MS-4…20mA Converter Quick Start Guide

Thank you for using EKO products.

Reading this QSG is recommended before installation of the product. This sheet provides the basic instructions for setup.

If any questions should remain, please feel free to contact:

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Warranty and liability

EKO Instruments guarantees that the product delivered has been tested to ensure that it meets its published specifications. The warranty included in the conditions of delivery is valid only if the product has been installed and used according to the instructions provided in the QSG.

- Gain 4 - 20mA / 0- 1600 W/m^2
- Updating time 1 second
- Supply voltage 12 … 24 VDC
- Internal consumption 0.025...0.8 W
- Dimensions (L=100 x W=65 x H=35mm)
- Cable glands (cable ø 3 – 6mm)

1. Introduction

The MS-4…20mA Converter is a digital signal conditioner to convert a Voltage input signal into a 4...20mA current output signal. By using the converter the 4-20mA output cable can be easily extended over long distances without signal loss or interference of the sensor signal. In industrial environments the converter can be used to reduce potential EMI. Cable between sensor and converter should be kept short (<50 cm) and grounded to the box.

Voltage output (Us)

Voltage output can be created by putting a shunt resistor in series with the current loop. The voltage measured across the resistor will be linear in the range 4 … 20 mA.

Example:
a) In case of a 50 Ohm resistor is used, the voltage across the shunt resistor will be 200 mV to 1V.
b) In case of a 500 Ohm resistor is used, the voltage across the shunt resistor will be 2V to 10V.

2. Electrical connection
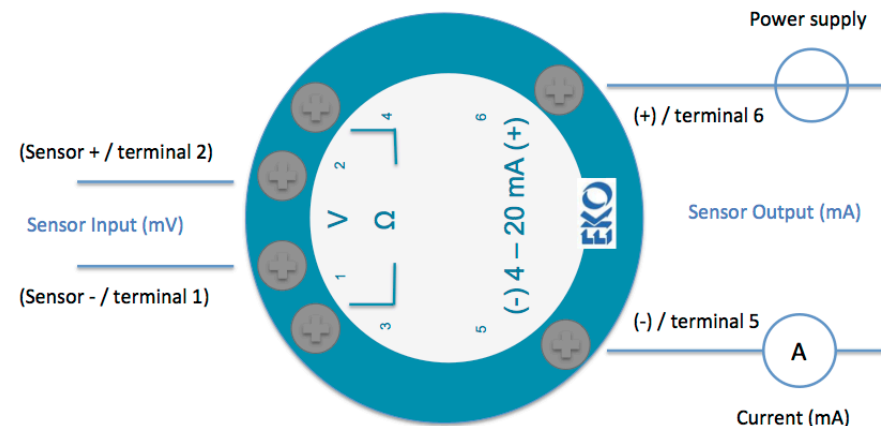
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3. Installation

(Converter input) Open the enclosure of MS-4...20mA converter by releasing the 4 top screws. Guide the sensor cable through the cable gland and secure the cable gland to seal the cable.

Connect the sensor terminals to the input terminal of the 4...20mA converter as shown in the picture below or wiring diagram shown below. For EKO pyranometers the Red terminal is connected to the (+ terminal 2) and the Blue terminal to the (- terminal 1) of the converter input. The cable shield must be connected to the aluminium housing by using the copper screw attached.

Note: In industrial environments to reduce potential EMI effects the cable between sensor and converter should be kept short (<1m).

(Converter output) Make sure that the power supply or current loop measurement device is switched off during installation of the sensor output cable. Guide the 2 wire output cable through the cable gland and secure the cable gland to seal the cable. Connect the two wires to the output terminals of the converter (Voltage to + terminal 6 and return wire to – terminal 5) and mount the cable shield to the aluminum housing by using the copper screws.

Mount the cover onto the enclosure and secure it with the 4 screws firmly. The MS-4...20mA converter is now ready to be used. For proper operation one should apply a supply voltage in the range as specified. The minimum required supply voltage is min. 7,2V which is needed to feed the internal electronics. In case of longer cables the voltage loss must be compensated in order to get 7,2V across the converter junctions.

4. Conversion factor

Note: The sensor sensitivity figure is preset corresponding to the sensitivity figure of the Solar Sensor serial number provided with the 4-20mA converter.

Note: The 4-20mA converter can't be used in combination with another Solar sensor having a different sensitivity factor, unless the sensitivity settings of the 4-20mA converter will be changed accordingly.

Conversion

$$4 - 20mA = 0 - 1600 \ W/m^2$$

To convert the mA output signal into the measurement unit [W/m^2] the following formula has to be used:

$$I = (Iout - 4mA) \times 100$$

I	= Irradiance	[W/m^2]
Iout	= Measured current	[mA]

Example

Iout   = 11 mA (measured current)

The irradiance I is 700 W/m^2