially when using optic fiber cables).

Via the cascadable interface and passive network cables or active distributors, one measuring computer can manage up to 100 ALMEMO® devices. User-friendly software packages (see Section 6) are available for automatically scanning measuring points within the network, for evaluating the measured values, and for graphically representing results in line chart or bar chart form.

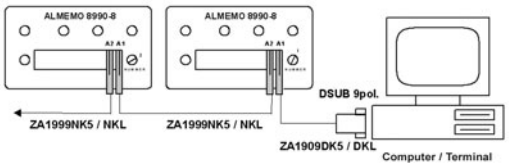
This permits measuring setups with a high level of operating reliability and with such flexible use of the device technology that even the most demanding and sophisticated measuring tasks can be successfully solved, e.g.

- Evaluation via a measuring computer with an RS232 interface.
- Interface conversion from RS232 to RS422.
- Bridging of long distances of up to 1 km implementation of network branches.
- Installation of measuring devices in separate rooms.
- Direct connection of ALMEMO® measuring devices with an RS485 interface.
- ALMEMO® connections to industry standard interfaces.
  We can, on request, supply customized modules for linking to Profibus, CAN-Bus, PLC S5 / S7.

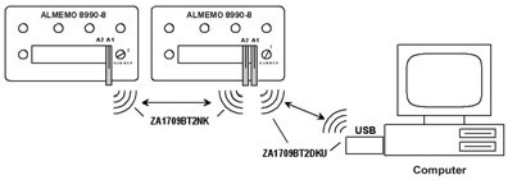
New Connection of ALMEMO® devices / networks to the PC via an available Ethernet network
New Linking up to the Internet now possible
New Wireless data / network connection using Bluetooth modules or radio modem

Examples of Typical Applications

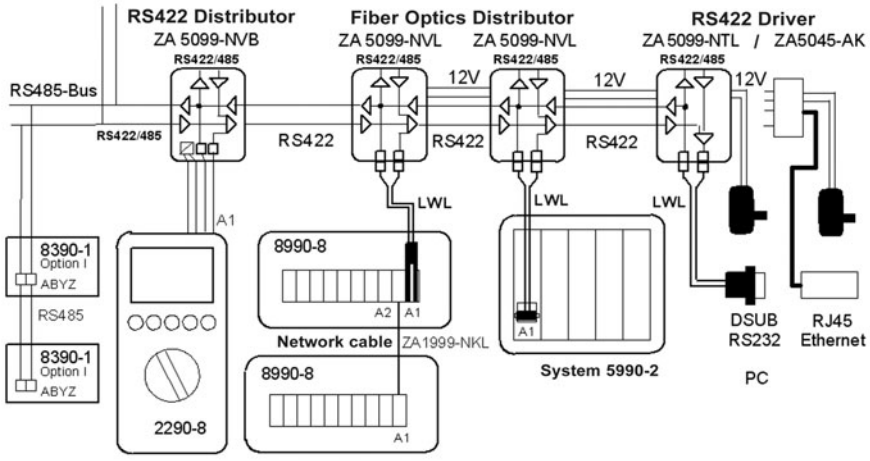
ALMEMO® network cables for short distances and mobile measuring setups



Wireless ALMEMO® radio network



ALMEMO® network RS422 / RS485 for longer distances and stationary measuring setups

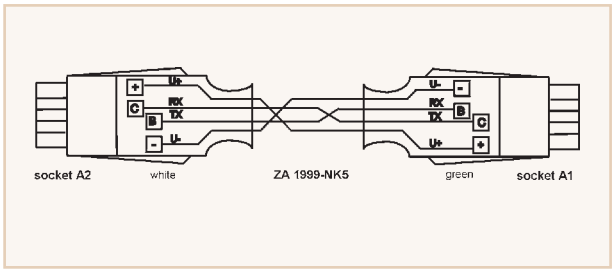


Examples of typical applications describing all the many options provided by the ALMEMO® system for decentralized data acquisition would be beyond the scope of this catalog. Please ask for our ALMEMO® Manual. It will provide you with many valuable tips and a detailed description of our ALMEMO® network technology.

We shall, of course, provide you with competent, individual advice and support to help you solve your particular measuring tasks. Or you can arrange a date for a demonstration. Our experts will be pleased to visit you - to introduce and explain the numerous application options of the ALMEMO® system.

ALMEMO® NETWORK TECHNOLOGY

ALMEMO® Network Interface Cables Type ZA1999NK5



Uses:

- Especially suitable for short distances and mobile measuring setups.
- Up to 100 ALMEMO® measuring instruments can be networked.

Advantages:

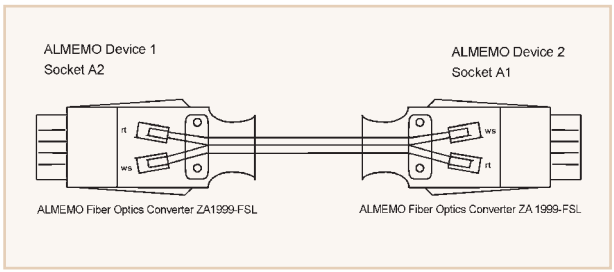
- Devices can be quickly and easily interconnected and networked.
- Low power consumption (approx. 1 mA) without additional power supply.
- You can easily assemble the network cable yourself, up to 50m in length, using just two single network connectors ZA1999FS5 (a couple) and one four-wire cable.

☞ The device network will be blocked if the measuring instrument fails to operate.
No further peripheral devices can be connected (analog output, alarm relay etc.).

Types:

Network cable for cascading several devices for baud rates up to 57.6 kbaud current loop, electrically isolated, 1.5 m long	**Order No. ZA1999NK5**
As above, but cable lengths 5m / 10m / 15m	**Order No. ZA1999NK5 -05/-10/-15/-xx**
2 Network connectors (a couple) with screw terminals for local self-assembly	**Order No. ZA1999FS5**

ALMEMO® Network Interface Cables with Fiber Optics Type ZA1999NKL



Uses:

- Especially suitable for safe and reliable data transmission in industrial environments with high levels of interference.
- Up to 10 ALMEMO® measuring instruments can be networked (at 9600 baud, double this number, if the transmission rate is halved).

Advantages:

- Devices can be quickly and easily interconnected and networked.
- No EMC problems, highest possible immunity to interference, absolute electrical isolation of the instruments - even under high voltages.
- No additional voltage supply is required.
- You can easily assemble the network cable with plastic optic fiber yourself, up to 50m in length, using just two single network connectors ZA1999FSL, without needing any special tools.

☞ In the event of the measuring instrument failing, the network will be blocked.
No further peripheral devices can be connected, (analog output, alarm relays, etc.).

Types:

Network cable with optic fiber for cascading several devices 1.5 m long for baud rates up to 57.6 kbaud	**Order No. ZA1999NKL**
As above, but cable lengths 5m / 10m / 15m	**Order no. ZA1999NKL -05/-10/-15/-xx**
Longer optic fiber cable for interiors, Duplex plastic 2.2 x 4.3 mm	**Order no. LL2243L** (please specify length L)
Network connector with optic fiber converter for local self assembly	**Order No. ZA1999FSL**

ALMEMO® NETWORK TECHNOLOGY

Wireless data link with ALMEMO® Bluetooth connector, class 2, ZA1709-BT2
Bluetooth module, class 1, ZA1709-BT1x

ALMEMO® Bluetooth connector, class 2

- Complete Bluetooth module, class 2, integrated in the ALMEMO® connector.
- Wireless link between ALMEMO® devices over up to 20 meters (free field).
- Paired connectors at A1 and A2 as direct substitute for network cable.
- Remote station on PC : Bluetooth USB stick or class 1 modules (see below).

Technical data

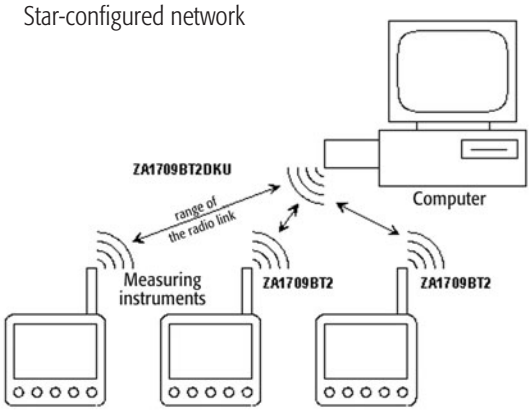
see page 04.03

Bluetooth modules, class 1

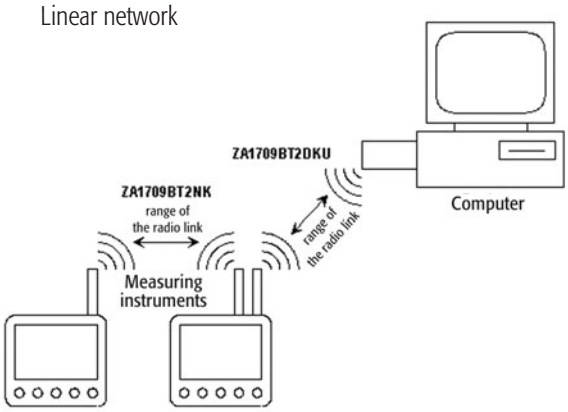
- Range over 100 meters thanks to special antenna (free field).
- Any connection is possible from ALMEMO® device to PC using the variants ALMEMO®, RS232, RS422, and Ethernet.
- Any combination is available as a ready-to-use pairing (except USB stick).
- Power supply via ALMEMO® devices or 12-V mains adapter.
- Multiple connections are possible using a Bluetooth USB stick on the PC.
  Measured data can be acquired via several COMs using the WinControl software (version SW5600WC2 and above, see page 06.06).

☞ The range of the radio link is substantially lower inside buildings.

Star-configured network



Linear network



Types:

Cost-efficient connections on the PC (including driver software)	
Wireless data link from Bluetooth USB stick and ALMEMO® Bluetooth connector, class 2	**Order no. ZA1709BT2DKU**
Wireless data link from Bluetooth USB stick and ALMEMO® Bluetooth module, class 1	**Order no. ZA1709BT1DKU**
Paired combinations (no installation necessary)	
Wireless data link from 2 Bluetooth modules, class 1, RS232, and ALMEMO®	**Order no. ZA1709BT1DK**
Wireless network link from 2 ALMEMO® Bluetooth connectors, class 2	**Order no. ZA1709BT2NK**
Wireless network link from 2 ALMEMO® Bluetooth modules, class 1	**Order no. ZA1709BT1NK**

Single positions

ALMEMO® Bluetooth connector, class 2	**Order no. ZA1709BT2**
Bluetooth module, class 1, with ALMEMO® adapter cable, cable length 1 meter	**Order no. ZA1709BT1**
Bluetooth module, class 1, with RS422 adapter cable for ALMEMO® networks, cable length 1 meter	**Order no. ZB1709BT1N**
Bluetooth module, class 1, with Ethernet socket RJ45, mains unit 12 V, 0.2 A	**Order no. ZB1709BT1E**
Special antenna for Bluetooth module, class 1, doubles the range	**Order no. ZB1709BT1A**

ALMEMO® NETWORK TECHNOLOGY

Wireless data link for particularly long distances, radio modem ZB1709FM5

- Wireless data link between ALMEMO® device and PC.
- Wireless networking between ALMEMO® devices, also possible in a star-configured network (broadcasting mode).
- The radio modem is already configured and easy to install.
- Frequency band 869 MHz, approved in many European countries.
- Wide range (up to 5 kilometers unobstructed) and reliable data transmission.
- The range can be increased using a directional antenna and repeater mode.

Technical data

Radio link	869.4 to 869.65 MHz, 500 mW (as per EN-300-220/1)
Radio data rate	19200 baud
Duty cycle	10% / hour (as per RegTP) (Regulierungsbehörde für Telekommunikation und Post, the German telecommunications and postal regulator)
Antenna connector	SMA socket
Range	up to 5 kilometers unobstructed
Connection	RS232, D-sub 9-pin, socket
ALMEMO® data rate	9600 baud
Power supply	10 to 30 V DC, 13 to 24 V AC
Current requirement	(at 12 V DC) quiescent current 80 mA, during radio operation, 350 mA
Operative range	-30 to +60 °C, 0 to 99% RH, non-condensing
Dimensions	110 x 185 x 30 mm, aluminum housing with DIN rail holder
EMC	EN 300 683, 89/336/EEC

Types :

Radio link complete from ALMEMO® device to PC, with 2 radio modems, 2 rod antennas, 1 ALMEMO® data cable with 1 adapter to the radio modem, 1 PC connecting cable, 2 connector mains units — **Order no. ZA1709FM5DK**

Single positions :

Radio modem, 869 MHz, 500 mW, with RS232 interface	**Order no. ZB1709FM5**
Rod antenna (up to 1 kilometer unobstructed), directional antenna available on request	**Order no. ZB1709FMKA**
ALMEMO® data cable	**Order no. ZA1909DK5**
Adapter connector for the radio modem	**Order no. ZA1709AS**
PC connecting cable	**Order no. ZB1909DV9**
Connector mains unit, 230 V AC, 12 V DC, 1000 mA	**Order no. ZB1012NA7**

ALMEMO® NETWORK TECHNOLOGY

RS422 network distributor ZA5099NVL
RS232 / RS422 network driver ZA5099NTL, Device / PC connection via optic fiber

Uses:

- Standard solution for stationary measuring setups in industrial environments.
- Suitable for relatively long distances, up to 1 km.
- Up to 100 ALMEMO® measuring instruments can be networked.

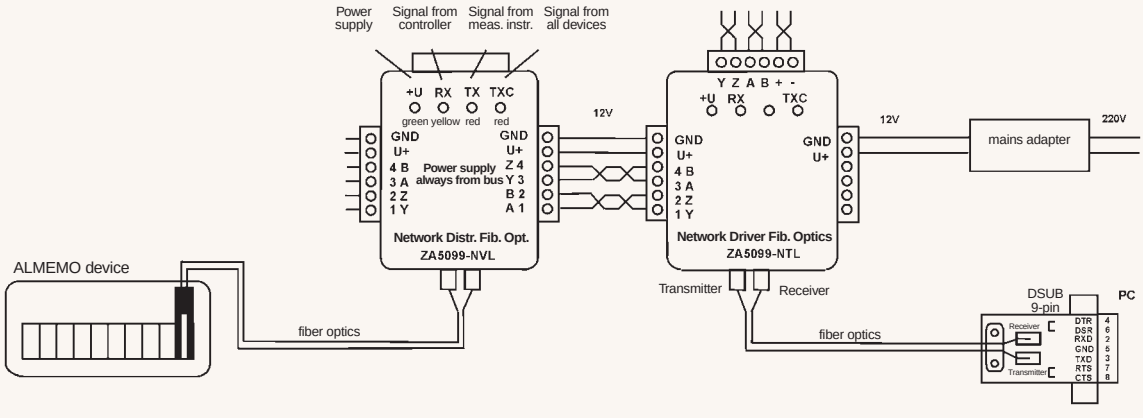
Advantages:

- Absolute electrical isolation of connected instruments - even under high voltages.
- Common mode interference on the transmission line is largely suppressed.
- Trouble-free implementation of branches and stub lines, directly inter-connectable, also as RS485 bus master.
- Easy to install - using a surface-mount housing, fastening brackets, and a screw terminal connector.
- Further peripheral devices can be connected to the ALMEMO® device, (analog output, alarm relays, etc.).

Technical Data:

Connection :	
ZA5099NVL:	3 x RS422, 4-wire, via terminal connector 1 x optic fiber cable, 1.5 m long via ALMEMO® connector to ALMEMO® device
ZA5099NTL:	2 x RS422, 4-wire, via terminal connector 1 x RS232 optic fiber cable, 1.5 m long via 9-pin sub-D to the PC
Wiring arrangements:	RS422, 4-wire plus voltage supply, 2-wire data line, (2 x 2 wires, duplicated)stranded in pairs
Max. line length:	between two RS422 distributors, 1 km optic fiber cable to the ALMEMO® device or PC, 50 m
Power supply:	10 to 12 V DC, via terminal connector
Current consumption:	approx. 10 to 18 mA
Dimensions:	L 71,5/90 x W 61,5/95 x H 30 mm

The distributor is supplied via the RS422 network or via its own mains power unit. The network remains functional - even when the ALMEMO® device is switched off or disconnected.



Types:

RS422 network distributor, ALMEMO, device connection via optic fiber (length = 1.5 m), Power supply via the mains supply unit	**Order no. ZA 5099 NVL**
RS232 / RS422 network driver ZA5099NTL, computer connection via optic fiber (length = 1.5 m) Power supply via the mains supply unit	**Order no. ZA 5099 NTL**
Mains supply unit, 12 V DC / 1000 mA	**Order no. ZB1012NA7**
Cable housing for ZA5099NVx (1 set = 3 pieces)	**Order no. ZB5099KG**
Data line 4 x 2 wires, stranded in pairs, per meter (power supply, 2 x 2 wires, duplicated)	**Order no. LD0042**

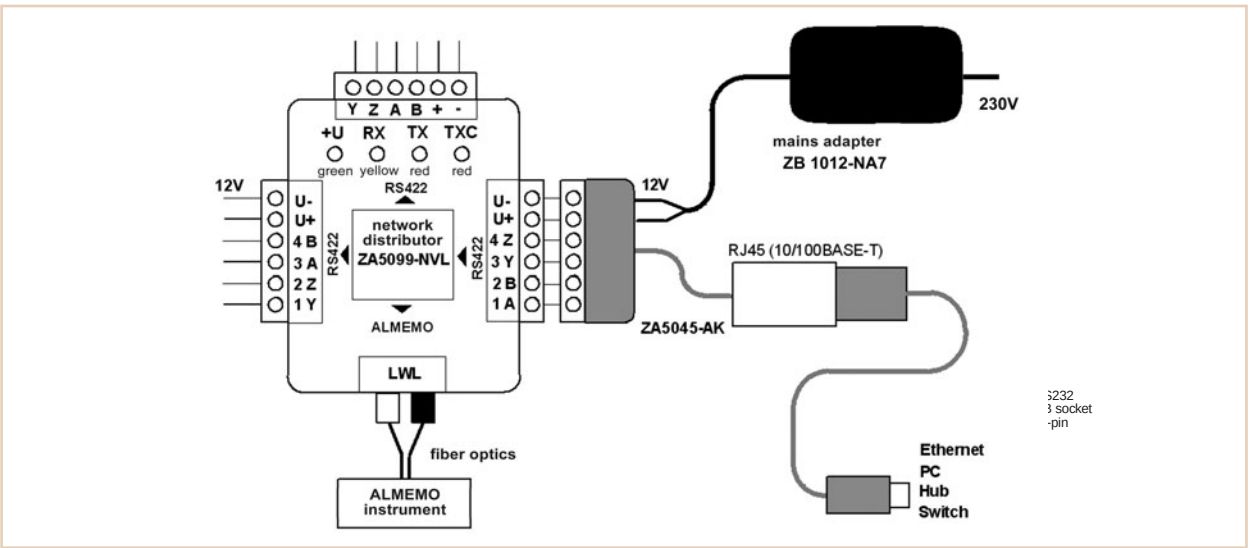
ALMEMO® NETWORK TECHNOLOGY

Ethernet network driver ZA5045AK

Technical data

Ethernet	Socket RJ45 (10/100 base-T) automatic switchover 10 / 100 MHz
RS422	6-pin screw terminal connector, 4-wire TX+, TX-, RX+, RX- and supply +12 V, -12 V; line length between driver and distributor, maximum 1 kilometer Baud rate maximum 115.2 kbaud
Power supply	9 to 12 V DC, <60 mA (10 MHz), <90 mA (100 MHz)

- Connection of all ALMEMO® networks to an Ethernet PC network.
- Linking up to the Internet now possible.
- Terminal operation using our AMR-Control software, available free-of-charge.
- Configuration software XPort/Device-Installer is also included on the AMR CD.
- Measured data acquisition using our WinControl software with the TCP/IP option and our AMR2ips diversion software; (see Chapter 06).
- Extension between driver and network distributor up to 1 kilometer now possible.
- Can also be used as RS485 bus driver.
- The driver in conjunction with network distributor ZA5099-NVL replaces previous Ethernet network distributor ZA5099-NVE.



Types :

Ethernet network driver, RJ45 to RS422, 4-wire	**Order no. ZA5045AK**
Mains adapter, 12 V DC, 1000 mA, with free ends, also for supplying other network distributors via the bus	**Order no. ZB1012NA7**
Patch cable RJ45, plug / plug, 2 meters	**Order no. ZB1904PK2**
Optic fiber network distributor RS422 to ALMEMO® optic fiber and 2 x RS422	**Order no. ZA5099NVL**
Data line 4 x 2 wires, stranded in pairs, per meter (power supply, 2 x 2 wires, duplicated)	**Order no. LD0042**
WinControl PC measuring software, AMR2ips diversion software; see Chapter 06	

ALMEMO® NETWORK TECHNOLOGY

RS422 network distributor ZA5099NVB
RS232 / RS422 network driver ZA5099AS, device connection via screw terminals

Uses:

- Especially suitable for relatively long distances, up 1 km, and for stationary measuring setups.
- Up to 100 ALMEMO® measuring instruments can be networked.

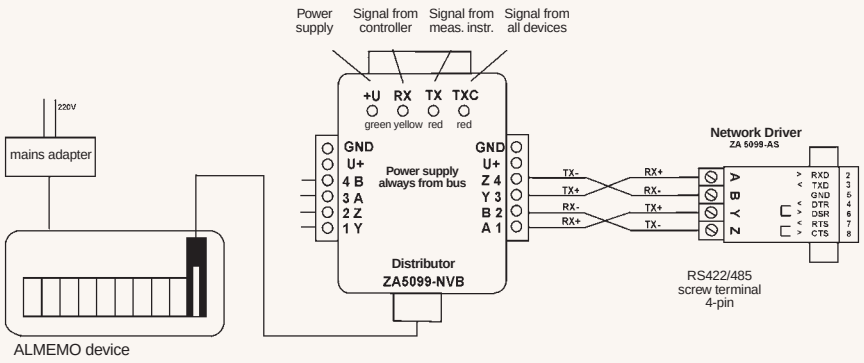
Advantages:

- Common mode interference on the transmission line is largely suppressed.
- Trouble-free implementation of branches and stub lines, directly inter-connectable, also as RS485 bus master.
- Easy to install - using a surface-mount housing, fastening brackets, and a screw terminal connector.
- Further peripheral devices can be connected to the ALMEMO® device, (analog output, alarm relays, etc.).

Technical Data:

Connection :	
ZA5099NVB :	3 x RS422, 4-wire, via terminal connector 1 x cable, 1.5 m, via ALMEMO connector to the ALMEMO device
ZA5099AS	1 x RS422, 4-wire, via terminal connector 1 x RS232, via 9-pin sub-D, to the PC
Wiring arrangements :	RS422, 4-wire data line, stranded in pairs
Max. line length :	between two RS422 distributors, 1 km
Power supply :	
ZA5099NVB :	via ALMEMO device (standard)
ZA5099AS	No external supply necessary
Current consumption :	approx. 25 to 35 mA
Dimensions :	
ZA5099NVB	L 71,5/90 x W 61,5/95 x H 30 mm
ZA5099AS	L 50 x W 33 x H 16 mm

The power for the distributor is, as standard, supplied via the ALMEMO® device. The network is only functional when the ALMEMO® device is switched on. Alternatively, the power for the distributor can be supplied via the RS422 network or via its own mains power unit.

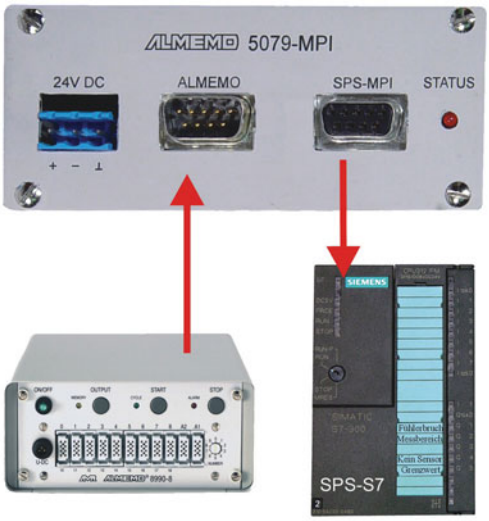


Types:

RS422 network distributor, ALMEMO device connection via cable (length = 1.5 m), Supply via ALMEMO device or via network (selectable by jumpers)	**Order no. ZA5099NVB**
RS232 / RS422 network driver, can be connected directly to the computer	**Order no. ZA 5099 AS**
Mains supply unit, 12 V DC / 1000 mA	**Order no. ZB1012NA7**
Cable housing for ZA5099NVx (1 set = 3 pieces)	**Order no. ZB5099KG**
Data line 4 x 2 wires, stranded in pairs, per meter (power supply, 2 x 2 wires, duplicated)	**Order no. LD0042**

ALMEMO® NETWORK TECHNOLOGY

ALMEMO® field bus coupler ZA5079 to the PLC via MPI interface / Profibus



- Low-cost connection of all ALMEMO® measuring instruments to an existing PLC S7.
- Easy-to-use - without additional programming.
- No interface card is required for the PLC.
- Any ALMEMO® measuring instrument or network can be continuously scanned by means of the field bus coupler; (the number of ALMEMO® devices of connected can be set via code switches).
- The coupler is connected to the MPI interface on the PLC S7 (programming interface); it is a permanent MPI slave with a freely selectable address; (this is preset at the factory but can be individually parameterized via the serial interface, coupler - PC).
- Measured data appears fully automatically in a data component of the PLC.
- In a second data component the status of the measured data and of the coupler appears; this is for the purposes of function monitoring.
- Alternatively, the field bus coupler for Profibus (Profibus L2DP) can be supplied (including GSD file and function component for the PLC S7).
- The coupler is connected to the Profibus interface on the PLC S7; it is a permanent Profibus DP-standard slave with its own DP address; (this is preset at the factory but can be individually parameterized via the serial interface, coupler - PC).

Technical data :

Input :	RS232, 9-pin DSUB for ALMEMO® device / network (ALMEMO® data cable ZA1909DK5 or network driver ZA5099NTL)
Output:	RS485 9-pin DSUB, for field bus
Field bus:	
ZA5079MPI :	MPI interface on the PLC S7, up to 187 kbps Protocol, write status variable
ZA5079DP :	Profibus L2DP on the PLC S7, up to 12 Mbps Protocol, read 256 inputs DATA X change
Also available on request : coupler for PLC S5	
Power supply :	9 to 32 V DC, typical 100 mA, via clamp connector, Mains unit ZB1012NA1
Housing :	(HxWxD) 44 x 105 x 132 mm, aluminum housing

Accessories :

ALMEMO® data cable, RS232 interface electrically isolated	Order no. ZA1909DK5
ALMEMO® network driver RS232 / RS422 (see page 05.06)	Order no. ZA5099NTL

Options :

Fixture for top-hat rail mounting	Order no. OA8000H
Brackets for wall or device mounting	Order no. OA8000L

Types :

ALMEMO® field bus coupler for the MPI programming interface on the PLC S7 including mains power unit ZB1012NA1	**Order no. ZA5079MPI**
ALMEMO® field bus coupler for Profibus L2DP on the PLC S7, with GSD file and function component including mains power unit ZB1012NA1	**Order no. ZA5079DP**