



Digital ThermArray System



Ultra-Rugged Field PC² showing direct node readings.

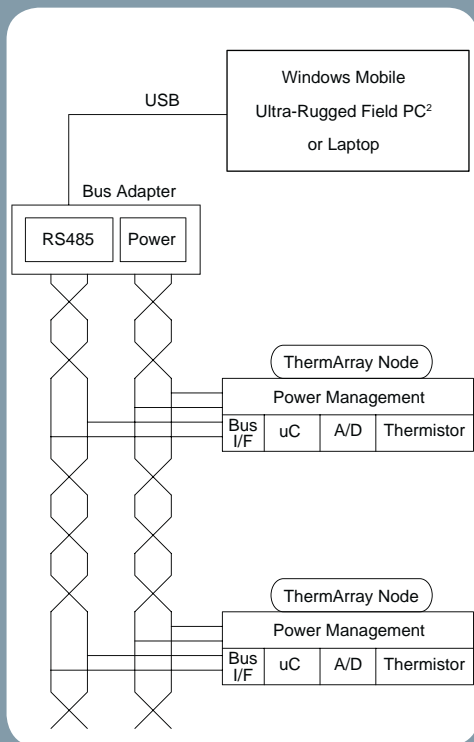


Diagram depicting ThermArray nodes along a digital thermistor string.

RST's Digital ThermArray System provides precision thermal gradient information for geotechnical, geothermal, and marine applications. The main component of the system consists of digital thermal data acquisition nodes distributed along a single cable, typically spaced at uniform intervals. This digital technology allows for many nodes to be placed on one string without greatly increasing the overall cost. Data setup and collection is performed by a stationary datalogger system (typically an RST flexDAQ Datalogger System), a laptop or an Ultra-Rugged Field PC² for portable readings.

digital vs. analog

The Digital ThermArray System provides substantial advantages that standard (non-digital) thermistor strings do not:

1) FIXED CABLE DIAMETER

Regardless of the number of nodes required (up to 256 maximum), the digital thermistor string cable will always be at a fixed diameter of 7 mm (19 mm at node points). This cable internally houses 4 wires which serve all nodes throughout the string. Adversely, an analog thermistor string requires 2 wires to service **each** individual node along the string which thereby increases the overall cable thickness (by two additional wires) per each node added. This drastic increase in wire diameter hinders installation, poses heatsink issues, and escalates overall costs - all of which can be avoided through the implementation of the Digital ThermArray System.

2) ADDRESSABLE NODES

Through the use of digital technology incorporated into each node along the ThermArray System thermistor string, every node can be individually addressed, and simultaneously read through the Ultra Rugged Field PC² (pictured left) via a single connection. Comparatively, analog versions require the user to physically locate the two wires from **each** node along the string and then collect a reading. The use of a Digital ThermArray System greatly reduces data collection time and lack of node addressing.

3) NOISE IMMUNITY

Instead of using microvolts, the digital technology used in the ThermArray System makes it extremely immune to noise.

4) POWER EFFICIENCY

The ThermArray System uses less than 10% of the power consumed by analog systems; this is highly advantageous in autonomous datalogging situations.

5) CREDIBLE PERFORMANCE

Overall higher accuracy and resolution is readily achieved with the Digital ThermArray System when compared to analog systems.



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applications

Provides precision thermal gradient information in geotechnical, geothermal, and marine applications.

features

Up to 256 nodes on a single, 4-conductor, Kevlar® reinforced cable.

High accuracy of 0.07°C.

Bussed digital thermistor points.

Optional piezometer(s), conductivity sensor(s) can be positioned along cable length.

Readout using Ultra-Rugged Field PC² or data acquisition system.

No cable resistance errors.

Minimal conducted heat thermal error.



Close-up of a digital thermistor string node on the ThermArray System.



specifications + ordering info

Digital ThermArray System



thermarray node

Each node consists of a precise, individually addressed, and individually calibrated digital temperature sensor which is molded directly onto the ThermArray cable.

thermarray cable

The ThermArray cable is a waterproof low-temperature cable which provides power and digital data access to the ThermArray nodes. It includes water-block filling and high-strength anti-stretch Kevlar® for precise and durable positioning.

thermarray terminal

The ThermArray terminal provides power and data isolation as well as transient protection.



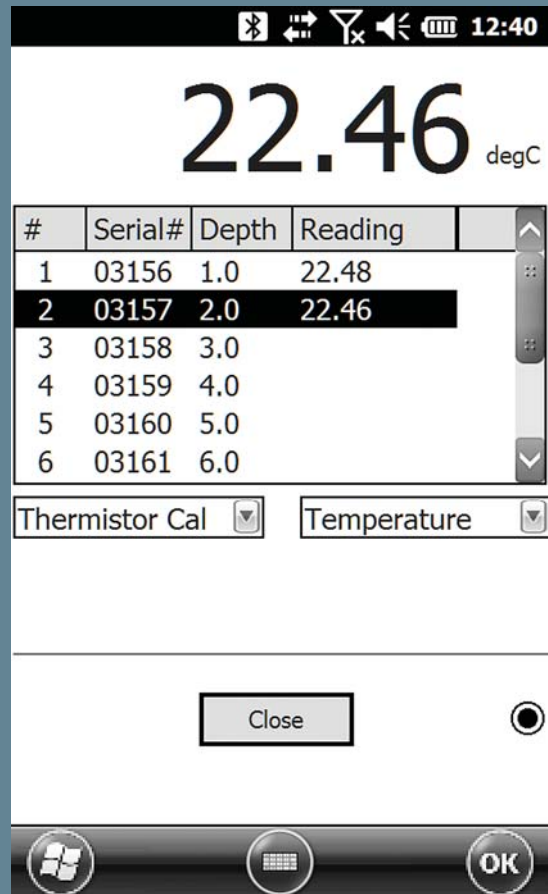
Thermistor String shown connected to the Ultra-Rugged Field PC² for direct reading.

specifications

ITEM	DESCRIPTION
THERMARRAY NODE	
Temperature Range	-20° to 50°C
Resolution	0.01°C
Accuracy	0.07°C
Time Constant	20 seconds
Address Range	0 - 255
Power Supply Voltage	7 - 18 VDC
Current per Node	0.8 mA
Acquisition Time	0.2 second
Node Length	90 mm
Node Diameter	19 mm
THERMARRAY CABLE	
Conductors	4
Diameter	7 mm
Breaking Strength	5 kN
Maximum Segment Length	500 m
Minimum Node Spacing	150 mm
Mechanical Terminal	6 mm x 1 mm threaded
Maximum Nodes	256

ordering info

ITEM	PART #
Digital ThermArray System	TH0100
Optional connection for bottom weight also available.	



Close-up screenshot of ThermArray Software shown on the Ultra-Rugged Field PC².

GEOTECHNICAL · MINING · ENVIRONMENTAL · STRUCTURAL