

# Thermistor-String Datasheet and Manual

(v2, 220811)

Precise, small sized, ultra-low power thermistor-string with user-definable positions of the temperature sensors.

- Up to 48 temperature-sensors within one thermistor-string.
- String lengths up to 250 m.
- Wide and flexible operation range.
- High long-term stability.
- Each string is manufactured with user-defined distances and length.
- Fully sealed and water-proof.
- Very small sensor dimensions, ideal for small drilled holes.
- Flexible, light-weight and rough cable for easy positioning and handling.
- Capability of factory recalibration.
- Selectable sensor types to meet the requirements for the application.
- Two-Wire Bus connection interface for direct usage with Geoprecision dataloggers.
- Meteorology SDI12-Bus interface available via “Geoprecision SDI12-Converter”.



### “Normal”

- Small
- Flexible
- Light-weight



### Ice-Stick

Up to 48 sensors with selectable, small distance within one Carbon-Stick



### Faraday-Cage

The whole system placed inside an ESD protection-shield.

Optional:

Fully sealed system with Wireless Mini-Datalogger directly connected for wet /under water conditions.

## 1. Technical data

- Two-Wire bus interface, 3-pole M8 connector (female).
- Operating temperature -40 to 85 °C.
- IP67 rating.
- PUR cable, 4.3 mm diameter, up to 250 m, tensile load up to 30 kg<sup>1</sup>.
- Sensor dimensions 80 mm length, 8 mm diameter, stainless steel.
- 3 to 3.8 Volt power supply via data-connection.

	<b>TNode</b>	<b>TNode EX</b>	<b>TNode HD</b>
Resolution	0.01 °C	0.001 °C	0.0001 °C
Accuracy	±0.1 °C @ -5 to +50 °C ±0.5 °C @ -40 to +85 °C	±0.1 °C @ -20 to +25 °C ±0.2 °C @ -30 to +40 °C ±0.5 °C @ -40 to +85 °C	±0.05 °C @ -20 to +25 °C ±0.1 °C @ -30 to +40 °C ±0.25 °C @ -40 to +85 °C
Stand-By power	0.75 µA	0.5 µA	0.6 µA
Operational power	2.5 mA @ 500 ms	2.5 mA @ 600 ms	4 mA @ 800 ms
2 <sup>nd</sup> temperature HK-value	-	-	yes
Long term stability <sup>2</sup>	0.1 °C in 5 years @ 1 hr	0.1 °C in 5 years @ 1 hr	0.05 °C in 5 years @ 1 hr

<sup>1</sup> Physical stability will decrease at extreme high or low temperatures.

<sup>2</sup> Temperatures outside the given specification or fast changes will lower the temperature-stability.

## 2. Handling information

### **High sensitive connector:**

Prevent the connector from physical load and water. Be sure that the connector is clean and dry before connecting any sensor.

### **Cable and tensile load:**

Bending, twisting, stretching or even slight cuts will decrease the lifetime and the physical stability.

### **ESD:**

High voltage installations around the measurement side (like railroads, power plants, power lines) can damage the sensors and other connected equipment.

Carefully place the thermistor-string in exposed areas or areas with high risk of thunderstorms.

→The usage of special ESD shielding is suggested!<sup>3</sup>

### **Additional information:**

- "Doku\_FlexGate\_Software\_Engl"
- <https://www.thermistor-string.com/questions>
- <https://www.geo-precision.com>

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<sup>3</sup> The Farady-Cage ESD shielding will not prevent but reduce the risk of electrical damage.

### 3. Usage

Normally the thermistorstring will be delivered with a connected Wireless-Minidatalogger or SDI12-Converter. In this case the datalogger (or converter) comes fully configured to read the sensors every hour and store the data.

Each sensor of the thermistor-string provides an internal, non-volatile information-memory, containing calibration-, positioning- and distance-information.

After connecting the string to an existing Geoprecision device, the configuration has to be applied carefully by following the separate manuals from below.

#### **SDI12-Converter:**

“Doku\_2W-SDI-Converter\_MANUAL”

<https://www.thermistor-string.com/additional-string-information/documentation-thermistor-string/category/3-documentation>

#### **Wireless-Mini-Datalogger (or String-Box):**

Refer to page 38 of “Doku\_FlexGate\_Software\_Engl”

<https://www.thermistor-string.com/additional-string-information/documentation-thermistor-string/category/3-documentation>

Download the latest version of the FG2-Shell software here:

<https://www.thermistor-string.com/additional-string-information/downloads/category/2-software>