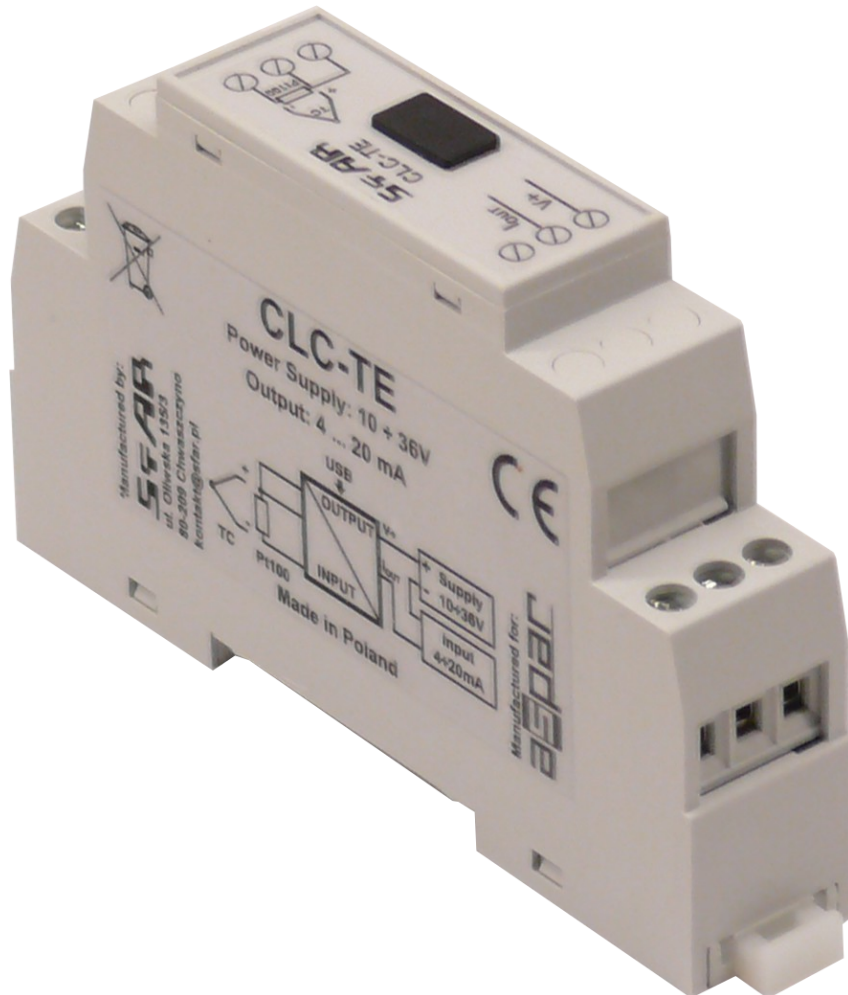# CLC-TE

Configurable temperature converter with 4 … 20mA output

Version 1.0 — 15/02/2013   **User Manual**

Manufactured for

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Thank you for choosing our product.

This manual will help you with proper support and proper operation of the device.

The information contained in this manual have been prepared with utmost care by our professionals and serve as a description of the product without incurring any liability for the purposes of commercial law.

This information does not release you from the obligation of own judgement and verification.

We reserve the right to change product specifications without notice.

Please read the instructions carefully and follow the recommendations contained therein.

WARNING!

Failure to follow instructions can result in equipment damage or impede the use of the hardware or software.

1. Safety rules

- Before first use, refer to this manual

- Before first use, make sure that all cables are connected properly

- Please ensure proper working conditions, according to the device specifications (eg: supply voltage, temperature, maximum power consumption)

- Before making any modifications to wiring connections, turn off the power supply

2. General description

CLC series converters has one measurement input which is linearised based on processing array. Measurement after processing with scale selected by user is converted to passive output current 4-20mA (CLC-TE) or active output current (CLC-TE-G with galvanic isolation, request additional power supply).

Among the supported input types of sensors are Pt100, Pt500, Pt1000, Ni100, KTY81-110, resistance from 0 to 8kΩ and thermocouples J, K, T, N, S, R, B.

The manufacturer provides the following versions of the devices:

- CLC-TE – without isolation (powered from current loop)

- CLC-TE-G – with galvanic isolation (request additional power supply)

Configuring the sensor type, temperature range and output currents is done by using the supplied software communicates with the device via USB.

3. Technical Specifications

|		
Power Supply		10 … **24** … 36V DC
Supply / output current (CLC-TE)		3 … 21mA
Supply current (CLC-TE-G)		30 … 52mA
Output current (CLC-TE-G)		0 … 22mA
Load resistance (max)		(Power Supply Voltage – 10V) / 21mA [Ω]
No of inputs		1
Input Type		Universal (RTD and thermocouple)
Measurement current		~250µA
Measurement error (RTD sensor) (25°C)		± 0,2°C
Measurement error (thermocouple sensor) (25°C)		± 2°C
Response time		100ms
Temperature stability		± 0,01% processing range / °C
Work temperature (RTD sensor)		-20 °C - +50°C
Work temperature (thermocouple sensor)		0 °C - +50°C
Storage temperature		-40 °C - +85°C
Relative humidity		0 – 90% (no condensation)
Supply / output connector		3 pins
Input connector		3 pins
Configuration connector		miniUSB
Size	**Height**	90 mm
	Length	56 mm
	Width	17 mm
Ingress protection		IP20
Electromagnetic compatibility (EMC) according to standards		PE-EN 55022:2011 PE-EN 55024:2011 PE-EN 61000-6-1:2004 PE-EN 61000-6-2:2004 PE-EN 61000-6-3:2004 PE-EN 61000-6-4:2004

4. Dimensions of the product

Look and dimensions of the module are shown below. The module is mounted directly to the rail in the DIN industry standard.
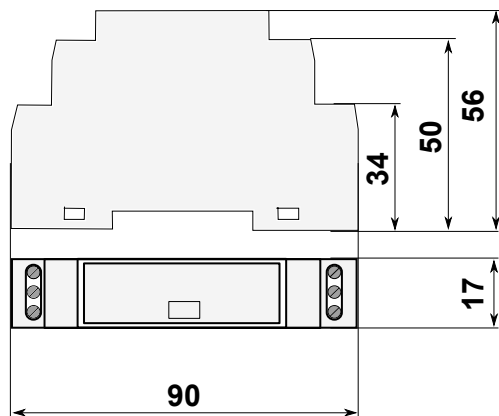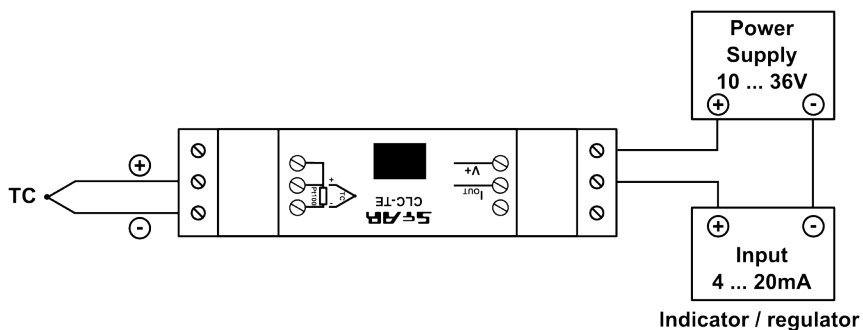

5. How to connect the device

5.1. CLC-TE-G connecting RTD sensor, external power supply
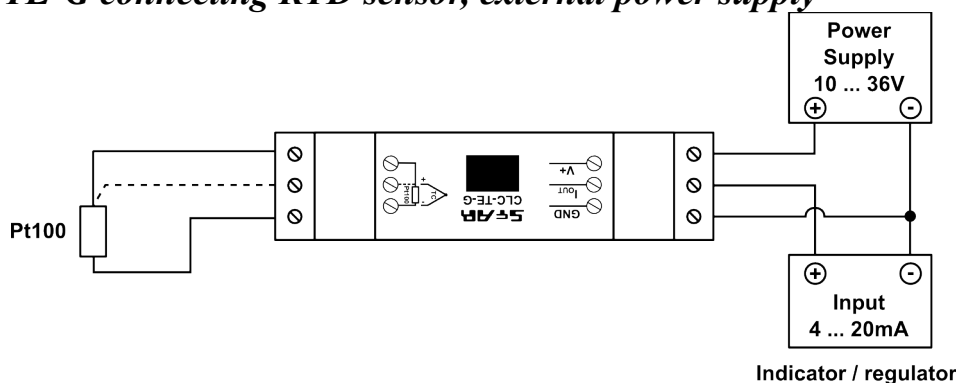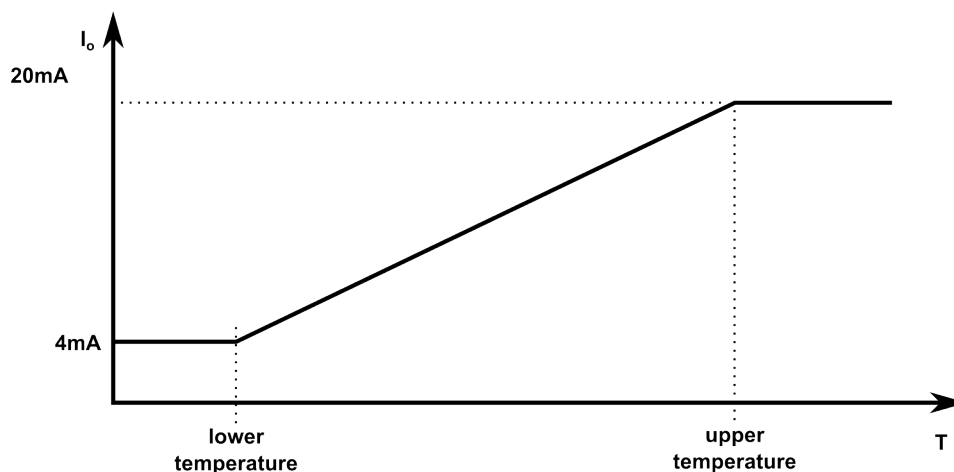

5.2. CLC-TE connecting thermocouple sensor, powered from current loop

6. Signalling of errors

6.1. Overrange

Exceeding the device range sets the output current in one of the selected by user values (eg. 4 and 20 mA), depending on which side of the range has been exceeded.

6.2. No sensor or short measuring inputs

In the absence of the sensor output current reaches value defined by configuration eg. 21 mA.

In the case of short-circuit measurement input in module configured to use with RTD sensors, output current reaches a value defined by user eg. 3mA

7. Converter settings

Converter configuration is done using a dedicated application (downloadable for free from the manufacturer website) via the USB port.

Device when connected to a computer via the USB cable is detected automatically and the correct actions are not needed any additional drivers.

After the device has been detected by the program in the status bar will display information about connected devices with converter's firmware version.

User has access to to configure the following parameters:

- **Input Mode** – drop-down list with all types of supported sensors. When you select "Off / Manual" you can manually enter the current output (useful for testing purposes)
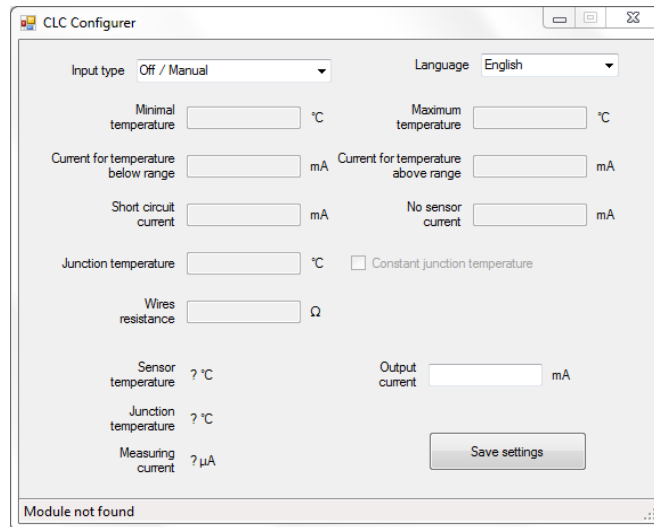
- **Minimum and maximum temperature** – define the upper and lower range of processed temperature

- **Currents for a temperature below and above the range** – determine the current value after exceeding a defined temperature range.

- **Short-circuit and open (no sensor) measuring inputs current** – the currents in the errors state. If the sensor type is selected in any of the thermocouples, the short-circuit current parameter does not matter (if short-circuit the output current is proportional to the temperature sensor connector).

- **Junctions temperature and constant junction temperature** – in the case of thermocouple sensors, it is possible to define a constant junction temperature. If the box is not checked, the temperature is calculated automatically.

- **Conductor resistance (offset)** - in the case of RTD sensors connected by two wire it is possible to determine the resistance of lead wires

- **Output current** – the output current. Possible to edit in case you select a type of position sensor to Manual.

Read-only fields:

- **Sensor Temperature** – Displays current temperature read from the sensor

- **Junction temperature** – measuring junction temperature

- **Measuring current** – value of measuring current used to read RTD sensors

Table of content

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