DataSheet

Thermocouple Logger

- For Type K, J, T & N
- Standard & miniature plugs
- Burnout response
- Cost-effective

The Tinytag Ultra 2 Thermocouple data logger uses a thermocouple sensor for the cost-effective monitoring of temperature in a wide variety of applications.

Thermocouples are temperature sensors that are popular because of their versatility and low cost.

They typically have a fast response time, can be very small in size and are often cheap enough to be treated as disposable.

Thermocouples are available for specific applications as diverse as aluminium smelting, air temperature monitoring and food preparation.

The Tinytag Ultra 2 Thermocouple logger supports four different types of thermocouple sensor and is compatible with both standard and miniature thermocouple plugs.

Tinytag Ultra 2 Thermocouple Logger

Features

- **Supports four types of thermocouple** - the logger supports Type K, J, T and N thermocouples. Different thermocouple types work over different temperature ranges and are used in different applications (see the next page for further information on thermocouple types).

- **Built-in temperature channel** - the data logger has a built-in temperature channel that allows ambient temperature to be monitored at the same time as the thermocouple temperature. This channel can be turned off to increase the reading capacity of the logger if required.

- **Two connection types** - the logger supports both standard and miniature thermocouple plugs.

- **Burnout response** - the logger can be set to drive readings low or high in the event of a fault with the thermocouple, highlighting that there is a problem.

- **Cold junction compensation** - the logger uses automatic cold junction compensation, ensuring the accuracy of the logger between -10 and +70°C.

- **Type K thermocouple included** - a Type K thermocouple, that can measure from -100 to +250°C, is included with this logger.

- **Tinytag Explorer** - this logger works with the popular Tinytag Explorer software, that allows users to easily combine data from different Tinytag data loggers and to export data to other programs. The software is also used to set the type of thermocouple being used.

Thermocouple Types
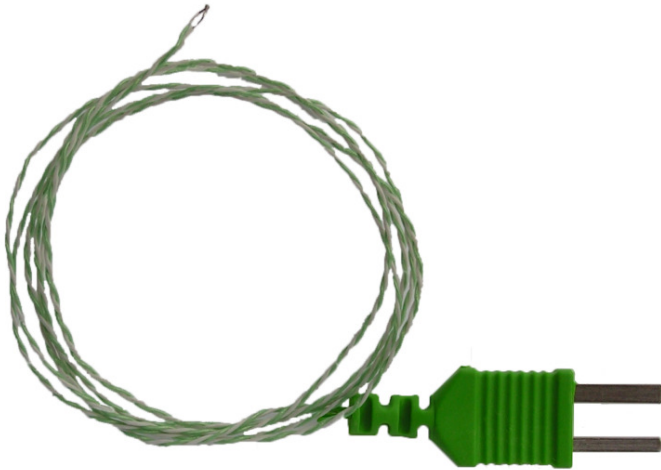
The logger can be used with four types of thermocouple: Types K, J, T and N. These sensors have different characteristics and temperature ranges and are suited to different applications. Below is some guidance on selecting the best type of thermocouple for your application.

Note: the temperature ranges stated in this section are the ranges supported by this logger. Thermocouples from different suppliers may have a narrower range for a given type than the figures quoted below.

Type K (-270 to +1370°C / -454 to 2498°F)

A general purpose thermocouple that can be used in most applications. A wide variety of low-cost probe types are available in this type. Generally a good choice of sensor, but Type T probes may be preferable at low temperatures, and Type N at high.

A Type K thermocouple for use between -100 and +250°C is supplied with the logger.

Type J (-210 to +1200°C / -346 to 2192°F)

A popular type of thermocouple that is commonly used to monitor temperatures of inert materials and in vacuum applications. This type of thermocouple is susceptible to oxidisation so is not the best choice for damp conditions or low temperature monitoring. Also, the accuracy of this type of sensor can be permanently impaired if used above 760°C.

Type T (-270 to +400°C / -454 to 752°F)

Good for low temperature and cryogenic applications. Used widely in the food industry because of its good accuracy and because it performs well in the presence of moisture.

Type N (-270 to +1300°C / -454 to 2372°F)

Another thermocouple with a wide temperature range, this one is better suited to high temperature monitoring than the Type K because it is more stable and resists oxidisation. Common applications include engine exhaust temperatures, smelting and kiln monitoring.

Specification

Features

Reading Capacity	22,000 readings (approximately)
Memory type	Non Volatile
Trigger Start	Magnetic Switch
Delayed Start	Relative / Absolute (up to 3650 days)
Stop Options	When full
	Never (overwrite oldest data)
Reading Types	Actual, Min, Max
Logging Interval	1 sec to 10 days
Alarms	4 fully programmable; latchable

Measurement Specification

Thermocouple

Sensor Type	Type K, J, T or N Thermocouple
Range	
Type K	-270 to +1370°C (-454 to 2498°F)
Type J	-210 to +1200°C (-346 to 2192°F)
Type T	-270 to +400°C (-454 to 752°F)
Type N	-270 to +1300°C (-454 to 2372°F)
Reading Resolution	0.01°C
Cold Junction Compensation	-10 to 70°C
Accuracy	Better than ±1.0°C across all thermocouple ranges when the logger is between -10 & +70°C.

Note: The above accuracy figures do not include the thermocouple probe.

Logger Temperature

Range	-40 to +85°C (-40 to +185°F)
Sensor Type	10K NTC Thermistor
Response Time	20 mins to 90% FSD in moving air
Reading Resolution	0.02°C or better
Accuracy	Better than ±0.5°C

Physical Specification

IP Rating	IP51
Working Temperature Range	-40 to +85°C (-40 to +185°F)
Case Dimensions	
Height	42mm / 2.83"
Width	60mm / 2.36"
Depth	33mm / 1.30"
Weight	65g / 2.29oz

Supplied Type K Thermocouple

Temperature Range	-100 to +250°C (-148 to 482°F)
Lead length	1m / 39.37"

Battery Information

Battery Type	Tekcell SBAA02P; SAFT LS14250 or LST14250

The logger will operate with other ½AA 3.6V Lithium (Li-SOCl2) batteries but performance cannot be guaranteed.

Battery Life   Greater than one year.

The Tinytag Explorer software will prompt the user when a new battery is required (about a week before the battery runs flat). If the logger is being used for long term monitoring, the battery should be replaced annually.

A service kit, containing a replacement battery and instructions for servicing the data logger, can be ordered using the part number SER-9500.

Before replacing the battery the data logger must be stopped.

Data stored on the logger will be retained after a battery is replaced.

Specification

Notes

If used at low temperatures the data logger should be allowed to warm to room temperature before it is opened to avoid condensation forming inside it.

The IP51 rating is valid only when the logger's connector cover is fitted and the unit is orientated with its hanging tab uppermost.

Trigger Start

The trigger start option allows a unit to be set up as required and then started at a later time with a magnet. The position of the unit's trigger start switch is indicated by the • • • label on the back of the logger. When the "Wait until trigger event" option is selected in the Tinytag Explorer software, the green LED on the unit will flash once every eight seconds, indicating that the unit is waiting to log. When a magnet passed over the label, the green LED will light briefly to indicate that the unit has been activated. Once activated, the green LED will flash every four seconds to indicate that the logger is recording.

Calibration

This logger is configured to meet Gemini's quoted specification during its manufacture.

We recommend that the calibration of the logger should be checked annually against a calibrated reference meter.

A certificate of calibration, traceable to a national standard, can be supplied for an additional charge either at the point of purchase, or if the unit is returned for a service calibration.

Approvals

Gemini Data Loggers (UK) Ltd. operates a Business Management System which conforms to ISO 9001 and ISO 14001.

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Part Numbers

TGU-4550: Tinytag Ultra 2 Thermocouple data logger.

To use these data loggers you will also require a copy of the Tinytag Explorer software (SWCD-0040) and a USB download cable (CAB-0007-USB).

The following starter kit contains a thermocouple data logger, a copy of Tinytag Explorer and a USB download cable.

TGU-4550-SPK: Tinytag Ultra 2 Thermocouple (K/J/T/N) Starter Pack.

Service Kit

SER-9500 Tinytag Data Logger Service Kit

Gemini
DATA LOGGERS