

# OMB 402



- OMB 402UNI** DC VOLTMETER AND AMMETER  
PROCESS MONITOR  
OHMMETER  
THERMOMETER FOR Pt, Cu  
THERMOMETER FOR Ni  
THERMOMETER  
FOR THERMOCOUPLES  
DISPLAY UNIT FOR LINEAR POTENTIOMETERS
- OMB 402PWR** AC NETWORK ANALYSER
- OMB 402UQC** UNIVERSAL COUNTER

## Description

The OMB 402 model series are panel programmable three-color bar graphs with auxiliary display designed for maximum efficiency and user comfort while maintaining its favourable price. Three versions are available: UNI, PWR and UQC.

The OMB 402UNI is a multifunction instrument with the option of configuration for 8 various input options, easily configurable in the instrument menu.

The instrument is based on an 8-bit microcontroller with a multichannel 24-bit sigma-delta converter, which secures high accuracy, stability and easy operation of the instrument.

## Operation

The instrument is set and controlled by five control keys located on the front panel. All programmable settings of the instrument may be performed in three adjusting modes:

**Light menu** is protected by optional number code and contains solely items necessary for instrument setting

**Profi menu** is protected by optional number code and contains complete instrument setting

**User menu** may contain arbitrary items from the programming menu (LIGHT/PROFI), which determine the right (see, change). Access w/o password.

Standard equipment is the OM Link interface, which together with operation program enables modification and filing of all instrument settings as well as perform firmware updates (with OML cable). The program is also designed for visualization and filing of measured values from more instruments.

All settings are stored in the EEPROM memory (they hold even after the instrument is switched off).

## Options

**Excitation** is suitable for feeding of sensors and transmitters. It is isolated, with continuously adjustable value in the range of 5...24 VDC.

**Comparators** are assigned to monitor one, two, three or four limit values with relay output. The user may select limits regime: LIMIT/DOSING/

- Horizontal bargraph 1 x 30 LED with display
- Multifunction device (DC, PM, RTD, T/C, DU)
- Digital filters, Tare, Linearization
- Size of DIN 96 x 48 mm
- Power supply 80...250 V AC/DC

OMLINK

## Options

- Excitation • Comparators • Data output • Analog output • Data record
- Power supply: 10...30 V AC/DC

FROM-TO. The limits have adjustable hysteresis within the full range of the display as well as selectable delay of the switch-on in the range of 0...99,9 s. Reaching the preset limits is signalled by LED and simultaneously by the switch-on of the relevant relay.

**Data outputs** are for their rate and accuracy suitable for transmission of the measured data for further projection or directly into the control systems. We offer an isolated RS232 and RS485 with the ASCII/MESSBUS/MODBUS/PROFIBUS protocol.

**Analog outputs** will find their place in applications where further evaluating or processing of measured data is required in external devices. We offer universal analog output with the option of selection of the type of output - voltage/current. The value of analog output corresponds with the displayed data and its type and range are selectable in menu.

**Measured data record** is an internal time control of data collection. It is suitable where it is necessary to register measured values. Two modes may be used. FAST is designed for fast storage (40 records/s) of all measured values up to 8 000 records. Second mode is RTC, where data record is governed by Real Time with data storage in a selected time segment and cycle. Up to 130 000 values may be stored in the instrument memory. Data transmission into PC via serial interface RS232/485 and OM Link.

## Standard functions

### PROGRAMMABLE PROJECTION

**Selection:** of input type and measuring range

**Measuring range:** adjustable as fixed or with automatic change

**Measuring modes (PWR):** voltage ( $V_{RMS}$ ), current ( $A_{RMS}$ ), real power (W), frequency (Hz) and with calculation of Q, S,  $\cos \psi$

**Setting:** manual, in menu optional projection on the display may be set for both limit values of the input signal

**Projection:** 30 LED + 6 digit auxiliary display

### COMPENSATION

**of conduct (RTD, OHM):** automatic (3- and 4-wire) or manual in menu (2-wire)

**of CJC (T/C):** manual or automatic, in menu it is possible to perform selection of the type of thermocouple and compensation of cold junctions, which is adjustable or automatic (temperature at the input brackets)

### LINEARIZATION

**Linearization (DC, PM, DU):** by linear interpolation in 50 points (solely via OM Link)

### DIGITAL FILTERS

**Filtration constant (UC):** transmits input signal up to 10...2 000 Hz

**Floating/Exp./Arithmetic average:** from 2...30/100/100 measurements

**Rounding:** setting the projection step for display

### MATHEMATIC FUNCTIONS

**Min/max. value:** registration of min/max. value reached during measurement

**Tare:** designed to reset display upon non-zero input signal

**Peak value:** the display shows only max. or min. value

**Mat. operations:** polynome,  $1/x$ , logarithm, exponential, power, root,  $\sin x$  and at the same time between inputs - sum, difference, product, quotient

### EXTERNAL CONTROL

**Lock** control keys blocking

**Hold** display/instrument blocking

**Tare** tare activation

**Resetting MM** resetting min/max value

**Technical data**

**PROJECTION**

**Display:** 30 three-color LED with 6 digit aux.display (9,1mm)  
**Decimal point:** setting - in menu  
**Brightness:** setting - in menu

**INSTRUMENT ACCURACY**

**TC:** 100 ppm/°C  
**Accuracy:** ±0,1% of range + 1 digit  
 ±0,15% of range + 1 digit (RTD, T/C)  
 ±0,3% of range + 1 digit (PWR)  
 The accur. applies for project. 9999 and rate 5 (2,5) meas./s (PWR)  
**Accuracy of cold junction measurement:** ±1 °C  
**Rate:** 1,3...40 meas./s, 0,5...5 meas./s (PWR)  
**Overload capacity:** 10x (t < 30 ms) - not for > 250 V, 5 A; 2x  
**Measuring modes (PWR):** voltage (V<sub>BUS</sub>), current (A<sub>BUS</sub>), real power (W), frequency (Hz) and with calculation of Q, S, cos φ  
**Linearization:** by linear interpolation in 50 points  
**Time base (UQC):** 0,05...50 s  
**Calibration constant (UQC):** 0,00001...999999  
**Filtration constant (UQC):** 0/10/20/45/55/.../1000/2000 Hz  
**PRESET (UQC):** 0...999999  
**Digital filters:** Exp./Floating/Arithmetic average, Rounding  
**Functions:** Offset, Min/max value, Tare, Peak value, Mat. operations  
**Ext. control:** HOLD, LOCK, Tare, Reset  
**Data record:** measured data record into instrument memory  
**RTC - 15 ppm/°C**, time-date-display value, < 130k data  
**FAST - display value**, < 8k data  
**Watch-dog:** reset after 1,2 s

**OM Link:** Company communication interface for operation, setting and update of instruments  
**Calibration:** at 25 °C and 40 % r.h.

**COMPARATOR**

**Type:** digital, setting in prog. mode, contact switch < 30 ms  
**Limits:** -99999...999999  
**Hysteresis:** 0...999999  
**Delay:** 0...99,9 s  
**Output:** 2x relays Form A (250 VAC/30 VDC, 3 A) and 2x Form C relays (250 VAC/50 VDC, 3 A), 2x/4x open collectors, 2x SSR, 2x bistable relays

**DATA OUTPUT**

**Protocol:** ASCII, MESSBUS, MODBUS - RTU, PROFIBUS  
**Data format:** 8 bit + no parity + 1 stop bit  
 7 bit + even parity + 1 stop bit (Messbus)  
**Rate:** 600...115 200 Baud  
 9 600 Baud...12 Mbaud (PROFIBUS)  
**RS 232:** isolated  
**RS 485:** isolated, addressing (max. 31 instruments)

**ANALOG OUTPUT**

**Type:** isolated, programmable with resolution of max. 10 000 points, AO corresponds with the displayed data, type and range are selectable in programming mode  
**Non-linearity:** 0,2 % of range  
**TC:** 100 ppm/°C  
**Rate:** response to change of value < 150 ms  
**Ranges:** 0...2/5/10 V, 0...5 mA, 0/4...20 mA

(comp. < 500 Ω/12 V or 1 000 Ω/24 V)

**EXCITATION**

**Adjustable:** 5...24 VDC/max. 1,2 W

**POWER SUPPLY**

10...30 V AC/DC, ±10%, max. 13,5 VA  
 80...250 V AC/DC, ±10%, max. 13,5 VA  
 Power supply is protected by a fuse inside the instrument

**MECHANIC PROPERTIES**

**Material:** Noryl GFN2 SE1, incombustible UL 94 V-1  
**Dimensions:** 96 x 48 x 120 mm  
**Panel cutout:** 90,5 x 45 mm

**OPERATING CONDITIONS**

**Connection:** connector terminal board, section < 2,5 mm<sup>2</sup>  
**Stabilization period:** within 15 minutes after switch-on  
**Working temperature:** 0 °...60 °C  
**Storage temperature:** -10 °...85 °C  
**Cover:** IP65 (front panel only)  
**El. safety:** EN 61010-1, A2  
**Insulation resistance:** for pollution degree II, measuring cat. III. power supply > 670 V (PI), 300 V (DI)  
 input, output, Exc. > 300 V (PI), 150 V (DI)  
**EMC:** EN 61000-3-2+A12; EN 61000-4-2, 3, 4, 5, 8, 11;  
 EN 550222, A1, A2  
**Seismic capacity:** IEC 980: 1993, par. 6

PI - Primary insulation, DI - Double insulation

**Measuring ranges**

**OMB 402 is a multifunction instrument available in following types and ranges**

**type UNI, standard (code „0“)**

**DC:** ±60/±150/±300/±1 200 mV  
**PM:** 0...5 mA/0...20 mA/4...20 mA/±2 V/±5 V/±10 V/±40 V  
**OHM:** 0...100 Ω/0...1 kΩ/0...10 kΩ/0...100 kΩ  
**RTD:** Pt 100/Pt 500/Pt 1 000  
**Cu:** Cu 50/Cu100  
**Ni:** Ni 1 000/Ni 10 000  
**T/C:** J/K/T/E/B/S/R/N/L  
**DU:** Linear potentiometer (min. 500 Ω)

**type UNI, option A**

**DC:** ±0,1/±0,25/±0,5/±2/±5 A/±100 V/±25 V/±500 V

**type PWR**

**input U:** 0...10 V/0...120 V/0...250 V/0...450 V  
**input I:** 0...60 mV/0...150 mV/0...300 mV/0...1 A/0...2,5 A/0...5 A

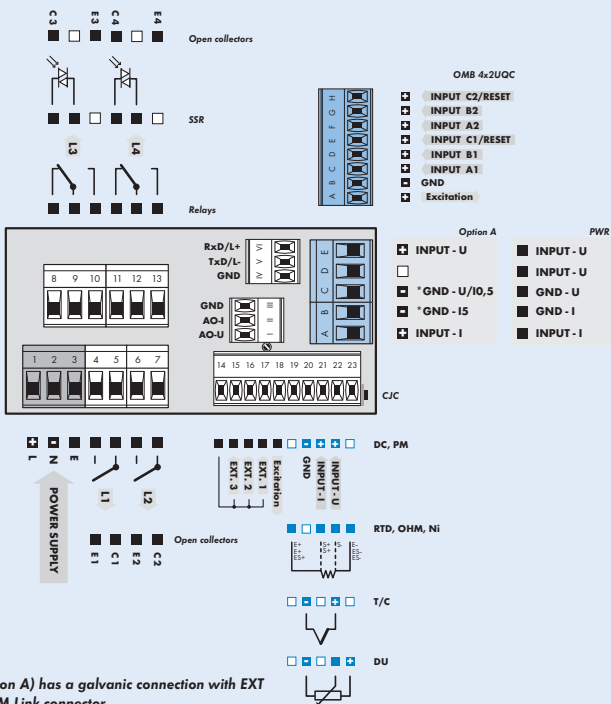
**type UQC**

**Measuring mode (UQC):** 2x UP or DW counter, UP or DW counter + frequency, UP/DW counter, UP/DW counter for IRC + frequency, timer/clock/phase (0,02...100 kHz/200 kHz for IRC)

**Order code specification**

|     | UNI   | PWR           | PWR               | UQC                   |
|-----|---|---------------|-------------------|-----------------------|
| w/o | 0 = Standard                                |               |                   | contact, TTL, NPN/PNP |
| A   | ±0,1/±0,25/±0,5/±2/±5 A<br>±100/±250/±500 V |               |                   |                       |
| K   |   |               | 0...60/150/300 mV |                       |
| P   |   |               | 0...1/2,5/5 A     |                       |
| S   |   | 0...10/120 V  |                   |                       |
| U   |   | 0...250/450 V |                   |                       |
| Z   | on request                                  | on request    | on request        |                       |

**Connection**



\*GND (Option A) has a galvanic connection with EXT input and OM Link connector

**Order code**

**OMB 402**

**Type**

|                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| UNI             | PWR             | PWR             | UQC             |
| • • • • • • • • | • • • • • • • • | • • • • • • • • | • • • • • • • • |

Order code shall not include blank spaces!

**Power supply** 10...30 V AC/DC 0  
 80...250 V AC/DC 1

**Option, see table „Measuring ranges“** ?

**Comparators**

none  
 1x relay (Form A)  
 2x relays (Form A)  
 3x relays (2x Form A + 1x Form C)  
 4x relays (2x Form A + 2x Form C)  
 2x open collector  
 4x open collector  
 2x open collector + 2x relays (Form C)  
 2x relays (Form C)  
 2x SSR  
 2x bistable relays  
 1x relay (Form C)

0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
A  
B

**Analog output**

no  
 yes (compensation < 500 Ω/12 V)  
 yes (compensatin < 1 000 Ω/24 V)

0  
1  
2

**Data output**

none  
 RS 232  
 RS 485  
 MODBUS  
 PROFIBUS

0  
1  
2  
3  
4

**Excitation**

no  
 yes

0  
1

**Data record**

no  
 RTC  
 FAST (only for UNI)

0  
1  
2

**Display color**

red  
 green

1  
2

\* Scheduled for distribution 1.Q/2008

For complete technical parameters of OMB 402UQC see the universal counter OM 602UQC