

# MINI-DATALOGGER SOFTWARE

The Mindsets Mini-datalogger software is available as a free download from the Mini Dataloggers product pages on Mindsets' website: [www.mindsetsonline.co.uk](http://www.mindsetsonline.co.uk)  
Click the 'Downloads' tab and select 'Mini Datalogger Setup'.  
Download and run the setup file and follow the on-screen instructions.

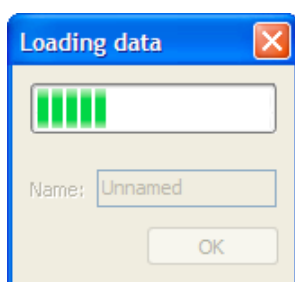


## LOADING DATA

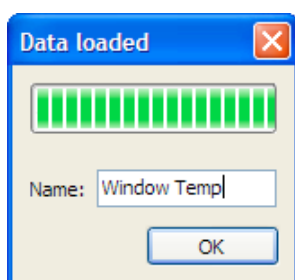
When the software is run, a window with an empty plot is shown. The main functions are accessed by clicking on the buttons to the right of the plot.



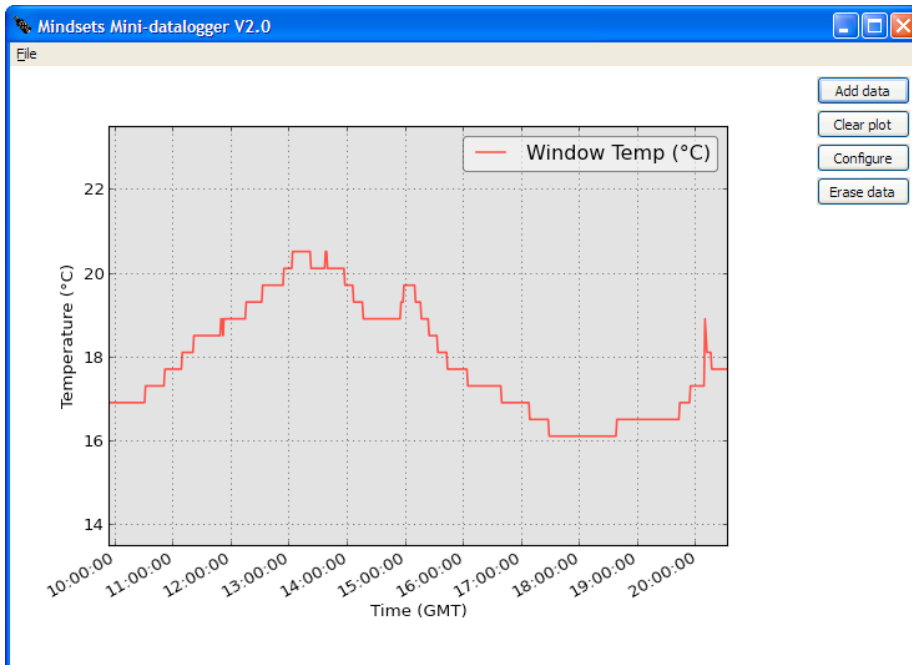
To read logged data, insert the datalogger into a free USB port (the green LED on the datalogger should light) and click the "Add data" button.  
A dialog window will show the progress of the read (it can take a few seconds when reading larger capacity dataloggers).



Once the read is complete the data can be named. Click OK to accept the name.



The graph will show the data with the axis appropriately labelled. A legend will be created using the name entered.

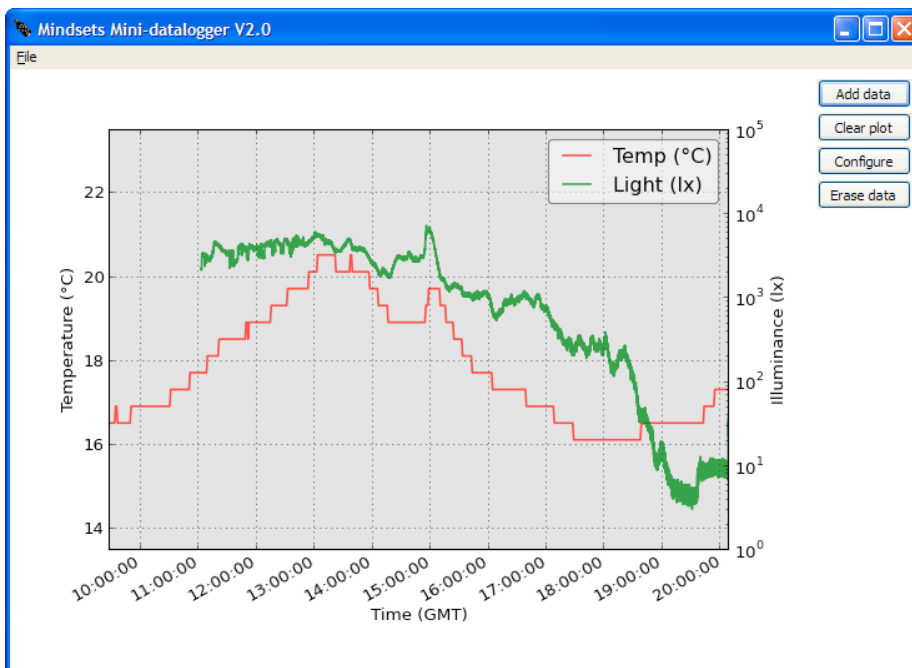


## OTHER FUNCTIONS

- The “Clear plot” button reverts to the initial empty plot.
- The “Erase data” button deletes all data from the datalogger currently connected to a USB port.
- The “Configure” button opens the settings window for the datalogger currently connected to a USB port. This window allows the sample rate to be set, and on newer dataloggers, a start date and time. The settings window varies depending on the datalogger; it will be discussed separately for the different dataloggers.

Note: the time is shown in GMT to avoid ambiguity when transitioning to and from daylight saving time.

## LOADING DATA FROM MULTIPLE DATALOGGERS



Data from other mini-dataloggers (or the same datalogger at a later time) can be added to an existing plot by simply pressing the “Add data” button and naming the new data. Adding data from a different type of datalogger will create a second y-axis. Currently only two types of data can be shown simultaneously.

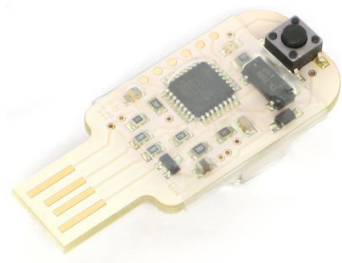
## EXPORTING DATA

The export commands can be found under the File menu. The data shown in the current plot can be exported as an image (PNG file) or a CSV file, which can be imported into a spreadsheet. The CSV file will contain a column for each mini-datalogger and single time and seconds (from start) columns will be automatically created.

## BATTERY

On the newer, cased, dataloggers the CR1220 battery can be changed. The two-part push-fit case can be carefully pulled apart to access the battery on the circuit board. Ensure the corners are aligned when pushing the case back together.

## LIGHT AND TEMPERATURE DATALOGGERS (ORIGINAL TYPE)



Light



Temperature

Note: the Temperature Mini-datalogger was also available in uncased form.

### SPECIFICATIONS

- 640 sample memory.
- The sample rate can be set between once per second and once every 12 hours, hence, the memory can store 10 minutes to almost a year of data.
- The Light datalogger is designed for use in timing experiments, hence, it can also take a fast burst of samples (up to 128 samples per second). It records the light level as a percentage of full-scale (not calibrated).
- Recommended temperature range  $-20\text{ }^{\circ}\text{C}$  to  $+60\text{ }^{\circ}\text{C}$
- Resolution of 0.1 degrees C (typical accuracy  $\pm 0.5$  degrees C).
- Battery life is estimated at 1 to 3 years, depending on settings (up to 10 years for uncased dataloggers).

### CONFIGURING THE SAMPLE FREQUENCY

The image shows a screenshot of the 'Mini-datalogger settings' window. The window title is 'Mini-datalogger settings' and it has a close button in the top right corner. The main text says 'This mini-datalogger records Temperature in  $^{\circ}\text{C}$ .' There are two radio buttons: 'Continuous mode: overwrite oldest data once memory is full' (which is selected) and 'Burst mode: record a fast burst of samples and stop once memory is full'. Under 'Continuous mode', there are two spinners: 'Record a sample every' with a value of '1' and 'minute(s)', and '0' and 'second(s)'. Under 'Burst mode', there is a note: 'Note: datalogger requires a start button to support this mode.' There are two spinners: 'Samples per second:' with a value of '128' and 'Delay (seconds):' with a value of '2'. At the bottom, there are two lines of text: 'The maximum number of samples is 640.' and 'The longest log duration is 10 hours 40 minutes.' There are 'OK' and 'Cancel' buttons at the bottom right.

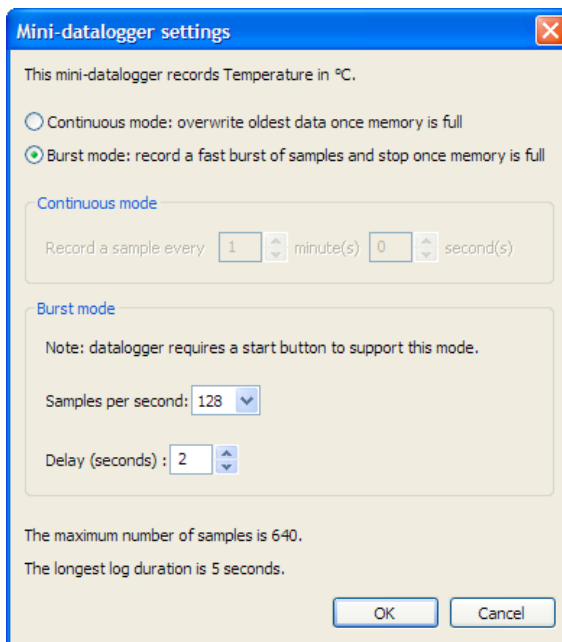
The sample rate can be changed in the settings window (accessed by clicking the "Configure" button). By default, the mini-datalogger is set to continuous mode. In continuous mode the samples are recorded at the chosen frequency. Once the memory is full, the oldest data is overwritten.

As the time between samples is altered, the total duration of the log is shown at the bottom of the screen. Intervals between 1 second and 720 minutes can be set.

Burst mode allows the datalogger take more frequent samples, and stop sampling once the memory is full. The use of this mode is discussed below.

## USING BURST MODE

Burst mode allows the mini-datalogger to use higher sampling rates (up to 128 samples per second) for short periods. Once the memory is full, the sampling stops. If a datalogger is in "burst" mode, sampling is started by pressing the button on the datalogger.



A mini-datalogger can be switched to "burst" mode by opening the settings window (click on the "Configure" button) and selecting "Burst mode". This will allow the burst sample rate and start delay to be adjusted. The delay indicates the time between pressing the button on the mini-datalogger and the start of the burst of samples. A delay of up to 254 seconds can be set. The LED on the mini-datalogger flashes when the button is pressed: once every second until sampling starts and once when the burst of samples is complete. Any data already stored will be overwritten.

Reading the data is done by pressing the "Add data" button.

## LIGHT (LOGARITHMIC) AND VOLTAGE DATALOGGERS (FROM MARCH 2013)



Light



Voltage

### LIGHT (LOGARITHMIC)

- Record up to 16,384 samples.
- Measure illuminance from 5 lux to 70 klux (logarithmic response).
- Can optionally set a start date and time.
- Recommended temperature range -20 degrees C to +60 degrees C.
- Battery life is estimated at 1 to 3 years, depending on settings.

The sample rate can be set between once per second and once every hour, hence, the 16,384 sample memory can store from 4 hours to almost 2 years of data.

### VOLTAGE

- Record up to 8,192 samples.
- Measure 0 to 10V with a resolution of 20mV.
- External voltage source is connected via a screw-less terminal block.
- Can optionally set a start date and time.
- Recommended temperature range -20 degrees C to +60 degrees C.
- Battery life is estimated at 1 to 3 years, depending on settings.

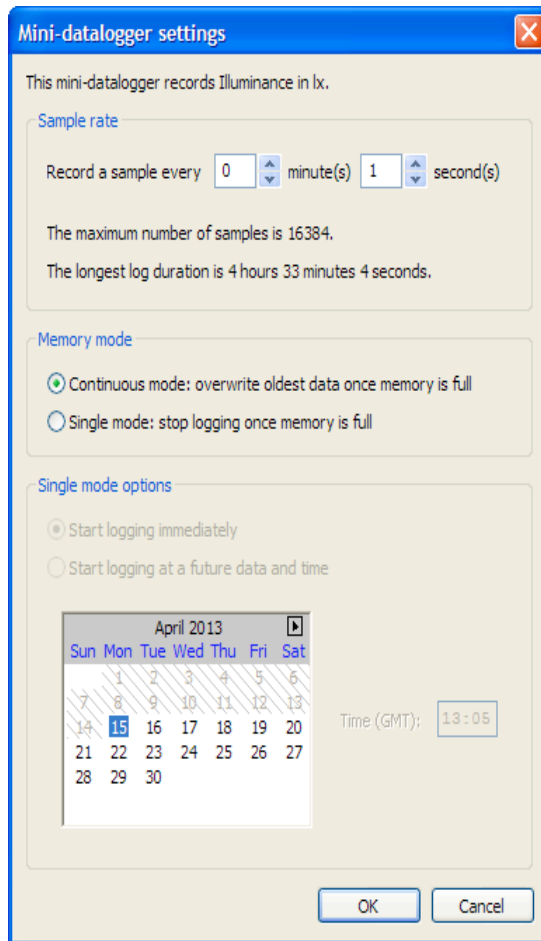
The sample rate can be set between once per second and once every hour, hence, the 8,192 sample memory can store from 2 hours to almost a year of data.

**Warning:** when the datalogger is attached to the USB port, the input ground is directly connected to the USB ground. If the voltage source is not isolated from the computer power supply, incorrect connection of the input can cause large currents to flow, potentially damaging the datalogger and host computer. Because of this, it is recommend that you always disconnect the voltage source before inserting the datalogger in to the USB port.

### CONFIGURATION

The settings window is accessed by clicking the "Configure" button. The time between samples can be set from 1 second up to 1 hour. As the time between samples is altered, the longest duration of the log is shown at the bottom of the screen.

By default, the mini-datalogger is set to continuous mode. In continuous mode the samples are recorded at the chosen frequency, once the memory is full, the oldest data is overwritten.



Alternatively, the datalogger can be set to single mode. In this mode, logging stops once the memory is full, however, the datalogger keeps track of how much time has passed so the data is still reference to GMT.

Logging can be set to start immediately, or at a future date and time.

## ACCELERATION DATALOGGER



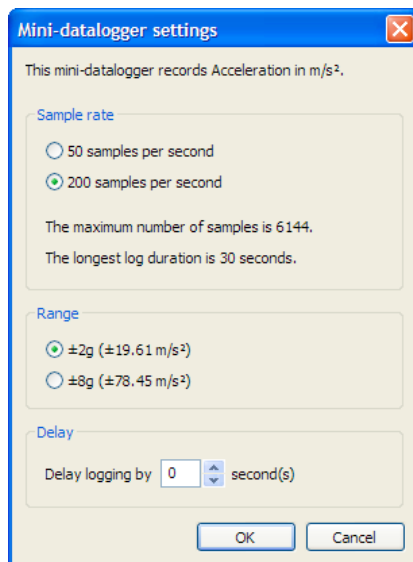
Acceleration

The Acceleration Mini-datalogger is design to be used in quick experiments and works differently to the other dataloggers. The button is used to start and stop recording and samples are not reference to GMT (the first sample is at  $t=0$ ).

### SPECIFICATION

- Record acceleration in three axis simultaneously (up to 6,144 samples per axis).
- Selectable sample rate of 50 or 200 samples per second.
- Measure acceleration up to  $\pm 8g$  ( $\pm 78.45m/s^2$ ) at a resolution of  $62.5mg$  ( $0.6129m/s^2$ ).
- A  $\pm 2g$  range is available for higher resolution (e.g. for free-fall experiments).
- Recommended temperature range  $-20$  degrees C to  $+60$  degrees C.
- Battery is estimated to last up to 1000 logs.

### CONFIGURATION



The settings window is accessed by clicking the "Configure" button.

Sample rates of 50 samples per second (SPS) and 200 SPS can be chosen, giving a log duration of 30 seconds and 2 minutes respectively.

The range can be set to suit the experiment.  $\pm 2g$  is ideal for free-fall experiments, while  $\pm 8g$  is better suited to impact experiments and rocket launches.

A start delay of up to 99 seconds can be set.

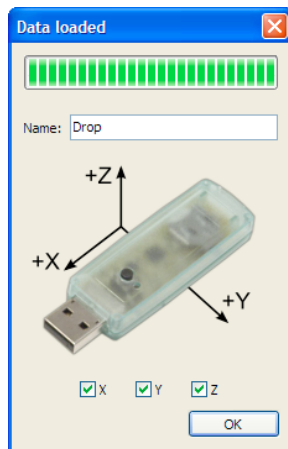
## LOGGING

Pressing the button starts a log. Old data will be overwritten immediately (unless a delay has been set). If a delay is set the LED double-flashes until logging starts. When logging at 50 SPS the LED will pulse once per second, at 200 SPS the LED will pulse four times per second.

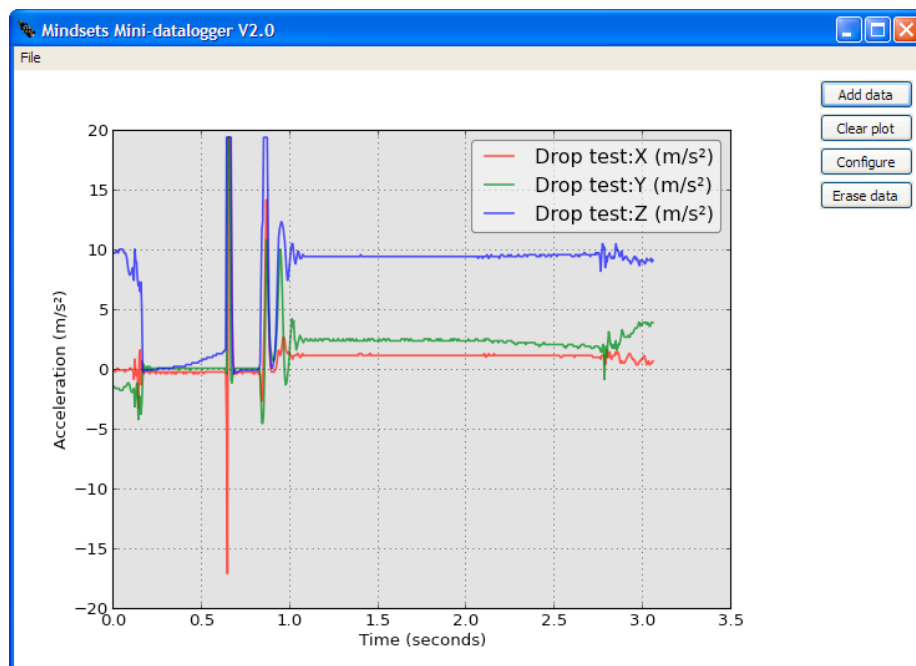
Once the memory is full, logging will stop, however, logging can be stopped by pressing the button again.

## LOADING DATA

Often, data for only one or two axis is needed. To prevent superfluous data being plotted, the axis can be selected in the load dialog.



The name entered will be postfixed with X,Y and Z to label the plots.



Note: when at rest, the datalogger will register the force due to gravity as an acceleration.