

Stem Diameter Sensor



This sensor measures stem diameter variations with micrometer-level precision, enabling real-time tracking of plant growth and response to environmental changes. Ideal for horticultural use in greenhouses or research environments. This device, belonging to the PRO sensor series, includes Aranet Sub-GHz ISM band radio which wirelessly transmits sensor measurements to the Aranet PRO base station.

Product numbers

Product number	Radio band	To be used in
TDSPSD03	EU868	European Union
TDSPSDU3	US920	United States of America, Canada, South America, Australia, New Zealand
TDSPSDU3	AS923	BRN, KHM, HKG, IDN, LAO, TWN, THA, VNM, MYS, SGP
TDSPSDJ3	JP923	Japan
Not available	KR923	South Korea

- This product is a kit consisting of several separate devices. It combines Aranet devices with carefully selected solutions from other companies to provide a single, unified solution. Please consult the *Kit contains* table for a detailed list of included devices.

Kit contains

Product number	Manufacturer	Product name	Amount
TDSCT1*2	Aranet	4-20 mA Transmitter with 12 VDC PSU	1
SD-5Mi	Bio Instruments	Stem Micro-Variation Sensor	1
--	Bio Instruments	Stem Micro-Variation Sensor Signal Conditioner	1

- Aranet product number designations include the symbol “*” to signify multiple product numbers, which, depending on the region of use, have either 0, U or J in place of the asterisk. Refer to the relevant product datasheets for more information.

Specifications of kit components

General

Ingress protection rating	IP64	
Operating temperature range	0–50 °C	-32–122 °F
Transmitter dimensions	160×132×46 mm	6.3×5.2×1.8 in
Signal Conditioner dimensions	95×95×60 mm	3.7×3.7×2.4 in
Sensor dimensions	35×28×95 mm	1.4×1.1×3.7 in
Total Weight	790 g	27.9 oz
Power cable length	1.8 m	6 ft
Signal cable length	3 m	9.8 ft
Probe cable length	1 m	3.3 ft
Packaging includes	1 pcs AA alkaline battery	

Stem Diameter Sensor

Measurement Range	0–5 mm	0–0.20 in
Stem diameter range	5–25 mm	0.2–0.98 in
Resolution (w/filter)	0.002 mm	0.00008 in
Temperature effect (total stroke/°C)	< 0.02 %	

- For detailed specifications of the transmitter parameters, please use the product code listed in the *Kit contains* table to locate the corresponding product data sheet.

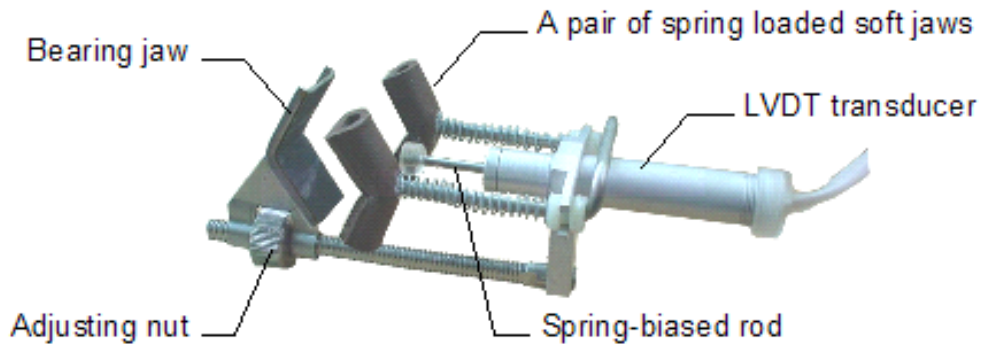
Aranet radio parameters

Line of sight range	3 km	1.9 mi
Transmitter power	14 dBm	25 mW
Data transmission interval	1, 2, 5 or 10 min	
Data protection	XXTEA encryption	

- Specifically for JP923 radio band, reduced transmitter power of 13 dBm (20 mW) is used.

Installing and using the Stem Diameter Sensor

- **Attach the diameter sensor.** Follow the instructions below to attach the diameter sensor to the top or base of the plant to monitor growth-related factors.



- Select an appropriate stem for sensor installation.
- Rotate the adjusting nut to move the bearing jaw away from the LVDT transducer.
- Position the stem between the sensor's jaws.
- Rotate the adjusting nut back until both jaws gently contact the stem.
- Continue rotating the adjusting nut until the rod reaches the desired position. If the stem is expected to grow, position the rod near the beginning of its stroke. If it is expected to shrink, position it near the end. Otherwise, place it somewhere in the middle.
- Secure the sensor cable to the stem to prevent unintentional movement.
- Readjust the sensor when its readings approach 0 mm or 5 mm.



- **Pair the Aranet transmitter.** For more details on pairing process consult Aranet product TDSCT1*2 data sheet. After pairing 4–20 mA transmitters with 12 VDC PSU included in this kit, configure the conversion from analog 4–20 mA to stem diameter values. Open the sensor settings menu in the Aranet base station's web interface, update its name,

and enable the conversion feature. Select Diameter as a Metric and mm or in as Unit and define the minimum and maximum measurement values as detailed below.

Current value	Diameter conversion value	
4 mA	0 mm	0 in
20 mA	5 mm	0.20 in

- For detailed description of the usage of the Aranet base station, consult the Aranet PRO/PRO Plus base station User Guide.

Compliance information

- CE** Conformité Européenne
 - FC** Federal Communications Commission (USA)
 - IC** Innovation, Science and Economic Development Canada
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