

GroPoint Profile

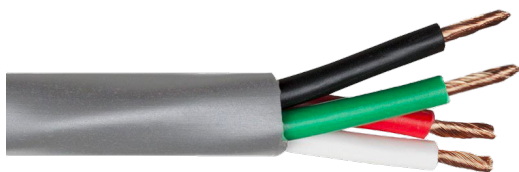
TECHNICAL INFORMATION

GroPoint Profile provides cost-effective measurement of volumetric water content over multiple depths using a single probe, eliminating the cumbersome excavation required for multiple sensors placed at different depths. Designed for vertical installation, the sensor takes measurements over multiple soil layers, with each measurement zone providing the average volumetric soil moisture content over a 15 cm range (approximately 6”).



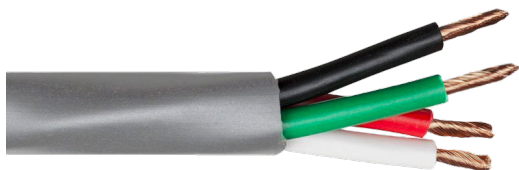
Wiring Legend

SDI-12



- Red: DC input voltage
- White: SDI-12 I/O
- Green: Ground/Common
- Black: no connection

RS-485



- Red: DC input voltage
- Black: RS-485 I/O A
- White: RS-485 I/O B
- Green: Ground/Common

Rugged Connector

Environmental sealing:

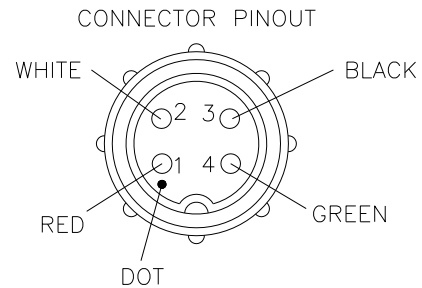
- Integral O-Ring gasket
- IP68 seal rating

Materials:

- Connector shell: thermoplastic
- Shell interior: Elastomeric
- Contacts: Copper alloy
- Contact plating: Gold over nickel

Mounting procedure:

Align connector, push on, rotate bayonet ring until tight.



Probe Geometry

GroPoint Profile probes contain a series of moisture sensor segments, each 15 cm in length.

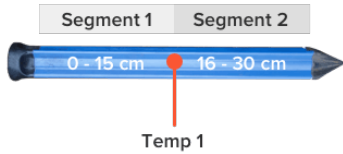
Probes can be configured with temperature sensors or without. If configured with temperature sensors, the configuration will be one of two, either “Standard” or “Scientific”.

For example, here is how the temperature sensors within a 4-segment probe are arranged with both configurations:

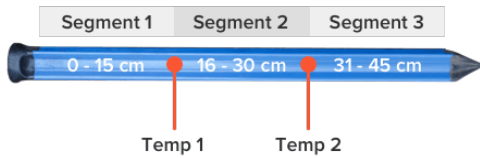
Standard Configuration

Temperature sensors are placed every 1 to 2 segments, depending on the probe model.

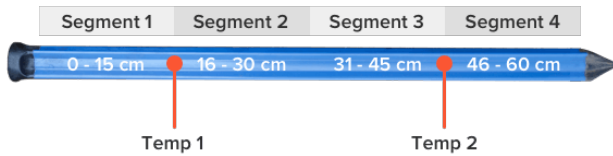
2-segment probe:



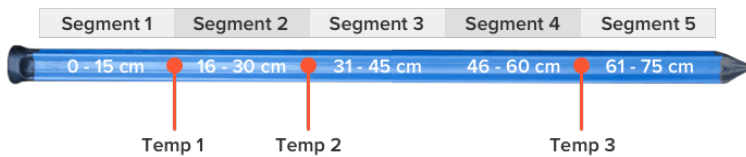
3-segment probe:



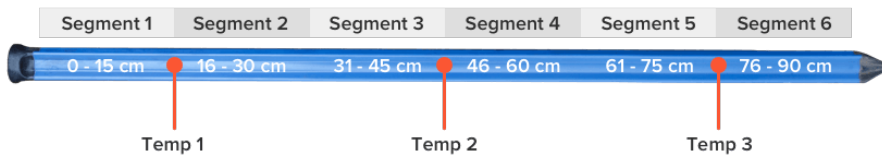
4-segment probe:



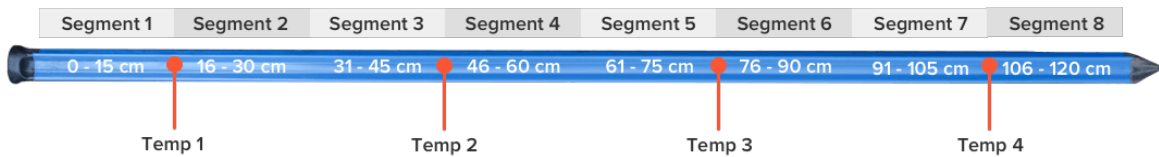
5-segment probe:



6-segment probe:



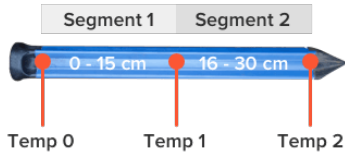
8-segment probe:



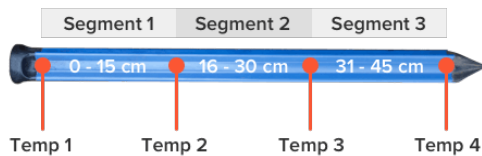
Scientific Configuration

In this configuration there's a temperature sensor before the first segment, after the last segment, and between every segment.

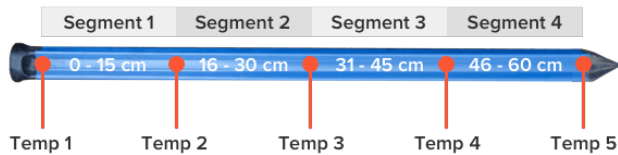
2-segment probe:



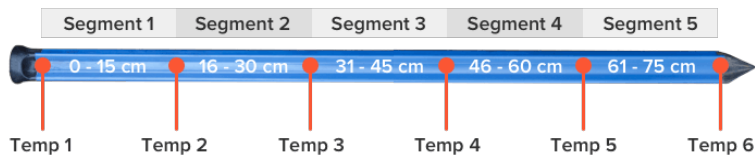
3-segment probe:



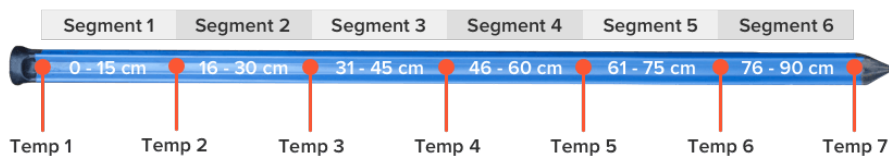
4-segment probe:



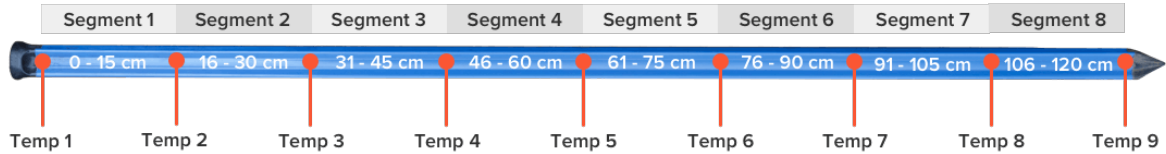
5-segment probe:



6-segment probe:



8-segment probe:



SDI-12 Command Set

The GroPoint Profile conforms to/implements all aspects of the SDI-12 V1.3 protocol specification. (a = sensor address).

Command	Meaning	Response
a!	Acknowledge	Device address (default address is '0')
aI!	Send identification	Identification string
aAb!	Change address	Change device address to 'b'
?!	Address query	Device address
aM!	Start moisture measurement	Measurement time and count (e.g. "a0026")
aM1!	Start temperature measurement	Measurement time and count (e.g. "a0023")
aC!	Start concurrent measurement	Measurement time and count (e.g. "a00206")
aD0!	Send data	Measurement results
aD1!	Send data	Additional data (if necessary)

All other commands received by the sensor will be acknowledged with the device address only.

Sensor Start-up Time / Measurement Time

The time from application of power to the SDI-12 power bus until the sensor is ready to receive a command is approximately 75ms. The reported measurement time in response to the aM! measure command (where a is sensor address) is 3 seconds, measured from

the end of aM! command response (a003n<CR><LF>) where n is the number of segments. Temperature measurements (M1!) always report 2 seconds for measurement time. Actual measurement times are less, and a service request is issued as soon as the measurement is completed. Current is at active level (15-20 mA) only during measurement time, otherwise current is less than 0.5 mA.

Measurement Sequence and Output Format

Below is an example measurement sequence for a 6 segment probe.

- SDI-12 logger- issued commands are in **bold**, followed by the sensor response.
- SDI-12 sensor address = 0.
- M! is use to measure the soil moisture content
- M1! Is used to measure the soil temperatures.
- All data values are delimited by either the + or – symbol.

```
OM!00036  
0  
OD0!0+12.6+17.6+22.8+19.5+13.4+16.7  
OM1!00023  
0  
OD0!0+18.6+16.2+15.8
```

Output the measurement data with the D0! command. For OM!, the volumetric moisture contents are returned, segment 1 through segment 6 in response to the D0! command. For OM1!, the soil temperature readings (in degrees Celsius) are returned.