# Excelog One

Thermocouple Data Logger
and Simulator

Operator's Guide


CALEX
ELECTRONICS LIMITED

## INTRODUCTION

The Excelog One is a miniature handheld single-channel thermocouple device with two main functions:

**Measure mode:** Read temperatures from a thermocouple probe and log data to the Excelog One's built-in memory.

**Simulate mode:** Generate a millivolt output to simulate a thermocouple probe with the chosen type and temperature. Connect this signal to your instrumentation in place of a thermocouple probe to check and calibrate your device's input.

The free Excelog software allows configuration and live data acquisition to a PC. The Excelog One uses the Modbus protocol, for use as a thermocouple input device with third party software.

## MODEL NUMBERS

| | |
|---|---|
| **EXCELOG-ONE** | Data logger and thermocouple simulator with USB cable |
| **EL1-MAU** | Mains USB power adapter |
| **EL1-CALCERTA** | Calibration certificate, UKAS traceable |

## GENERAL SPECIFICATIONS

| | |
|---|---|
| **Inputs** | 1 x thermocouple input (any of the below types), for use with miniature thermocouple connectors |
| **Outputs** | 1 x simulated thermocouple voltage output (any of the below types) |

**Temperature Range**

Depending on mode and thermocouple type:

| Thermo-couple Type | Temperature Range, Input (Measured) | Temperature Range, Output (Simulated) |
|---|---|---|
| **J** | -200°C to 1200°C | -50°C to 1200°C |
| **K** | -200°C to 1372°C | -50°C to 1372°C |
| **T** | -200°C to 400°C | -50°C to 400°C |
| **R** | 0°C to 1768°C | 300°C to 1768°C |
| **S** | 0°C to 1768°C | 300°C to 1768°C |
| **N** | 0°C to 1300°C | 200°C to 1300°C |
| **E** | -200°C to 1000°C | -50°C to 1000°C |

| | |
|---|---|
| **Input Accuracy (Measured)** | ± 0.1% or 0.8°C, whichever is greater |
| **Output Accuracy (Simulated)** | At 23°C ± 5°C: ± 0.1% or 0.8°C, whichever is greater<br>At 0°C to 50°C: ± 0.25% or 0.8°C, whichever is greater |
| **Temperature Resolution** | 1° for temperatures below -99.9° (C or F)<br>0.1° for temperatures below 1000° (C or F)<br>1° for temperatures above 1000° (C or F) |
| **Display** | 27 x 27 mm colour LCD, backlit |
| **Configurable Parameters** | Temperature units, date and time, data logging, power options, languages, thermocouple type, cold junction compensation |
| **Temperature Units** | °F or °C |
| **Display Response Time** | Temperatures update every 1 s |
| **Operating Temperature** | 0°C to 50°C |
| **Power Supply** | Built-in rechargeable Li-ion battery, or USB (cable included) |
| **Battery Life (typical)** | Measure mode:<br>35 hours (power save enabled)<br>10 hours with full brightness (typical)<br>Simulate mode:<br>32 hours (power save enabled) |
| **Charge Time** | 3.5 hours |
| **Weight** | 60 g |
| **Dimensions** | 78(h) x 38(w) x 15(d) mm |

## DATA LOGGING SPECIFICATIONS

| | |
|---|---|
| **Interval** | 1 to 86,400 seconds (1 day) |
| **Capacity** | 1.5 MB (2 days, logging every second) |
| **Variables Logged** | Measured temperature, cold junction temperature, voltage |
| **File Format** | .csv (can be imported to Excel) |
| **Configurable Parameters** | Sample period, number of samples, scheduled start date/time (or manual start/stop) |

## ⚠ Warning

This device has an internal, non-removable, rechargeable Lithium-Ion Polymer battery.

Do not attempt to remove or replace the battery as this could cause damage and will invalidate the warranty.

Do not attempt to charge the battery in ambient temperatures outside of the range 0°C to 40°C (32°F to 104°F).

Do not dispose of batteries in a fire as they may explode.

Dispose of batteries according to local regulations.

Do not dispose as household waste.

Improper use or use of unapproved chargers may present a risk of fire, explosion, or other hazard, and will invalidate the warranty.

Never use a damaged charger.

Only use the charger indoors.

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Refer to this instruction sheet when the warning symbol ( ⚠ ) is encountered.

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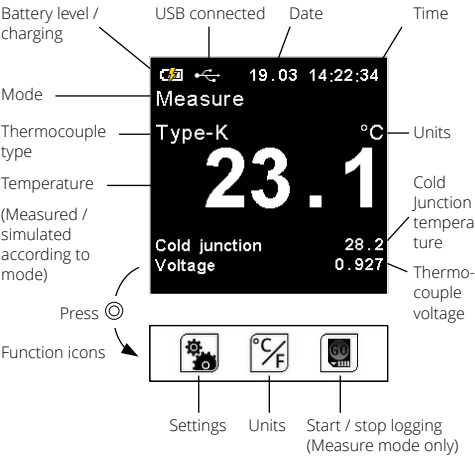
To avoid the possibility of electric shock or personal injury:

- Before using the thermometer, inspect the case. Do not use the thermometer if it appears damaged. Look for cracks or missing plastic;
- Do not apply a voltage between any terminal and earth ground while the USB is connected;
- To prevent damage, do not apply more than 1V between any two input terminals;
- Do not use the instrument around explosive gas, vapour or dust.
- Do not attach thermocouples to hazardous voltages.

## USING THE EXCELOG ONE

Press the power button to switch the unit on. The unit starts up in Measure mode, with the input set to Type K thermocouple by default.




Press ◎ to show the function icons. Use ◁ & ▷ to change between functions and ◎ to activate the chosen function.

Hold ◎ to power off.

## CHARGING

Connect the device to a USB port or charger using the supplied cable.

For the fastest possible charge time, use a USB charger with a current rating of 200 mA or higher.

## DEFAULT SETTINGS

| | |
|---|---|
| **Thermocouple Type** | K |
| **Cold Junction** | Internal |
| **Logging Sample Period** | 1 second |
| **Power Saving** | Enabled |
| **Idle Time** | 1 minute |
| **Language** | English |

## SETTINGS MENU

### Measure / Simulate

Select the operation mode of the Excelog One:

**Measure** (thermocouple input)

Connect a thermocouple probe via a miniature thermocouple connector to the socket on the Excelog One. Set the unit to the correct type (K, J, T etc) in Settings - Thermocouple Type.

Select GO / STOP to start/stop data logging. Temperature data is stored to the internal memory.

Connect the Excelog One to a PC via the USB cable to log data live to a PC.

Transfer data to a PC via the USB cable and software.

**Simulate** (thermocouple voltage output)

Connect the Excelog One to a thermocouple input on your instrument, thermometer, PLC etc. Be sure to use the correct type of thermocouple wire and connectors to avoid errors. Select the type in Settings - Thermocouple Type.

On the main screen, set the output temperature via the ⊘ & ⊘ keys.

### Thermocouple Type

Select the type of thermocouple for measurement or simulation.

### Cold Junction

**Internal:** Use the Excelog One's internal cold junction for compensation.

**External:** Connect the measurement thermocouple probe to an external cold junction in an ice bath at 0°C, and connect it to the Excelog One via copper wires and a Type-U connector.

## SETTINGS MENU

### Data Logging

**Sample Period:** The interval between samples. Enter the period in seconds (e.g. enter 60 for 1 sample per minute).

Example Total Time Capacity by Sample Period (approx)

| Period | Capacity |
|---|---|
| 1 second | 2 days |
| 2 seconds | 4 days |
| 10 seconds | 20 days |
| 60 seconds | 120 days etc. |

**No. of Samples:** Enter the number of samples to be taken. Enter 0 to log continuously until manually stopped, or until the memory is full.

**Scheduled Start:** Enter the date and time for logging to start.

**Erase Files:** Clear the memory of the Excelog One.

### Date and Time

Enter the date and time for the Excelog's clock - this is used for data logging time stamps.

### Power Settings

**Enable Power Saving:** enable this option to significantly extend the battery life.

**Idle Time (mins):** with Power Saving enabled, the display is dimmed after this many minutes. The unit continues to function.

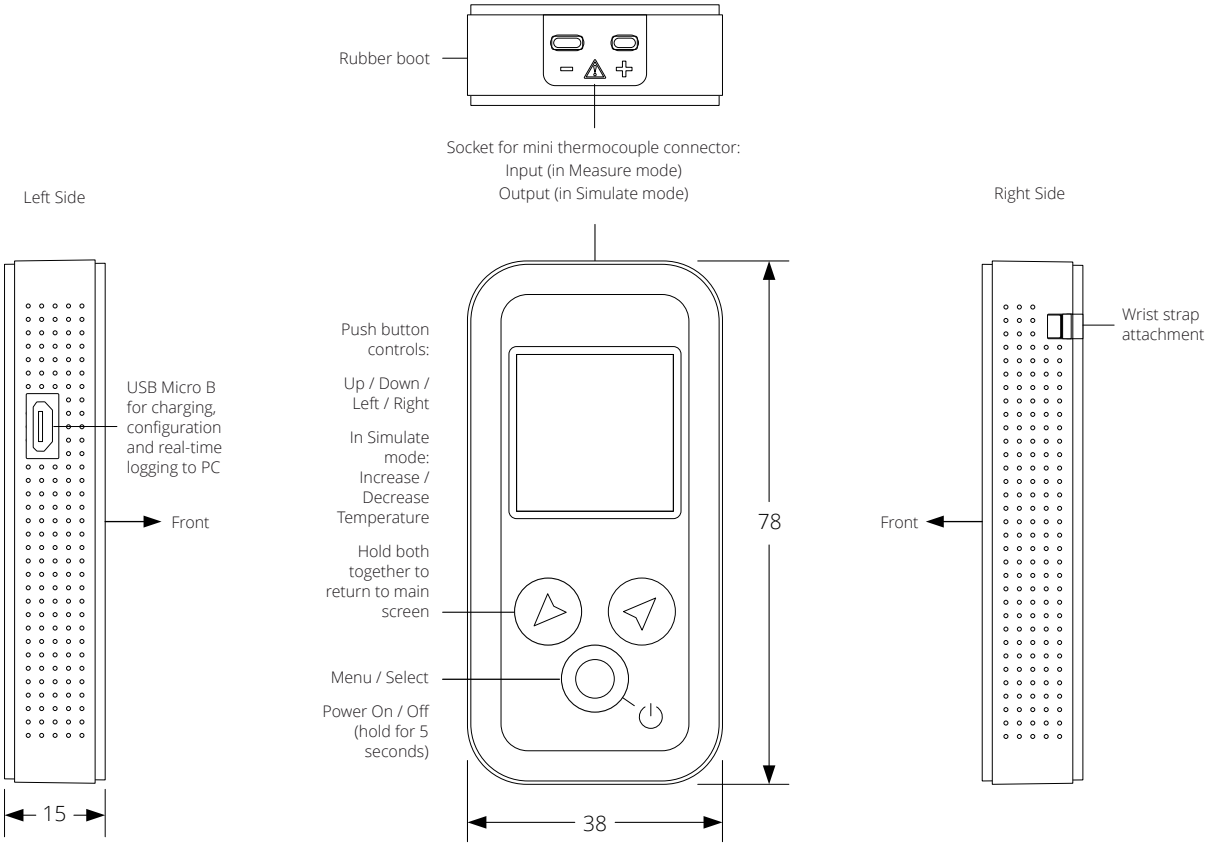
### Language

Select English, French, Spanish, Italian, German, Simplified Chinese or Japanese.

### Exit

Returns to previous screen.

## DIMENSIONS / CONNECTIONS




All dimensions in mm

## SOFTWARE

The free Excelog software is available to download from www.calex.co.uk/software

### Software functions

- Live temperature display
- Data logging of live temperature data direct to PC
- File format: Comma-separated text file (compatible with Excel)
- Scrolling temperature chart
- Configuration of Excelog One settings

### System requirements

- Windows 7 or newer
- USB 2.0 port; internet access (for software download)

### Installation

1. Download the software and run the installer.
2. Connect the Excelog One when prompted.

### Operation

On starting the program, the connected Excelog One unit will be recognised automatically. If the unit is not recognised, check the USB cable is connected and click the Search icon to look for connected devices.

### Live Data Logging (Data Acquisition)

When logging long periods of data, to avoid long transfer times it is recommended to use live data acquisition instead of logging to internal memory.

In software Settings, specify the file name and location for the data logging file.

By default, files are stored in Documents/Excelog.

Click **[START LOGGING]** to begin live data capture. The Excelog One functions as a thermocouple input channel with the PC as a data logger.

### Data Download

Click Download Data and specify the download folder location on your PC. Click OK to begin downloading the data. Transfer time depends on the number of samples. When the memory is full, data download takes up to 25 minutes.

## TROUBLESHOOTING

**Symptom:** Temperature display does not change when measuring

**Probable cause:** Unit is set to Simulate (output) mode

**Solution:** Select Measure mode (Settings - Measure/Simulate)

**Symptom:** No output

**Probable cause:** Unit is set to Measure (input) mode

**Solution:** Select Simulate mode (Settings - Measure/Simulate)

**Symptom:** Inaccurate measurement

**Probable cause:** Thermocouple type mismatch

**Solution:** Check Thermocouple Type setting matches the probe

**Symptom:** Inaccurate measurement

**Probable cause:** Use of incompatible types of cable (including ordinary copper wires) or connectors

**Solution:** Use only compensated thermocouple cable and connectors matching the thermocouple type

**Symptom:** Inaccurate measurement

**Probable cause:** Cold Junction mode incorrectly set

**Solution:** Use External Cold Junction only if using a cold junction in an ice bath, connected to Excelog One via copper wires and Type U connector.

Use Internal Cold Junction when connecting the probe directly to Excelog One without the use of an external cold junction.

## GUARANTEE

Calex guarantees each instrument to be free from defect in material and workmanship under normal use and service for the period of one year from the date of purchase. This guarantee extends only to the original buyer.

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