

# Produkt-Datenblatt

## Technische Daten, Spezifikationen

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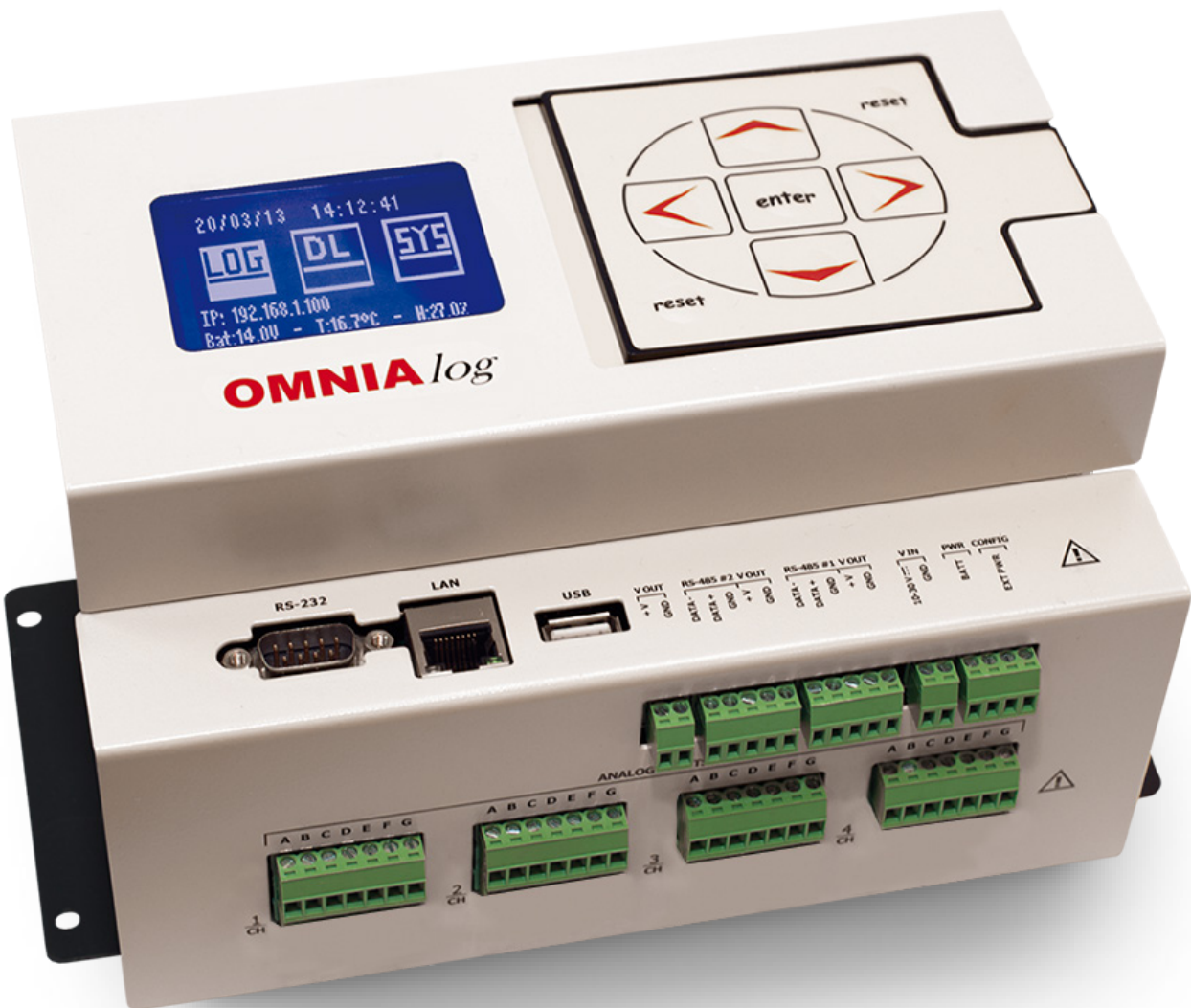
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# OMNIALOG datalogger

NI-48XX



# OMNIALOG datalogger

## APPLICATIONS



INDUSTRY MONITORING



HVAC MONITORING



LOGISTIC MONITORING



OIL & GAS MONITORING



WATER QUALITY MONITORING



ENERGY MONITORING



BUILDING MONITORING



## OMNIALog

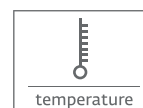
Technology skills of Next Industries plus 25 years of expertise in geotechnical instruments of Sisgeo srl have produced OMNIALog – a versatile, high accurate “smart” data acquisition system - with 4/8 analog inputs and expandable up to 384 analog channels.

With OMNIALog no other configuration/analysis software package is needed as it is provided with web server on board; just a browser and it is ready to use. Logged data is ready to be showed in graphic “real time” mode or exported in CSV file.

### Features

- 2 GB internal memory and real time data
- Available GPRS version
- 0,01% F.S. Accuracy
- 4/8 differential analog channels
- Expandable up to 384 channels
- Ethernet, RS485, RS232 and USB connections
- Available Measures: mV, mA, mV/V, PT100, NTC
- Thermocouples

### Available Measure



## Specifications

### CPU AND MEMORY

Processor	ARM Cortex-M3 MCU with 1 MB Flash, 120 MHz CPU, ART Accelerator, Ethernet
RAM Memory	1 Mbyte RAM with backup
Mass storage	SD CARD 2 GB for data (about 5Mega data points) and WEB pages
Clock accuracy	High precision RTC (real time clock with battery back-up) self compensated in temperature (3ppm @ 25°C, 10ppm @ -30..70°C)
On-board sensors	Temperature and humidity (accuracy $\pm 1\%$ ), measured inside the datalogger

### INPUT

Analog differential inputs	<p>Cod. NI480 MAVT: 4/8 differential, individually configured. Channel expansion provided by multiplexers.</p> <p>Cod. NI4866 MAVT: 4/8 differential, individually configured. 6 Digital input 6 digital output. Thermocouple reading. Channel expansion provided by multiplexers.</p>
Digital inputs	<p>Cod. NI480 MAVT: Two opto-isolated digital inputs (BACK PANEL) Max Input Voltage: 24V (Max Current: 10mA) Min Input Voltage: 5V (Max Current: 2mA)</p> <p>Cod. NI4866 MAVT: Two opto-isolated digital inputs (BACK PANEL) Six opto-isolated digital inputs (FRONT PANEL) Max Input Voltage: 24V (Max Current: 10mA) Min Input Voltage: 5V (Max Current: 2mA)</p>

### INTERFACES

Display & Keyboard	Backlight graphic LCD 128x64 dpi with membrane keyboard for the minimal local management without the PC. Keyboard for start a uniscan, sequential display of the last memorized readings for each channel (sensor ID, converted unit reading, UM), device status, data download and FW/web pages update by USB pen drive, safe mode (back-up/format/restore internal SD card)
LAN ethernet isolated	10/100 Mbps, RJ45
RS232	9-pin, DE9: DCE port for GSM/GPRS modem connection Baud Rates: selectable from 9600 bps to 115.2 kbps Default Format: 8 data bits; 1 stop bits; no parity
USB	USB 2.0 pen drive only (FAT 32), 5 V 200 mA
RS485#1 opto-isolated	5 screw clamp: DCE port for max. No.253 digital Modbus sensors Communication interface: RS485 Communication protocol: MODBUS RTU The voltage 'V OUT' is switched on and off under program control. V OUT is the unregulated input power supply 'V IN' (1 A) Power supply management (always on or energy safe)
RS485#2 opto-isolated	5 screw clamp: DCE port for max. 16 multiplexer boards connection. Communication interface: RS485 Communication protocol: MODBUS RTU The voltage 'V OUT' is switched on and off under program control. V OUT is the unregulated input power supply 'V IN' (1 A) Every channel of each multiplexer board is completely independent.

ANALOG MEASUREMENTS

Measurement rate (MR)	<p><b>MAXIMUM SPEED</b>                  Init. analog: 1.70 sec*                  Instrument warm-up: depending on sensor configuration                  Measurement: 80mS* Accuracy: 0.13% FS</p> <p><b>STANDARD SPEED</b>                  Init. analog: 7.10 sec                  Instrument warm-up: depending on sensor configuration                  Measurement: 1.57 sec Accuracy : 0.01% FS</p> <p>*Note: Times referred to measures with scale <math>\pm 10V</math></p>
Type of measurements	mA, mV, V, mV/V, °C
ADC	24-bit (22 true bit) differential Analog-to-Digital Converters, 5SPS, 0-24 Average Function, auto-calibration and auto-range
Range and power supply	<p><b>Cod. NI480 MAVT</b>                  Current loop (2 wires): range 0÷25 mA Power supply:external                  Transmitter (3-4 wires): range 0÷25mA Power supply:external                  Voltage (4 wires): range <math>\pm 10mV, \pm 100mV, \pm 1V, \pm 10V</math> Power supply:external                  Servo inclinometer: range <math>\pm 5V</math> Power supply:external                  Wheatstone bridge (6 wires, with sensing): range <math>\pm 10mV/V</math> Power supply:external                  Maximum bridge resistance: 10 k<math>\Omega</math>, minimum bridge resistance: 200 <math>\Omega</math> Power supply:external</p> <p><b>Cod. NI4866 MAVT:</b>                  Current loop (2 wires): range 0÷25 mA Power supply:24/10VDC,external                  Transmitter (3-4 wires): range 0÷25mA Power supply:24/10VDC,external                  Voltage (4 wires): range <math>\pm 10mV, \pm 100mV, \pm 1V, \pm 10V</math> Power supply:24/20/10/5VDC,external                  Servo inclinometer: range <math>\pm 5V</math> Power supply: <math>\pm 12VDC</math>(dual),external                  Wheatstone bridge (6 wires, with sensing): range <math>\pm 10mV/V</math> Power supply:10/5VDC,external(max 10VDC)                  Maximum bridge resistance: 10 k<math>\Omega</math>, minimum bridge resistance: 200 <math>\Omega</math> Power supply:10/5VDC,external(max 10VDC)                  Platinum RTD (Pt100): range -50°C to +150°C Power supply:1.2mA</p> <p><b>Thermocouple (NI-480 , NI-4866):</b>                  Termocouple R: range -50°C to 1768°C Accuracy: <math>\pm 2.10^\circ C</math>                  Termocouple T: range -200°C to 400°C Accuracy: <math>\pm 0.42^\circ C</math>                  Termocouple J: range -200°C to 1200°C Accuracy: <math>\pm 0.62^\circ C</math>                  Termocouple B: range 250°C to 1820°C Accuracy: <math>\pm 2.44^\circ C</math>                  Termocouple E: range -200°C to 1000°C Accuracy: <math>\pm 0.78^\circ C</math>                  Termocouple K: range -200°C to 1372°C Accuracy: <math>\pm 0.87^\circ C</math>                  Termocouple N: range -200°C to 1300°C Accuracy: <math>\pm 0.87^\circ C</math>                  Termocouple S: range -50°C to 1768°C Accuracy: <math>\pm 2.81^\circ C</math></p>
Cold junction Compensation Accuracy	$\pm 0.25^\circ C$ * With stable temperature conditions. Tested in climatic chamber. Model NI4866
Reading resolution	1 $\mu A$ at FS 20 mA - 1 $\mu V$ at FS $\pm 10$ mV - 10 $\mu V$ at FS $\pm 100$ mV - 100 $\mu V$ at FS $\pm 1$ V - 1 mV at FS $\pm 10$ V 0.1 °C for Pt100 - 0.1 °C for NTC - 0.1 Hz at FS 6000 Hz - 0.001 mV/V at FS $\pm 10$ mV/V
Measurement accuracy	0.01% mV/mA FS (0.1% FS for Pt100 and NTC) - with Standard Measurement 0.1% mV/mA FS (0.1% FS for Pt100 and NTC) - with Standard Measurement
Temperature drift	< 10 ppm / °C, range -30°C to +70°C

Input noise voltage	5,42 $\mu$ Vpp
Input limits	$\pm$ 12V
Sustained input voltage w/o damage	$\pm$ 50V DC max
DC common mode rejection	>105dB
Normal mode rejection	>90dB
Input impedance	20 G $\Omega$ typical
<b>SWITCHED OUTPUT POWER SUPPLY</b>	
	The voltage 'V OUT' is switched on and off under program control. V OUT is the unregulated input power supply 'V IN' (2 A)
<b>OUTPUT</b>	
Digital output	<p>Cod. NI480 MAVT: One relay output (for alarm, etc.): volt-free closure (low voltage 30V, 2A)</p> <p>Cod. NI4866 MAVT: Back panel: One relay output (for alarm, etc.): volt-free closure (low voltage 30V, 2A) Front panel: Six relay outputs (general purpose):volt-free closure (low voltage 30V,2A)</p>
<b>DIGITAL INPUTS</b>	
Measurement rate (MR)	Max frequency 1kHz ( NI-480 model )
Accuracy	0.1 Hz
<b>PROTECTIONS</b>	
	<p>Electro-mechanical relays for each measuring channel: Electrical endurance: min. 2x10<sup>5</sup> operations (1A 30V DC resistive) Mechanical endurance: 100x10<sup>5</sup> operations.</p> <p>Circuit protection: Gas Discharge Tubes: DC Breakdown Voltage( @100v/s ) 90; tolerance of DCBV <math>\pm</math> 20%; impulse Breakdown Voltage ( @100v/<math>\mu</math>s ) 250. impulse Breakdown Voltage ( @1kv/<math>\mu</math>s ) 500.</p> <p>Overvoltage and reverse polarity protection.</p> <p>Short circuit protection on every outputs.</p>
<b>SYSTEM POWER REQUIREMENTS</b>	
Voltage (external power supply)	10 to 30 V DC (reverse polarity protected), max 5 A
External rechargeable batteries	12V DC nominal
Internal non-rechargeable batteries (no external power supply)	2 batteries size D, chemistry Lithium Thionyl Chloride spiral (Li/SOCl <sub>2</sub> ), nominal voltage 3.6 V, min 2 A continous current, min 4 A pulse capability, low self discharge (<1% per year)
Autonomy with internal batteries	1 year with 1 acquisition every 3 hours with No.8 4-20 mA (current loop) instruments @ 25 °C, datalogger in "timed mode"(display off, ethernet off, no remote communication device)
Typical current drain (@12Vdc, external power supply)	<p>Sleep mode: 100 <math>\mu</math>A</p> <p>ON: 62 mA - ON with ethernet connected: 87 mA - ON with display ON: 115 mA</p> <p>ON with display ON and ethernet connected: 142 mA</p> <p>Analog initialisation: 115 mA</p> <p>Measurement: 123 mA (with 12 mA @ 24 V sensor consumption)</p>
Typical current drain	<p>Sleep mode: 100<math>\mu</math>A</p> <p>On (with ethernet disabled and display off): 15 mA</p> <p>Analog initialisation: 105 mA</p> <p>Measurement: 110 mA (with 12 mA @ 24 V sensor consumption)</p>

ENVIROMENTAL CONDITIONS

Operating temperature	-30 to +70°C (display -20 to +70°C)
Storage temperature	-40 to +85°C (display -30 to +80°C)
Humidity	80%
Overvoltage category	II
Pollution degree	2
Sound levels	< 74dBA
Maximum height of use	3000m

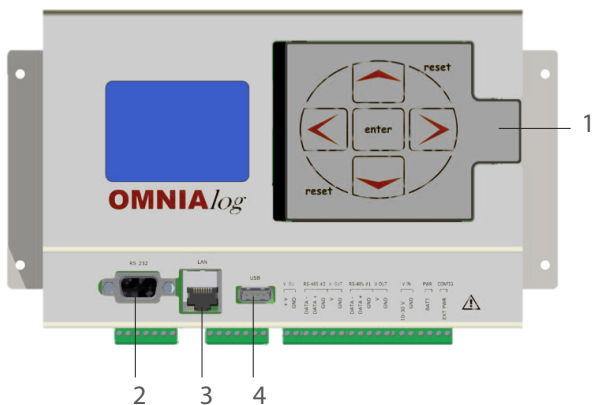
SOFTWARE & FIRMWARE

Web server on board (independent OS platform).  
 Live update (firmware and web pages).  
 FTP client to sent data/alarms on a FTP server (SFTP not supported)  
 MAIL to sent data/alarms to max 5 email address (SMTPS / SSL not supported)  
 SMS to sent alarms to max 5 telephone numbers  
 Data download (readings, logs) in .csv file (compatible with Microsoft Excel)  
 Virtual channels management  
 Languages: Italian, English and French

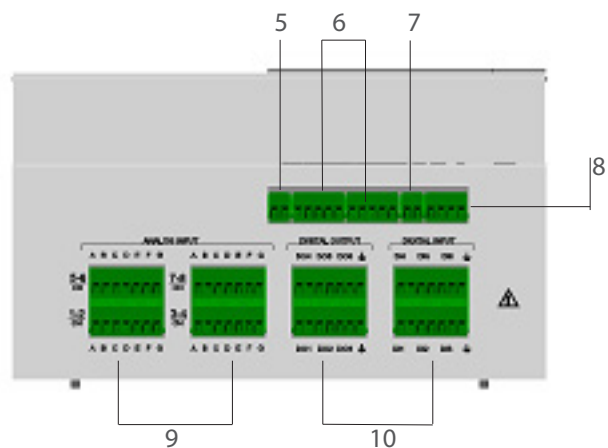
PHYSICAL CHARACTERISTICS

Weight	980 grams
Dimensions (L x W x H)	231 x 138 x 117 mm
Material	Plastic and metal
Wiring	Removable connector

TOP VIEW



FRONT VIEW



- 1 Batteries box
- 2 RS-232
- 3 LAN
- 4 USB
- 5 "V" OUT
- 6 RS-485

- 7 "V" IN
- 8 PWR input
- 9 Analogical inputs
- 10 Digital Input/Output \*

\*There are no digital channels in NI-480 model