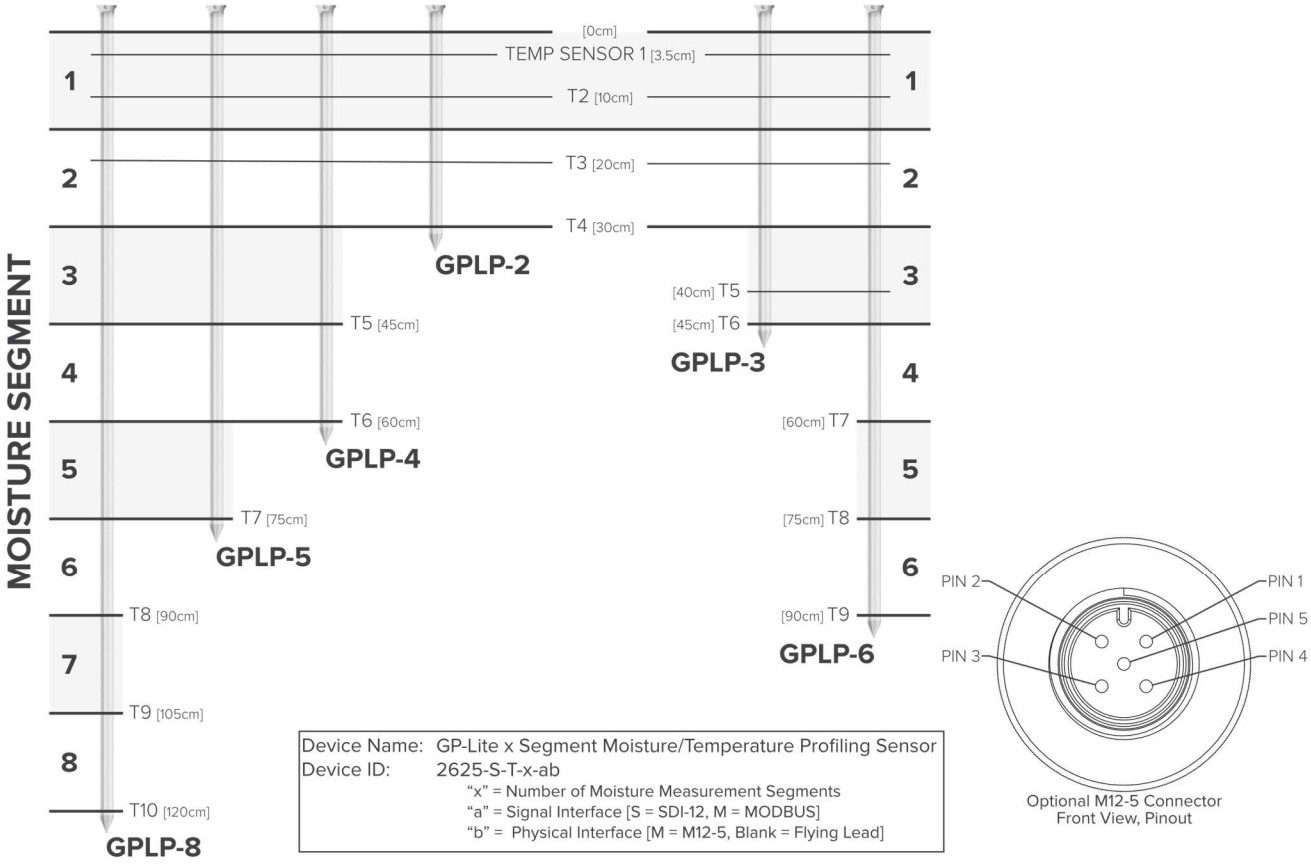
GroPoint™ GPLP-S-T-x Moisture/Temperature Profiling Probe (MODBUS)



Sensor Wirings

Function	M12-5 Pinout (Code A)	Wire Color	
		Flying Lead	Molded M12-5 & M12-5 to Flying Lead
Power	1	Red	Brown
RS-485 Serial I/O A	2	Black	White
RS-485 Serial I/O B	3	Orange/Brown	Blue
SDI-12 I/O	4	White	Black
Ground	5	Green	Grey

Specifications

Moisture Measurement	0% to 50% volumetric moisture content
Interface	SDI-12 V1.3 (all basic commands) or Modbus RTU
Operating Voltage	7.5 to 14.0 VDC (MAX 18.0 VDC)
Operating Temperature	-20°C to +70°C (MIN -40°C, MAX +85°C)

Current Ratings

ID Number	Average Operating Current	Maximum Current
2625-S-T-2	15-20mA (<0.5mA idle)	50mA surge
2625-S-T-3		
2625-S-T-4	20-25mA (<0.5mA idle)	100mA surge
2625-S-T-5		
2625-S-T-6		
2625-S-T-8	25-30mA (<0.5mA idle)	

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Modbus Basic Commands and Default Settings

Register / Function Code	Name	Description
Function Code 03 (0x03)	Read Holding Registers	For reading 40000 series registers.
Function Code 04 (0x04)	Read Input Registers	For reading 30000 series registers. Maximum of 9 values in one read.
Function Code 06 (0x06)	Write Single Register	For writing to a single 40000 series register.
Function Code 17 (0x11)	Report Slave ID	Returns the ASCII encoded ID string. "13RIOTTECHGPLPTSfffSNxxxxxx" "fff" = Firmware version "xxxxxx" = 6-digit serial number
Register 40201	Modbus Sensor Address	Default = 01
Register 40202	Sensor Calculation Mode	Default = 1 (0 = Raw Value, 1 = Apply Polynomial)
Register 40203	Serial Baud Rate	Default = 0 (0 = 19200, 1 = 9600, 2 = 4800, etc.)
Register 40204	Parity Setting	Default = 2 (0 = None, 1 = Odd, 2 = Even)
Registers 30001-30008	Moisture Reading	30001 = Segment 1, 30002 = Segment 2, etc.
Registers 30101-30114	Temperature Reading	30101 = Temp Sensor 1, 30102 = Temp Sensor 2, etc.

Example 2625-S-T-3 Commands *(sensor address = 01)*

***Square brackets and text are not a part of the commands and responses.**

```
[01][11][C0][2C]                        % Send slave ID command
[address][function code][CRC low][CRC high]

[01][11][1B][31 33 52 49 4F 54 54 45 43 48 47 50 4C 50 54 53 30 33 35 53 4E 33 30 30 30 30
30][FF][88][CE]                         % Sensor response
[address][function code][# of bytes of data][data string][FF][CRC low][CRC high]
Received Sensor ID: 13RIOTTECHGPLPTS035SN300000

[01][04][00 00][00 03][B0][0B]          % Send moisture measurement command
[address][function code][starting address of registers][# of registers to read][CRC low][CRC high]

[01][84][05][83][03]                    % Sensor response
[address][exception on command 0x04][command received, sensor is now busy][CRC low][CRC high]

[01][04][00 00][00 03][B0][0B]          % Resend moisture measurement command
[address][function code][starting address of registers][# of registers to read][CRC low][CRC high]

[01][04][06][00 3F][00 6C][00 4D][74][BE]    % Sensor data
[address][function code][# of bytes of data][data set x3][CRC low][CRC high]
Received moisture values:     Segment 1: 00 D0 = 208 = 20.8%
                              Segment 2: 00 D3 = 211 = 21.1%
                              Segment 3: 00 D2 = 210 = 21.0%

[01][04][00 64][00 06][31][D7]          % Send temperature measurement command
[address][function code][starting address of registers][# of registers to read][CRC low][CRC high]

[01][84][05][83][03]                    % Sensor response
[address][exception on command 0x04][command received, sensor is now busy][CRC low][CRC high]

[01][04][00 64][00 06][31][D7]          % Resend temperature measurement command
[address][function code][starting address of registers][# of registers to read][CRC low][CRC high]

[01][04][0C][00 FD][00 FC][00 FC][00 FA][00 FA][00 FB][79][B5]      % Sensor data
[address][function code][# of bytes of data][data set x6][CRC low][CRC high]
Received temperature values:  Sensor 1: 00 FD = 253 = 25.3%
                              Sensor 2: 00 FC = 252 = 25.2%
                              Sensor 3: 00 FC = 252 = 25.2%
                              Sensor 4: 00 FA = 250 = 25.0%
                              Sensor 5: 00 FA = 250 = 25.0%
                              Sensor 6: 00 FB = 251 = 25.1%
```