

## OMB 451



**OMB 451UNI** DC VOLTMETER AND AMMETER  
PROCESS MONITOR  
OHMMETER  
THERMOMETER FOR Pt, Cu  
THERMOMETER FOR Ni  
THERMOMETER  
FOR THERMOCOUPLES  
DISPLAY UNIT FOR LINEAR  
POTENTIOMETERS

**OMB 451PWR** AC NETWORK ANALYSER  
**OMB 451UQC** UNIVERSAL COUNTER

### Description

The OMB 451 model series are programmable, three-color panel bargraphs with auxiliary display and adjustable LCD scale. The instruments are designed as dimensional replacement of the ZEPAKOMP instruments. Available are types UNI, PWR and UQC.

Type OMB 451UNI is a multifunction instrument with the option of configuration for 8 different types of input, easily configurable in the instrument menu.

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

### Control

The instrument is set and controlled by two control keys and a turn knob located on the front panel. All programmable settings of the instrument are implemented in three setting 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

- Bargraph - 50 LED with display and LCD scale
- Multifunction device (DC, PM, RTD, T/C, DU)
- Digital filters, Tare, Linearization
- Size of 160 x 60 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

with relay output. The user may select limits regime: LIMIT/DOSING/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 266 000 values may be stored in the instrument memory. Data transmission into PC via serial interface RS232/485 and OM Link.

### Standard function

#### PROGRAMMABLE PROJECTION

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

**Measuring range:** adjustable as fixed or with automatic change (OHM)

**Scale:** LCD, freely programmable

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

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

**Projection:** 50 LED + 6-digit auxiliary display

#### COMPENSATION

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

**of cold junctions (T/C):** manual or automatic, selection of thermocouple and compensation of cold junctions may be performed in the menu, which is either adjustable or automatic (brackets' temperature)

#### LINEARIZATION

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

#### DIGITAL FILTERS

**Input filter (UQC):** transmits the input signal up to 10...2 000 Hz

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

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

#### MATHEMATIC FUNCTIONS

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

**Tare:** designed for clearing the display under non-zero input signal

**Peak value:** only min or max value is projected on the display

**Mat. operations:** polynome, 1/x, logarithm, exponential, square power, root, sin x

#### EXTERNAL CONTROL

**Lock:** control keys locking

**Hold:** blocking the display/instrument

**Tare:** tare activation

**Resetting MM:** resetting min/max value to zero

Technical data

**PROJECTION**

**Display:** 50 three-color LED + three-color LED for indication of the limits, 6-digit aux. display (9.1 mm)  
illuminated and freely programmable LCD scale  
**Decimal point:** setting - in menu  
**Brightness:** setting - in menu

**INSTRUMENT ACCURACY**

**TC:** 50 ppm/°C  
**Accuracy:** ±0,1% of range + 1 digit  
±0,15% of range + 1 digit **RTD, T/C**  
±0,3%(0,6/0,9%) 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 a 5 A; 2x  
**Measuring modes (PWR):** voltage (V<sub>RMS</sub>), current (A<sub>RMS</sub>), real power (W), frequency (Hz) and with calculation of Q, S, cos φ  
**Linearization (DC, PM, DU):** by linear interpolation in 50 points  
**Time base (UQC):** 0,2...50 s  
**Calibration constant (UQC):** 0,00001...999999  
**Filtering 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. operat.  
**Ext. control:** HOLD, LOCK, Tare, resetting  
**Data record:** measured data record into instrument memory  
**RTC - 15 ppm/°C**, time-date-display value, < 266k data  
**FAST - display value**, < 8k data

**Watch-dog:** reset after 0,4 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:** 1...4x relays Form A (250 VAC/50 VDC, 3 A), 2x/4x open collector

**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)  
**Ethernet:** 10/100BaseT, Security Protocols, POP3, FTP

**ANALOG OUTPUT**

**Type:** isolated, programmable with 12-bit D/A converter, type and range are selectable in programming mode  
**Non-linearity:** 0,1% of range  
**TC:** 15 ppm/°C  
**Rate:** response to change of value < 1 ms  
**Ranges:** 0...2/5/10 V, ±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*

**MECHANICAL PROPERTIES**

**Material:** Noryl GFN2 SE1, incombustible UL 94 V-I  
**Dimensions:** 160 x 60 x 80 mm  
**Panel cutout:** 150 x 50 mm

**OPERATING CONDITIONS**

**Connection:** connector terminal board, section < 2,5 mm<sup>2</sup>  
**Stabilization period:** within 15 minutes after switch-on  
**Working temperature:** -20 °...60 °C (storage: -20 °...85 °C)  
**Cover:** IP65 (front panel only)  
**El. safety:** EN 61010-1, A2  
**Dielectric strength:** 4 kVAC after 1 min between supply and input  
4 kVAC after 1 min between supply and data/analog output  
4 kVAC after 1 min between supply and relay output  
2,5 kVAC after 1 min between input and data/analog output  
**Insulation resistance:** for pollution degree II, measuring cat. III.  
power supply > 670 V (ZI), 300 V (DI)  
input, output, excitation > 300 V (ZI), 150 V (DI)  
**EMC:** EN 61326-1  
**Seismic capacity:** IEC 980: 1993, par. 6  
**SW validation:** class B, C in compliance with IEC 62138, 61226  
*PI - Primary insulation, DI - Double insulation*

Measuring ranges

OMB 451 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/Cu 100  
**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/±10 V/±250 V/±500 V

**type UNI, option B (expansion about three inputs)**  
**PM:** 3x 0...5 mA/0...20 mA/4...20 mA/±2 V/±5 V/±10 V/±40 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 Hz...1 MHz)

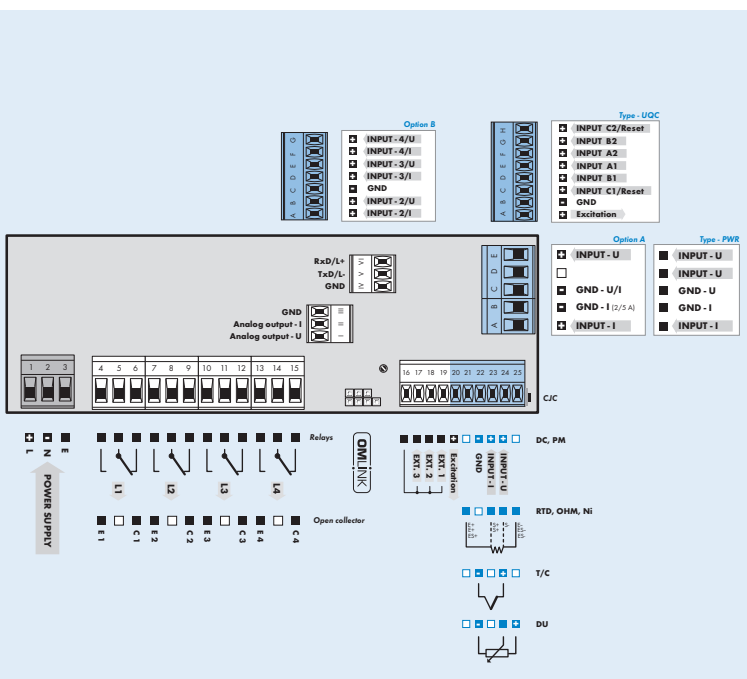
Connecting individual inputs

	INPUT „I“	INPUT „U“
DC		±60/±150/±300/±1200 mV
PM	0...5/20 mA/4...20 mA	±2/±5/±10/40 V

Order code specification

	UNI	PWR	PWR	UQC
w/o	standard			
A	±0,1/±0,25/±0,5/±2/±5 A ±100/±250/±500 V			contact, TTL, NPN/PNP
B	expansion about three inputs (PM)			SSI input
C				Line input
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 451** [ ] [ ] [ ] - [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Type	U	N	I	P	W	R	Q	C	*
Order code shall not include blank spaces!	•	•	•	•	•	•	•	•	•
<b>Power supply</b>	10...30 V AC/DC	0							
	80...250 V AC/DC	1							
<b>Option, see table „Measuring ranges“</b>				?					
<b>Comparators</b>	none	0							
	1x relay (Form C)	1							
	2x relays (Form C)	2							
	3x relays (Form C)	3							
	4x relays (Form C)	4							
	2x open collector	5							
	4x open collector	6							
	2x open collector + 2x relays (Form C)	7							
<b>Analog output</b>	no	0							
	yes (compensation < 500 Ω/12 V)	1							
	yes (compensation < 1 000 Ω/24 V)	2							
<b>Data output</b>	none	0							
	RS 232	1							
	RS 485	2							
	MODBUS	3							
	PROFIBUS	4							
	10/100BaseT Ethernet (not possible with analog output)*	7							
<b>Excitation</b>	no	0							
	yes	1							
<b>Data record</b>	no	0							
	RTC	1							
	FAST (only for UNI)	2							
<b>Display color</b>	red								1
	green								2
<b>Other</b>	customer version, do not fill in								00
	SW validation - IEC 62138, IEC 61226								VS

\* Market launch not determined  
For complete technical parameters of OMB 451UQC see the universal counter OM 602UQC