

DOSi 13TC-TK... Solar radiation intensity sensor



Summary

DOSi 13TC-TK.. sensors are electronic outdoor sensors of solar radiation intensity and temperature for photovoltaic power plants. The output signal is 0...10V DC or communication interface RS485 with Modbus RTU.

Application

- Photovoltaic plants – monitoring of solar radiation intensity and panel temperature

Function

The sensor contains monocrystalline solar element. Its short-circuit current is proportional to solar radiation intensity. Thanks to positive factor of the short-circuit current the measuring error is small. All TC.. sensors contain embedded temperature sensor which reduces the measuring error significantly. The signal is electronically processed and converted to 0...10 V output or brought to RS485 bus with Modbus RTU protocol.

Each sensor is calibrated against a reference element of the same type. This reference cell is periodically calibrated against an element which is calibrated in Fraunhofer institute ISE in Freiburg.

The connection cable length is 3 m. Extended cables are available on request. Wire colours see below.

Technical data

Power	12 ... 28 V DC
Consumption	800 mW
Solar radiation measuring range	0...1300 W/m ² corresponds to 0...10 V
Solar radiation measuring error with temperature compensation compared with a pyranometer in range of -40...85 °C	5% (from scale of range)
Cell temperature measuring range	-40...90 °C, $U_{out} = 2,268V + T[°C]*86,9mV/°C$
Ambient temperature measuring range	-40...85 °C
Temperature measuring error	+/- 1.5 °C
Temperature non-linearity	+/- 0.5 °C

Ambient temperature	-40...85 °C
Protection	IP65
Cable	3 m length, UV resistant
Cover	aluminium
Weight	360 g
Dimensions	154 x 80 x 38 mm

Sensor types

Type	Measured values	Interface
DOSi 13TC-TK	radiation, panel temperature	0...10 V, 0...10 V
DOSi 13TC-TKM	radiation, panel temperature	Modbus RTU / RS485
DOSi 13TC-TKM2	radiation, panel temperature, outside temperature	Modbus RTU / RS485

Wire colours

DOSi 13TC-TK

Power (+)	red
Power (-), signal ground	black (thin)
Output 0...10 V radiation	orange
Output 0...10 V temperature	brown
Shield	black (thick)

DOSi 13TC-TKM

Power (+)	red
Power (-), signal ground	black (thin)
RS485 A (+)	brown
RS485 B (-)	orange
Shield	black (thick)

Modbus communication

To set up the Modbus address and other parameters, use the configuration software at <http://www.imt-solar.com/products/solar-irradiance-sensor/si-sensor.html>.

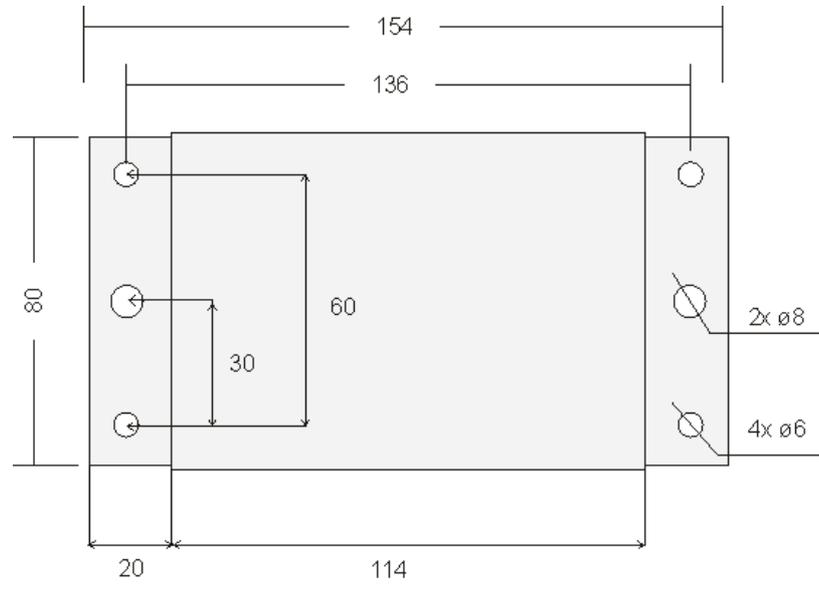
- connect the sensor to a PC through a RS485 converter (e.g. M080)
- run the configuration program
- set the correct COM port in the software
- power on the sensor
- the software should report „Sensor connected“
- set the new parameters.

Default values: 9600 Bd, 8, N, 1, address 1.

Function 04: Read input register

Register	Value	Range
0000	Radiation intensity in 0.1 W/m ²	0...14000 for 0...1400 W/m ²
0001	Cell temperature in 0.1 °C (offset -25 °C)	0...1000 for -25...75 °C
0002	External temperature in 0.1 °C (offset -25 °C) (only for DOSi 13 TC-TKM2)	0...1000 for -25...75 °C
0003	Reserved	
0004	Reserved	
0005	Cell temperature in 0.1 °C (offset -100 °C)	600...1900 for -40...90 °C
0006	External temperature in 0.1 °C (offset -25 °C) (only for DOSi 13 TC-TKM2)	600...1850 for -40...85 °C

Dimensions



Dimensions are in *mm*.

Release notes

Version 02/2015 – Changes in measuring ranges, modbus table and web pages for downloading software.