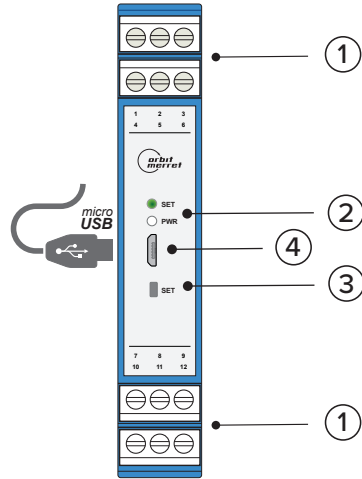
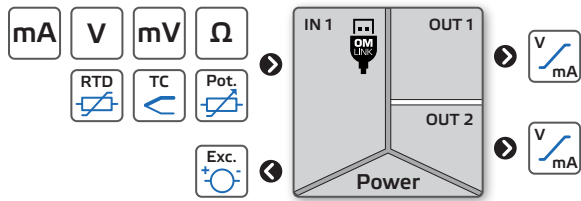


- Multifunction input (DC, PM, RTD, T/C, DU)
- Configurable type and measuring range
- 2x Analog output, passive/active
- Quick configuration by DIP switch
- PC configurable via USB port
- Galvanic isolation 2.5 kVAC
- Simple installation to DIN rail

OMX 312UNI

Digital DIN rail mounted signal conditioner

MULTIFUNCTION INPUT (DC, PM, RTD, T/C, DU)



Legend

- ① Connectors
- ② RGB Status LED
- ③ Control button
- ④ microUSB port for PC connection

LED indication

PWR	SET	STATUS
●		Device is running
●		Device error - processor
●	○	Tare function is activated
●	●	Sensor error
●	●	Simulation mode is activated

⚠ DANGER ⚠

HAZARD OF ELECTRICAL SHOCK

- Disconnect all power and other supply lines before servicing equipment

Failure to follow this instruction may result in death or serious injury.

⚠ WARNING ⚠

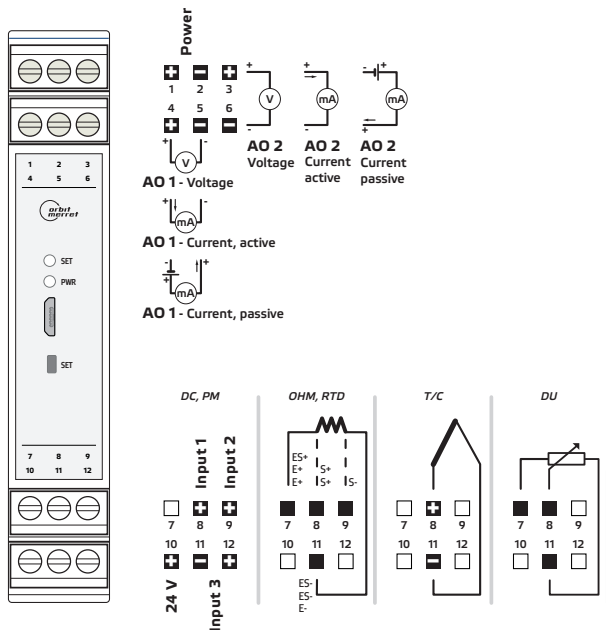
EQUIPMENT OPERATION HAZARD

- Do not use this product in safety critical system
- Do not disassemble, repair or modify this product
- Do not operate beyond the recommended operating environment

Failure to follow these instructions may result in death, serious injury, or equipment damage.

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by ORBIT MERRET for any consequences arising out of the use of this device.

Connection



Connection

Type	Input 1	Input 2	Input 3
DC	±60/±75/±100/±150 mV ±300/±1000mV	±20/±40V	±100 mA
PM		±2/±5/±10 V	0...5/20 mA, 4...20 mA
OHM	0...0,1/0,3/1/3/10/30/100/300 kΩ		
Pt	Pt 50/100/500/1000		
Cu	Cu 50/100		
Ni	Ni 1000/10000		
NTC	NTC 2/2,2/10/12/20kΩ		
PTC	KTY 81		
T/C	J/K/T/E/B/S/R/N/L/XK		
DU	Potenciomter > 500 Ω		

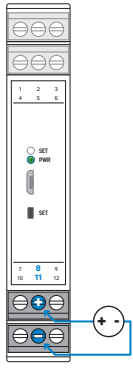
	0,05...2,5 mm ² 30...12 AWG	
	Ø 3,5 mm Ø 0.14 in	

Note

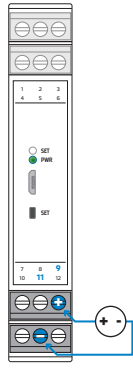
Contactors, high power electric motors, frequency drives and other power devices should not be in a close proximity of the meter. Input signal leads (measured value) should be separated from all power lines and power devices. Even though the device has been designed and tested according to standards for industrial environment, we strongly advise to adhere to the above presented rules.

Wiring diagram

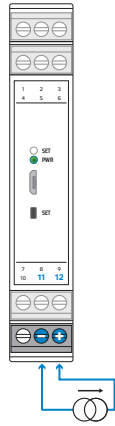
DC
Input - Voltage [mV]



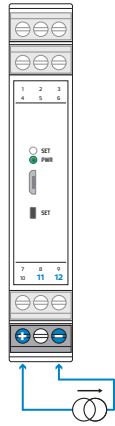
DC/PM
Input - Voltage [V]



DC/PM
Input - Current, passive [mA]



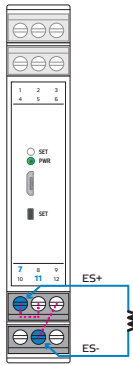
PM
Input - Current, active [4...20 mA]



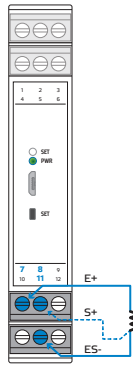
Range	DC
0...60/75/100/150/300mV	Input 1 8
0...1000	
±60/±75mV	
±100/150/300mV	
±1000	
0...20/±40V	Input 2 9
±20/±40V	
0...100 mA	Input 3 12
±100 mA	

Range	PM
Passive	Input 3 12
0...5/20 mA	
±5/±20 mA	
4...20 mA	
Active	Input 3 10
4...20 mA	
0...2/5/10 V	Input 2 9
±2/±5/±10V	

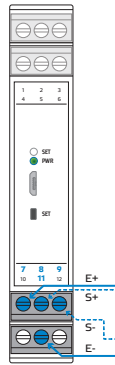
OHM/RTD/NTC/PTC
Input - 2-wire



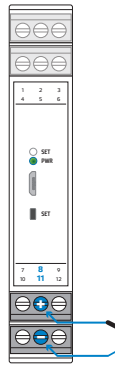
OHM/RTD/NTC/PTC
Input - 3-wire



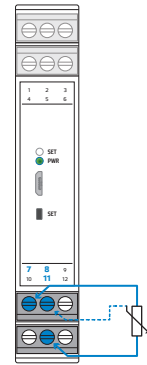
OHM/RTD/NTC/PTC
Input - 4-wire



T/C
Input - Thermocouple



DU
Input - Potentiometer



Range	T/C
J/K/T/E/B/S/R/N/L/XK	Input 1 8



In case **2-wire connection** is used either for **RTD** or for **OHM** measurement, it is absolutely essential to interconnect the unconnected terminals(7+8/9+11).

3

Device setting

DIP switch

For a quick set up you can use the DIP switch. Changing a configuration only takes effect after power off/on.

1	2	3	4	5	Input - Type	1	2	3	4	5	Input - Type	1	2	3	4	5	Input - Type	6	7	8	Input - Range	9	10	Output 1 - Range	11	12	Output 2 - Range
					Working Mode includes Teach-in, Setup via OM Link	●	●	●	●	●	Pt100/3920 ppm, 2/4-wire [US]	●	●	●	●	●	NTC 10k/3435, 2/4-wire	●	●	●	Voltage [V]	●	●	0...10 V	●	●	0...10 V
●					Volatge [V]	●	●	●	●	●	Pt100/3920 ppm, 3-wire [US]	●	●	●	●	●	NTC 10k/3435, 3-wire	●	●	●	0...5 V	●	●	0...20 mA [Act.]	●	●	0...20 mA [Act.]
●	●				Current [mA] DEF	●	●	●	●	●	Pt100/3910 ppm, 2/4-wire [RU]	●	●	●	●	●	NTC 20k/4263, 2/4-wire	●	●	●	0...10 V	●	●	4...20 mA [Act.] DEF	●	●	4...20 mA [Pas.]
						●	●	●	●	●	Pt100/3910 ppm, 3-wire [RU]	●	●	●	●	●	NTC 20k/4263, 3-wire	●	●	●	0...20 V	●	●	4...20 mA [Act.]	●	●	4...20 mA [Pas.]
●	●				Voltage [mV]	●	●	●	●	●	Pt1000/3850 ppm, 2/4-wire [EU]	●	●	●	●	●	Thermocouple - B	●	●	●	0...40 V	●	●	0...10 V	●	●	0...10 V
●	●	●			Resistance, 2/4-wire	●	●	●	●	●	Pt1000/3850 ppm, 3-wire [EU]	●	●	●	●	●	Thermocouple - E	●	●	●	5...0 V	●	●	0...20 mA [Act.]	●	●	0...20 mA [Act.]
●	●	●	●		Resistance, 3-wire	●	●	●	●	●	Ni1000/5000, 2/4-wire	●	●	●	●	●	Thermocouple - J	●	●	●	0...20 V	●	●	0...20 mA [Act.]	●	●	0...20 mA [Act.]
●	●	●	●	●	Potentiometer	●	●	●	●	●	Ni1000/5000, 3-wire	●	●	●	●	●	Thermocouple - K	●	●	●	0...40 V	●	●	0...20 mA [Act.]	●	●	0...20 mA [Act.]
●	●	●	●	●	Pt100/3850 ppm, 2/4-wire [EU]	●	●	●	●	●	Ni1000/6180, 2/4-wire	●	●	●	●	●	Thermocouple - R	●	●	●	5...0 V	●	●	0...20 mA [Act.]	●	●	0...20 mA [Act.]
●	●	●	●	●	Pt100/3850 ppm, 3-wire [EU]	●	●	●	●	●	Ni1000/6180, 3-wire	●	●	●	●	●	Thermocouple - S	●	●	●	±5 V	●	●	0...20 mA [Act.]	●	●	0...20 mA [Act.]
						●	●	●	●	●		●	●	●	●	●	Thermocouple - T	●	●	●	±10 V	●	●	0...20 mA [Pas.]	●	●	0...20 mA [Pas.]

Analog input range setting, Teach-in

1. Enter the teach-IN mode by a long press (>2 s) of the **SET** button - LED **PWR** ● yellow and LED **SET** ● turquoise (DIP 1-5 to OFF)
2. Put the connected sensor in the position that shall have minimum output **RNG.MIN** (for example 4.02 mA)
3. Set the minimum output value by a long press (>2 s) of the **SET** button - LED **PWR** ● yellow, LED **SET** ● purple
4. Put the connected sensor in the position that shall have maximum output **RNG.MAX** (for example 19.97 mA)
5. Set the maximum output value by a long press (>2 s) of the **SET** button - LED **PWR** ● yellow, LED **SET** ● green
6. Leave teach-IN mode by a short press of the **SET** button and return to the standard working mode - LED **PWR** ● green

The teached measuring range is non volatile and retained even after power off/on

Zero settings (Tare)

1. Enter the tare mode by a short press of the **SET** button - LED **PWR** ○ white and LED **SET** ● turquoise
2. Put the connected sensor in the position where the tare function shall be executed
3. Set the tare by a long press (>2s) of the **SET** button - LED **PWR** ○ white, LED **SET** ● green
4. Leave tare mode by a short press of the **SET** button - LED **PWR** ● green, LED **SET** ○ white

The tare is always reset automatically when the device is switched off.



Setting of **Analog input**, **Teach-in** is active only when DIP switches **No. 1-5** are in the **"OFF"** position, i.o. **Setting via OM Link**



Minimum range of **Analog output** for U/I inputs signals is pre-set as unipolar, i.e. "0 V/mA" or "4 mA".
If required, it is also possible to enter a negative value of the maximum in the minimum, i.e. zero will be in the middle of the selected range.



A short press at any time during the calibration will end the calibration without saving. After one minute of inactivity, the calibration is terminated without saving and both LEDs return to the basic state.

Input

Reset of internal values	CLEAR	>	CL. TAR. CL. LEA. Tare resetting, 2-wire line resistance resetting
Sampling rate	READ. S.	>	1 2 5 10 20 50 100 Measuring rate selection
Type of measurement	TYPE	>	DC PM OHM TEMPER. LIN.POT. Measuring type selection
Measuring range	M.RANGE	>	60mV 75mV 100mV 150mV 300mV 1000mV 20V 40V 100mA Measuring range selection (Type of measurement - DC)
	M.RANGE	>	2V 5V 10V 0-5mA 0-20mA 4-20mA Measuring range selection (Type of measurement - PM)
	M.RANGE	>	100 300 1k 3k 10k 30k 100k 300k Measuring range selection (Type of measurement - OHM)
	M.RANGE	>	0-100% Measuring range selection (Type of measurement - Potentiometr)
Offset	OFFSET	>	-9999...0...999999 Setting the offset value ("0")
Temperature sensor	SENSOR	>	Pt Ni Cu NTC PTC T/C Temperature sensor selection (Type of measurement - Temperature)
Temperature sensor type	TM.TYPE	>	EU 100 EU 500 EU 1k US 100 RU 50 RU 100 Temperature sensor selection (Temperature sensor - Pt)
	TM.TYPE	>	5.0 1k 6.2 1k 5.0 10k 6.2 10k Temperature sensor selection (Temperature sensor - Ni)
	TM.TYPE	>	4.26 50 4.28 50 4.26 k1 4.28 k1 Temperature sensor selection (Temperature sensor - Cu)
	TM.TYPE	>	NTC 1 NTC 2 NTC 3 NTC 4 NTC 5 NTC 6 Temperature sensor selection (Temperature sensor - NTC)
	TM.TYPE	>	KTY81 Temperature sensor selection (Temperature sensor - PTC)
	TM.TYPE	>	B E J K L N R S T XK Temperature sensor selection (Temperature sensor - T/C)
Connection	CONN.	>	2-WIRE 3-WIRE 4-WIRE (OHM, Temperature)
	CONN.	>	TTC-IN 2TC-IN TTC-EX 2TC-EX Cold junction compensation, (Temperature - T/C) ----->
Temperature unit	T. UNIT.	>	°C °F Temperature
Cold junction compensatio	CJC	>	0...99.9 °C Temperature (T/C)
Input offset	R. ADD.	>	0...99.9 Ohm OHM, Temperature (Pt, Ni, Cu, NTC, PTC)
2-wire leads resist.compens.	LEADS.	>	YES Short circuit the cable wires on the sensor side and select „YES“ (OHM, RTD)
Setting of converted value	RNG.MIN.	>	-99999...4...999999 For the minimum of the selected input range ----->
	RNG.MAX.	>	-99999...20...999999 For the maximum of the selected input range ----->
Input setting Expert	TEACH-IN	>	T-IN.LO T-IN.HI Setting the input range in the Teach-in mode ----->
	MANUAL	>	MAN. LO MAN. HI Setting the input range in the Manual mode ----->
Digital filters	F. MODE.	>	OFF AVERAG. FL. AVG. EXPON. ROUND. Filters for math. adjust. of the input signal
Filter constant	F.CONST.	>	0...9999 Setting the constant for the filter

TTC-IN	1x T/C, internal compensation
2TC-IN	2x T/C, internal compensation
TTC-EX	1x T/C, external compensation
2TC-EX	2x T/C, external compensation
T-IN.LO	Device measures the value of the Lo signal
YES	Lo signal connection confirmed
T-IN.HI	Device measures the value of the Hi signal
YES	Hi signal connection confirmed
MAN. LO	Manual entry of Lo input signal for MIN
4.02	Entry of signal value (example: 4.02 mA)
MAN. HI	Manual entry of Hi input signal for MAX
19.97	Entry of signal value (example: 19.97 mA)

Function

Input of mathematical function	INP. M.F.	>	OFF INPUT INRFIL. Input selection for the math function
	TYPE M.F.	>	POL. IN. POL. LOGAR. EXPON. POWER. ROOT ----->
	CONST. A ... F	>	0...99 Setting constants for mathematical functions
Input of linearization table	INP. LT.	>	OFF INPUT INRFIL. Input selection for the linearization table
	N.OF.PTS.	>	5...100 Number of points in the table
	VALUES	>	-9999...99999 Values X/Y

POL.	Polynomial	$Ax^3 + Bx^2 + Cx + Dx^2 + Ex + F$
IN. POL.	Inv. polynomial	$\frac{A}{x^2} + \frac{B}{x} + \frac{C}{x^3} + \frac{D}{x^2} + \frac{E}{x} + F$
LOGAR.	Logarithmic	$A \times \ln\left(\frac{Bx + C}{Dx + E}\right) + F$
EXPON.	Exponential	$A \times e^{\left(\frac{Bx + C}{Dx + E}\right)} + F$
POWER	Power	$A \times (Bx + C)^{(Dx + E)} + F$
ROOT	Square root	$A \times \sqrt{\frac{Bx + C}{Dx + E}} + F$

Output

Analog output 1	A.O. INP.	>	INPUT INRFIL. MAT.FNC. LIN.TAB. Selection of input for analog output 1
	A.O.TYPE	>	0-20 mA 4-20 mA P.4-20 ER.4-20 0-10 V ----->
	A.O. MIN.	>	-99999...0...99999 Assigning the value of the input to the lower end of the range of AO 1
	A.O. MAX.	>	-99999...100...99999 Assigning the value of the input to the upper end of the range of AO 1
Analog output 2	A.O. INP.	>	INPUT INRFIL. MAT.FNC. LIN.TAB. Selection of input for analog output 2
	A.O.TYPE	>	0-20 mA 4-20 mA P.4-20 ER.4-20 0-10 V ----->
	A.O. MIN.	>	-99999...0...99999 Assigning the value of the input to the lower end of the range of AO 2
	A.O. MAX.	>	-99999...100...99999 Assigning the value of the input to the upper end of the range of AO 2

P.4-20	4...20 mA, passive
ER.4-20	4...20 mA, with error indication (< 3.6 mA)
P.4-20	4...20 mA, passive
ER.4-20	4...20 mA, with error indication (< 3.6 mA)

Service

Sett password	PASSW.	>	0...9999 Password to connect the device to PC. If it is set to "0", access is not blocked
Delayed Start	DLY.STR.	>	0...99 Setting the time [sec.] - when the measurement is not performed after powering the device on
Save user settings	SAV.SET.	>	YES Saves the current device settings
Load user settings	LOA.SET.	>	YES Loads the user settings into the device
Factory reset	FACT.ST.	>	YES Loads the original factory settings, restores the initial settings (BLUE TEXTS)
Erase user calibration	CLR.CAL.	>	YES Clears user calibration, restores factory calibrations (after user calibration by script via OM Link SW had been performed)
Key lock	KEY.LCK.	>	ON. OFF Disables the push button(s) on the front panel of the device
Simulation of input signal	SIM.MIN.	>	MIN -99999...0...99999 Setting the beginning of the range for simulation
	SIM.MAX.	>	MAX -99999...100...99999 Setting the end of range for simulation
	STEP	>	-99999...1...999999 Setting of increment/step value
	TIME	>	0...100...999.9 Setting the increment/step duration time [sec.]
	START	>	STOP YES Start of simulation
	STOP	>	START YES End of simulation



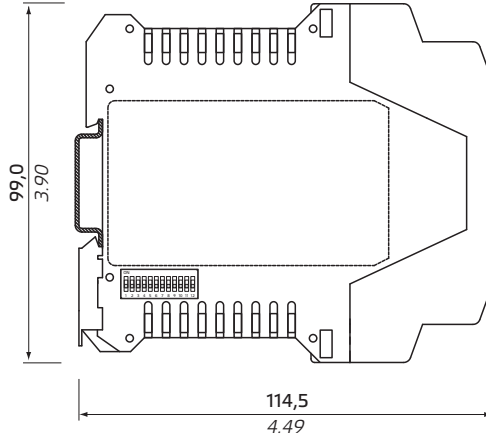
The USB connector is galvanically connected to the input!
 USB-to-USB Isolator must be used when input signal is connected to the device.
DANGER OF COMPUTER DAMAGE

5 Instrument dimensions and installation

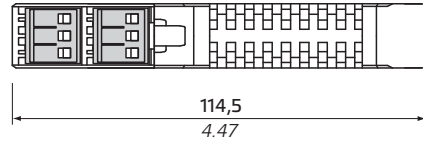
Front view



Side view



Top view



mm
inch

Installation to DIN rail of 35 mm width

6 Technical data

INPUT

No. of inputs	1			
	Rozsah je volitelný DIP přepínačem nebo programem OM Link z PC			
DC Range	±60 mV	> 10 MΩ	Input 1	
	±75 mV	> 10 MΩ	Input 1	
	±100 mV	> 10 MΩ	Input 1	
	±150 mV	> 10 MΩ	Input 1	
	±300 mV	> 10 MΩ	Input 1	
	±1000 mV	> 10 MΩ	Input 1	
	±20 V	1 MΩ	Input 2	
	±40 V	1 MΩ	Input 2	
PM Range	±5 mA	< 200 mV	Input 3	
	±20 mA	< 200 mV	Input 3	
	4...20 mA	< 200 mV	Input 3	
	±2 V	1 MΩ	Input 2	
OHM Range	0...100 / 300 Ω		Input 2	
	0...1 / 3 / 10 / 30 / 100 kΩ		Input 2	
Connection	2-, 3- and 4-wire with broken cable/sensor detection		Input 2	
	0...300 kΩ (only 2- and 4-wire)		Input 2	
Pt Range	Pt 100/500/1 000, 3 851 ppm/°C	-50°...450°C	Input 2	
	Pt 100, 3 920 ppm/°C	-50°...450°C	Input 2	
	Pt 50, 3 910 ppm/°C	-200°...1100°C	Input 2	
	Pt 100, 3 910 ppm/°C	-200°...450°C	Input 2	
Connection	2-, 3- and 4-wire with broken cable/sensor detection		Input 2	
			Input 2	
NI Range	Ni 1 000/10 000, 5 000 ppm/°C	-50°...250°C	Input 2	
	Ni 1 000/10 000, 6 180 ppm/°C	-200°...250°C	Input 2	
Connection	2-, 3- and 4-wire with broken cable/sensor detection		Input 2	
			Input 2	
Cu Range	Cu 50/100, 4 260 ppm/°C	-50°...200°C	Input 2	
	Cu 50/100, 4 280 ppm/°C	-200°...200°C	Input 2	
Connection	2-, 3- and 4-wire with broken cable/sensor detection		Input 2	
			Input 2	
NTC Range	NTC 1 2k2, B _{25/5} =3600	-40°...125°C	Input 2	
	NTC 2 2k0, B _{25/5} =3528	-40°...125°C	Input 2	
	NTC 3 10k, B _{25/5} =3435	-40°...125°C	Input 2	
	NTC 4 10k, B _{25/5} =3977	-40°...125°C	Input 2	
	NTC 5 12k, B _{25/5} =3740	-40°...125°C	Input 2	
	NTC 6 20k, B _{25/5} =4263	-40°...125°C	Input 2	
Connection	2-, 3- and 4-wire with broken cable/sensor detection		Input 2	
			Input 2	
PTC Range	KTY 81/210	-55°...150°C	Input 2	
			Input 2	
Connection	2-, 3- and 4-wire with broken cable/sensor detection		Input 2	
			Input 2	
T/C Range	J (Fe-CuNi)	-200°...900°C	Input 2	
	K (NiCr-Ni)	-200°...1 300°C	Input 2	
	T (Cu-CuNi)	-200°...400°C	Input 2	
	E (NiCr-CuNi)	-200°...690°C	Input 2	
	B (PtRh30-PtRh6)	300°...1 820°C	Input 2	
	S (PtRh10-Pt)	-50°...1 760°C	Input 2	
	R (Pt13Rh-Pt)	-50°...1 740°C	Input 2	
	N (Omega alloy)	-200°...1 300°C	Input 2	
	L (Fe-CuNi)	-200°...900°C	Input 2	
	XX (Chromel-Copel)	-200°...800°C	Input 2	
	with broken cable/sensor detection		Input 2	
	CJC		adjustable -20°...99°C or automatical	Input 2
	DU Power	1.65 VDC/3 mA, potentiometer resistance > 500 Ω		Input 2
		Input 2		

INSTRUMENT SPECIFICATIONS

TC	50 ppm/°C	
Accuracy	±0.1% of FS	
	accuracy is valid at 20 measurements/s	
Rate	1...100 measurements/s	
Latency	< 13 ms	
Overload	10x (t < 30 ms), 2x	
Compensation of conduct	< 30 Ω	RTD
Measurement accuracy CJC	±1.5°C	T/C
Functions	Teach-in, Offset, Tare, Math functions, Simulation	
Digital filters	exponential / floating / arithmetic average, rounding	
Math functions	polynomial / inverse polynomial / logarithm / exponential / power / root	
Linearization	linear interpolation in 100 points (only via OM Link)	
OM Link	company communication interface for operation, setting and update of instruments. (microUSB)	
Watch-dog	reset after 500 ms	
Calibration	at 25°C and 40 % r.h.	

ANALOG OUTPUT

No. of outputs	2
Type	isolated, configurable with a resolution of 10 000 parts, type and range are selectable in the menu
Accuracy	±0.1% of FS
TC	15 ppm/°C
Rate	response to change of value < 3.5 ms
Ranges	0...10 V resistive load > 2.6 kΩ 0...20 mA compen. < 600 Ω/12 V 4...20 mA (active/passive) compen. < 600 Ω/12 V with error indication (< 3.6 mA)
Error indication	at range 4...20 mA (ER 4-20) - A/D converter oversaturated - range exceeded by 20 % (in both directions) - broken current loop 4...20 mA (≤ 3.6 mA)

EXCITATION

Fixed voltage	24 VDC/35 mA, isolated
---------------	------------------------

POWER SUPPLY

Power	10...30 VDC/24 VAC, ±10 %, PF ≥ 0.4, I _{typ} < 40 A/1 ms, isolated Fuse inside (1500mA)
Consumption	< 2.5 W / 2.4 VA

MECHANIC PROPERTIES

Material	PA66, incombustible UL 94 V-0, blue
Dimensions	114.5 x 99.0 x 17.5 mm
Installation	to DIN rail 35 mm wide

OPERATING CONDITIONS

Connection	connector terminal blocks, section < 2.5 mm ²
Stabilization period	within 5 minutes after switch-on
Working temp.	-20°...60°C
Working humidity	< 95 % r.h., non condensing
Storage temp.	-20°...85°C
Protection	IP20
Construction	safety class I
El. safety	EN 61010-1, A2
Dielectric strength	2.5 kVAC for 1 min. between power supply and signal input 2.5 kVAC for 1 min. between signal input and outputs
Insulation resist.*	for pollution degree II, measurement cat. III power supply > 300 V (PI), 255 V (DI) Input/outputs > 300 V (PI)
EMC	EN 61326-1 (Industrial area)
RoHS	EN IEC 63000000:2018
Seismic qualification	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



ORBIT MERRET, spol. s r.o.

Vodňanská 675/30
198 00 Praha 9
Czech Republic

+420 - 281 040 200 info@orbitmerret.eu