Bio Instruments S.R.L.

SENSORS AND SYSTEMS
FOR MONITORING GROWING PLANTS

LT-IRM
Leaf Temperature Infrared Sensor Quick Start Guide

www.phyto-sensor.com

Series 5000

Introduction

The LT-IR infrared temperature sensor offers intelligence in a rugged, easy-to-use package. Every sensor is individually tested and calibrated within the measurement range.

The LT-IR probe comes a holder, and a weatherproof box with electronics, which combines signal conditioner.

Installation

Install LT-IR as close as practical to view target foliage to be measured. Use the sensors's holder to mount the LT-IR.

Please note that the LT-IR have 5:1 field of view. Holding the thermometer 5 meters from the target will result in a 1 meter diameter spot size (measurement area) on the target. Holding the thermometer 10 meters from the target will result in a measurement area of 2 meters, and so on.

Keep the sunlight at back of the sensor.

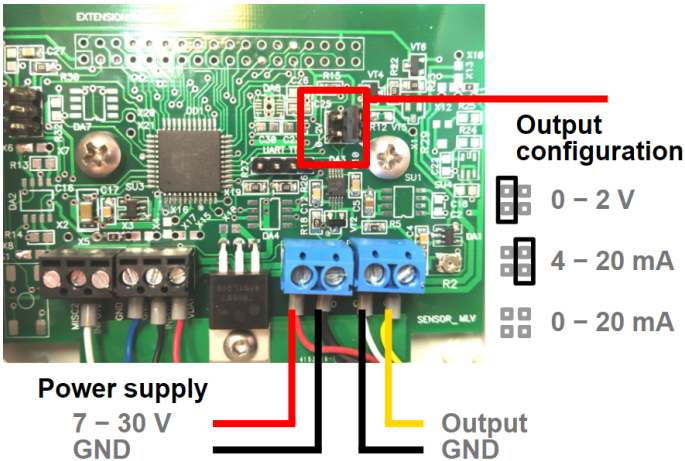
Remember that when you shine at an angle, the beam being cast will be oval, (similar to a flashlight beam) just something to bear in mind.

Hold the sensor so that the beam will not see the sky or soil, the confounding variables.

Connection

Please use a four-core cable with 3 to 6 mm outer diameter.

The connection diagram is shown in the picture below (modification of the output is determined by appropriate jumper position):



First, please choose a right output cable for connecting the sensor to a datalogger. The cable must be round with four wires. The maximal diameter of the cable is 6.5 mm. The cable length shall not exceed 10 m for 0 to 2 Vdc output (model LT-xM) and with about 1 km maximal length for 4 to 20 mA or 0 to 20 mA output (model LT-xMi).

Power supply

The 7 to 30 Vdc @ 10 mA (+20 mA for current output) regulated power supply may be used.

In case of using the intermittent power supply, please respect the following recommendations: When using analog outputs, all possible measures for reducing instrumental errors shall be undertaken:

- Screened cables.
- Cables with low impedance.
- Filtration of the signal with low cutoff frequency.
- Digital filtration of the signal.

Calibration equations

0 to 2 Vdc Output

$$T = 30 \times U$$

4 to 20 mA Output

$$T = 3.75 \times I - 15$$

0 to 20 mA Output

$$T = 3 \times I$$

where:
T — measured temperature, °C
U — output voltage, V
I — output current, mA

Calibration table

U, Volts	I, mA 4 to 20	I, mA 0 to 20	T, °C
0.0	4.0	0.0	0.0
0.2	5.6	2.0	5.0
0.4	7.2	4.0	12.0
0.6	8.8	6.0	18.0
0.8	10.4	8.0	24.0
1.0	12.0	10.0	30.0
1.2	13.6	12.0	36.0
1.4	15.2	14.0	42.0
1.6	16.8	16.0	48.0
1.8	18.4	18.0	54.0
2.0	20.0	20.0	60.0

Specifications

Measurement range	0 to 60°C
Field of view	5:1
Emissivity setting	0.9
Spectral response	5.5 to 14 µm
Outputs	0 to 2 Vdc 4 to 20 mA, 0 to 20 mA
Absolute accuracy	±1.0°C
Repeatability	±0.1°C
Output auto update time	5 s
Excitation time	500 ms
Supply voltage	7 to 30 Vdc
Current consumption	< 10 mA (+20 mA for current output)
Sensor's weight (approximate)	320 g
Sensors's dimensions (w/holder)	140 × 90 × 150 mm
Protection index	IP64

Customer Support

If you ever need assistance with your sensor, or if you just have questions or feedback, please e-mail at support@phyto-sensor.com. Please include as part of your message your name, address, phone, and fax number along with a description of your problem.

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