Bio Instruments S.R.L.

PHYTO-SENSORS™ SERIES

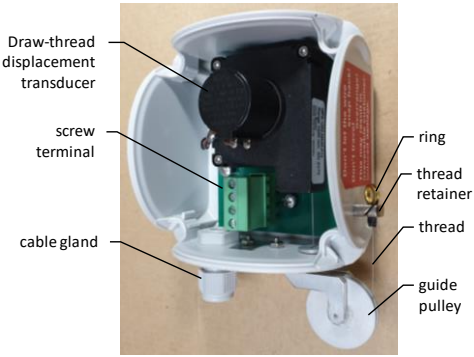
SA-1250L-V

Auxanometer

Introduction

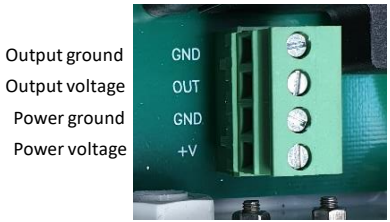
The SA-1250L-V Auxanometer is designed to measure the growth increment and growth rate of a tree.

The Auxanometer is based on a draw-thread displacement transducer. The linear voltage output of the Auxanometer is proportional to the amount of thread pulled out of the device. The thread is a plastic coated stretch-resistant cord tensioned by an internal spring pack. A thread begins with a ring for connecting an extension wire (thread, cord, or clip) provided by a user. A thread outlet is located at the bottom side of the housing. The Auxanometer comes in a weatherproof box with the displacement transducer and a signal conditioner inside.

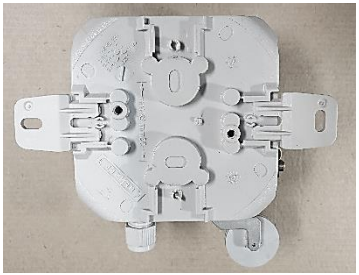


Connection

Please use a four-wire cable with 3 to 6 mm outer diameter. Connection diagram is shown below. The Power ground and the Output ground may be connected at the input of the data logger. Maximal length of the output cable is 10 m.



Installation



The attached screw holders are used to secure the device. The holders should be inserted into slots located on the back side of the instrument.

The Auxanometer should be installed at the base of the tree trunk under study. A cord exceeding the height of the tree must be attached to the ring of the device. The free end of the cord shall be fixed in tension at a top of the tree in any convenient way. With further growth of the top of the tree, the cord will be pulled out of the device.

Attention! Do not let the thread and cord draw in back sharply. This may result in permanent damage of the displacement transducer. If necessary, let the thread and cord to draw in back very slowly.

Also, prevent overrange.

Please note that both such cases will be considered as a customer induced damage.

Readings

When pulling the thread during the growth of a tree, the growth increment is determined as follows:

$$\Delta H = \frac{U_{t2} - U_{t1}}{2} \text{ (mm)},$$

Where ΔH is the growth increment in mm; U_{t1} and U_{t2} are the output voltages in mV, recorded at the times t1 and t2; '2' is the standard sensitivity of the Auxanometer in mV/mm.

The average growth rate of a tree may be determined as follows:

$$GR = \frac{\Delta H}{t2 - t1}$$

If (t2-t1) is expressed in days, the growth rate GR returns in mm per day.

An example. The output voltage was measured at 8am on Moday and Wednsday. $U_{t1} = 440\ mV$ and $U_{t2} = 480\ mV$. Therefore, $\Delta H = \frac{480-440}{2} = 20\ mm$, and $GR = \frac{20}{2} = 10\ mm/day$.

Specifications

Measurement range: 125 to 1250 mm
Linear output range: 250 to 2500 mV
Linearity: ± 0.1 FS
Sensitivity: 2 mV/mm
Supply voltage: 2.8 to 16 Vdc
Excitation time: < 1 s
Operating temperature: 0 to 50 °C
Extension/retraction force: 150 g typ. (200 g max.)
Protection index: IP53
Overall dimensions: 120 x 100 x 60 mm^3

Bio Instruments S.R.L.

20 Padurii St., Chisinau MD-2002
REPUBLIC OF MOLDOVA
Tel./Fax: +373-22-550026
info@phyto-sensor.com
www.phyto-sensor.com