





The OM 402 model series are 4-digit panel programmable instruments designed for maximum efficiency and user comfort while maintaining their favourable price.

Type OML 402UNI is a multifunction instrument with the option of configuration for 8 different input options, easily configurable in the instrument menu. By completing the input modules, larger ranges of DC voltage and current can be measured to extend the number of inputs to 4 (applies to PM).

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



## UNIVERSAL INSTRUMENT

- 4-digit programmable projection
- Multifunction input (DC, PM, RTD, T/C, DU)
- Digital filters, Tare, Linearization
- Size of DIN 96 x 48 mm
- Power supply 10...30 V AC/DC; 80...250 V AC/DC
- Option

Comparators • Data output • Analog output Data record • Three-color display - 20 mm

## **OM** 402UNI

DC VOLTMETER AND AMMETER
PROCESS MONITOR
OHMMETER
THERMOMETER FOR Pt/Cu/Ni/THERMOCOUPLES
DISPLAY UNIT FOR LINEAR POTENTIOMETERS

## **OPERATION**

The instrument is set and controlled by five buttons 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 performing 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 (settings hold even after the instrument is switched off).

# STANDARD FUNCTIONS

## PROGRAMMABLE PROJECTION

Selection: of input type and measuring range

**Measuring range**: adjustable, either fixed or with automatic change (OHM) **Setting**: manual, optional projection on the display may be set in menu for both limit values of the input signal, e.g. input 0...10,00 V > 0...850.0

Projection: -9999...9999

## **EXCITATION**

Range:~5...24~VDC/1,2~W, for feeding sensors and transmitters

## COMPENSATION

Of conduct (RTD, OHM): automatic (3- or 4-wire) or manual in menu (2-wire)
Of conduct in probe (RTD): internal connection (conduct resistance in measuring head)

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 of terminals)

## OPTION

**COMPARATORS** are assigned to monitor one, two, three or four limit values with relay output. As a user you can select the mode limit: LIMIT/BATCH/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/PROFIBUS protocols.

**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. 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.

## FUNCTIONS

**Linearization:** non-linear signals can be linearized by the means of a linearization table (up to 50 points)

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

Mathemat. operations: polynom, 1/x, logaritmus, exponenciál, root, root and operations between inputs - součet, podíl

## **DIGITAL FILTERS**

Floating/Exp./Arithm. average: from 2...30/100/100 measurements Rounding: setting the projection step for display

## EXTERNAL CONTROL

Lock: control keys blocking
Hold: display/instrument blocking

Tare: tare activation

 $\textbf{Resetting MM:} \ resetting \ min/max \ value$ 

## TECHNICAL DATA

Numb	er of inputs	1						
DC	Range	optional in configuration menu						
		±60 mV	Input L					
		±150 mV	> 100 MΩ	Input U				
		±300 mV	> 100 MΩ	Input U				
		±1 200 mV	> 100 MΩ	Input U				
PM	Range	optional in con	figuration menu					
		020 mA	< 400 mV	Input I				
		420 mA	< 400 mV	Input I				
		±2 V	1 ΜΩ	Input U				
		±5 V	1ΜΩ	Input U				
		±10 V	1ΜΩ	Input U				
		±40 V	1 ΜΩ	Input U				
онм	Range	optional in configuration menu with autorange						
		0100 Ω						
		01 kΩ						
		010 kΩ 0100 kΩ						
	Connection	2, 3 or 4 wire						
Pt	Туре	optional in configuration menu						
		EU > 100/500/1 000 Ω, 3 850 ppm/°C -50°450 US > 100 Ω, 3 920 ppm/°C -50°450						
		RU > 50 Ω, 3 910 ppm/°C -200°110						
		RU > 100 Ω, 3 9	P10 ppm/°C	-200°450°C				
	Connection	2, 3 or 4 wire						
Ni	Туре	optional in configuration menu						
		Ni 1 000/10 000 with 5 000 ppm/°C -50°25						
		Ni 1 000/10 00	0 with 6 180 ppm/°0	-50°250°C				
	Connection	2, 3 or 4 wire						
Cu	Туре	optional in con	figuration menu					
	•	Cu 50/100 with 4 260 ppm/°C -50°200						
			n 4 280 ppm/°C	-200°200°C				
	Connection	2, 3 or 4 wire						
T/C	Туре	ontional in con-	figuration menu					
.,0	Турс	J (Fe-CuNi)	iligaration mena	-200°900°C				
		K (NiCr-Ni)		-200°1300°C				
		T (Cu-CuNi)		-200°400°C				
		E (NiCr-CuNi)		-200°690°C				
		B (PtRh30-PtR	h6)	300°1820°C				
		S (PtRh10-Pt)		-50°1760°C				
		R (Pt13Rh-Pt)		-50°1740°C				
		N (Omegalloy)		-200°1300°C				
		L (Fe-CuNi)		-200°900°C				
DU	Supply	2 VDC/6 mA, P	otentiometer resista	nce > 500 Ω				
Ext. in	puts	3 inputs, on contact						
			The following functions can be assigned:					
			OCK / PASS. / TARE					
		OFF/HOLD/L		/ CL. TA. /				

### OPTION "A

DC	Range	optional in configuration menu				
		±0,1 A	< 300 mV	Input I		
		±0,25 A	< 300 mV	Input I		
		±0,5 A	< 300 mV	Input I		
		±1 A	< 30 mV	Input I		
		±5 A	< 150 mV	Input I		
		±100 V	20 ΜΩ	Input U		
		±250 V	20 ΜΩ	Input U		
		±500 V	20 ΜΩ	Input U		
OPTI	ON "B"					

## Number of inputs

PM	Range	optional in configuration menu					
		020 mA	< 400 mV	Input 2, 3, 4 - I			
		420 mA	< 400 mV	Input 2, 3, 4 - I			
		±2 V	1ΜΩ	Input 2, 3, 4 - U			
		±5 V	1ΜΩ	Input 2, 3, 4 - U			
		±10 V	1ΜΩ	Input 2, 3, 4 - U			
		±40 V	1ΜΩ	Input 2, 3, 4 - U			

### PROJECTION

Display: -99999...999999, single color 14-segment LED;

-999...9999, 3-color 7-segment LED

Digit height: 14 or 20 mm

Display color: red or green (height 14 mm) red/green/orange (height 20 mm)

Description: last two characters on the display may be used for description of measured quantities (only 14 mm display)

Decimal point: adjustable - in menu

Brightness: adjustable - in menu

## INSTRUMENT ACCURACY

TC: 50 ppm/°C

Accuracy: ±0,1% of range + 1 digit (for proj. 9999 and 5 measur./s) ±0,15% of range + 1 digit

Accuracy of cold junction measur.: ±1,5°C
Rate: 0,1...40 measurement/s

Overload capacity: 2x; 10x (t < 30 ms) - not for > 200 V and 5 A
Resolution (RTD, T/C): 1°/0,1°/0,01° C

Line compensation: max. 30 Ω (RTD)

Cold junction compens.: adjustable -20°...99°C or automatic

Linearization: linear interpolation in 50 points (only via OM Link)
Digital filters: Exp./Floating/Arithm. average, Rounding

Functions: min./max. value, tare, peak value, math. operations

Data record: measured data record into instrument memory

RTC - 15 ppm/°C, time-date-display value < 266k data

FAST - display value < 8k data

OM Link: company communication interface for operation, setting and update of instruments

Watch-dog: reset after 400 ms Calibration: at 25°C and 40 % r.h.

Type: digital, menu adjustable, contact switch-on < 30 ms Hysteresis mode: switching limit, hysteresis band (Lim and ±1/2 Hys.) and

time (±99,9 s) determining the switching delay

Mode From-To: switching on and switching off interval

Mode Batch: period, its multiples and time (0...99.9 s), within which the

output is active
Output: 1...2x relays Form A (250 VAC/30 VDC, 3 A)

and 1...2x relays Form C (250 VAC/50 VDC, 3 A); 2x/4x open collector (30 VDC/100 mA); 2x SSR (250 VAC/1A); 2x bistable relays (250 VAC/250 VDC, 3 A/0,3 A)

### DATA OUTPUTS

Protocol: ASCII, MESSBUS, MODBUS RTU, PROFIBUS DP

Data format: 8 bit + no parity + 1 stop bit (ASCII)

7 bit + even parity + 1 stop bit (Messbus) Rate: 600...230 400 Baud, 0,0096...12 Mbaud (PROFIBUS)

RS 232: isolated

RS 485: isolated, addressing (max. 31 instruments)

### ANALOG OUTPUTS

 $\label{type:solated} \textbf{Type:} \ isolated, programmable with a 16-bit D/A \ converter, output type \ and \ range \ are optional in the menu$ 

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. < 600  $\Omega/12$  V or 1 000  $\Omega/24$  V)

## EXCITATION

Adjustable: 5...24 VDC/max. 1.2 W

## POWER SUPPLY

Range: 10...30 V AC/DC, ±10 %, PF≥ 0,4, I<sub>STP</sub>< 40 A/1 ms, isolated

80...250 V AC/DC, ±10 %, PF≥0,4, I<sub>STP</sub>< 40 A/1 ms, isolated Consumption: < 9,4 W/9,2 VA

#### MECHANIC PROPERTIES

Material: Norvi GFN2 SF1 incombustible UL 94 V-I

ions: 96 x 48 x 120 mm (w x h x d)

Panel cutout: 90.5 x 45 mm (w x h)

### OPERATING CONDITIONS

Connection: connector terminal blocks, section < 1.5/2.5 mm<sup>2</sup>

Stabilization period: within 5 minutes after switch-on Temper. working/storage: -20°...60°C/-20°...80°C

Protection: IP64 (front panel only) El. safety: EN 61010-1, A2

Dielectric strength: 4 kVAC per 1 min test between supply and input 4 kVAC per 1 min test between supply and data/analog output

4 kVAC per 1 min test between input and relay output 2,5 kVAC per 1 min test between input and data/analog output

Insulation resistance: for pollution degree II, measuring cat. III power supply > 670 V (PI), 300 V (DI)

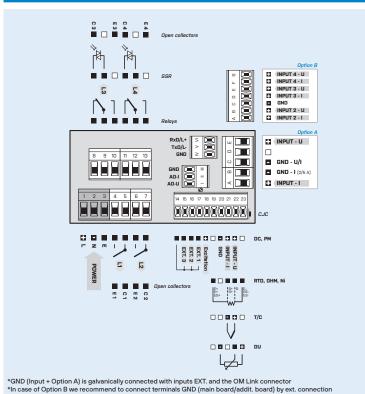
input, output, PN > 300 V (PI), 150 V (DI)

EMC: EN 61326-1

Seismic capacity: IEC 980: 1993, par. 6
SW validation: Class B, C in compl. with IEC 62138, 61226

PI - Primary insulation, DI - Double insulation

## CONNECTION



## ORDER CODE

OM 402U	NI -						1			-[
Power supply	1030 V AC/DC	0								П
	80250 V AC/DC	1								
Measuring range	standard		0							
	option "A"		Α							
	option "B"		В							
Comparators	no			0						
	1x relay (Form A)			1						
	2x relay (Form A)			2						
	3x relays (2x Form A + 1x Form C)			3						
	4x relays (2x Form A + 2x Form C)			4						
	2x open collector			5						
	4x open collector			6						
	2x open collector + 2x relays (Form C)			7						
	2x relays (Form C)			8						
	2x SSR			9						
	2x relays, bistable			Α						
	1x relay (Form C)			В						
Analog output	no				0					
	yes (compensation < 600 Ω/12 V)				1					
	yes (compensation < 1000 Ω/24 V)				2					
Data output	no					0				
	RS 232					1				
	RS 485					2				
	MODBUS*					3				
	PROFIBUS					4				
Excitation	yes						1			
Data record	no							0		
	RTC							1		
	FAST							2		
Display color	red (14 mm)								1	
	green (14 mm)								2	
	red/green (20 mm)								3	
Specification	customized version, do not fill in									C
•	SW validation - IEC 62138. IEC 61226									V

Basic configuration of the instrument is indicated in bold.

\* Unavailable in combination with RTC/FAST