

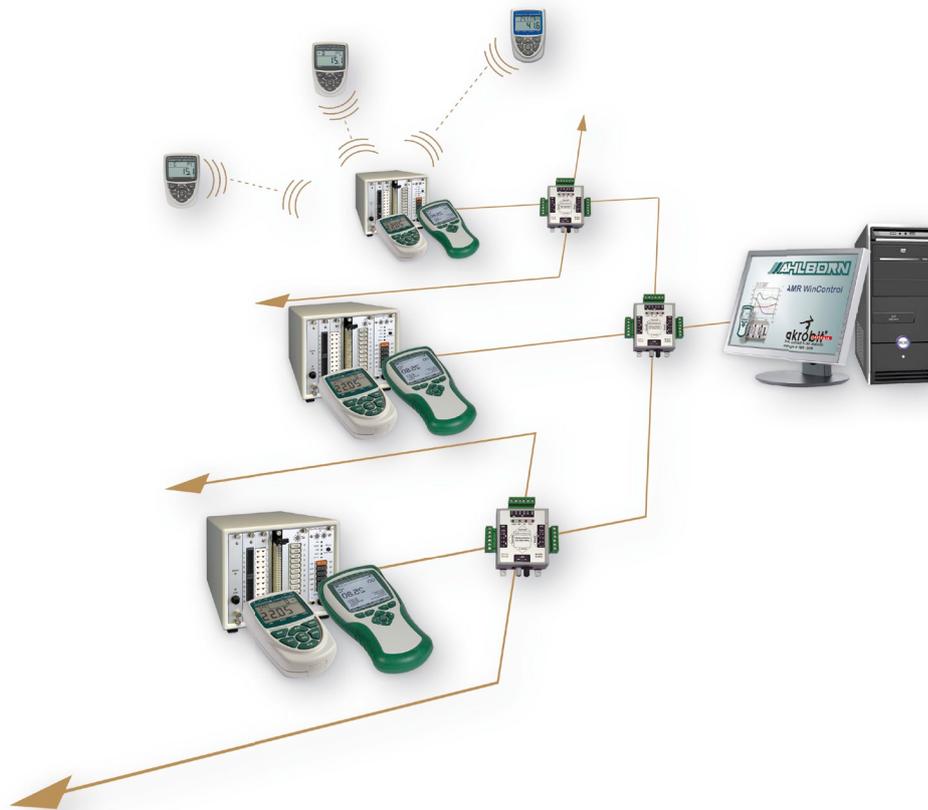
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# ALMEMO® Network technology



## ALMEMO® networking technology

The ALMEMO® system provides optimal support for networked, decentralized measured 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 wiring requirements but also goes a long way to solving EMC problems (especially if optic fiber cables are used).

Via the cascadable interface provided by ALMEMO® devices it is possible, thanks to our ALMEMO® networking technology, to manage up to 100 ALMEMO® measuring instruments from just one computer. User-friendly software packages (see Chapter 05) are

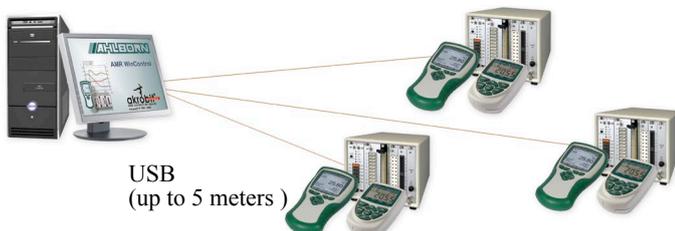
available for automatically scanning measuring points within the network, for evaluating the measured values, and for graphically representing results in line chart or bar chart form. This permits measuring setups in which devices can be used with such high operational reliability and with such great flexibility that even the most demanding measuring tasks can be solved.

For example:

- Data connection from the PC to ALMEMO® devices via USB, Ethernet, RS232, RS422, Bluetooth, GPRS mobile communications, modem.
- Can be combined in a wide variety of ways via the output sockets A1 and A2 on the ALMEMO® measuring

instrument

- Various networking arrangements can be implemented.
- Measuring instruments can be installed in separate rooms; considerable distances can be bridged.
- ALMEMO® devices / networks can be connected to the PC via an existing Ethernet network.
- **New** PC and devices can be connected over a wireless link using Bluetooth modules.
- Measured data can be acquired and also read out from the measured value memory on an ALMEMO® data logger - all online - using the WinControl software package



USB  
(up to 5 meters)

### PC connection via USB

(over a wireless Bluetooth link, see page 04.03)  
Inexpensive for relatively short distances (up to 5 m) several connections in parallel (star-configured network) for mobile use, e.g. notebook

Necessary component  
ZA 1919 DKU  
see page 04.05

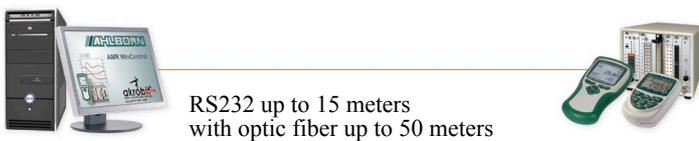
# ALMEMO® Network technology



## PC connection via Ethernet

(over a wireless Bluetooth link, see page 04.03)  
Measured data acquisition, on a decentralized basis, using existing LAN cabling (bus networking), relatively long distances, via Internet worldwide.

Necessary component(s)  
ZA 1945 DK see page 04.05



## PC connection via RS232

(over a wireless Bluetooth link, see page 04.03)  
Single connection via COM interface (also USB with converter), up to 15 meters, and with optic fiber up to 50 meters

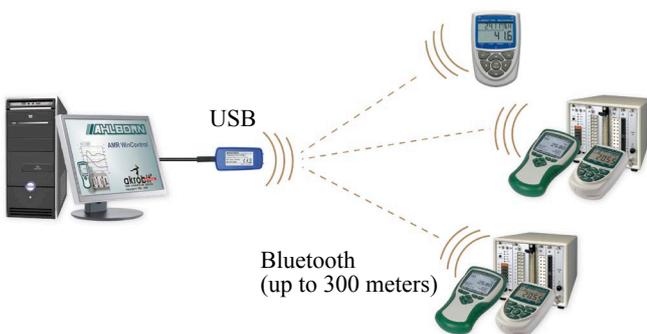
Necessary component  
ZA 1909 DK5 see page 04.05



## Connection between ALMEMO® measuring instruments over ALMEMO® network cable

(over a wireless Bluetooth link, see page 04.03)  
Inexpensive linear network solution, flexible, plug-and-play, easy to expand.

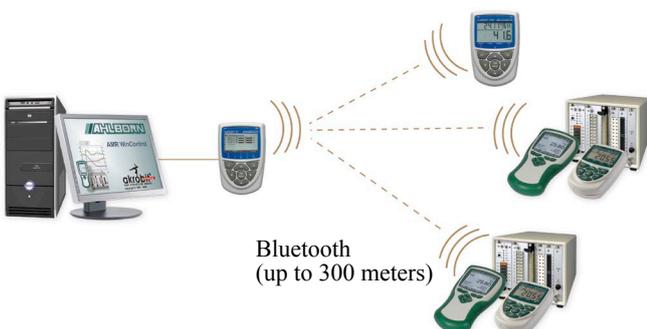
Necessary component ZA 1999 NK5  
see page 04.06



## Wireless Bluetooth link PC - USB

Inexpensive USB for mobile applications expandable for up to 7 ALMEMO® measuring instruments in parallel (star-configured network).

Necessary components  
ZA1719BPVU,  
ZA1719BT1XS or Bluetooth meas. instrument  
MA2790BT1XS  
see page 04.08



## Wireless PC link with Bluetooth

Highly flexible irrespective of location expandable for up to 7 ALMEMO® measuring instruments in parallel (star-configured network) display and configuration of (multiple) connections via Bluetooth device CPU.

Necessary components  
ZA2719BPVU or ZA2719BPVN  
ZA1719BT1XS or Bluetooth meas. instrument  
MA2790BT1XS  
see page 04.09

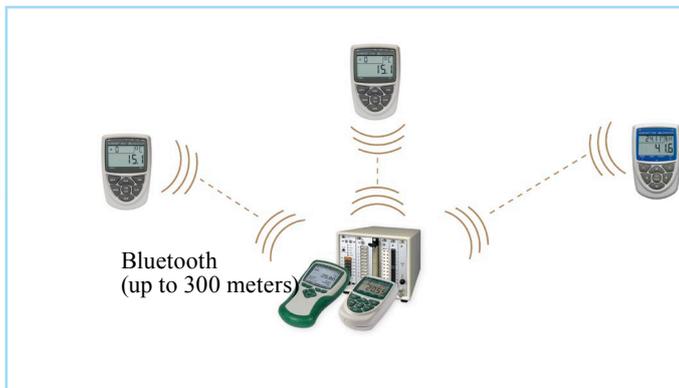
# ALMEMO® Network technology



## Wireless Bluetooth link between ALMEMO® measuring instruments

For mobile networking highly flexible network topology (linear / star-configured network) all connections expandable for up to 7 ALMEMO® measuring instruments in parallel.

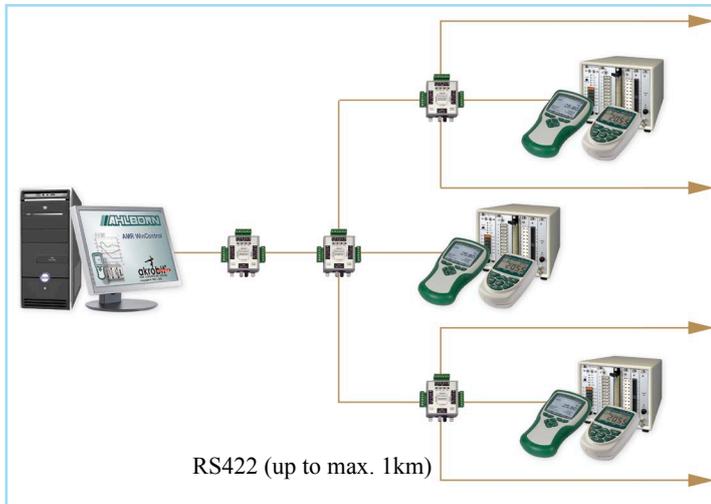
Necessary components  
ZA1719BNV,  
ZA1719BT1XS or Bluetooth meas. instrument  
MA2790BT1XS  
see page 04.10



## Wireless sensor connection via Bluetooth (ALMEMO® wireless sensor)

Single connection from a measuring ALMEMO® device (wireless sensor) to a receiving ALMEMO® device with display and saving of measured values (also without PC). Any number of sensor connections in parallel.

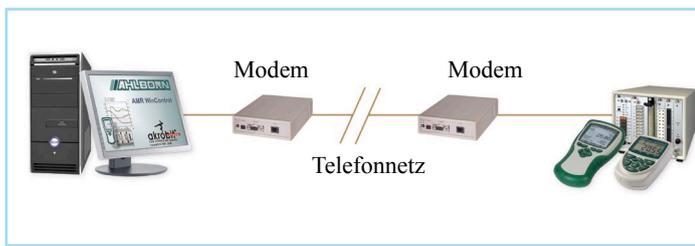
Necessary components  
ZA1719BT1XFV or ZA2790BT1XFV  
(with Bluetooth measuring instrument)  
see page 04.12



## Connection between ALMEMO® measuring instruments over ALMEMO® RS422 network (over a wireless Bluetooth link, see page 04.03)

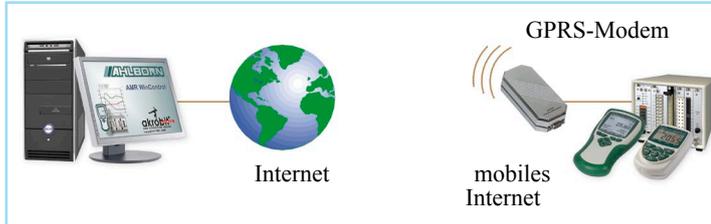
Fixed installation, measured data acquisition on a decentralized basis, linear / star-configured network, relatively long distances, good resistance to radio interference affecting transmission.

Necessary components  
ZA 5099 NTL or ZA 5045 AK  
ZA 5099 NVL  
see pages 04.13 to 04.15



## PC connection via fixed-line telephone network

Fixed installation any distance, worldwide.  
Necessary components  
on request



## PC connection via GPRS mobile modem

Mobile operation over any distance.  
Necessary components:  
ZA 1709 GPRS  
see page 04.16 to 04.19

## ALMEMO® PC connection using USB data cable ZA 1919 DKU RS232 data cable, type ZA 1909 DK5, USB adapter cable ZB 1909 USB



- ALMEMO®-USB data cable for data connection between an ALMEMO® device and a PC with a USB interface
- ALMEMO® RS232 data cable with a DSUB socket for data connection between an ALMEMO® device and a PC with a COM interface
- ALMEMO® optic fiber cable (RS232 or with adapter to USB) for absolute electrical isolation and extensive protection against lightning.

### Types:

USB data cable, electrically isolated, maximum 115.2 kbaud, cable length 1.5 meters, including CD with Windows driver  
 As above but cable length 5 meters  
 RS232 data cable electrically isolated, max. 115.2 kbaud,  
 Current consumption : approx. 1 mA, Cable length : 1.5 m  
 As above, but cable lengths 5m / 10m / 15m  
 RS232 data cable with optic fiber, max. 115.2 kbaud, Cable length 1,5 m  
 Longer optic fiber (up to 50 m) for interiors, Duplex plastic 2.2 x 4.3mm, per meter  
 Converter, USB to RS232, 9-pin DSUB for ALMEMO® data cable ZA1909DKx,  
 including WINDOWS driver

### Order no.

**ZA1919DKU**  
**ZA1919DKU-05**  
**ZA1909DK5**  
**ZA1909DK5-05 /-10 /-15**  
**ZA1909DKL**  
**LL2243L**  
**ZB1909USB**

## ALMEMO® PC connection using Ethernet data cable ZA 1945 DK



- For connecting almost any ALMEMO® measuring instrument to an Ethernet PC network.
- Linking up to the Internet now possible.
- Terminal operation using our AMR-Control software, available free-of-charge.
- Device-Installer configuration software also included on the AMR CD.
- Measured data acquisition via several Ethernet modules using our Win-Control software. (Version SW5600WC2 and above, see chapter Software).

### Technical data

Ethernet:	Socket RJ45 (10/100 base-T) Automatic switchover 10 / 100 MHz	Power supply	12 V DC via measuring instrument (suitable mains supply unit recommended)
ALMEMO®	ALMEMO® connector for socket A1 Baud rate standard 9600 bd, max. 115.2 kbd (can be changed via Device-Installer and browser)	Current consumption	<60 mA (10 MHz), <90 mA (100 MHz)

### Accessories

Patch cable RJ45, plug / plug, 2 meters

**Order no.**  
**ZB1904PK2**

### Type

Ethernet data cable, RJ45 socket on ALMEMO® connector, cable length 1.5 meters

**Order no.**  
**ZA1945DK**

## Data cable for digital ALMEMO® D6 sensors

### Types

ALMEMO® USB adapter cable length 1.5 meters  
 for connecting an ALMEMO® D6 sensor directly to the USB port on a PC (power supply via USB)  
 ALMEMO® Ethernet adapter cable total length 3 meters  
 for connecting an ALMEMO® D6 sensor directly to an Ethernet PC network, including mains unit

**Order no.**  
**ZA1919AKUV**  
**ZA5045AKFBV**

# ALMEMO® Network technology

## ALMEMO® Network Interface Cables ZA 1999 NK5



### 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  
As above, but cable lengths 5m / 10m / 15m  
2 Network connectors (a couple) with screw terminals for local self-assembly

### Order no.

**ZA1999NK5**  
**ZA1999NK5 -05/ -10 / -15/ -xx**  
**ZA1999FS5**

## ALMEMO® Network Interface Cables with Fiber Optics ZA 1999 NKL



### 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.

! 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 with optic fiber for cascading several devices 1.5 m long  
for baud rates up to 57.6 kbaud  
As above, but cable lengths 5m / 10m / 15m  
Longer optic fiber cable for interiors, Duplex plastic 2.2 x 4.3 mm  
Network connector with optic fiber converter for local self assembly

### Order no.

**ZA1999NKL**  
**ZA1999NKL -05/ -10 / -15/ -xx**  
**LL2243L** (please specify length L)  
**ZA1999FSL**

## Wireless data links using ALMEMO® Bluetooth modules

### Various types of connection are possible

#### Wireless PC connection see page 04.08/04.09

Wireless connection from a PC with ALMEMO® Bluetooth CPU to up to 7 ALMEMO® measuring instruments each with Bluetooth slave

#### Wireless device connection see page 04.10

Wireless connection from an ALMEMO® measuring instrument with Bluetooth CPU to up to 7 ALMEMO® measuring instruments each with Bluetooth slave

#### Wireless sensor connection see page 04.12

Wireless sensor connection from a measuring ALMEMO® device with Bluetooth slave to the measuring input on a receiving ALMEMO® device with Bluetooth sensor module.

Up to 4 measuring channels can be transmitted per connection..

### Common technical data

Class 1 with active antenna	
Protocol	SPP (sequence packet protocol) (128-bit encryption)
Operating range	300 meters (free field)*
ALMEMO® data rate	1200 baud up to 115.2 kbaud
Module housing	(LxWxH) 61 x 30 x 12 mm Polystyrene (-10 to +70 °C)
Cable length	for plug-in module with option OA1719BK Length = 1 meter

\* Inside a building the operating range of the wireless link will be substantially lower.

### Advantages of ALMEMO® connections using Bluetooth compared with other wireless technologies

- Bluetooth wireless technology is industrial standard in compliance with IEEE 802.15.1; it ensures high transmission reliability.
- The frequency hopping procedure used ensures robustness against interference. The Bluetooth partners move continually to and from among the 79 wireless channels available.
- Any number of Bluetooth connections can operate in parallel with complete reliability.

- The multi-digit PIN code ensures that all Bluetooth participants are identified reliably and unequivocally.
- These links - once configured - will, as soon as the device is switched ON, be automatically setup - and, in the event of interruption, be automatically restored.
- One Bluetooth CPU supports up to 7 parallel connections to Bluetooth slaves.
- These powerful new Bluetooth class 1 wireless modules incorporate an integrated active antenna ensuring an especially wide operating range (up to 300 meters free field); there is no need for an extra antenna.

### Common technical features

- Bluetooth links are supplied already paired, i.e. simply plug in and start measuring.
- In the event of interruption to the Bluetooth connection the USB / COM interface in the PC remains available for the software being used. For continuous monitoring purposes this ensures very high transmission reliability.  
Advisory note : The Bluetooth links integrated in some laptops / PCs cannot be used for these purposes because in the event of interruption the operating system deactivates the COM interface and this must then be reactivated manually each time.
- Any ALMEMO® measuring instrument with a Bluetooth slave module connected can be used.
- Using the Bluetooth CPU on the PC or a plug-in Bluetooth CPU module on the ALMEMO® measuring instrument up to 7 measuring instruments with Bluetooth slave modules can participate in a star-configured network. Compared with paired single connections star-configured networking saves on additional master modules.
- To extend the operating range or raise the number of parallel connections further CPUs can be cascaded as repeaters or routers (increasing the switchover times for device scanning in the WinControl software).
- The plug-in module variant with a 1-meter cable can, in order to optimize the wireless link, be positioned away from the measuring instrument between the ALMEMO® connector and the module (option OA1719BK) and specially aligned (using Velcro fastener).
- All (multiple) connections can be configured end-to-end quickly and easily either with the AMR-Control software or on the Bluetooth device CPU via the display and keypad.
- To search through and select from all the available Bluetooth slave partners the user simply enters the appropriate PIN codes. The Bluetooth device CPU can also be configured fully automatically by simply plugging in the slave module; (pairing is performed automatically in an exchange of PIN codes and hardware addresses).

# ALMEMO® Network technology

## Wireless PC link with Bluetooth

### Bluetooth USB CPU module ZA 1719 BCU

Wireless connection from a PC with ALMEMO® Bluetooth CPU to up to 7 ALMEMO® measuring instruments with Bluetooth slave



### Technical data

Common technical data see page 04.07

Cable	ZA1719BCU	Length = 1.5 meters
Voltage supply	ZA1719BCU	via USB interface on the PC
	ZA1719BT1XS	via ALMEMO® measuring instrument, approx. 35 mA (9 V)



ZA 1719 BCU    ZA 1719 BT1XS

- Connection of the CPU module to the USB interface on a PC
- Connection of the plug-in slave module to socket A1 on an ALMEMO® device

**Order no.**

**Option** for plug-in module ZA1719BT1XS

Cable between ALMEMO® connector and module Length = 1 meter

OA1719BK

### Variants

**Order no.**

**Paired wireless PC connection (USB) for 1 ALMEMO® measuring instrument (configured and ready-to-operate)**

Bluetooth CPU module with USB (ZA1719BCU)

and plug-in Bluetooth slave module (ZA1719BT1XS)

ZA1719BPVU

**Paired connection with Bluetooth measuring instrument ALMEMO® 2790** see page 04.11

### Extension for multiple connections

Plug-in Bluetooth slave module for 1 ALMEMO® device

ZA1719BT1XS

Bluetooth measuring instrument ALMEMO® 2790 see page 04.11

## Wireless PC link with Bluetooth

### Bluetooth device CPU ZA2719BC

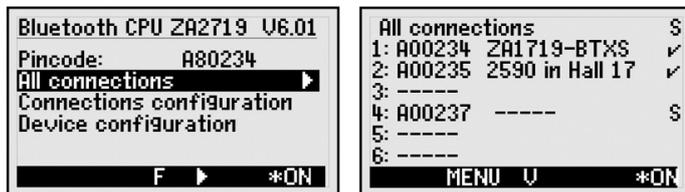
Wireless connection from a PC with ALMEMO® Bluetooth CPU to up to 7 ALMEMO® measuring instruments with Bluetooth slave.



ZA 2719 BC      ZA 1719 BT1XS

- Connection of the device CPU to the USB interface on a PC  
Or, alternatively, an ALMEMO® data cable can be used (Ethernet, RS232, or RS422).
- Connection of the plug-in slave module to socket A1 on an ALMEMO® device

#### Display



Selection menu

main menu



device configuration

connecting menu

#### Technical features of the device CPU

Common technical features see page 04.07

- Modern, compact housing - also suitable for DIN top-hat rail mounting
- Graphic display - shows status of connections - can be illuminated
- All (multiple) connections can be configured end-to-end using the display and keypad.
- **Use as repeater**  
This extends the operating range or raises the number of parallel connections. An ALMEMO® Bluetooth slave module is connected to socket A1 on the CPU. Power is supplied via a mains unit.

#### Technical data

Common technical data see page 04.07

#### ALMEMO® Bluetooth device CPU ZA 2719 BC

Display	Graphics display 128x64 (55x30mm)
Illumination	2 white LEDs
Keypad	7 silicone keys (of which 4 softkeys)
Housing	(LxWxH) 127 x 83 x 42 mm ABS (-10 to +70 °C) 290 g
Voltage supply	with USB data cable ZA1919DKU5 via USB interface on the PC or with connector mains unit 12V 1A ZA1312NA7 or battery set (3 AA cells), approx. 40 mA (5 V) with illumination approx. 70 mA (5 V)
ZA1719BT1XS	via ALMEMO® measuring instrument approx. 35 mA (9 V)

#### Accessories for device CPU ZA2719BC:

Fixture for DIN rail mounting	ZB2490HS
Rubberized impact protection	ZB2490GS2

#### Option for plug-in module ZA1719BT1XS:

Cable between ALMEMO® connector and module Length = 1 meter	OA1719BK
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#### Variants

**Paired wireless PC connection (USB) for 1 ALMEMO® measuring instrument (configured and ready-to-operate) comprising :**

Bluetooth device CPU (ZA2719BC) including USB cable ZA1919DKU5  
and plug-in Bluetooth slave module (ZA1719BT1XS)

**Order no.**  
ZA2719BPVU

**Paired wireless PC connection for 1 ALMEMO® measuring instrument (configured and ready-to-operate) comprising :**

Bluetooth device CPU (ZA2719BC) including connector mains unit ZA1312NA7 (without data cable)  
and plug-in Bluetooth slave module (ZA1719BT1XS)

ZA2719BPVN

ALMEMO® RS232 data cable

ZA1909DK5

ALMEMO® Ethernet data cable

ZA1945DK

**Paired connection with Bluetooth measuring instrument ALMEMO® 2790 see page 04.11**

**Extension for multiple connections**

Plug-in Bluetooth slave module for 1 ALMEMO® device

ZA1719BT1XS

Bluetooth measuring instrument ALMEMO® 2790 see page 04.11

# ALMEMO® Network technology

## Wireless device connection with Bluetooth

Wireless connection from an ALMEMO® measuring instrument with Bluetooth CPU to up to 7 ALMEMO® measuring instruments with Bluetooth slave.



### Technical data

Common technical data see page 04.07

Voltage supply	
ZA1719BC	via ALMEMO® measuring instrument, approx. 20 mA (9 V)
ZA1719BT1XS	via ALMEMO® measuring instrument, approx. 35 mA (9 V)



ZA 1719 BC    ZA 1719 BT1XS

- Connection of the plug-in CPU module to socket A2 on an ALMEMO® device
- Connection of the plug-in slave module to socket A1 on a second ALMEMO® device

**Order no.**

**Option for plug-in module ZA1719BT1XS:**

Cable between ALMEMO® connector and module Length = 1 meter

OA1719BK

### Variants

**Order no.**

**Paired wireless device connection (configured and ready-to-operate) between 2 ALMEMO® measuring instruments comprising:**

Plug-in Bluetooth CPU module (ZA1719BC)  
and plug-in Bluetooth slave module (ZA1719BT1XS)

**ZA1719BNV**

**Paired connection with Bluetooth measuring instrument ALMEMO® 2790 see page 04.11**

**Extension for multiple connections:**

Plug-in Bluetooth slave module for 1 ALMEMO® device  
Bluetooth measuring instrument ALMEMO® 2790 see page 04.11

**ZA1719BT1XS**

## Bluetooth measuring instrument ALMEMO® 2790 with integrated Bluetooth slave

Measuring instrument ALMEMO® 2790 operates as Bluetooth slave in an ALMEMO® Bluetooth network.  
(connection to a CPU on a PC or on an ALMEMO® device)



ALMEMO® 2790  
mit Option T/RH

### Technical features

- Modern, compact housing - also suitable for DIN top-hat rail mounting
- Generously dimensioned 2-row static 7 / 16 segment display including units
- Operating functions: Key locking with password, atmospheric pressure compensation, device address.

### Accessories:

Connector mains unit, 12 V, 1 A  
DC adapter cable 10 to 30 VDC 12V / 0.25A, electrically isolated  
DIN top hat rail mounting

### Option:

Integrated temperature / humidity sensor (For technical data see FHAD462, page 08.09)  
Integrated temperature sensor (not with option RHS)  
Integrated atmospheric pressure sensor (For technical data see FDAD12SA, page 10.10) Chapter pressure)

### Order no.

ZA1312NA7  
ZA2690UK  
ZB2490HS

OA2790RHS  
OA2790TS  
OA2790APS

### Variants (including manufacturer's test certificate)

#### Bluetooth measuring instrument ALMEMO® 2790

1 measuring input, LCD screen, 7 keys, 1 ALMEMO® socket for mains unit / interface  
Integrated Bluetooth slave, 3 AA alkaline batteries

### Order no.

MA2790BT1XS

#### Paired wireless connection (configured and ready-to-operate) from a Bluetooth CPU to Bluetooth measuring instrument ALMEMO® 2790

##### Paired PC connection (USB) see page 04.08 comprising :

Bluetooth CPU module with USB (ZA1719BCU)  
and Bluetooth measuring instrument 2790 (MA2790BT1XS)

ZA1790BPVU

##### Paired PC connection (USB) see page 04.09 comprising :

Bluetooth device CPU (ZA2719BC) including USB cable ZA1919DKU5  
and Bluetooth measuring instrument 2790 (ZA1719BT1XS)

ZA2790BPVU

##### Paired PC connection see page 04.09 comprising :

Bluetooth device CPU (ZA2719BC) including connector mains unit ZA1312NA8 (without data cable)  
and Bluetooth measuring instrument 2790 (MA2790BT1XS)

ALMEMO® RS232 data cable

ZA2790BPVN

ALMEMO® Ethernet data cable

ZA1909DK5  
ZA1945DK

##### Paired wireless device connection see page 04.10 comprising :

Plug-in Bluetooth CPU module (ZA1719BC)  
and Bluetooth measuring instrument ALMEMO® 2790 (MA2790BT1XS)

ZA1790BNV

# ALMEMO® Network technology

## Wireless sensor connection with Bluetooth

Wireless sensor connection from a measuring ALMEMO® device with Bluetooth slave to the measuring input on a receiving ALMEMO® device with Bluetooth sensor module. Up to 4 measuring channels can be transmitted per connection.

Any number of sensor connections can operate in parallel.



## Sensor connection with plug-in slave module



ZA 1719 BT1XS      ZA 1719 BT1XFM

- Connection of the plug-in slave module to socket A1 on the measuring ALMEMO® device
- Connection of the plug-in sensor module to input socket Mxx of a receiving ALMEMO® device.

## Technical data

Common technical data see page 05.07

Voltage supply	
ZA1719BT1XS	via ALMEMO® measuring instrument, approx. 35 mA (9 V)
ZA1719BT1XFM	via ALMEMO® measuring instrument, approx. 35 mA (9 V)

**Option** for plug-in module ZA1719BT1XFM/S:  
Cable between ALMEMO® connector and module  
Length = 1 meter

**Order no.**

OA1719BK

## Sensor connection with Bluetooth sensor measuring instrument ALMEMO® 2790 with integrated Bluetooth module



MA 2790 BT1XF      ALMEMO® 2790 ZA 1719 BT1XFS with Option T/RH

## Technical features

- Modern, compact housing - also suitable for DIN top-hat rail mounting
- Generously dimensioned 2-row static 7 / 16 segment display including units
- Operating functions : cycle, key locking with password, atmospheric pressure compensation
- Energy-saving sleep mode (cycle of 1 minute and above), up to 20,000 measuring operations per set of alkaline batteries.

## Technical data

Measuring input	1 ALMEMO® input socket
A/D converter, measuring ranges, equipment, housing:	As for ALMEMO® 2490-1 see page 01.15, but :
Sensor supply	6 to 12 V (depending on the minimum sensor supply voltage programmed in the ALMEMO® connector) maximum 150 mA
Voltage supply	5 to 13 VDC not electrically isolated
Battery set	3 AA alkaline batteries
Current consumption	appr. 19 mA wireless (without sensor) approx. 30 mA in sleep mode approx. 0.1 mAh per meas. operation
ALMEMO® DC socket	for mains unit / interface
Bluetooth connection	Integrated slave module

## Accessories

Connector mains unit, 12 V, 1 A	<b>Order no.</b> ZA1312NA7
DC adapter cable, 10 to 30 VDC, 12 V / 0.25A, electrically isolated	ZA2690UK
DIN top hat rail mounting	ZB2490HS

## Option:

Integrated temperature / humidity sensor (For technical data see FHAD462, page 08.06)	<b>Order no.</b> OA2790RH
Integrated temperature sensor (not with option RHS)	OA2790T
Integrated atmospheric pressure sensor (For technical data see FDAD12SA, Chapter pressure)	OA2790AP

## Variants

## Order no.

Paired wireless sensor connection (configured and ready-to-operate) with Bluetooth sensor measuring instrument ALMEMO® 2790 comprising :

Bluetooth sensor measuring instrument ALMEMO® 2790, 1 measuring input, integrated Bluetooth, including 3 AA alkaline batteries (MA2790BT1XF) and plug-in Bluetooth sensor module (ZA1719BT1XFS)      **ZA2790BT1XFV**

## RS422 network distributor ZA 5099 NVL

## RS232 / RS422 network driver ZA 5099 NTL, Device / PC connection via optic fiber



### 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

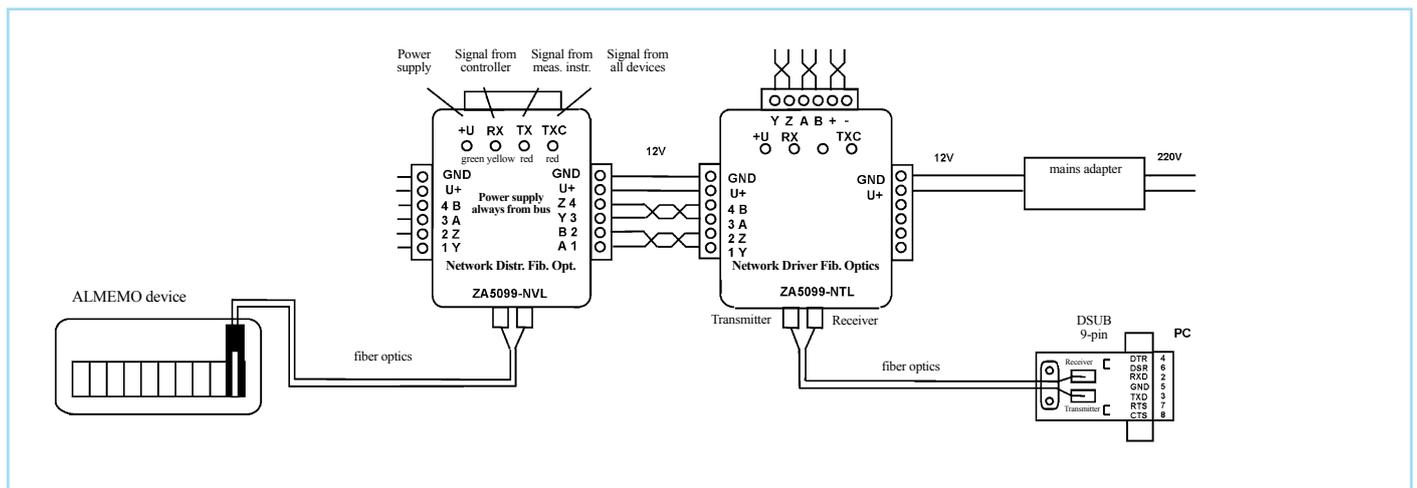
### Uses:

- 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.).

! 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

RS232 / RS422 network driver ZA5099NTL, computer connection via optic fiber (length = 1.5 m)

Power supply via the mains supply unit

Mains supply unit, 12 V DC / 2.5 A

Cable housing for ZA5099NVx (1 set = 3 pieces)

Data line 4 x 2 wires, stranded in pairs, per meter (power supply, 2 x 2 wires, duplicated)

### Order no.

ZA 5099 NVL

ZA 5099 NTL

ZB1012NA9

ZB5099KG

LD0042

# ALMEMO® Network technology

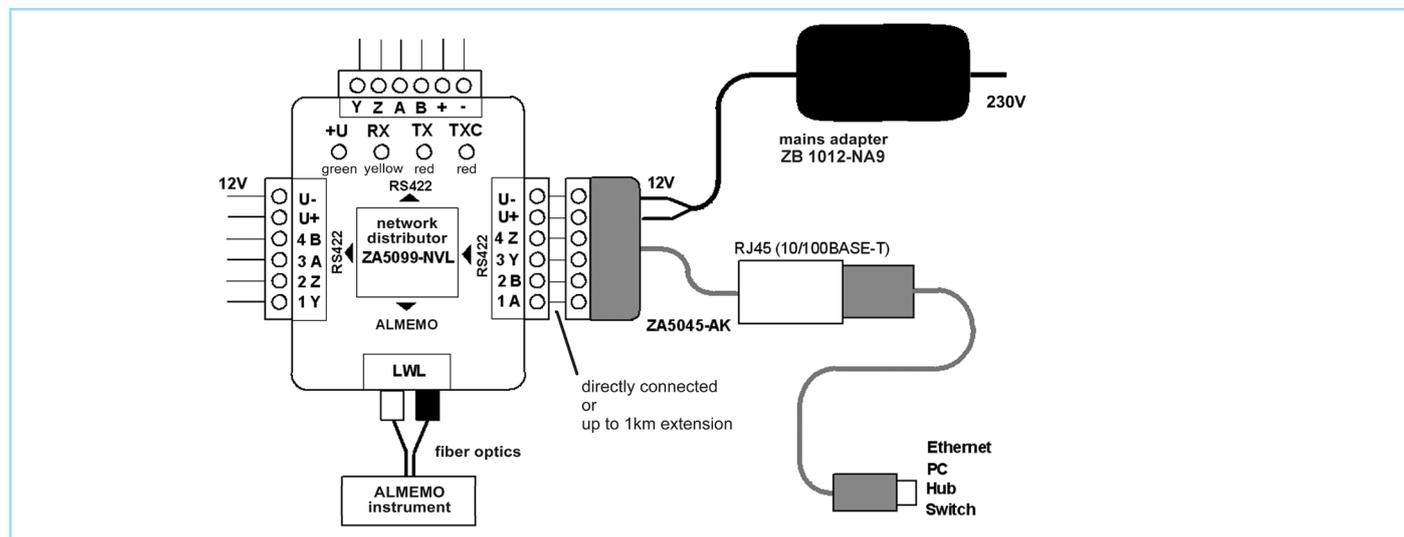
## Ethernet network driver ZA 5045 AK



### 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 (see Chapter Software).
- 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

Mains adapter, 12 V DC, 2.5 A, with free ends, also for supplying other network distributors via the bus

Patch cable RJ45, plug / plug, 2 meters

Optic fiber network distributor RS422 to ALMEMO® optic fiber and 2 x RS422

Data line 4 x 2 wires, stranded in pairs, per meter (power supply, 2 x 2 wires, duplicated)

WinControl PC measuring software, see Chapter Software

### Order no.

**ZA5045AK**

**ZB1012NA9**

**ZB1904PK2**

**ZA5099NVL**

**LD0042**

## RS422 network distributor ZA 5099 NVB

## RS232 / RS422 network driver ZA 5099 AS, 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

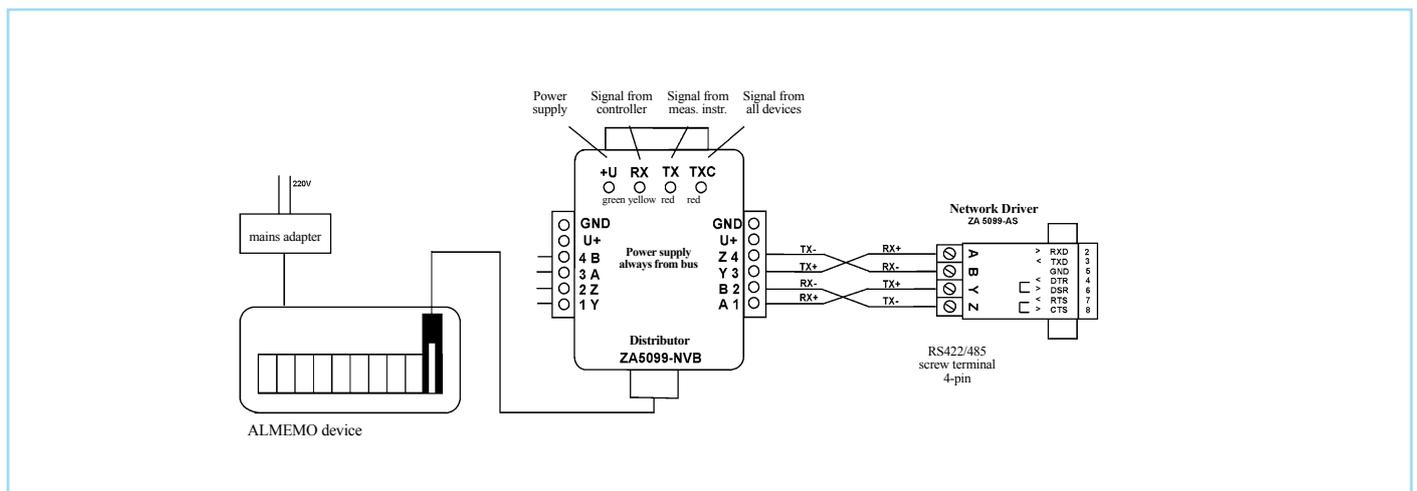
Current consumption : approx. 25 to 35 mA

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)

RS232 / RS422 network driver, can be connected directly to the computer

Mains supply unit, 12 V DC / 2.5 A

Cable housing for ZA5099NVx (1 set = 3 pieces)

Data line 4 x 2 wires, stranded in pairs, per meter (power supply, 2 x 2 wires, duplicated)

### Order no.

ZA5099NVB

ZA 5099 AS

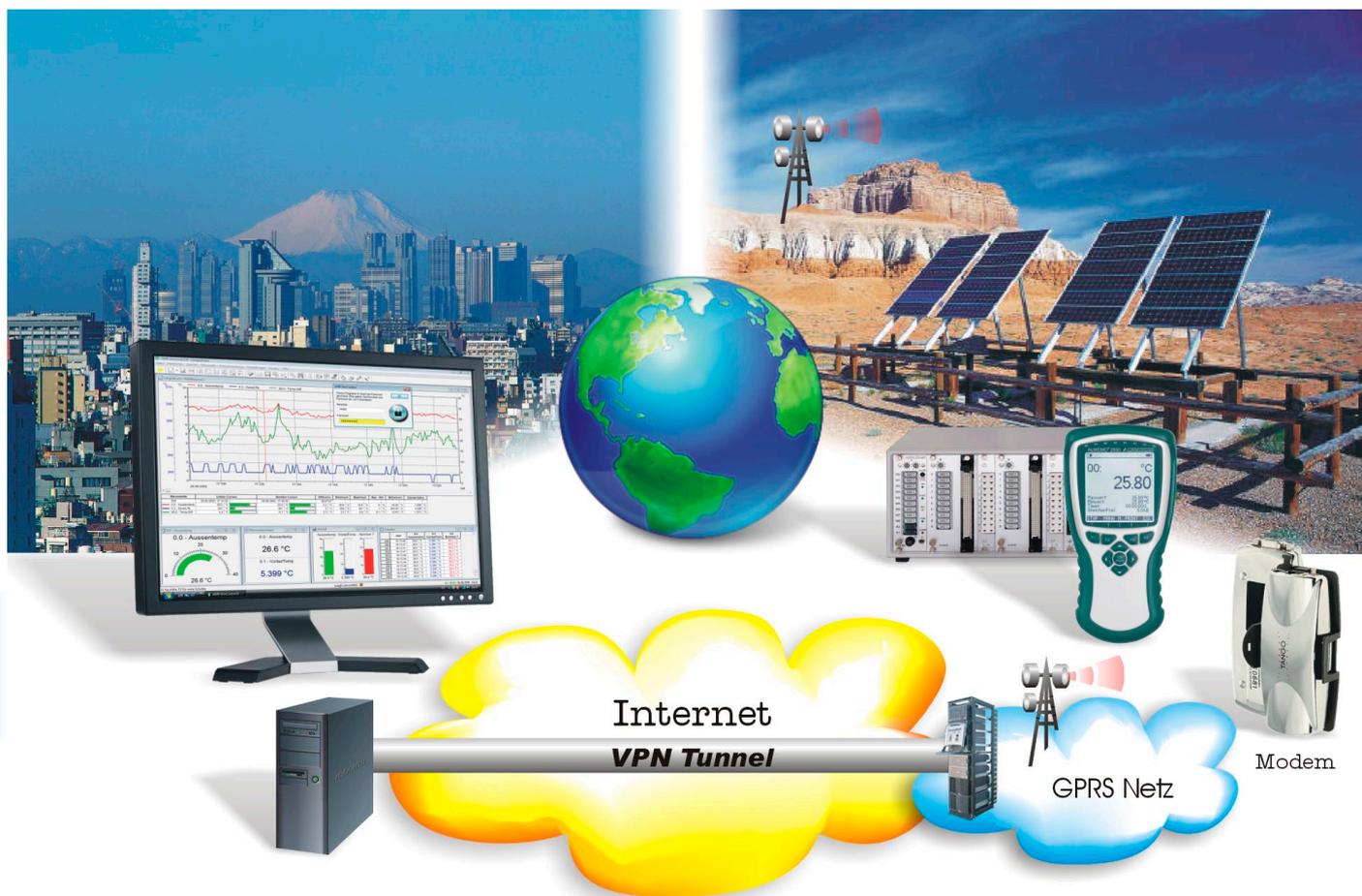
ZB1012NA9

ZB5099KG

LD0042

# ALMEMO® Network technology

10/2013 • We reserve the right to make technical changes.



Mobile Internet and terms such as UMTS (universal mobile telecommunications system) and GPRS (general packet radio service) are on everyone's lips. Our solutions access ALMEMO® measuring technology over a mobile Internet connection (GPRS). It makes no difference whether our measuring technology is being used on a mobile basis or is installed in the remote locations. Operation may involve measuring instruments all over the world but it will be as though they were set up right next to your computer.

## Mobile communication via GSM

- + The measuring instrument is accessed via the telephone network.
- + Connection setup is controlled by schedule and the measuring instrument memory is read out automatically.
- Given the costs structure communication with the measuring instrument will be limited basically to reading out from the measuring instrument memory at fairly infrequent intervals.
- An additional modem is required at the computer end.
- Connection is set up via a conventional telephone line and for a limited period of time.
- It is not possible to scan multiple devices simultaneously because the number of telephone lines / modems is limited.
- Charges are calculated according to connection duration.

## Mobile Internet via GPRS

- + The measuring instrument is accessed via the Internet.
- + Connection setup is controlled by schedule and the measuring instrument memory is read out automatically.
- + The measuring instrument is connected with the computer online. The measuring instrument on site can save measured values and simultaneously these can be read out at regular, frequent intervals.
- + No additional computer hardware is required.
- + The measuring instrument connects to your network automatically and is then available continuously.
- + Measured data can be acquired simultaneously from an unlimited number of devices.
- + Connection charges are calculated on a real utilization basis, i.e. according to the volume of data transmitted.

## GPRS mobile communications modem ZA 1709 GPRS



- Remote interrogation and remote control of ALMEMO® devices
- Ideal for measuring operations at remote sites
- Automatic memory readout or inexpensive 24-hour online measuring - thanks to a charges structure according to actual data usage.

### Technical data

Frequency range	Quad band 850 / 900 / 1800 / 1900 MHz
Output power	2 W for EGSM 850 / 900 1 W for GSM 1800 / 1900
Connections	RS-232 (9600 baud, 9-contact. sub-D socket) FME antenna connection (male) Power supply, SIM card reader
Power supply	8 to 30 V, via mains unit, included in delivery
Current consumption	30 mA at 12 V (basic consumption) maximum 190 mA at 12 V (sending)
Operating temp.	-30 to +65 °C (mains unit 0 to +40 °C)
Dimensions	65 x 74 x 33 mm
Weight	approx. 110 g
Mains unit	Input voltage 110 to 240 VAC Output voltage 10.5 to 13.5 VDC Operating temperature 0 to +40 °C

### ! Advisory note

For technical reasons a special data tariff and a VPN access are required; these can be arranged via „akrobit software GmbH“. Akrobit software GmbH offers various tariffs for VPN and mobile communications; depending on the tariff chosen, the GPRS modem can be used within Germany, within Europe, or worldwide. A VPN client software must also be installed on the computer used for evaluation. The VPN client software is included in delivery free-of-charge. For automatic memory readout the software AMR WinControl is required together with additional module „Automatic ALMEMO® memory readout“ SW5600WCZM9.

### Accessories

Additional protocol „Automatic memory readout“ for WinControl (SW5600WC1/2/3/4) **Order no. SW5600WCZM9**

### Variants

GPRS mobile communications modem for connecting to ALMEMO® devices, including data cable ZA1909DK5, adapter ZA1709AS, mains unit, documentation, antenna with magnetic base Cable approx. 2.5 meters. **Order no. ZA1709GPRS**

Other variants are available on request:

GPRS modem for texting SMS, with digital inputs, alarm-driven by the ALMEMO® device.

## GPRS connections and cost accounting - examples

### Advisory note

These cases are provided as examples only; the number of VPN1 accesses is for illustration purposes and can be modified as required. However, at least two accesses are always required (1x PC + 1x modem).

The software AMR WinControl can, depending on requirements, normally be used. The modem option is not always necessary; however, if several modems / devices need to be addressed simultaneously, at least one WC2 (standard) will be required. For device-internal data recording (especially with a memory card) we strongly recommend the optional software module for automatic memory readout (SW5600WCZM9).

The costs incurred as per the mobile communications tariff Vodafone and by Telekom Deutschland depend on actual data usage. All data tariffs permitting use of an alternative APN<sup>2</sup> are supported. Prepaid cards are not supported. A suitable tariff can be arranged by akrobit software GmbH. Customers preferring to make their own arrangements must have set up the mobile communications contract before ordering the modem. Rental solutions for modem, VPN, and mobile communications accesses, and provision of a test access by akrobit software GmbH are all available on demand.

# ALMEMO® Network technology

## GPRS connection 1+1

Installation of the VPN software on one computer for the purpose of addressing one modem with one or more connected devices



Required	Costs (net)	Note
GPRS modem	see price list	Preconfigured with RS-232 connection
Data cable ZA1909-DK5	included	RS-232
Modem adapter	included	
VPN access	approx. EUR 15 / month	1x mobile + 1x PC (minimum contractual term 12 months)
Mobile communications card	approx. EUR 14 / month	m2m 5 MB included (minimum contractual term 24 months) <sup>3</sup>
AMR WinControl software	see price list	SW5600WC1 (Light version for 1 device, 20 meas. channels)
Automatic memory readout (option)	see price list	SW5600WCZM9

## GPRS connection 1+3

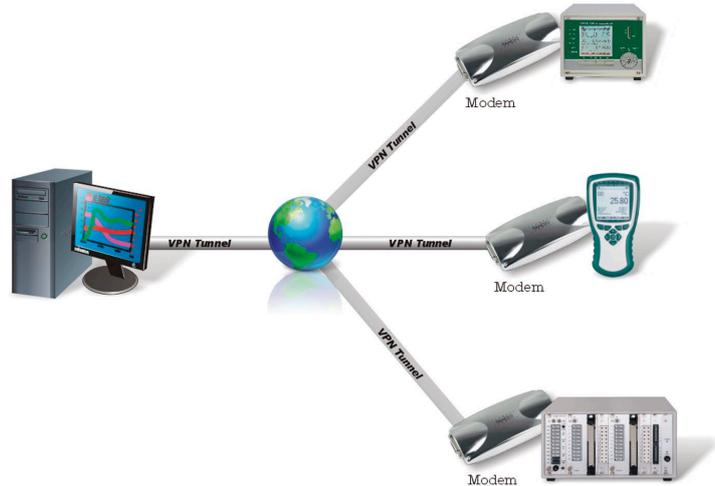
Installation of the VPN software on several computers for the purpose of addressing one modem with one or more connected devices. Each such computer is allocated a separate access with its own unique IP address; however, only one such computer can establish a connection to the modem at any one time.



Required	Costs (net)	Note
GPRS modem	see price list	Preconfigured with RS-232 connection
Data cable ZA1909-DK5	included	RS-232
Modem adapter	included	
VPN access	approx. EUR 30 / month	1x mobile + 3x PC (minimum contractual term 12 months)
Mobile communications card	approx. EUR 14 / month	m2m 5 MB included (minimum contractual term 24 months) <sup>3</sup>
3x AMR WinControl software	see price list	3x SW5600WC1 (Light version for 1 device, 20 meas. channels)
3x automatic memory readout (option)	see price list	3x SW5600WCZM9

## GPRS connection 3+1

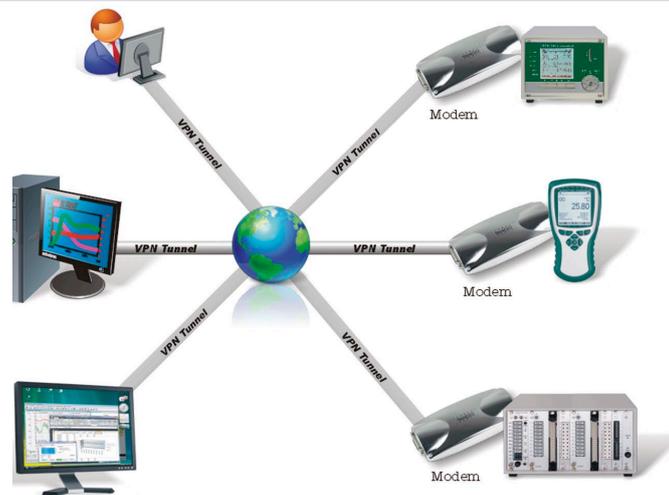
Installation of the VPN software on one computer for the purpose of simultaneously addressing several modems each with one or more connected devices. Each such modem is allocated a separate access with its own unique IP address; all connected devices can be interrogated simultaneously (requires at least SW5600WC2).



Required	Costs (net)	Note
3x GPRS modem	see price list	Preconfigured with RS-232 connection
3x data cable ZA1909-DK5	included	RS-232
3x modem adapter	included	
VPN access	approx. EUR 30 / month	3x mobile + 1x PC (minimum contractual term 12 months)
3x mobile communications card	approx. EUR 42 / month	m2m 5 MB included (minimum contractual term 24 months)
AMR WinControl software	see price list	SW5600WC2 (standard version)
Automatic memory readout (option)	see price list	SW5600WCZM9

## GPRS connection 3+3

Installation of the VPN software on several computers for the purpose of addressing several modems each with one or more connected devices. Each such computer and each such modem is allocated a separate access with its own unique IP address. Each computer can establish connections to several modems; however, one modem can only be connected to one computer at any one time.



Required	Costs (net)	Note
3x GPRS modem	see price list	Preconfigured with RS-232 connection
3x data cable ZA1909-DK5	included	RS-232
3x modem adapter	included	
VPN access	approx. EUR 45 / month	3x mobile + 3x PC (minimum contractual term 12 months)
3x mobile communications card	approx. EUR 42 / month	m2m 5 MB included (minimum contractual term 24 months) <sup>3</sup>
3x AMR WinControl software	see price list	3x SW5600WC2 (standard version)
3x automatic memory readout (option)	see price list	3x SW5600WCZM9

<sup>1)</sup> VPN (virtual private network) is a non-public network that uses the infrastructure of another - usually public - network (e.g. the Internet).

<sup>2)</sup> APN (access point name) is the name of a connection point in a GPRS network that permits access to an external packet data network (e.g. the Internet).

<sup>3)</sup> The prices quoted are examples only; real prices will fluctuate depending on terms currently offered by providers.