

# ALMEMO® PANEL DEVICES

## Decentralised (Local) Data Acquisition with ALMEMO® Panel Instruments and Transmitters

ALMEMO® panel instruments and transmitters are ideally suitable for a decentralised, networked data acquisition. Measuring data can be locally acquired using short sensor signal lines and small modular measuring instruments and can be evaluated together on a measuring computer. As a result, this does not only minimise the wiring efforts but it also significantly reduces EMC problems (and totally avoids them if fiber optics are used in the cables). This allows for measurement setups with a very flexible application of the devices so even the most demanding measuring tasks can be solved, e.g.

- ▶ Connection of a network controller with RS232 interface
- ▶ Installation of measuring devices in separate rooms
- ▶ Bridging of longer distances up to 1km
- ▶ Realisation of network branches
- ▶ Connection of measuring instruments with RS485 interface
- ▶ Interface conversion from RS232 to RS422 and vice versa

**+** ALMEMO® output modules - see Chapter 04  
For information regarding ALMEMO® interface cables for the best data transmission and for detailed information on solving your measuring tasks using ALMEMO® network technology please refer to Chapter 05.

If questions still remain unanswered, please do not hesitate to contact us for further advice, or request a date for a demonstration.

Our experts look forward to visiting you and to introduce the numerous application options of the ALMEMO® system.

# ALMEMO® PANEL DEVICES

02

## ALMEMO® MA 4390-2

**Precision measuring instrument in control panel housing with 1 measuring input, measured value memory either internal or with memory card**  
**2 outputs for USB, RS232, Ethernet, networking**  
**2 limit value relays, integrated**  
**Option Double analog output, 0 to 10 V / 20 mA**



### Technical features:

- ▶ 1 ALMEMO input socket for all ALMEMO sensors. per sensor, maximum 4 channels for double sensors, functions
- ▶ Or 6-contact socket for clamp connector, also for 26V and 20mA
- ▶ More than 65 standard measuring ranges
- ▶ As standard, 2 limit value relays, can also be driven via interface
- ▶ 2 ALMEMO output sockets for digital interfaces  
Analog output, trigger input, alarm contacts, memory card
- ▶ High-resolution 24-bit A/D converter, up to 50 mops (measuring operations per second), and with option Q4 up to 400 mops (only possible with MMC memory connector)
- ▶ 8-character alphanumeric 14-segment display
- ▶ **New** Programming functions displayed in normal text (3 languages)
- ▶ **New** 5 programming menus Measuring function, memory, sensor, device, output
- ▶ Measuring functions: Measured value, double display, smoothing, zero-setting, setpoint adjustment, maximum / minimum / average values, temperature compensation, atmospheric pressure compensation
- ▶ Sensor programming: Measuring range, measured value correction, scaling, units, limit value monitoring, graduated locking of functions, scaling of analog output
- ▶ Device programming: Conversion rate, real-time clock with date, output cycle, baud rate, choice of languages
- ▶ Multi-point calibration and special measuring ranges in the ALMEMO connector. e.g. 50.000 ohms, 100 kilohms, NTC - 5.000 to 46.000 °C, YSI400
- ▶ EEPROM sufficient for 8000 measured values, internal  
Configurable as linear or ring memory
- ▶ Memory connector with pluggable micro SD (accessory)
- ▶ Device software update via interface
- ▶ Option with double analog output, can also be driven via interface

### Included as standard

(including manufacturer's test certificate, operating instructions)

Panel meter ALMEMO® 4390-2 with 1 input, 2 outputs, cascable interface, 2 relays, LED display, 5 keys, real-time clock, measured value memory

**Order-No. MA43902**

### Technical data:

|                          |   |
|--------------------------|---|
| <b>Measuring inputs:</b> | 1 ALMEMO®-input socket or 6-contact screw connector with inputs 26 V and 20 mA (0.1%) |
| Channels                 | 4 channels for double sensors and function channels                                   |
| A/D converter            | Delta-sigma 24-bit, 50 mops up to 400 mops (see Technical data, page 01.05)           |
| With option Q4           |   |
| Sensor power supply      | 12V/0.1A, 9V/0.15mA, 6V/0.2mA   |

|                                  |  |
|----------------------------------|--|
| <b>Outputs:</b>                  | 2 ALMEMO® sockets suitable for all output modules (analog / data / trigger / relay cable, memory, etc.)  |
| 2 limit value relays             | mechanical changeover, 230V, 2A  |
| Option with double analog output | 10V or 20 mA (programmable)<br>16 bit DAC, electr. isol.<br>0.5 mV/ digit, Load >100 kohm<br>0.1mA/digit, Load <500 ohm<br>0.1% of final value<br>10 ppm/K<br>100 µs |
| 0.0 to 10.0 V                    |  |
| 0.0 to 20.0 mA                   |  |
| Accuracy                         |  |
| Temperature drift                |  |
| Time constant                    |  |

### Standard equipment

|                      |  |
|----------------------|--|
| Display              | 8 characters, 14 segments, LED display         |
| Keypad               | 5 membrane keys                                |
| Date and time-of-day | Real-time clock, buffered with lithium battery |
| Memory, internal     | 64-KB EEPROM (8000 measured values)            |

### Power supply

|                 |  |
|-----------------|--|
| Mains operation | 90 ... 240 VAC, 50/60 Hz                 |
| Option U        | 10 to 30 V, 0.5 A, electrically isolated |

### Housing

|                          |              |
|--------------------------|--------------|
| Standard plastic housing |              |
| 96 x 48 x 132 mm (WxHxD) |              |
| Panel opening            | 90 x 42.5 mm |

Other general data see ALMEMO® "Technical data", page 01.05.

### Options

|   |           |
|---|-----------|
| Option Q4 400 mops measuring rate (see 01.05)           | SA0000Q4  |
| Power supply 10 to 30 VDC, electr. isolated             | OA4390U   |
| 2 analog outputs (common ground), electrically isolated |           |
| 10 V or 20 mA (programmable)                            | OA4390R02 |
| Temperature ranges for 8 refrigerants                   | SB0000R2  |

### Accessories

|  |           |
|--|-----------|
| Memory connector with micro SD, min. 128 MB          | ZA1904SD  |
| USB data cable, electrically isolated, max. 115.2 KB | ZA1919DKU |
| V24 data cable, electrically isolated, max. 115.2 KB | ZA1909DK5 |
| Ethernet data cable, electr. isolated, max. 115.2 KB | ZA1945DK  |
| Network cable, electrically isolated, max. 115.2 KB  | ZA1999NK5 |
| Analog output cable, -1.25 to +2.0 V, 0.1 mV / digit | ZA1601RK  |
| Network technology, Bluetooth modules see Chapter 05 |           |

01/2011 We reserve the right to make technical changes.

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# TRANSMITTER

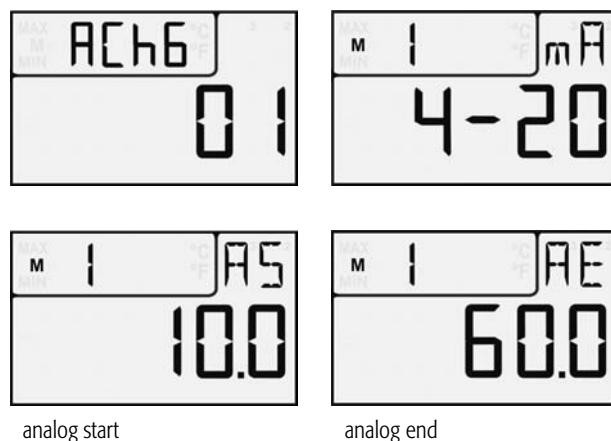
**new!**

## Universal ALMEMO® transmitter 2450 / 2490

- ▶ 1 or 2 measuring inputs
- ▶ Various outputs - digital, analog
- ▶ Various power supplies



Programming analog output (example)



analog start

analog end

## ALMEMO® transmitters - a comparison

|  | ALMEMO® 2450   | ALMEMO® 2490   |
|--|--|--|
| Measuring ranges<br>(see table. page 01.10 / 01.11)  | Over 35 measuring ranges, inter alia<br><br>Thermocouples, NTC<br>Temperature / humidity, capacitive | Over 65 measuring ranges, inter alia<br>Pt100, Pt1000<br>Thermocouples, NTC<br>Temperature / humidity, capacitive<br>Temperature / humidity, psychrometric |
| A/D converter<br>(For technical data see page 01.05) | Delta-sigma, 15-bit resolution   | Delta-sigma, 16-bit resolution   |
| Measuring inputs                                     | ALMEMO® 2450-1x 1 measuring input  | ALMEMO® 2490-1x 1 measuring input<br>ALMEMO® 2490-2x 2 measuring inputs  |
| Other technical data                                 | (see ALMEMO® 2450, page 01.12)   | (see ALMEMO® 2490, page 01.19)   |

### Common technical data

|                       |   |
|-----------------------|---|
| Analog outputs        | 10 V or 20 mA (programmable)<br>16-bit DAC, electrically isolated |
| 0.0 to 10.0 V         | 0.5 mV / digit Load >100 kohms                                    |
| 0.0 to 20.0 mA        | 0.1 mA / digit Load <500 ohms                                     |
| Accuracy              | 0.1 % of final value  |
| Temperature drift     | 10 ppm / K  |
| Time constant         | 100 µs  |
| Standard equipment    | LCD screen, keypad  |
| Housing               | ABS (maximum 70 °C)<br>(LxWxH) 127 x 83 x 42 mm                   |
| Operating temperature | -10 to +60 °C   |
| Atmospheric humidity  | 10 to 90 % RH (non-condensing)                                    |

## ALMEMO® 2450-1x

Universal transmitter with display for a wide variety of ALMEMO® sensors

### Technical data

|                                    |   |
|------------------------------------|---|
| Measuring input<br>ALMEMO® 2450-1x | 1 ALMEMO® socket  |
| Measuring ranges                   | (see table. page 01.10 / 01.11)<br>Over 35 measuring ranges, inter alia<br><br>Thermocouples, NTC<br>Temperature / humidity, capacitive |

Other common data (see page 02.04)

### Variants

#### Digital transmitter

Measuring input for ALMEMO® sensors, LCD screen, 7 keys, with interface via 2 ALMEMO® output sockets A1, A2, and 1 ALMEMO® DC socket for mains adapter including 3 AA alkaline batteries, operating instructions, manufacturer's test certificate

ALMEMO® 2450 1 measuring input **Order no. MA24501**

Analog transmitter, like the digital transmitter described above, plus integrated analog output via socket P0, electrically isolated (scaling via keypad), including ALMEMO® clamp connector, 2 analog outputs (common ground), electrically isolated, 10 V or 20 mA (programmable)

ALMEMO® 2450 1 measuring input **Order no. MA24501R02**

### Option

Protection IP54  
(if water-proof connectors are used) **Order no. OA2450W**

Option U

Power supply, electrically isolated **Order no. OA2450U**

Option I RS485 interface **Order no. OA2450I**

## ALMEMO® 2490-1x/-2x

Universal transmitter with display for all ALMEMO® sensors

### Technical data

|   |   |
|---|---|
| Measuring input<br>ALMEMO® 2490-1x:<br>ALMEMO® 2490-2x: | 1 ALMEMO® socket<br>2 ALMEMO® sockets   |
| Measuring ranges  | (see table. page 01.10 / 01.11)<br>Over 65 measuring ranges, inter alia<br>Pt100, Pt1000<br>Thermocouples, NTC<br>Temperature / humidity, capacitive<br>Temperature / humidity, psychrometric |

Other common data (see page 02.04)

### Variants

#### Digital transmitter

Measuring input for ALMEMO® sensors, LCD screen, 7 keys, with interface via 2 ALMEMO® output sockets A1, A2, and 1 ALMEMO® DC socket for mains adapter including 3 AA alkaline batteries, operating instructions, manufacturer's test certificate

ALMEMO® 2490-1 1 meas. input **Order no. MA24901**

ALMEMO® 2490-2 2 meas. inputs **Order no. MA24902**

Analog transmitter, like the digital transmitter described above, plus integrated analog output via socket P0, electrically isolated (scaling via keypad), including ALMEMO® clamp connector, 2 analog outputs (common ground), electrically isolated, 10 V or 20 mA (programmable)

ALMEMO® 2490-1 1 meas. input **Order no. MA24901R02**

ALMEMO® 2490-2 2 meas. inputs **Order no. MA24902R02**

### Option

Protection IP54  
(if water-proof connectors are used) **Order no. OA2490W**

Option U

Power supply, electrically isolated **Order no. OA2490U**

Option I RS485 interface **Order no. OA2490I**

### Accessories, options

(please place a special order)

#### Power supply:

230 VAC, via connector mains unit,  
12 V, 1 A **Order no. ZA1312NA8**

10 to 30 VDC, maximum 80 mA, electr. isol., integrated  
incl. ALMEMO® clamp connector **see option U**

10 to 30 VDC, maximum 200 mA, electr. isol.  
via DC adapter cable, with banana plugs **Order no. ZA2690UK**

10 to 30 VDC, not electrically isolated  
(not suitable for thermocouple measuring)  
including ALMEMO® clamp connector **Order no. ZA1312FS1**

#### Digital interface (see Chapter 05)

USB interface via ALMEMO® USB cable **Order no. ZA1919DKU**

Ethernet interface  
via ALMEMO® Ethernet cable **Order no. ZA1945DK**

RS232 interface  
via ALMEMO® RS232 cable **Order no. ZA1909DK5**

RS485 interface, integrated  
including ALMEMO® clamp connector **see option I**

#### Limit value contact (see Chapter 04)

Programming via digital interface (see above)

2 normally open contacts, 50 VDC / 500 mA (can also be  
programmed as inverted) via ALMEMO® relay cable, V6, clamped  
connection **Order no. ZA1006EKG**

ALMEMO® limit value cable with banana plugs  
(for electrical socket adapter) **Order no. ZA1006GK**

Electrical safety socket adapter, 250 V / 6 A  
(for ALMEMO® limit value cable) **Order no. ZB2280RA**

#### Mounting

DIN rail **Order no. ZB2490HS**

Magnet **Order no. ZB2490MH**