GroPoint™

Growing innovation.

GroPoint Pro

Moisture, salinity, temperature and wetting front in a single SDI-12 sensor

The GroPoint™ Pro soil sensor is robust, reliable and highly accurate, providing cost-effective measurement of soil moisture, soil temperature, salinity (electrical conductivity or EC).

This SDI-12 sensor also functions as a wetting front detector, providing a separate output for the wetting front measurement. By placing the tip of the sensor just above the bottom of your crop's root zone, the wetting front measurement will indicate when water has reached the bottom of the probe during irrigation, allowing you to have your irrigation stop at precisely the optimal time to ensure only the water needed is applied.

The sleek, lightweight design installs quickly with minimal soil disruption. When installed vertically, the sensor averages volumetric moisture content over a soil layer of about 6" (15cm). When installed horizontally, the sensor can be used to measure moisture at a specific soil depth.

GroPoint Pro can be deployed in irrigation-sensitive zones, such as around the root zone, to enable full control of precision irrigation needs.

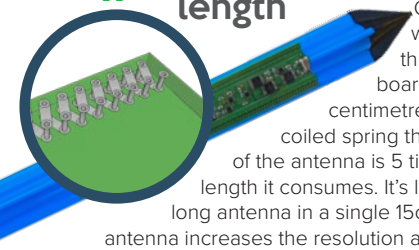
- ✔ Provides SDI-12 output of moisture, temperature and salinity (electrical conductivity).
- ✔ Detects when wetting front has reached bottom of probe.
- ✔ Moisture readings can be user-calibrated with 3rd-order polynomials to meet custom requirements.
- ✔ Low power requirements—suitable for remote, autonomous applications.
- ✔ Patented TDT5 technology for scientific-grade accuracy and excellent long-term stability of measurements.
- ✔ Fully potted electronics for excellent durability.

Our proprietary TDT^5 technology delivers an **exceptional price:performance ratio**, with performance as good (in most cases better) as sensors costing much more.

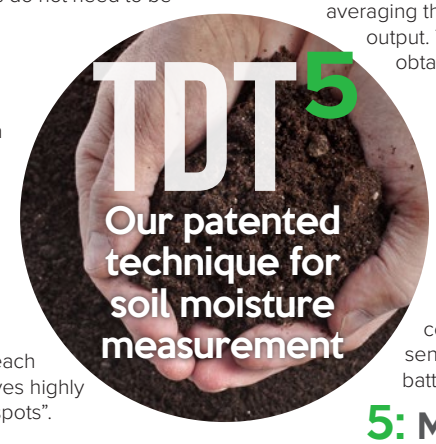
GroPoint™ sensors are based on the field-proven Time Domain Transmission (TDT) method of reliably measuring soil moisture, which is a refined version of Time Domain Reflectometry (TDR). TDT-based sensors do not need to be calibrated to each type of soil they will be buried in.

TDT5 enhances TDT in 5 key ways:

1: Accurate across entire length



Our patented design weaves the antenna through the circuit board 20 times per centimetre, and much like a coiled spring the effective length of the antenna is 5 times the physical length it consumes. It's like having a 75cm long antenna in a single 15cm sensor. A larger antenna increases the resolution and sample area of each sample, allowing more noise to be filtered out. This gives highly accurate tracking of moisture changes with no "dead spots".



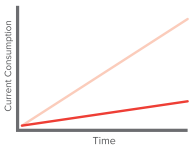
2: Reduced manufacturing costs

Unlike other moisture probes, Gropoint sensors do not have separate components for electronics and bulky metal antennas. By integrating the antenna and all electronics into the same circuit board (possible thanks to the patented antenna design), manufacturing costs are dramatically reduced.

3: Repeatable accuracy

400,000 pulses filtered per measurement

Each time a measurement is taken, GroPoint sends 400,000 pulses through the sensing element to generate data for the measurement, then employs advanced filtering to eliminate outlying readings (noise) before averaging the data and sending the measurement as SDI-12 output. This ensures that the same extreme accuracy (±1%) is obtained each and every time moisture is measured.



4: Low power consumption

Despite 400,000 pulses for each measurement, the total time to take the measurement is less than 100 ms. This means that power consumption is minimal, and that permits GroPoint sensors to be operated for many months with small 9V battery-powered data loggers.

5: Maximum durability

Unlike typical sensors, the antenna is not exposed to the soil, so there's nothing to bend or break. The entire sensor circuit board (including antenna) is sealed in epoxy, then encased in a sealed polycarbonate housing.

Technical Specifications

MOISTURE

Measurement range	0% to 100% of VMC
Accuracy	±2.0% *
Precision	< 0.2%

ELECTRICAL CONDUCTIVITY/SALINITY

Measurement range	0 to 4 dS/m
Accuracy	±3%

TEMPERATURE

Measurement range	-20°C to +70°C (-4°F to 158°F)
Accuracy	±0.5°C

WETTING FRONT

Output parameter	0 to 10, corresponding to rate of change of moisture from last reading

* 8% to 42% VMC, in controlled laboratory conditions; factory calibrated for most agricultural soils. In field applications, accuracy may slightly decrease due to the inevitable heterogeneity of soil texture, soil compaction, moisture and fluctuation in soil temperature. The accuracy may also decrease in difficult soil conditions (higher clay and salinity content). In normal conditions, GroPoint sensors will maintain their accuracy from permanent wilting through field capacity in sandy loam through clay soils with less than 60% clay particles. Under moderately saline conditions. GroPoint sensors will maintain their accuracy up to 6 ds/m.

ELECTRICAL

Interface	SDI-12 v.1.3
Connection	Bare wire (optional 4 pin, IP66/IP68 rated environmental connector)
Warm-up time	< 1 sec
Input voltage	6 to 14 VDC max. 18 VDC
Current consumption	< 0.1 mA (quiescent), 15-35 mA (active)

ENVIRONMENTAL

Operating temperature	-20°C to +70°C (-4°F to 158°F)
Storage temperature	-40°C to 85°C (-40°F to 185°F)

PHYSICAL

Dimensions	19.6 cm x 2.0 cm x 0.56 cm (7.7" x 0.8" x 0.2")
Weight	272 g (0.6 lb.)
Cable weight	38 g per m (0.42 oz. per foot)
Standard cable	5 m (16.3 ft.) 3xAWG22 (4xAWG22 for digital version) dual-shielded, twisted pair, rated for direct burial
Warranty	1-year limited parts and labour

GroPoint™

RioT Technology Corp.
10114 McDonald Park Rd, Suite #217
North Saanich, BC V8L 5X8
CANADA

1 833 GRO-POIN (North America)
250 412 6642 (rest of the world)
gropoint.com

DISTRIBUTED BY: