

OM 402UNI

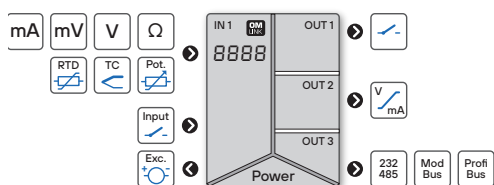


- 4-digit programmable projection
- Multifunction input (DC, PM, RTD, T/C, DU)
- Digital filters, Tare, Linearization
- Size of DIN 96 x 48 mm
- Power supply 10...30 V AC/DC; 80...250 V AC/DC

Option

Comparators ● Data output ● Analog output ● Data record
Three-color display (20 mm)

UNIVERSAL INSTRUMENT



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

Type OML402UNI 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 No. of inputs to 4 (applies to PM).

The instrument is based on a microcontroller and multichannel 24-bit $\Delta\Sigma$ ADC, which secures high accuracy, stability and easy operation of the instrument.

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).

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.

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 V > 0...850.0

Projection: -9999...9999

EXCITATION

Range: 5...24 VDC/1.2 W, for feeding sensors and transmitters

COMPENSATION

Wiring (RTD, OHM): automatic (3- or 4-wire) or manual in menu (2-wire)

Probes (RTD): internal wiring (resistance of conductors in the measuring head)

CJC (T/C): manual or automatic (terminal temperature)

FUNCTIONS

Linearization: non-linear signal is converted by a 50-point linear interpolation

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, logarithmus, exponential, root, and operations between inputs - sum, ratio

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

Resetting Min/Max: resetting min/max value

TECHNICAL DATA

INPUT

No. of inputs	1 The range is adjustable in the instrument menu	
DC Range	±60 mV > 100 MΩ ±150 mV > 100 MΩ ±300 mV > 100 MΩ ±1200 mV > 100 MΩ	Input U Input U Input U Input U
PM Range	0...20 mA < 400 mV 4...20 mA < 400 mV ±2 V 1 MΩ ±5 V 1 MΩ ±10 V 1 MΩ ±40 V 1 MΩ	Input I Input I Input U Input U Input U Input U
OHM Range	0...100 Ω 0...1/10/100 kΩ	
Connection	2, 3- and 4-wire	
RTD Range	Pt 100/500/1 000, 3 850 ppm/°C Pt 100, 3 920 ppm/°C Pt 50, 3 910 ppm/°C Pt 100, 3 910 ppm/°C	-50°...450°C -50°...450°C -200°...1100°C -200°...450°C
Connection	2, 3- and 4-wire	
Ni Range	Ni 1 000/10 000, 5 000 ppm/°C Ni 1 000/10 000, 6 180 ppm/°C	-50°...250°C -200°...250°C
Connection	2, 3- and 4-wire	
Cu Range	Cu 50/100, 4 260 ppm/°C Cu 50/100, 4 260 ppm/°C	-50°...200°C -200°...200°C
Connection	2, 3- and 4-wire	
T/C Range	J (Fe-Cu/Ni) -200°...900°C K (NiCr-Ni) -200°...1300°C T (Cu-Cu/Ni) -200°...400°C E (NiCr-Cu/Ni) -200°...690°C B (PtRh30-PtRh6) 300°...1 820°C S (PtRh10-Pt) -50°...1 760°C R (Pt13Rh-Pt) -50°...1 740°C N (Omega/Alloy) -200°...1 300°C L (Fe-Cu/Ni) -200°...900°C	
CJC	adjustable -20°...99°C or automatical	
DU Sensor power supply	2 VDC/6 mA, potentiometer resistance > 500 Ω	

OPTION „A“

No. of inputs	1 The range is adjustable in the instrument menu	
DC Range	±0.1 A < 300 mV ±0.25 A < 300 mV ±0.5 A < 300 mV ±1 A < 30 mV ±5 A < 150 mV ±100 V 20 MΩ ±250 V 20 MΩ ±500 V 20 MΩ	Input I Input I Input I Input I Input I Input U Input U Input U

OPTION „B“

No. of inputs	3 The range is adjustable in the instrument menu	
3x PM Range	0...20 mA < 400 mV 4...20 mA < 400 mV ±2 V 1 MΩ ±5 V 1 MΩ ±10 V 1 MΩ ±40 V 1 MΩ	Input 2, 3, 4 - I Input 2, 3, 4 - I Input 2, 3, 4 - U Input 2, 3, 4 - U Input 2, 3, 4 - U Input 2, 3, 4 - U

EXTERNAL INPUT

No. of inputs	3, on contact	
Function	OFF LOCK HOLD PASS. TARE CL. TA CL. M.M SAVE CL. ME CHAN. A FIL. A MAT. FN SWIT.	no function assigned control keys blocking measurement paused menu access blocking tare activation tare resetting resetting min/max value data recording start (FAST/RTC) data recording reset (FAST/RTC) value display „Channel A“ value display „Channel A“ + filter value display „Math. functions“ sequential or BCD channel switching

PROJECTION

Display	-9999...99999, single color 14-segment LED -999...9999, 3-color 7-segment LED
Digit height	14 mm 20 mm
Display color	red or green red / green / orange
Description	last two characters on the display may be used for description of measured quantities <i>only for display with LED height 14 mm</i>
Decimal point	adjustable - in menu
Brightness	adjustable - in menu

INSTRUMENT SPECIFICATION

TC	50 ppm/°C	
Accuracy	±0.1% of FS + 1 digit ±0.15% of FS + 1 digit <i>above accuracies apply for projection 9999 and 5 meas./s</i>	RTD / T/C
Rate	0.1...40 measurement/s	
Overload	10x (t < 30 ms), 2x <i>not valid for 250 / 450 V and 5 A ranges</i>	
Compensation of conduct	< 30 Ω	RTD
Measurement accuracy CJC	±15°C	T/C
Resolution	0.1°C / 1°C	RTD / T/C
Functions	offset, Min/max value, Tare, peak value, math. functions	
Digital filters	exponential / floating / arithmetic average, rounding	
Math functions	polynomial / inverse polynomial / logarithm / exponential / power / root	
Linearization	linear interpolation in 50 points <i>setup only via CIM Link</i>	
Data record	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 % rh.	

RELAYS / OC OUTPUT

No. of outputs	up to 4	
Type	digital, menu adjustable	
Mode	HYSTER. WINDOW BATCH	active above set value active in the set window / band active in set period
Function Relays/OC	CLOSE OPEN	is closed in active mode is open in active mode
Limits	-9999...999999	
Hysteresis	0...999999	
Delay	0...99.9 s	
Outputs	1...2x relay with switch-on contact (Form A) (250 VAC/30 VDC, 3 A)* 1...2x relay with switching contact (Form C) (250 VAC/50 VDC, 3 A)* 2x bistable relays (250 VAC/250 VDC, 3 A/0.3 A) 2...4x open collector (30 VDC/100 mA)	
Relays	1/8 HP 277 VAC, 1/10 HP 125 V, Pilot Duty D300	

* values apply for resistance load

ANALOG OUTPUTS

No. of outputs	1	
Type	isolated, adjustable with 16-bit DAC, output type and range is selectable	
TC	15 ppm/°C	
Non-linearity	0.1 % from FS	
Accuracy	±0.02 % of FS	
Rate	response to change of value < 1 ms	
Ranges	0...5 / 10 V, ±10 V, resistive load ≥ 1 kΩ 0...5 / 20 mA / 4...20 mA, compensation < 600 Ω/12 V or 1000 Ω/24 V Indication of error message (output < 3.2 mA)	

DATA OUTPUTS

No. of outputs	1	
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	300...230 400 Baud 9 600 Baud...12 Mbaud (PROFIBUS)	
RS 232	isolated	
RS 485	isolated, addressing (max. 31 instruments)	

EXCITATION

Adjustable	5...24 VDC, < 12 W, isolated	
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POWER SUPPLY

Range	10...30 V AC/DC, ±10 %, PF ≥ 0.4, I _{typ} < 40 A / 1 ms, isolated 80...250 V AC/DC, ±10 %, PF ≥ 0.4, I _{typ} < 40 A / 1 ms, isolated <i>Protection by fuse inside the device</i>
Consumption	< 9.4 W / 9.2 VA

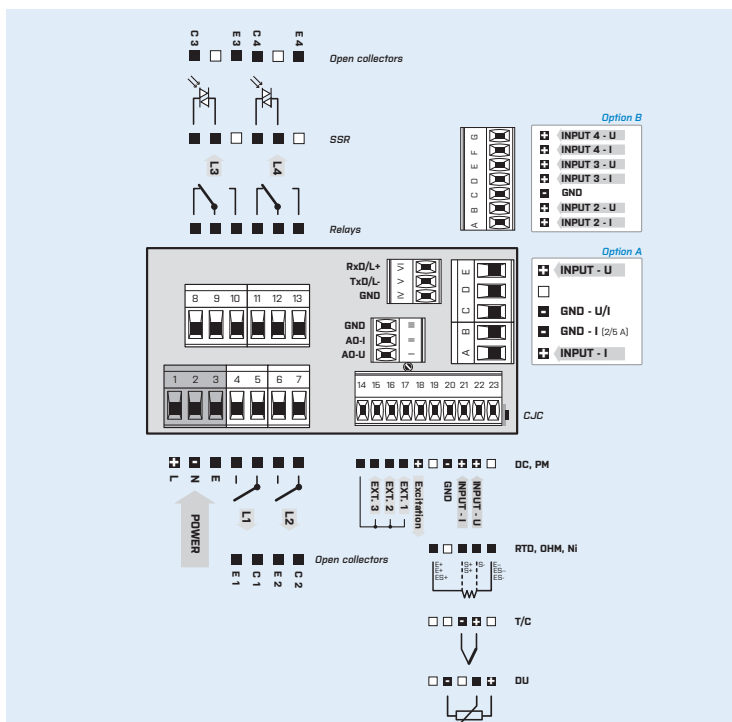
MECHANIC PROPERTIES

Material	Noryl GFN2 SE1, incombustible UL 94 V-1, black
Dimensions	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 ²
Stabilization period	within 5 minutes after switch-on
Working temperat.	-20°...60°C
Storage temperat.	-20°...85°C
Working humidity	< 95 % r.v., non condensing
Protection	IP64, front panel only
Construction	safety class I
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 resist.*	for pollution degree II, measuring cat. III power supply, input > 670 V (PI), 300 (DI) input, output, excitation > 300 V (PI), 150 V (DI)
EMC	EN 61326-1, Industrial area
Seismic capacity	IEC 980: 1993, par. 6
SW validation	Class B, C in compl. with IEC 62138, 61226 <small>* PI - Primary insulation, DI - Double insulation</small>

CONNECTION



*GND (Input + Option A) is galvanically connected with inputs EXT. and the OM Link connector
*In case of Option B we recommend to connect terminals GND (main board/addit. board) by ext. connection

ORDER CODE

OM 402UNI

Power supply	10...30 V AC/DC 80...250 V AC/DC	0 1
Measuring range	standard option „A“ option „B“	0 A B
Comparators	no 1x relay (Form A) 2x relay (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 relays, bistable 1x relay (Form C)	0 1 2 3 4 5 6 7 8 9 A B
Analog output	no yes (compensation < 600 Ω/12 V) yes (compensation < 1000 Ω/24 V)	0 1 2
Data output	no RS 232 RS 485 Modbus* PROFIBUS	0 1 2 3 4
Excitation	yes	1
Data record	no RTC FAST	0 1 2
Display color	red (14 mm) green (14 mm) red/green (20 mm)	1 2 3
Specification	customized version, do not fill in SW validation - IEC 62138, IEC 61226	00 VS

Basic configuration of the instrument is indicated in bold.

* Unavailable in combination with RTC/FAST