elap

OMX 380iDU

Digital DIN rail mounted signal convertor
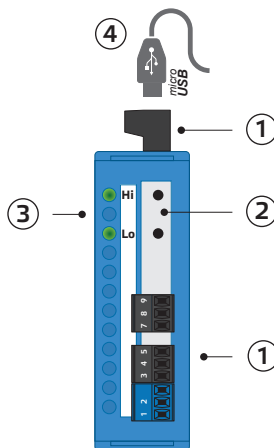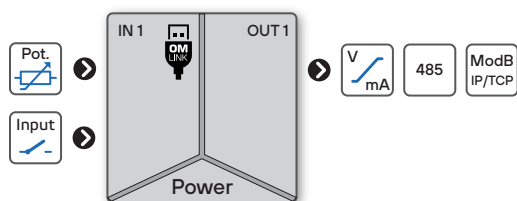
INPUT FOR POTENTIOMETERS

- Input for potentiometers
- Analog output
- Up to 7 200 measurements/s
- Quick configuration by DIP switch
- PC configurable via USB port
- Galvanic isolation 2.5 kVAC
- Simple instalation to DIN rail

OM LINK

LED Indication

Hi	Lo	Status
🟢		Device is running
✳		Device functionality is limited, powered via USB
🟡		This device has a Delayed Start option
🔴		Error: device is out of order
🟢	⚪	Tare function is activated
🟢	🔴	Error: of input (> ±110% of range) or of sensor [ERR.1, 3]
🟢	🟣	Error: AO loop open [ERR.10]
🔴	🔴	Error: setting / calibration [ERR.34-36]
✳	✳	Serious error (Safe mode) [ERR.50]
✳	✳	Button function is blocked
🟢	🟡	Simulation mode is activated

Legend

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

| ⚡ **DANGER** ⚡	⚠ **WARNING** ⚠
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.	**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.

2 Connection
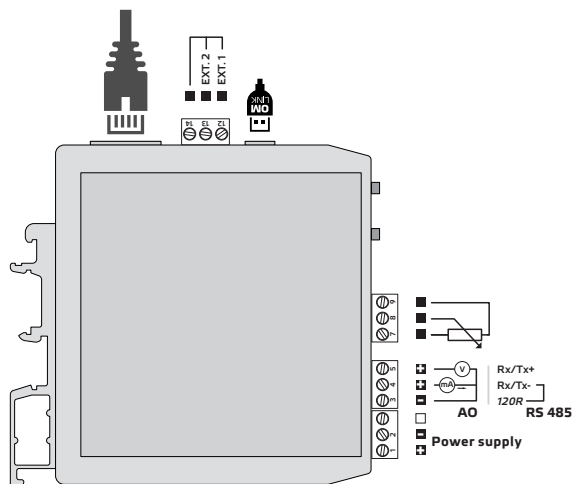
Note

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 seperated 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.
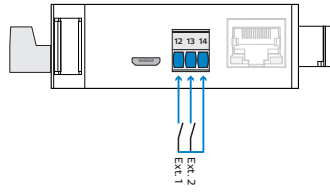
	0,05…2,5 mm² *30…12 AWG*		8 *0.32*
	Ø 3,5 mm *Ø 0.14 in*		1,5 Nm *13.2 lb-in*

Input wiring diagram
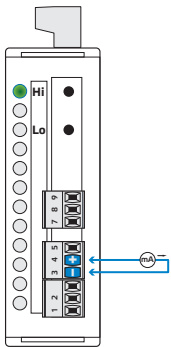
Input - Potentiometers
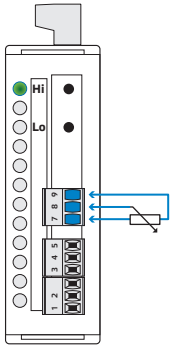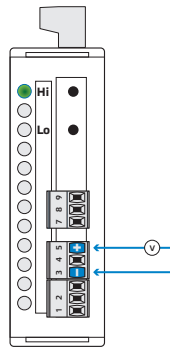
Input - External inputs

i Control of external inputs is via contact (voltage-free)

Output wiring diagram

Analog current output [mA]

Analog Voltage Output [V]

Analog output	
0…5 / 20 mA 4…20 mA	3 - 4
0…2 / 5 / 10 V ±10 V	3 - 5

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3 Device setting

DIP switch

For a quick set up you can use the DIP switch

1	2	Input
		Setting via OM Link
●		Potentiometer (default)

3	4	5	Rate [measurements/s]
			50
●			300
	●		400
●	●		400 - FFT
		●	1200
●		●	2400
	●	●	4800
●	●	●	7200 (default)

6	7	8	Output - range
			0…2 V
●			0…5 V
	●		0…10 V
●	●		±10 V
		●	0…5 mA
●		●	0…20 mA
	●	●	4…20 mA (default)
●	●	●	Er. 4…20 mA

Analog input range setting, TEACH-IN

1. by a short press of the **Lo** button enter the configuration mode - LED **Hi** ☀ yellow and LED **Lo** 🔵 turquoise
2. connect the signal of the desired value for the minimum of the range **RNG.MIN** (for example 5 mA)
3. by a long press (>2s) of the **Lo** button this value is se - LED **Hi** ☀ yellow, LED **Lo** 🟣 purple
4. connect the signal of the desired value for the maximum of the range **RNG.MAX**. (for example 19,5 mA)
5. by a long press (>2s) of the **Lo** button this value is set - LED **Hi** ☀ yellow, LED **Lo** 🟢 green
6. by a short press of the **Lo** button return to the standard working mode - LED **Hi** 🟢 green

i Setting of **Analogue input TEACH-IN** is active only when DIP switches No. 1-2 are in the "0" position, i.o. **Setting via OM Link**

Tare settings

1. by a short press of the **Hi** button enter configuration of Tare - LED **Hi** ❄ white and LED **Lo** 🔵 turquoise
2. by a long press (>2s) of the **Hi** button set the current value of Tare - LED **Hi** ❄ white, LED **Lo** 🟢 green
3. by a short press of the **Hi** button return to the standard working mode with active Tare - LED **Hi** 🟢 green, LED **Lo** ⚪ white

i 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.

i 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

4 Configuration from PC using OM Link SW

Inputs

Reset of Tare	CLEAR	›	CL.TAR.	Tare resetting
Sampling rate	READ. S.	›	50 100 400 1200 2400 4800 7200	Measuring rate selection
Measuring range	M.RANGE	›	0-100%	Measuring range selection
Preset tare	P. TARE	›	0…9999	Setting of fixed tare
Setting of converted value	RNG.MIN.	›	-99999…0…999999	For the minimum of the selected input range
	RNG.MAX.	›	-99999…100…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
External input	EXT.IN.1	›	OFF TARE CL.TAR. HOLD SAMPLE HLD.MIN HLD.MAX HLD.MM KEY.LCK.	Selection of functions controlled by external input 1
	EXT.IN.2	›	OFF TARE CL.TAR. HOLD SAMPLE HLD.MIN HLD.MAX HLD.MM KEY.LCK.	Selection of functions controlled by external input 2

T-IN.LO	Device measures the value of the Lo signal
ANO	Lo signal connection confirmed
T-IN.HI	Device measures the value of the Hi signal
ANO	Hi signal connection confirmed
MAN. LO	Manual entry of Lo input signal for MIN
4.02	Entry of signal value (example: 4.02 Ω)
MAN. HI	Manual entry of Hi input signal for MAX
997.2	Entry of signal value (example: 997.2 Ω)

Function

Mathematical function	INP. M.F.	›	OFF INPUT FILTER.	Input selection for the math function
	TYPE.M.F.	›	POLYN. IN. POL. LOGAR. EXPON. POWER SQ.ROOT	
	CONST. A … F	›	0…99	Setting constants for mathematical functions
Linearization table	INP. L.T.	›	OFF INPUT FILTER.	Input selection for the linearization table
	N.OF.PTS.	›	5…100	Number of points in the table
	VALUES	›	-9999…99999	Values of X/Y

POLYN.	Polynomial	$Ax^5 + Bx^4 + Cx^3 + Dx^2 + Ex + F$
IN. POL.	Inv. polynomial	$\dfrac{A}{x^5} + \dfrac{B}{x^4} + \dfrac{C}{x^3} + \dfrac{D}{x^2} + \dfrac{E}{x} + F$
LOGAR.	Logarithmic	$A' \ln\left(\dfrac{Bx + C}{Dx + E}\right) + F$
EXPON.	Exponential	$A \times e^{\left(\frac{Bx+C}{Dx+E}\right)} + F$
POWER	Power	$A \times (Bx + C)^{(Dx+E)} + F$
SQ.ROOT	Square root	$A \times \sqrt{\dfrac{Bx + C}{Dx + E}} + F$

Output

Analog output	INP. A.O.	›	INPUT FILTER. MAT.FNC. LIN.TAB.	Selection of input for analogue output
	A.O.TYPE	›	0-2 V 0-5 V 0-10 V ±10 V 0-5 mA 0-20 mA 4-20 mA T.4-20 ER.4-20 E.T.4-20	Selection of range for analogue output
	A.O. MIN.	›	-99999…0…99999	Assigning the value of the input to the lower end of the range of AO
	A.O. MAX.	›	-99999…100…99999	Assigning the value of the input to the upper end of the range of AO

T.4-20	with error indication (< 3.2 mA)

Service

Setting of 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
Error selection for signalling	SIG.ERR.	›	ERR 1 ERR 3 ERR 10 ERR 20 …	Errors that will be signalled on the selected output
Simulation of input signal	SIM.MIN.	›	MIN › -99999…0…99999	Setting of the start of the range for simulation
	SIM.MAX.	›	MAX › -99999…100…99999	Setting of the end of the 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	Stop of simulation

Error messages

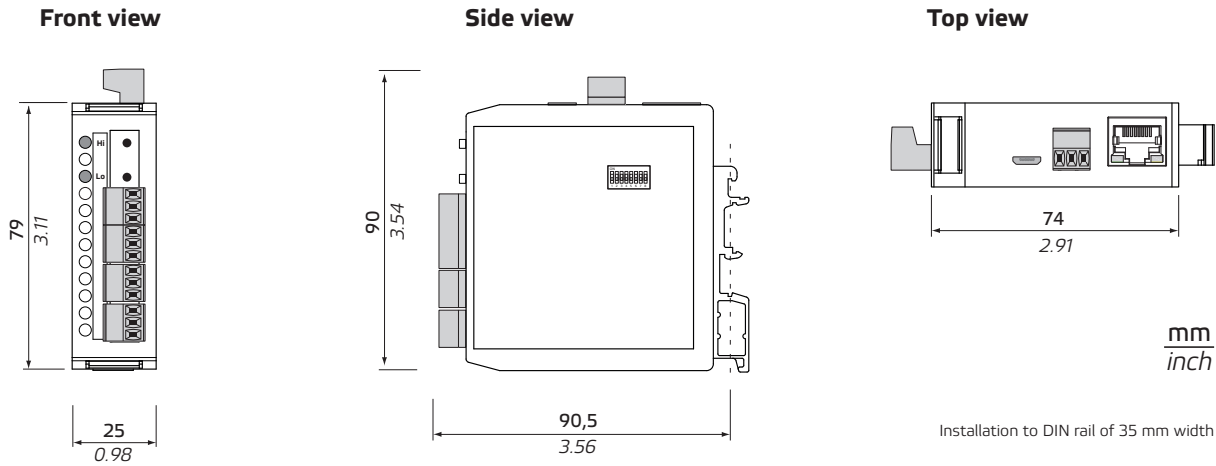| Error	Error description	Solution
ERR 1	Input range exceeded by ±10% or more.	Change input signal value or input setting (range).
ERR 3	Potentiometer wire broken.	Check sensor cable and connection.
ERR 10	Output current loop broken.	Check cable and current loop connection.
ERR 20	Math function error.	Change math function settings.
ERR 21	Linearization table error.	Change/complete the settings of the linearization table.
ERR 30	Powered only by USB, analog circuits inactive.	Connect power supply to the device (clamp 1,2).
ERR 34	Default configuration not successfully set.	Repeat device configuration. If message is shown repeatedly, send the device for repair.
ERR 35	Factory default calibration not successfully set.	When this error occurs, send the device for re-calibration or upload factory calibration data.
ERR 36	Default user calibration not successfully set.	Repeat the user calibration. If message is shown repeatedly, send the device for repair.
ERR 50	Serious device error - damaged EEPROM. The device operates in an emergency mode, i.e. settings cannot be changed. Measurement error can be up to 5%	Send the device for repair.

Errors ERR 34-50 are displayed permanently, until they are corrected.

⚠️ 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

79 / 3.11

25 / 0.98

Side view

90 / 3.54

90,5 / 3.56

Top view

74 / 2.91

mm / *inch*

Installation to DIN rail of 35 mm width

6 Technical data

INPUT

No. of inputs	1
Setting	24-bit ΔΣ ADC with PGA The range is selectable either by DIP switch or by OM Link free SW from PC
DU Power	2.5 VDC/5 mA, potentiometer resistance > 500 Ω

EXTERNAL INPUT

No. of inputs	2, on contact	
Function	OFF	No function assigned
	TARE	Activation of Tare
	CL.TAR.	Reset of Tare
	HOLD	Measurement paused
	SAMPLE	Take a one-off measurement
	HLD.MIN	Value of minimum *
	HLD.MAX	Value of maximum *
	HLD.M-M	Value of MAX-MIN*
	KEY.LCK.	Device buttons blocked

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

INSTRUMENT SPECIFICATION

TC	15 ppm/ºC
Accuracy	±0.01% of FS
Rate	100…7 200 measurements/s *speed of 400 meas./s is with FFT signal filtering*
Latency	< 580 µs
Overload	10x (t < 30 ms), 2x
Functions	Teach-in, Tare, Math. functions, Simulation
Digital filters	exponential / floating / arithmetic average, rouding
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 25ºC and 40 % r.h.

ANALOG OUTPUT

No. of outputs	1	
Type	isolated, adjustable with 16-bit DAC, output type and range is selectable	
TC	15 ppm/ºC	
Non-linearity	0.024 % of FS	
Accuracy	±0.02% of FS	
	±0.03% of FS	0…5 V
	±0.05% of FS	0…2 V / 0…5 mA
Rate	response to change of value < 160 µs	
Output singals	0…2 / 5 / 10 V, ±10 V, resistive load ≥ 1 kΩ 0…5 / 20 mA /4…20 mA, comp. < 600 Ω /12 V Indication of broken current loop Indication of error message (output < 3.2 mA)	

POWER SUPPLY

Power	10…30 VDC/24 VAC, ±10 %, 2.5 VA, PF ≥ 0.4, I_{STP}< 40 A/1 ms, isolated *Fuse inside (T500mA)*

MECHANIC PROPERTIES

Material	PA66, incombustible UL 94 V-0, green
Dimensions	25 x 79 x 90.5 mm (w x h x d)
Installation	to DIN rail 35 mm wide

OPERATING CONDITIONS

Connection	connector terminal blocks, section < 1.5 mm²
Stabilization period	within 5 minutes after switch-on
Working temp.	-20º…60ºC
Storage temp.	-20º…85ºC
Working humidity	< 95 % r.h., non condensing
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 resistance*	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 63000 : 2018
Seismic qualification	IEC/IEEE 60980-344 Edition 1.0, 2020, par. 6, 9
Mechanical resistance	EN 60068-2-6 ed. 2:2008

* PI - Primary insulation, DI - Double insulation

Measuring instruments of the OMX 380/DU series conform to the European regulation 2014/30/EU, 2014/35/EU and 2011/65/EU, 2015/863/EU.

This product must be installed, connected and used in compliance with prevailing standards and/or installation regulations.
As standards, specifications and designs develop from time to time, always ask for confirmation of the information given in this publication.