SD-5(6,10)T-SDI12

Stem Dendrometers

Implexx

Digital Environmental Sensing

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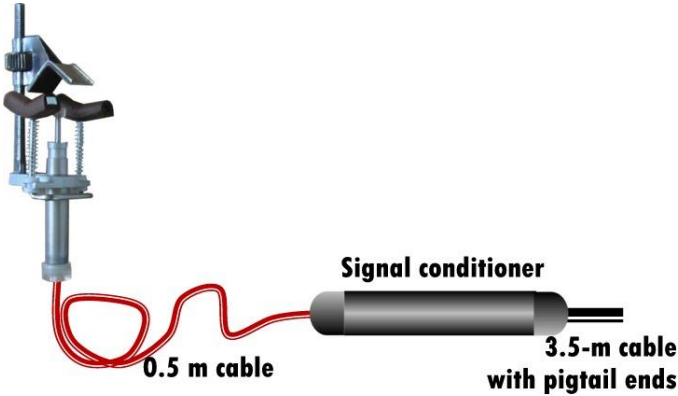
Introduction

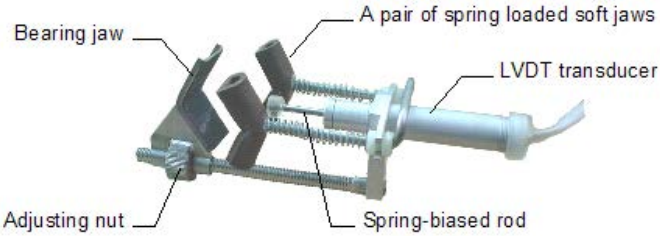
SD-type sensor is a highly precise incremental LVDT-based sensor for monitoring micro-variations of stem diameter in micron range.

Plant growth and water balance affect diurnal behavior of stem diameter. The growth rate depends on a vegetation stage and environmental conditions. The diurnal variations represent mostly fluctuations of water content in plants. Two diameter-based indices are commonly used for evaluating plant water status: daily contraction amplitude and trend of daily maxima. The SD-type sensor allows investigating effects of irrigation rate and other environmental factors on water balance and growth of plants.

The SD-type sensor consists of an LVDT probe mounted in special fixing brackets, and a DC powered signal conditioner.



Installation

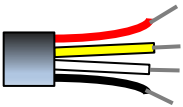


- Select an appropriate stem for sensor installation.
- Move the bearing jaw apart from LVDT transducer by rotating the adjusting nut.
- Locate the stem between the sensor's jaws.

- By rotating the adjusting nut, move the bearing jaw back until the jaws touch the stem.
- Continue rotation of the adjustment nut until then rod takes necessary position. If the stem is supposed to grow, the rational position is somewhere in the beginning of the rod's stroke. If the stem is supposed to shrink, choose a point somewhere at the end of the stroke. In other cases, leave the sensor somewhere in the middle between those two positions.
- Secure the sensor's cable on a stem to prevent occasional movement of the sensor.
- Readjust the sensor when its readings become close to 0 or 5 (10) mm.

Connection

The connection diagram is shown below. The shield shall be grounded at the data loggers side or connected to the 'minus' contact of the power source.



Red: +Power 5 to 24Vdc
Yellow: SDI-12 Input/Output
White: Ground
Black: Shield

Data logging

SDI-12 : single output with the M! command in accordance with SDI-12 Standard (version 1.3)

SDI-12 Communication

Default Address
0

Identification I! Command
SDI-12 command: 0I!
Returns: 013BIOINST SD-5T 3.026
Sensor address: 0
SDI-12 version: 1.3
Vendor: BIOINST
Model: SD-5T
Version Number: 3
Sensor Serial Number: 026

Measurement M! Command
SDI-12 command: 0M!
Returns: 00011
Return 1 measurement after 1 second settling period

Measurement Range, Resolution and Units
SD-5T: 0.000 - 5.000 millimetres (mm)
SD-6T: 0.000 - 5.000 millimetres (mm)
SD-10T: 0.000 - 10.000 millimetres (mm)

Specifications

Model	**SD-5T**	**SD-6T**	**SD-10T**
Measurement range	0 to 5 mm		0 to 10 mm
Stem diameter range	5 to 25 mm	20 to 70 mm	
Resolution	< 0.002 mm		
Operating temperature	0 to 50°C		
Temperature effect	<0.02% total stroke/°C		
Supply voltage	5 to 24 Vdc 10mA typ.		
Measurement time	0.3s		
Protection index	IP 64		
Cable length	Customized (4 m total length standard)		

Customer Support

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