

SENSORS CONDITIONING

RS485 Modbus RTU, 4÷20 mA outputs

MSB-Modbus Sensor box



- ▶ N.1 high-resolution input (18 bit) for Pyranometer/reference cell (μV , mV) or 0÷1V. Configurable pyranometer sensitivity value
- ▶ N.2 Pt100 inputs (3-wire) with 0,5°C accuracy
- ▶ N.1 included internal Pt100 temperature sensor as alternative to external sensor
- ▶ N.1 pulse/frequency input for LSI LASTEM wind speed sensors (DNA202.1-30x)
- ▶ N.1 input RS232 for Storm Front Distance sensor (DQA601.1)
- ▶ RS485 (2-wire) Modbus RTU® port with galvanic insulation
- ▶ Output: instant value and current statistical values (min/avg/ max, tot.) for every channel over programmable time base
- ▶ 9÷30 Vdc Power Supply
- ▶ N.1 RS232 port on board for configuration using Terminal Emulation program
- ▶ IP66 protection grade

Sensor conditioning unit to convert (Volt, Pt100 e Hz) signals into RS485 over RTU Modbus protocol. It can receive signals from different sensors on the market as: solar irradiance sensor, also pyranometers (configurable sensitivity value), temperature sensors (Pt100), wind speed sensor (Hz) and Storm distance sensor.

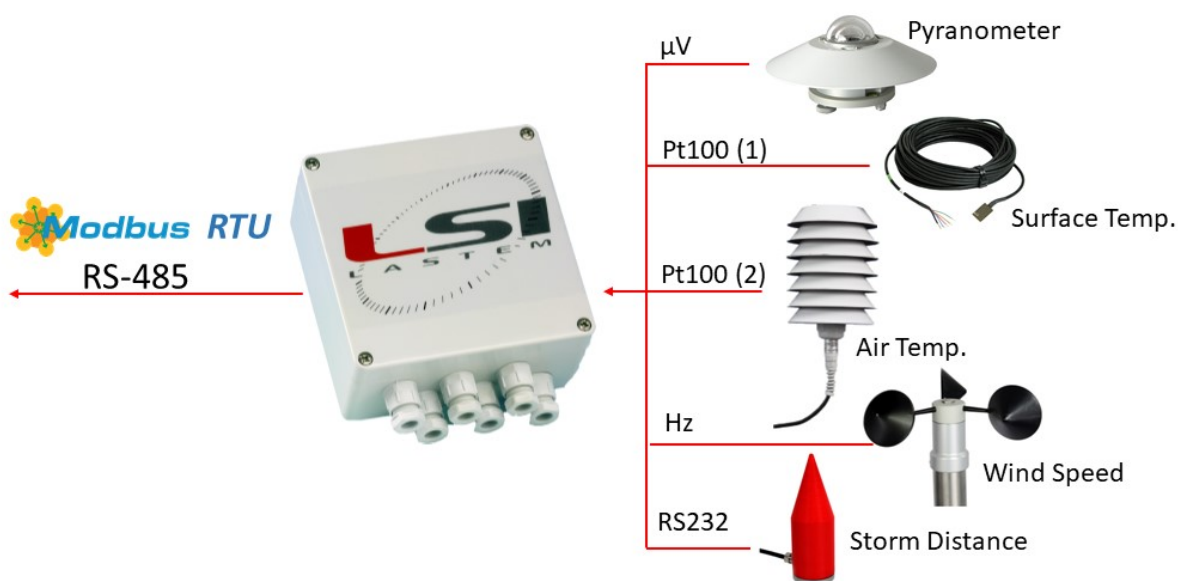
Technical Specifications

PN	MDMMA1010.1	
Input 1	Type	Voltage
	Ranges	0÷30 mV, 0÷1000 mV selectable by switch
	Resolution (@25°C)	< $\pm 0,5 \mu\text{V}$ (range 0÷30 mV) < $\pm 20 \mu\text{V}$ (range 0÷1000 mV)
	Accuracy (@25°C)	< $\pm 5 \mu\text{V}$ (range 0÷30 mV) < $130 \mu\text{V}$ (range 0÷1000 mV)
Input 2 & 3	Type	RTD Pt100 3-wires
	Range	-20÷100°C
	Resolution	~ 0,04°C
	Accuracy (@25°C)	< $\pm 0,1^\circ\text{C}$
	Thermal drift	0,1°C/10°C
	Line resistance error	0,06°C/ Ω
Input 4	Sensor type	Wind speed (DNA202.1, DNA30x)
	Range	0÷10 kHz
	Input signal	0÷3 V (supported 0÷5 V)
	Photodiode power	3,3 V (limited to 6 mA)
	Resolution	1 Hz
	Accuray	$\pm 0,5\%$ reading
	User's adjustment	Using polynomial function (3th°)



MSB-Modbus Sensor Box

Input 5	Sensor type	Storm front distance (DQA601.1)
	Range	1 ÷ 40 km, N.15 steps: 1, 5, 6, 8, 10, 12, 14, 17, 20,
	Configurations	• Strikes number for true measurement • Strikes absence time for reset • Sensitivity
Output	Type	2-wires RS485
	Protocols	Modbus RTU®
	Programmable output	• Instant values • Current values (Average, Maximum, Minimum, Total) over programmable time rate: 1÷3600 s
	Protection	Galvanic insulation (3 kV, according to UL1577)
	Connection	Screw terminals
Configuration	Program	Hyper Terminal emulation program
	Input	9-pin RS232 on board (DTE/DCE cable, not
Power supply	Input voltage	9÷30 Vcc, free polarity
	Consumption	250 mW
Sampling rate	Sampling rate (input 1, 2, 3, 4)	1 Hz
EMC Protections	Type	Transzorb, EMI filters
Environmental limit	Operative temperature	- 30÷70°C
	Protection	IP66



► MSB unit can be used as converter between a range of signals into Modbus RS485. It finds great application in PV plants, where the sensors list is suitable for the assessment of the plant performances (Performance ratio).



SENSORS CONDITIONING RS485 Modbus RTU, 4÷20 mA output STB-Sensor Transducer Box



- ▶ N.1 high resolution input (18 bit) for Pyranometer/reference cell (μV , mV). Configurable sensitivity value
- ▶ DEA421: N.2 Voltage inputs ($0\div 1\text{ V}$)
- ▶ DEA420.1: N.2 Pt100 inputs (3-wire)
- ▶ DEA420.2: N.1 Pt100 inputs (3-wire) N.1 Thermocouple T type input
- ▶ N.1 pulse/frequency input
- ▶ N.1 Pt100 internal temperature sensor as alternative to external sensor
- ▶ Screw terminal connections
- ▶ Output as instant values or current statistical values for every parameter over programmable time base
- ▶ $9\div 30\text{ Vdc}$ or $85\div 264\text{ Vac}$ (DEA421) Power Supply
- ▶ IP66 protection grade
- ▶ N.1 RS232 port for setup using Terminal Emulation program

Four inputs signal conditioning unit to convert Voltage, Pt100, Thermocouples and Frequency signals into $4\div 20\text{ mA}$. It can receive signals from different sensors on the market as: solar irradiance sensor, also pyranometers (configurable sensitivity value), temperature sensors (Pt100 and thermocouples) and wind speed sensor (Hz).

The DEA421 model, thanks to the internal power supply, has two $0\div 1\text{ V}$ inputs to power external 12V sensors.

Technical Specifications

PN		DEA420.1	DEA420.2	DEA421
				
Input 1	Type	RTD Pt100 3 wires		Voltage
	Measurement range	$-20\div 100^{\circ}\text{C}$		$0\div 1\text{ V}$
	Resolution	$\sim 0,04^{\circ}\text{C}$		$< 0,3\text{ mV}$
	Accuracy	$< \pm 0,2^{\circ}\text{C}$		$< \pm 0,7\text{ mV}$
	Thermal Drift	$0,05^{\circ}\text{C}/10^{\circ}\text{C}$		NA
	Line resistance error	$0,06^{\circ}\text{C}/\Omega$		NA
Input 2	Type	RTD Pt100 3 wires	Termocouple T	Voltage
	Measurement range	$-20\div 100^{\circ}\text{C}$	$-20\div 100^{\circ}\text{C}$	$0\div 1\text{ V}$
	Resolution	$\sim 0,04^{\circ}\text{C}$	$\sim 0,04^{\circ}\text{C}$	$< 0,3\text{ mV}$
	Accuracy	$< \pm 0,2^{\circ}\text{C}$	$< \pm 0,3^{\circ}\text{C}$ (+ cold joint: $\pm 0,3^{\circ}\text{C}$)	$< \pm 0,7\text{ mV}$
	Thermal Drift	$0,05^{\circ}\text{C}/10^{\circ}\text{C}$	$0,1^{\circ}\text{C}/10^{\circ}\text{C}$	NA
	Line resistance error	$0,06^{\circ}\text{C}/\Omega$		NA



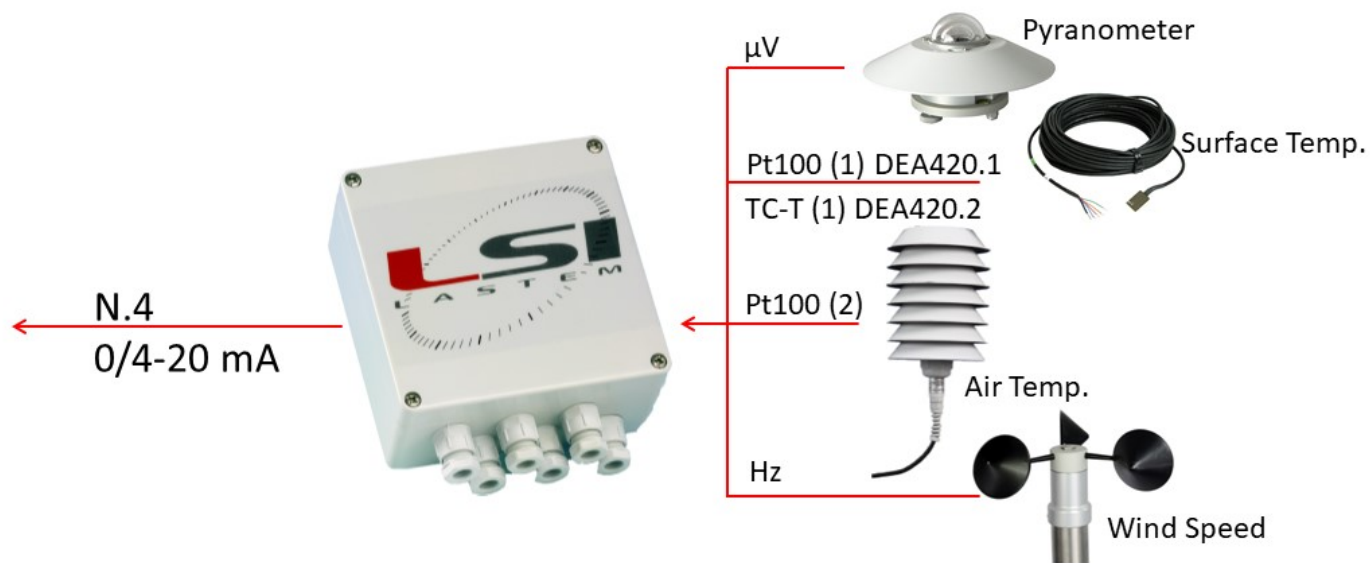
PN		DEA420.1	DEA420.2	DEA421
Input 3	Type	Frequency		
	Sensor	DNA202.1-30x wind sensor		
	Measurement range	0÷10 kHz		
	Signal input	0÷3 V (supports 0÷5 V)		
	Photodiode power supply	3,3 V (6 mA)		
	Resolution	1 Hz		
	Accuracy	± 0.5% reading		
	User's calibration	Using polynomial function (3th°)		
Input 4	Type	Voltage		
	Sensor	Pyranometer $\mu\text{V}/\text{W}/\text{m}^2$ output		
	Measurement range	0÷30 mV		
	Resolution (@25°C)	8 μV		
	Accuracy (@25°C)	< ±20 μV		
	Thermal Drift	1 W/m^2 (radiation) / 10°C		

Common Technical Specifications

Output	Type	N.4 x 4÷20 mA (Max load 500 Ω 24 V; 300 Ω 12 V)	
	Resolution	< 6 μA	
	Accuracy	±15 μA	
	Programmable output	Instant, max., min., ave. (1÷3600 sec)	
	Connection	Screw terminals	
Configuration	Program	Using Hyper Terminal emulation program	
	Input	9-pin RS232 on board (DTE/DCE cable not included)	
Instrument power supply	Input voltage	9÷30 Vcc	85÷264 Vca
	Power		30 W
	Consumption	< 0.4 W	
Power supply for external devices (only DEA421)	Power supply	-	13,8 V
	Max output current	-	2 A
EMC Protections	Type	Transzorb, EMI filters Short circuit, Overtensions, Overcurrents	
Data acquisition	Sampling rate	1 s	
Environmental limit	Operative temperature and Humidity	-30÷70°C ; 20÷90%	
	Protection grade	IP66	IP65



STB-Sensor Transducer Box



► STB unit can be used as converter between a range of signals into 0/4÷20 mA.
It finds great application in PV plants, where the sensors list is suitable for the assessment of the plant performances.

