Data Sheet

OM 403UNI
4- or 6-Digit Programmable Panel Meter with Bar Graph and Auxiliary Display

Distributed by

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OM 403UNI

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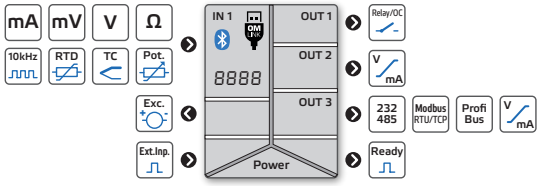
- 3-color LED main display, auxiliary display and bargraph
- Multifunctional input (DC, PM, RTD, T/C, DU, Counter)
- Touch keys with haptic feedback and RGB backlighting
- Teach-in, Digital filters, Tare, Mat. function, Linearization
- DIN size 96 x 48 mm
- Power supply 10...30 V AC/DC or 80...250 V AC/DC

Option

Comparators ● Data communication ● Analog output ● Data recording

UNIVERSAL INSTRUMENT



The OM 403 series are 6-digit panel instruments designed for fast and easy setup, as well as accuracy and reliability.

The OM 403UNI is a multifunctional device that can be easily configured for a wide variety of input signals in the device menu. The setup and operation of the device are user-friendly, despite its versatility, by incorporating two displays, touch keys with color navigation and haptic feedback, as well as our Setup Wizard integrated into the meter.

The device is based on a 32-bit processor and a multi-channel 24-bit ΔΣ ADC, which ensure high accuracy, stability and easy operation.

CONTROLS

The device is controlled and set by either five touch keys located on the front panel or via a PC. For easier navigation of the device menu, the keys are backlit in different colors and provide haptic feedback when pressed.

Initial set up of the device is easily done using our Setup Wizard, which guides you step by step through the basic settings required to make the device operational.

There are two menu levels, USER and PROFI. The PROFI menu is password protected and it allows access to all menu items. If necessary, a narrowed down USER menu can be created using only selected items. These can be any items you select. USER menu is not password protected.

OM 403UNI can also be configured from a PC using our free OM Link software via USB-C or Bluetooth. This SW also lets you archive all settings, transfer them from one device to another, perform firmware updates and even device calibration.

All settings are stored in the EEPROM memory, so they are preserved even after the device is turned off.

OPTIONS

COMPARATORS (Relays or Open Collectors) are designed to monitor two, three, four or six limit values. The user can select various output modes and functions to match specific operational requirements. Reaching one or more set limit values is indicated by signaling LEDs and by switching on/off the relevant output.

DATA COMMUNICATION OUTPUTS can transfer measured values to other display devices or directly to control systems with speed and accuracy. Galvanic isolated RS232 and RS485 interfaces are available, supporting ASCII, Modbus and PROFINET protocols.

ANALOG OUTPUTS are ideal for applications where further evaluation or processing of measured values in external devices is required. The galvanic isolated analog output is universal with the option of choosing the type and range - voltage or current.

RECORDING OF MEASURED VALUES is ideal for applications that require measured values to be analyzed retrospectively, or simply archived. Recording takes place in real time (RTC). Recording parameters (start and stop times as well as frequency) are user defined. In case of short-term events, recording can be continuous with writing speed equal to sampling rate. Data is stored either in the device's internal memory or on a USB-C flash drive.

STANDARD FUNCTIONS

PROGRAMMABLE PROJECTION
Selection: user can choose from different types of inputs and measuring ranges
Standard: for both endpoints of the input range, any value can be set on the display, e.g. input 0...20 mA > 0...500.00
Teach-In: with this function, it is possible to assign any display values for the currently measured endpoints of the input signal, e.g. input 4.02...20.01 mA > 0...500.0
Manual: user can manually set the two endpoint values of the input signal and assign to them any display values, e.g. input 0.04...9.58 V > 0...700.0
Overall projection: -99999...999999

EXCITATION
Fixed: 24 VDC/50 mA, it is suitable for powering sensors and converters

COMPENSATION
Leads resistance (RTD, OHM): automatic (3 and 4-wire) or manual in menu (2-wire)
Probes (RTD): internal resistance between actual sensor and its terminal block
Cold junction (T/C): manual or automatic (temperature of terminal block)

FUNCTIONS
Linearization: non-linear signal can be converted by up to 100-point linear interpol.
Tare: zeroing the display when the input signal is not zero
Offset: fixed offset of the initial value
Min/max value: registration of min./max. values reached during the measurement
Peak value: the display projects only the highest or the lowest measured value
Mathematical functions: polynomial, 1/x, logarithm, exponential, power, square root
Simulation: the device simulates its function without a connected input signal
Log: recording of events and error messages with a date and time stamp

DIGITAL FILTERS
Floating / Exponential / Arithmetic average: from 2 to 100 measurements
Rounding: setting the display step for the display

EXTERNAL CONTROL
Hold: stop measurement
Lock: locking out the buttons
Tare: activation and zeroing of tare
Reset Min/Max: reset the min/max value
Hold Min/Max: start the measurement to evaluate the Min/Max value
Sample: start of one-time measurement
Data recording: storage of measured values in the device memory
Opening of a relay: enabling a relay to disengage while in Permanent mode (safety relay)

TECHNICAL DATA

INPUT

No. of inputs		1 The range is adjustable in the instrument menu	
DC	Range	±60 mV > 10 MΩ Input - mV ±75 mV > 10 MΩ Input - mV ±100 mV > 10 MΩ Input - mV ±150 mV > 10 MΩ Input - mV ±300 mV > 10 MΩ Input - mV ±1000 mV > 10 MΩ Input - mV ±20 V 1 MΩ Input - U ±40 V 1 MΩ Input - U ±100 mA < 200 mV Input - U	
PM	Range	±5 mA < 200 mV Input - I ±20 mA < 200 mV Input - I 4...20 mA < 200 mV Input - I ±2 V 1 MΩ Input - U ±5 V 1 MΩ Input - U ±10 V 1 MΩ Input - U	
OHM	Range	0...100 / 300 Ω 0...1 / 3 / 10 / 30 / 100 kΩ 0...300 kΩ (only 2- and 4-wire)	
	Connection	2-, 3- and 4-wire, with broken cable/sensor detection	
RTD	Range	Pt 100/500/1 000, 3 850 ppm/°C -50°...450°C Pt 100, 3 920 ppm/°C -50°...450°C Pt 50, 3 910 ppm/°C -200°...1100°C Pt 100, 3 910 ppm/°C -200°...450°C	
	Connection	2-, 3- and 4-wire, with broken cable/sensor detection	
Ni	Range	Ni 1 000/10 000, 5 000 ppm/°C -50°...250°C Ni 1 000/10 000, 6 180 ppm/°C -200°...250°C	
	Connection	2-, 3- and 4-wire, with broken cable/sensor detection	
Cu	Range	Cu 50/100, 4 260 ppm/°C -50°...200°C Cu 50/100, 4 280 ppm/°C -200°...200°C	
	Connection	2-, 3- and 4-wire, with broken cable/sensor detection	
NTC	Range	NTC 1 2k2, $B_{25/85}$ = 3600 -40°...125°C NTC 2 2k0, $B_{25/85}$ = 3528 -40°...125°C NTC 3 10k, $B_{25/85}$ = 3435 -40°...125°C NTC 4 10k, $B_{25/85}$ = 3977 -40°...125°C NTC 5 12k, $B_{25/85}$ = 3740 -40°...125°C NTC 6 20k, $B_{25/85}$ = 4263 -40°...125°C	
	Connection	2-, 3- and 4-wire, with broken cable/sensor detection	
PTC	Range	KTY 81/210 -55°...150°C	
	Connection	2-, 3- and 4-wire, with broken cable/sensor detection	
T/C	Range	J (Fe-CuNi) -200°...900°C K (NiCr-Ni) -200°...1 300°C T (Cu-CuNi) -200°...400°C E (NiCr-CuNi) -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 (Omegalloy) -200°...1 300°C L (Fe-CuNi) -200°...900°C XK (Chromel-Copel) -200°...800°C with broken cable/sensor detection	
	CJC	adjustable -20°...99°C or automatical	
DU	Sensor power supply	1.65 VDC/3 mA, potentiometer resistance > 500 Ω	
UC	Input	per contact, TTL, NPN/PNP	
	Range	0.1 Hz...10 kHz, <30 V	
	Mode	counter/frequency, stopwatch, clock	
	Setting	time base, multiplication/division constant	

CONTROL INPUTS AND OUTPUT

No. of inputs	3, isolated, on contact, PNP/NPN, < 30 V
Function	No function assigned Activation of Tare Reset of Tare Reset of Min./Max.and PEAK values Tare activation (<1s) + Zero tare (>1s) Activation of Tech-In for Offset Open relay/OC (Type LATCH) Controlling of cumulative measurement Min/Max and PEAK value Measurement paused Take a one-off measurement Value of minimum/maximum/MAX-MIN/Average* Device buttons blocked Data recording Delete memory Show value of all Channels and Brutto
No. of output	1, isolated, open collector 30 V/100 mA
Function - Ready	Active when the device reports no error messages

*The value is calculated from the period starting with the previous external input activation

PROJECTION

Primary display	-99999...999999, three-color alphanumeric LED, 6 digits 11-segment, red / green / orange, digit height 14 mm
Secondary display	-99999...999999, single-color alphanumeric LED, 6 digits, 11-segment, green, digit height 7 mm
Info display	0...99, single-color alphanumeric LED, 2 digits, 11-segment, orange, digit height 7 mm
Bar graph	17 single-color LEDs, horizontal column
Signal LEDs	20 single-color LEDs indicating device functions and status (red, yellow, orange)
Decimal point	adjustable, floating or exponential display
Description	displayed on the secondary display or on the last two characters of the primary display
Brightness	adjustable or automatic

INSTRUMENT SPECIFICATION

TC	25 ppm/°C
Accuracy	±0.07 % of FS ±0.05 % of FS DC, PM ±0.1 % of FS OHM - 100k/300k *Accuracy specified at 20 meas./s, display 9999*
Rate	1...400 measurement/s
IIR filter	mains hum suppression (50/60 Hz) greater than 45 dB (≈180× reduction of interference amplitude) *For measurement speeds >100 measurements/s*
Overload	10x (t < 30 ms), 2x
Comp. of conduct	< 30 Ω RTD
Accuracy CJC	±1.5°C T/C
Control	5 touch keys backlit by LEDs and haptic feedback
Functions	Teach-in, tare, preset tare, peak value, min/max value, math. functions, delayed start, simulation, error and event logging
Timer	time and daily operational restrictions of the device, functions, and its peripherals (data recording, relays, ...)
Digital filters	exponential / floating / arithmetic average, rouding
Math functions	polynomial / inverse polynomial / logarithm / exponential / power / root
Linearization	linear interpolation in 100 points *setup only via OM Link*
Measured data logging	< 100 000 records Long-term time-date-measured value Single-shot high-speed logging < 400 meas./s
OM Link	company communication interface for operation, setting and update of instruments (BT, USB-C)
Time	accuracy < 1 minute/year
Watch-dog	reset after 500 ms
Calibration	at 25°C and 40 % r.h.

RELAYS / OC OUTPUT

No. of outputs	up to 6
Type	digital, menu adjustable
Mode	RISE active above set value DROP active below set value WINDOW active in the set window / band BATCH active in set periods
Function Relays/OC	SW. ON is closed in active mode SW. OFF is open in active mode PULSE switches on once in active mode LATCH in active mode the output is switched permanently, disconnection is blocked (IEC EN 61496) *- disconnection is performed by ext. input*
Limits	-99999...999999
Hysteresis	0...999999
Delay / Time	0...999.9 s
Outputs	2 - 4x relay with switching contact (Form C) (250 VAC/50 VDC, 3 A)* 3 - 6x relay with switch-on contact (Form A) (250 VAC/30 VDC, 3 A)* 3 - 6x 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 or 2
Type	isolated, adjustable with 16-bit DAC, output type and range is selectable
TC	15 ppm/°C
Accuracy	±0.02 % of FS ±0.03 % of FS 0...5 V ±0.06 % of FS 0...2 V / 0...5 mA
Rate	response to change of value < 160 µs
Ranges	Range Error indication 0...2 V ~ 2.2 V *resistive load ≥ 1 kΩ* 0...5 V ~ 5.5 V *resistive load ≥ 1 kΩ* 0...10 V ~ 11.0 V *resistive load ≥ 1 kΩ* ±10 V ~ 11.0 V *resistive load ≥ 1 kΩ* 0...5 mA ~ 5.5 mA *comp. < 600 Ω/12 V* 0...20 mA ~ 22.0 mA *comp. < 600 Ω/12 V* 4...20 mA ~ 3.2 mA *comp. < 600 Ω/12 V* Indication of broken current loop

DATA COMMUNICATION

No. of outputs	1
Protocol	ASCII, Modbus RTU, Modbus TCP/IP, PROFINET
Rate	600...230 400 Baud 10 Mbit/s, 100 Mbit/s (Modbus TCP/IP, PROFINET)
Data format	Format 8bits + parity + stop bit Parity none / even / odd Stop bit 1 / 1.5 / 2
Adressing	1...99 instruments (ASCII) 1...247 instruments (Modbus)
Line termination	interním odporem 120 Ω *DIP switch on the last device*

EXCITATION

Fixed	24 VDC / 50 mA, isolated

POWER SUPPLY

Range	10...30 V AC/DC, PF ≥ 0.4, I_{STP} < 40 A / 1 ms, isolated 80...250 V AC/DC, PF ≥ 0.4, I_{STP} < 40 A / 1 ms, isolated *Protection by fuse inside the device*
Consumption	< 9.4 W / 9.2 VA

MECHANIC PROPERTIES

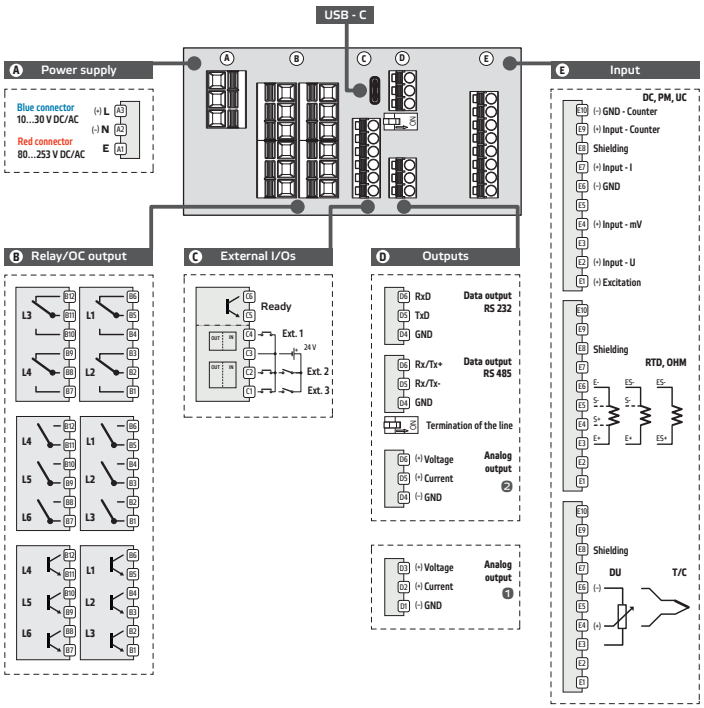
Material	Noryl GFN2 SE1, incombustible UL 94 V-I, black
Dimensions	96 x 48 x 120 mm (w x h x d)
Panel cutout	90 x 45.5 mm (w x h)

OPERATING CONDITIONS

Connection	connector terminal blocks, section < 1.5 / 2.5 mm²
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	IP65, 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 61326-1:2021, Industrial area EN IEC 62003:2021, Nuclear facilities
RoHS	EN IEC 63000:2018
Seismic capacity	EN IEC/IEEE 60980-344 ed. 1.0:2020, par. 6, 9
Mechanical resistance	EN 60068-2-6 ed. 2:2008

* PI - Primary insulation, DI - Double insulation

CONNECTION



ORDER CODE

OM 403UNI - □□□□□ - □

Power supply	10...30 V AC/DC	0					
	80...250 V AC/DC	1					
Comparators	no		0				
	2x relay (Form C)		1				
	4x relays (Form C)		2				
	3x relays (Form A)		3				
	6x relays (Form A)		4				
	3x open collectors		5				
	6x open collectors		6				
Outputs	no			00			
	Analog output			10			
	RS 232			01			
	RS 485			02			
	Modbus TCP/IP			03			
	PROFINET			05			
	Analog output + RS 232			11			
	Analog output + RS 485			12			
	2x Analog outputs			19			
Recording of measured values	no				0		
	yes				1		
Specification	customized version, do not fill in						00

Basic configuration of the instrument is indicated in bold.