



Read the user manual carefully before using the device! Responsibility for any damage, loss or accidents to persons arising from failure to comply with the warnings in the user manual belongs to the user. In case of malfunctions in this case, the device will be out of warranty.

ESTC-P

RS-485 Signal-Temperature Converter

- Current input: 0...20mA, 4...20mA,
- Voltage input: 0...150mV, 0...5V, 1...5V, 0...10V,
- Thermocouple input: E, J, K, L, N, R, S, T, U,
- PT100 (EN 60751) resistance thermometer input,
- Readout and configuration over Modbus RTU (RS-485),
- 3-way isolation: input, communication, power supply,
- Rail-mountable enclosure,
- CE certified according to EN standards.



Order Code

ESTC-P

Technical Specifications

Electrical Specifications

Supply Voltage	24VDC (±5%)
Power Consumption	Maximum 6W
Measurement Accuracy	± 0.5% (full scale)
Isolation	1.5 kVrms between input, communication and power supply
Wiring	1.5mm ² terminal
Line Resistance	Max 100Ω for thermocouple, max 20Ω for PT100
Input Impedance	100Ω for current inputs, 100kΩ for voltage inputs
Data Retention	FLASH memory (min 20 years)
EMC	EN 61326-1: 2021 (Performance criterion B for EN 61000-4-3 standard is met)
Safety Requirements	EN 61010-1: 2010 (Pollution degree 2, overvoltage category II)

Environmental Specifications

Ambient/Storage Temperature	0 ...+50°C/-25 ...+70°C (without icing)
Relative Humidity	Up to 31°C 80%, then linearly decreasing to 50% at 40°C.
Protection Rating	IP20 according to EN 60529
Operational Height	Max. 2000m



KEEP AWAY device from exposed to corrosive, volatile and flammable gasses or liquids

Inputs

Input Type		Scale Range		Accuracy
Current	-	0 ...20mA	4 ...20mA	± 0.5% (full scale)
Millivolt	-	0 ...150mV	-	± 0.5% (full scale)
Voltage	-	0 ...5V, 1 ...5V	0 ...10V	± 0.5% (full scale)
PT100 Resistance thermometer	EN 60751	-200 ...600°C	-328 ...1112°F	± 0.5% (full scale)
E (NiCr-CuNi) Thermocouple	EN 60584	0 ...1000°C	32 ...1832°F	± 0.5% (full scale)
J (Fe-CuNi) Thermocouple	EN 60584	0 ...600°C	32 ...1112°F	± 0.5% (full scale)
K (NiCr-Ni) Thermocouple	EN 60584	0 ...1300°C	32 ...2372°F	± 0.5% (full scale)
L (Fe-CuNi) Thermocouple	DIN 43710	0 ...600°C	32 ...1112°F	± 0.5% (full scale)
N (NiCrSi-NiSi) Thermocouple	EN 60584	0 ...1300°C	32 ...2372°F	± 0.5% (full scale)
R (Pt13Rh-Pt) Thermocouple	EN 60584	0 ...1700°C	32 ...3092°F	± 0.5% (full scale)
S (Pt10Rh-Pt) Thermocouple	EN 60584	0 ...1700°C	32 ...3092°F	± 0.5% (full scale)
T (Cu-CuNi) Thermocouple	EN 60584	0 ...400°C	32 ...752°F	± 0.5% (full scale)
U (Cu-CuNi) Thermocouple	DIN 43710	0 ...600°C	32 ...1112°F	± 0.5% (full scale)

Communication

Interface	RS-485, isolated
Protocol	Modbus RTU (slave)
Baud Rate	2400 - 57600 bps, default 9600 bps
Slave Address	1 - 247, default 1

Housing

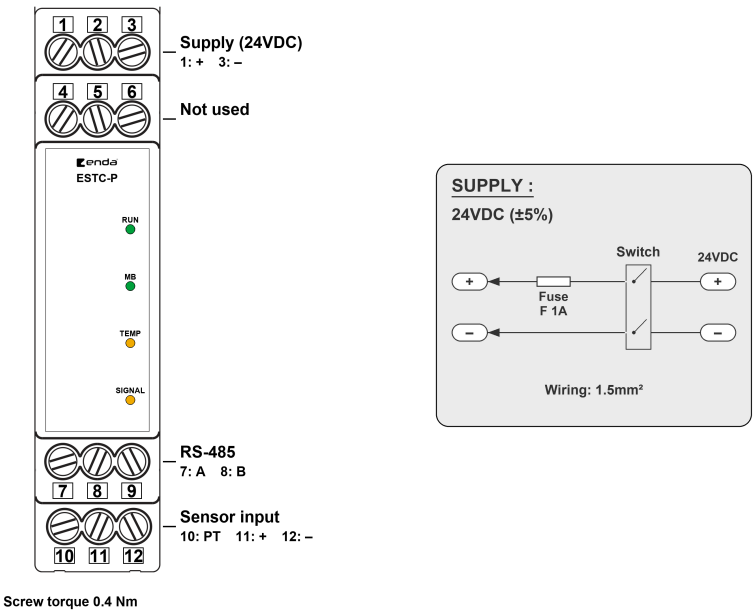
Mounting Style	Mountable on rail (according to DIN 43 700)
Dimensions	W18.5xH90xD66mm
Weight	Approx. 120g (with packaging)
Housing Material	Self-extinguishing plastics used

 **The device should not be cleaned with solvent-containing or abrasive cleaning agents (thinner, gasoline, acid, etc.).**

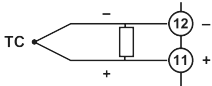
Connection Diagram



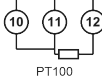
ENDA ESTC-P is a rail-mountable device. The device must be used in accordance with the instructions. Installation and electrical connections must be carried out by technical personnel in accordance with the instructions in the user manual. Care should be taken to ensure that there is no electricity during installation. The device must be protected from moisture, vibration, and pollution. Attention should be paid to the operating temperature. Installation cables should not pass near high power lines and other devices.



Sensor Inputs



• **E, J, K, L, N, R, S, T, U type thermocouple**
Use the correct compensation cable. Do not splice. Connect the thermocouple cables to terminals 11 (+) and 12 (-), paying attention to the + and - signs.

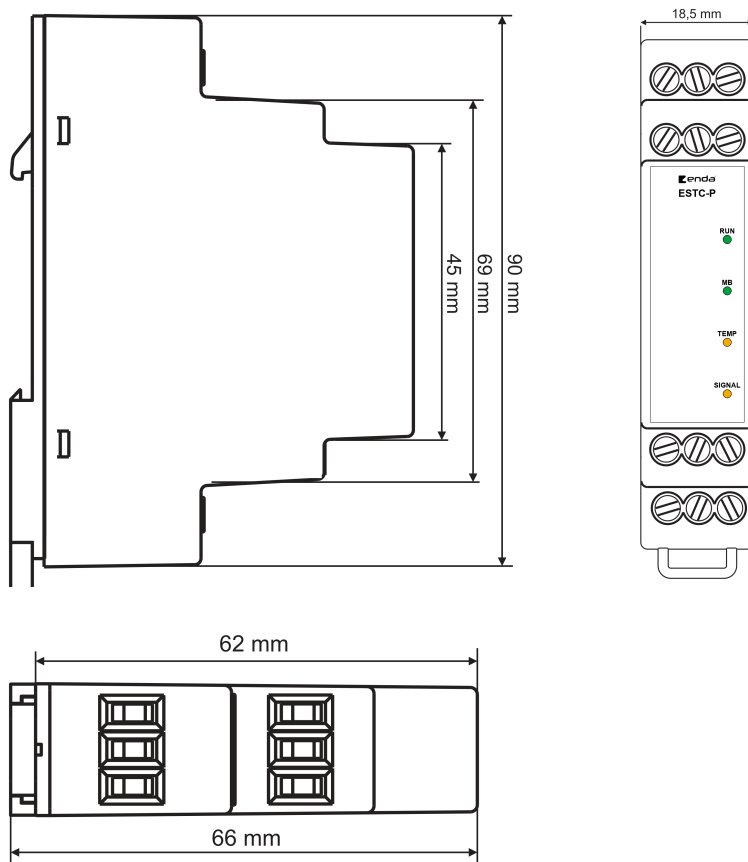


• **For resistance thermometers:**
Connect the PT100 sensor between terminals 11 and 12. When using a 2-wire PT100, short-circuit terminals 10 and 11.

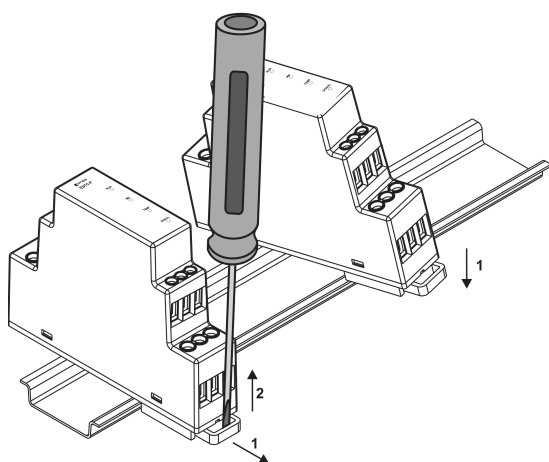
mA / mV / V

• **For signal inputs:**
Connect the signal to terminals 11 (+) and 12 (-). The input type is selected over Modbus.

Dimensions and Montage



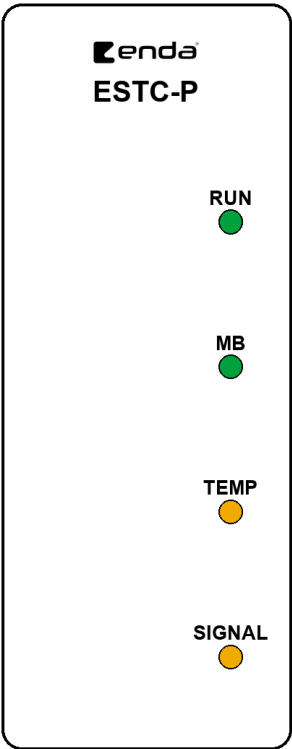
The dimensions are in millimeters.



Mounting: push the device onto the rail in direction 1 so that the rail latch grips the rail.

Removal: push the rail latch with a screwdriver in direction 1 and pull the device in direction 2.

LED Definitions



The device has no potentiometers; the input type and the communication settings are configured by writing the holding registers over Modbus RTU (see the Modbus section).

LEDs	
RUN	Steady on while the device is running. Flashes an error code during error conditions (see the Error LED Definitions table).
MB	Flashes during Modbus communication.
TEMP	Lights up when the selected input type is a temperature input (PT100 or thermocouple).
SIGNAL	Lights up when the selected input type is a signal input (mA, mV or V).

Error Leds Definitions	
RUN LED 960ms 960ms	Calibration error
RUN LED 60ms 120ms 60ms 120ms 60ms 120ms 60ms 1320ms	Sensor disconnected / measurement circuit error



NOTE: When an error occurs, the RUN LED flashes periodically. For example, in the case of a calibration error, the LED in the first graph lights up for 960 ms, turns off for 960 ms, and the cycle repeats with a period of 1920 ms. When the error is resolved the LED returns to steady on.

Modbus RTU Communication

Factory Defaults

Slave Address	1
Baud Rate	9600 bps
Parity	None (8N1), selectable with H6
Terminals	7: RS-485 A, 8: RS-485 B

Input Type Selection		
H0	H1	Input type
0	0	0 ...20mA
0	1	4 ...20mA
0	2	0 ...150mV
0	3	0 ...5V
0	4	1 ...5V
0	5	0 ...10V
1	0	PT100 (2-wire)
2	0	E type thermocouple
2	1	J type thermocouple
2	2	K type thermocouple
2	3	L type thermocouple
2	4	N type thermocouple
2	5	R type thermocouple
2	6	S type thermocouple
2	7	T type thermocouple
2	8	U type thermocouple

Communication Settings and Readout

H4	Slave address (1-247, factory default 1)
H5	Baud rate (1: 2400 ... 6: 57600 bps, factory default 3 = 9600 bps)
H6	Parity (0: none, 1: even, 2: odd; factory default 0)
H3	Decimal places of the measured value (0-3)
C0	Temperature unit (0: °C, 1: °F)
I0	Measured value (mA / mV / V for signal inputs, °C or °F for temperature inputs)
I1	Ambient (cold-junction) temperature
D0 / D1	Probe disconnected / probe short-circuit status (1 = fault)

Example: reading a temperature with a K type thermocouple

1	Connect the thermocouple to terminals 11 (+) and 12 (-).
2	Write H0 = 2 (thermocouple), H1 = 2 (type K); the TEMP LED lights up.
3	Write C0 = 0 (°C), H3 = 1 (one decimal place).
4	Read I0: a value of 1234 means 123.4 °C. I1 gives the ambient temperature in the same format.
5	For a 4 ... 20mA signal write H0 = 0, H1 = 1; the SIGNAL LED lights up and I0 reads mA (1200 = 12.00 mA with H3 = 2).



The input type is selected by writing the H0 and H1 registers together (table above). The measured value is read from I0. The full register list follows in the next section.

ESTC-P RS-485 Signal-Temperature Converter Modbus Map**Holding Registers**

Param	Register Addresses		Data Type	Description	Permission	Default
	Decimal	Hex				
H0	0	0x0000	word	Input type family. The sub-type is selected with H1. 0: Voltage / current (mV, V, mA) 1: PT100 resistance thermometer 2: Thermocouple	Readable Writable	0
H1	1	0x0001	word	Input sub-type (0-8). Its meaning depends on H0; set together with H0 according to the Input Type Selection table.	Readable Writable	0
H2	2	0x0002	word	Digital filter coefficient (Can be adjusted between 0 - 255. If 0, the digital filter is disabled.)	Readable Writable	20

Param	Register Addresses		Data Type	Description	Permission	Default
	Decimal	Hex				
H3	3	0x0003	word	Number of decimal places of the measured value 0: 0 no decimal 1: 0.0 single decimal 2: 0.00 double decimal 3: 0.000 triple decimal	Readable Writable	1
H4	4	0x0004	word	Modbus slave device address (Can be adjusted between 1-247.)	Readable Writable	1
H5	5	0x0005	word	Modbus communication speed 0: OFF 1: 2400 bps 2: 4800 bps 3: 9600 bps 4: 19200 bps 5: 38400 bps 6: 57600 bps	Readable Writable	3
H6	6	0x0006	word	Modbus serial frame parity 0: None (8N1) 1: Even (8E1) 2: Odd (8O1)	Readable Writable	0

Coils

Param	Register Addresses		Data Type	Description	Permission	Default
	Decimal	Hex				
C0	0	0x0000	bit	Measurement unit for the temperature inputs (PT100, TC) 0: Centigrade 1: Fahrenheit	Readable Writable	0
C1	1	0x0001	bit	Restoring factory settings 0: 1: The factory settings are loaded.	Readable Writable	0

Input Registers

Param	Register Addresses		Data Type	Description	Permission	Default
	Decimal	Hex				
I0	0	0x0000	word	Measured value for the selected input type (mA / mV / V for signal inputs, °C or °F for temperature inputs)	Readable	0
I1	1	0x0001	word	Internal (cold-junction) temperature. Follows the temperature-unit (C0) selection.	Readable	0

Discrete Inputs

Param	Register Addresses		Data Type	Description	Permission	Default
	Decimal	Hex				
D0	0	0x0000	bit	Probe disconnected alarm status (0 = No error , 1 = Probe disconnected)	Readable	0
D1	1	0x0001	bit	Probe short-circuit alarm status (0 = No error , 1 = Short circuit)	Readable	0