

# MULTIFUNCTION INSTRUMENT

V-A METER PROCES MONITOR OHMMETER THERMOMETER LINEAR POTENTIOMETER

4 digit programmable projection Digital filters Mathematic functions Linearization Power supply 80...250 V AC/DC

## DESCRIPTION

The OM 402 model series are 4 digit panel programmable instruments designed for maximum purposefulness and comfort of the client while retaining good price. We offer two types - UNI and PWR.

Type OM 402UNI is a multifunction instrument with configuration options for 7 various types of input, easily configurable in the instrument menu. By further extension of the input modules it is possible to measure larger ranges in DC voltage and current or to extend the number of inputs up to 4 (applies for PM).

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



## OPERATION

The instrument is set and controlled by five control keys located on the front panel. All programmable settings of the instrument are realised in two setting modes.

**Configuration menu** (hereinafter referred to as CM) is protected by an optional numeral code and contains complete instrument setting.

**User menu** may contain arbitrary settings defined in „CM“ with another optional restriction (see, change) or fully configurable via OM Link.

Standard accessories include the OM Link interface, which together with operation program enables modification and filing of all instrument settings as well as perform firmware update (with OML cable). The program is also assigned for visualisation 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). Measured units may be projected on the display.



## STANDARD FUNCTION

### PROGRAMMABLE PROJECTION

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

**Measuring range:** to be set firmly or with automatic change

**Setting:** manual, in „CM“ optional projection on the display may be set for both limit values of the input signal, e.g. 0...39,99 V  $\leftrightarrow$  0...850,0

**Projection:** -99999...999999

### COMPENSATION

**of conduct (RTD, OHM):** compensation for 2-wire connection

**of conduct in probe (RTD):** internal connection (conduct resistance in measuring head)

**of CJC (T/C):** manual or automatic (temperature at the input brackets)

### LINEARISATION

**Linearisation (DC, PM, DU):** lin. interpolation at 50 points (OM Link)

### DIGITAL FILTERS

**Exponential average:** from 2...100 measurements

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

### MATHEMATIC FUNCTIONS

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

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

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

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

### EXTERNAL CONTROL

**Lock:** control keys blocking

**Hold:** display/instrument blocking

**Tare:** tare activation

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

## EXTENSION

**Excitation** is suitable for feeding sensors and transmitters.

**Comparators** are assigned to monitor one, two, three or four limit values with relay output. The user may select limits regime: LIMIT/DOSING/FROM-TO. The limits have adjustable hysteresis and delay of the switch-on. Reaching the preset limits is signalled by LED and the relay switch-on.

**Data outputs** are for their rate and accuracy suitable for transmission of measured data for further projection or directly into the control systems. We offer isolated RS232 and RS485.

**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 selectable type of input - voltage/current and range.

**Measured data record** is an internal time control of data collection. „FAST“, is designed for express storing (80 records/s) of all measured values up to 8 000 records and „RTC“, where data recording is controlled by Real Time with storing in selected time segment and period, up to 250 000 values. Data transmission into PC via serial interface RS232/485 and OM Link.

## Technical data

### PROJECTION

**Display:** -99999...999999, red or green 14-segment LED, digit height 14 mm  
**Description:** the last two symbols on display may be used for description of measured quantities (adjustable in menu)  
**Decimal point:** adjustable - in menu  
**Brightness:** adjustable - in menu

### INSTRUMENT ACCURACY

**TK:** 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 accuracy applies for projection 9999 and rate 5 measur/s  
**Rate:** 0,1...80 measurements/s  
**Overload capacity:** 10x (t < 30 ms) - not for > 400 V, 5 A; 2x  
**Measuring mode (PWR):** voltage ( $V_{RMS}$ ), current ( $A_{RMS}$ ), real power (W), frequency (Hz) and with calculation Q, S, cos φ  
**Linearization (DC, PM, DU):** by linear interpolation at 50 points  
**Input filters:** exp. average, rounding  
**Function:** offset, min./max. value., Tare, Peak value, Math. operations  
**Ext. control:** HOLD, LOCK, Tare  
**Data record:** measured data record into instrument memory  
**RTC** - 15 ppm/°C, time-date-display value, < 250k data  
**FAST** - display value, < 8k data

**Resolution:** 0,1°C (RTD), 1°C (T/C)  
**Watch-dog:** reset after 1,2 s  
**OM Link:** Company communication interface for operation, setting and update of instruments  
**Calibration:** at 25°C a 40% r.v.

### COMPARATOR

**Type:** digital, adjustable in programming mode, switch-on < 30 ms  
**Limits:** -99999...999999  
**Hysteresis:** 0...999999  
**Delay:** 0...99,9 s  
**Output:** 2x relays w/switch-on contact (250 VAC/30 VDC, 3A) and 2x relays w/ switching contact (250 VAC/50 VDC, 3 A)

### DATA OUTPUT

**Data format:** 8 bit + no parity + 1 stop bit  
**Rate:** 600...115 200 Baud  
**RS 232:** isolated  
**RS 485:** isolated, addressing (max. 31 instruments)

### ANALOG OUTPUT

**Type:** isolated, programmable with resolution of max. 10 000 points, analog output corresponds with the displayed data, type and range are selectable in „CM“  
**Non-linearity:** 0,2% of range  
**TK:** 100 ppm/°C  
**Rate:** response to change of value < 40 ms

**Range:** 0...2/5/10 V, 0...5 mA, 0/4...20 mA (comp. < 500 Ohm)

### EXCITATION

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

### POWER SUPPLY

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

### MECHANIC PROPERTIES

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

### OPERATING CONDITIONS

**Connection:** connector terminal board, into 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  
**Protection:** IP65 (front panel only)  
**El. safety:** EN 61010-1, A2  
**Insulation resistance:** for pollution degree II, measuring cat. III.  
 AC power supply > 600 V (ZI), 300 V (DI)  
 DC power supply, input, output, exc. > 300 V (ZI), 250 V (DI)  
**EMC:** EN 61000-3-2+A12; EN 61000-4-2, 3, 4, 5, 8, 11; EN 550222, A1, A2

ZI - Primary insulation, DI - Double insulation

## Measuring ranges

**OM 402 is a multifunctional instrument available in following types and ranges**

### type UNI

**DC:** 0...60/150/300 mV  
**PM:** 0...5 mA/0...20 mA/4...20 mA/±2 V/±5 V/±10 V/0...40 V  
**OHM:** 0...100 Ohm/0...1 kOhm/0...10 kOhm/0...100 kOhm/5...105 Ohm  
**RTD:** Pt 100/Pt 500/Pt 1000  
**Ni:** Ni 1 000/Ni 10 000  
**T/C:** J/K/T/E/B/S/R/N  
**DU:** For linear potentiometer (min. 500 Ohm)

### type UNI, option A

**DC:** 0...1 A/0...5 A/±30 V/±120 V/±500 V

### type UNI, option B (expansion by three more inputs)

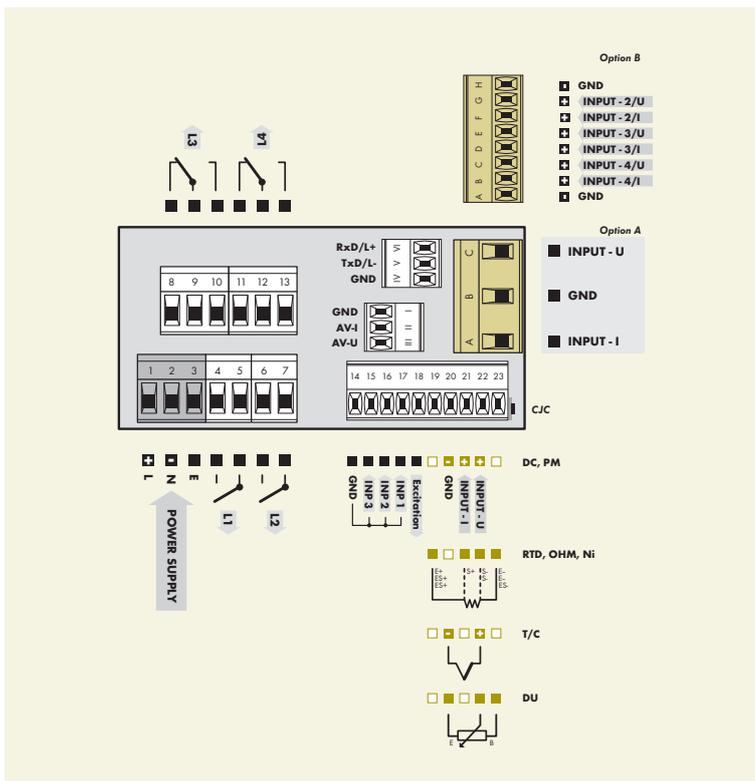
**PM:** 3x 0...5 mA/0...20 mA/4...20 mA/±2 V/±5 V/±10 V/0...40 V

### 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

	UNI	PWR	PWR
w/o			
A	0...1/5 A, 0...30/120/500 V		
B	expansion about three inputs (PM)		
C			
D			
E			
F			
G			
H			
I			
J			
K			0...60/150/300 mV
L			
M			
N			
P			0...1/2,5/5 A
R			
S		0...10/120 V	
T			
U		0...250/450 V	
Z	on request	on request	on request

## Connection



## Order code

### OM 402

#### Type

#### Power supply

10...30 V AC/DC  
 80...250 V AC/DC

#### Extension, in table „Measuring ranges“

#### Comparators

none  
 1 relay  
 2 relays  
 3 relays  
 4 relays

#### Analog output

no  
 yes

#### Data output

none  
 RS 232  
 RS 485

#### Excitation

no  
 yes

#### Data record

no  
 RTC  
 FAST

#### Display color

red  
 green



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