



## Bio Instruments S.R.L.

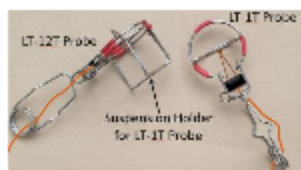
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This is to inform you that Bio Instruments S.R.L. have launched two new leaf temperature sensors in 2023.

### LT-12T Leaf Temperature Sensor

The LT-12T sensor is a modification of our standard LT-1T Leaf Temperature Sensor. A new remarkable feature of the LT-12T is a lightweight openwork holder for suspension of another standard LT-1T probe at a certain distance below the LT-1T probe. When installed on a plant leaf, the LT-12 probe measures the leaf temperature, and the LT-1T probe, which is suspended below, measures the air temperature outside the boundary layer near the measurement point on the leaf. That realizes a remarkable possibility to measure correctly the temperature difference between the leaf and air in a close vicinity.

The outline of the new LT-12T sensor is illustrated in the pictures below.



LT-12T and LT-1T Probes



The coupled LT-12T and LT-1T Probes



The coupled probes on a leaf

In fact, the LT-12T Sensor can measure leaf temperature as accurately as the LT-1T Sensor. And, when coupled with another LT-1T sensor, both can be used to measure either the leaf-air temperature difference or the temperature of two leaves.

The LT-12 Leaf temperature Sensor is supplied with the miniature in-cable signal conditioner. The user may choose one of the following interfaces when ordering:

Model	Interface
LT-12T-V1	Output: 0 to 2 Vdc; Power supply range: 2.8 to 12 Vdc
LT-12T-V2	Output: 0 to 2 Vdc; Power supply range: 5 to 16 Vdc
LT-12T-SDI12	SDI-12, Power supply range: 5 to 24 Vdc
LT-12T-485M	RS-485 with built-in Modbus RTU protocol; Power range: 5 to 24 Vdc.

The common features for all models:

- Thermistor's head size: about 1 mm.
- Cable length between the probe and the signal conditioner: 0.5 m
- Cable length after the signal conditioner: 3.5 m. The total standard cable length is 4 m. For an appropriate fee, the cable may be extended up to a maximum length specified for every interface at customer's request.
- Excitation time: 0.15 s.
- Output auto-update time: 5 s.
- Protection index: IP64.
- Probe weight: < 2 g.

## LT-2T Leaf Temperature Sensor.

This is the sensor, which includes both the LT-1T probe and the LT-12T probe in connection with a single signal conditioner. Therefore, one may use this sensor for measuring either the temperature of two leaves or the leaf-air temperature difference of a single leaf. The combined LT-2T sensor is cheaper than two separate LT-1T and LT-12T sensors, but may have a digital interface only. The sensor transmits date, time and three measured values: temperature of every probe and the difference between those temperatures.



Specifications are shown in the table below:

Model	Interface
LT-2T-SDI12	SDI-12
LT-2T-485M	RS-485 with built-in Modbus RTU protocol

The common feature for all models:

- Transmitted values: date, time, temperature of the LT-1T probe, temperature of the LT-12T probe, the difference between temperature of the LT-1T probe and LT-12T probe.
- Power requirement: 5 to 24 Vdc.
- Thermistor's head size: about 1 mm.
- Cable length between the probe and the signal conditioner: 0.5 m
- Cable length after the signal conditioner: 3.5 m. The total standard cable length is 4 m. For an appropriate fee, the cable may be extended up to a maximum length specified for every interface at customer's request.
- Excitation time: 0.15 s
- Output auto-update time: 5 s.
- Protection index: IP64