

Mirrin LL400

Multi-Channel Load Logger

Quick Start Guide



1. General

The Mirrin Multi-Channel Battery Operated Load Logger (MLL) measures AC RMS current (load) up to four channels and is ideal for monitoring loads on circuits and switchboards to record load profiles and used to identify slow changing events such as long duration interruptions, outages and derive estimates of usage patterns.

The two models of the Mirrin Multi-Channel Load Logger that CHK PQ provide are:

- LL400W – Mirrin Load Logger with WiFi
- LL400WT – Mirrin Load Logger with WiFi plus two temperature ports

The MLL 400 is sold as part of a kit which include the following:

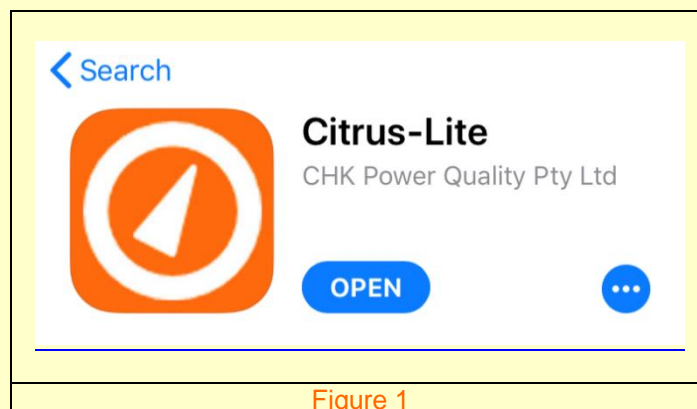
- 1 x Mirrin Load Logger unit
- 4 x 3000A Flexible Rogowski Coil Current Sensors. (Iron-core Clamp-on CTs are also available)
- 2 x Temperature sensors (1 x ambient & 1 x magnetic mount, for LL400WT models only)
- 1 x Soft Carry bag
- 1 x USB communications cable
- 1 x Protective rubber holster
- 1 x Backplate & magnetic feet
- 1 x Integrated WiFi module
- 1 x Citrus software
- 1 x Citrus Lite mobile application for Android and iOS devices
- 1 x Integrated rechargeable battery

2. Requirements

The Citrus software is compatible with any PC or Laptop with Microsoft Windows, version XP or later. The Citrus software provides a platform which allows users to quickly and easily configure the Mirrin, download the data, upgrade firmware and analyse the logged data. The latest version of the Citrus software is free to download from the downloads section of our website. Please see the link below:

<http://www.chkpowerquality.com.au/downloads/>

The Mirrin is equipped with an integrated WiFi module which allows users to wirelessly communicate to the unit via a laptop, tablet or smartphone. To communicate with the Mirrin via a tablet or smart phone, users are required to download the Citrus Lite mobile application which is available on Android and iOS devices as shown in **Figure 1**.



3. Configuration

The Mirrin Load Logger should be configured before installing the unit onsite. This is to ensure that the correct data is recorded at suitable measurement intervals. The user should have the Mirrin connected to a PC via the USB cable provided in the kit. See the steps below:

1. Once installed, open the Citrus software. This will display a window as shown in Figure 2. The user should select the 'Mirrin' option.



Figure 2

2. Ensuring the Mirrin is connected via the USB cable, the user should select 'Connect', as shown in Figure 3. This will open the 'Status' window as shown in Figure 4. This displays the general information of the Mirrin including the Serial number; Firmware version; Calibration date; and much more.



Figure 3

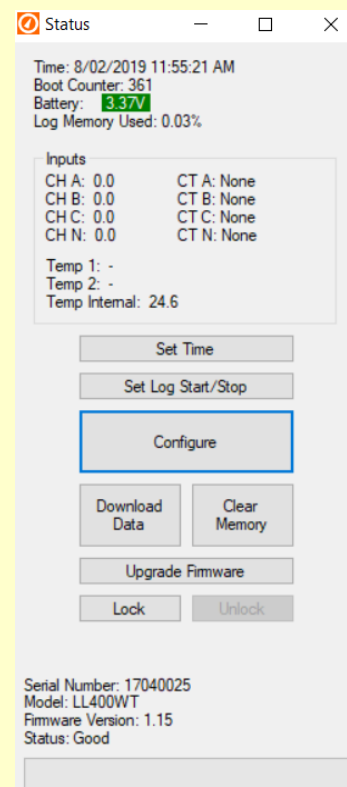


Figure 4

3. The user has various options within this page, such as: 'Configuration'; 'Download'; and 'Upgrade Firmware'. By selecting the 'Configuration' option, the user will be prompted with a window as shown in **Figure 5**.

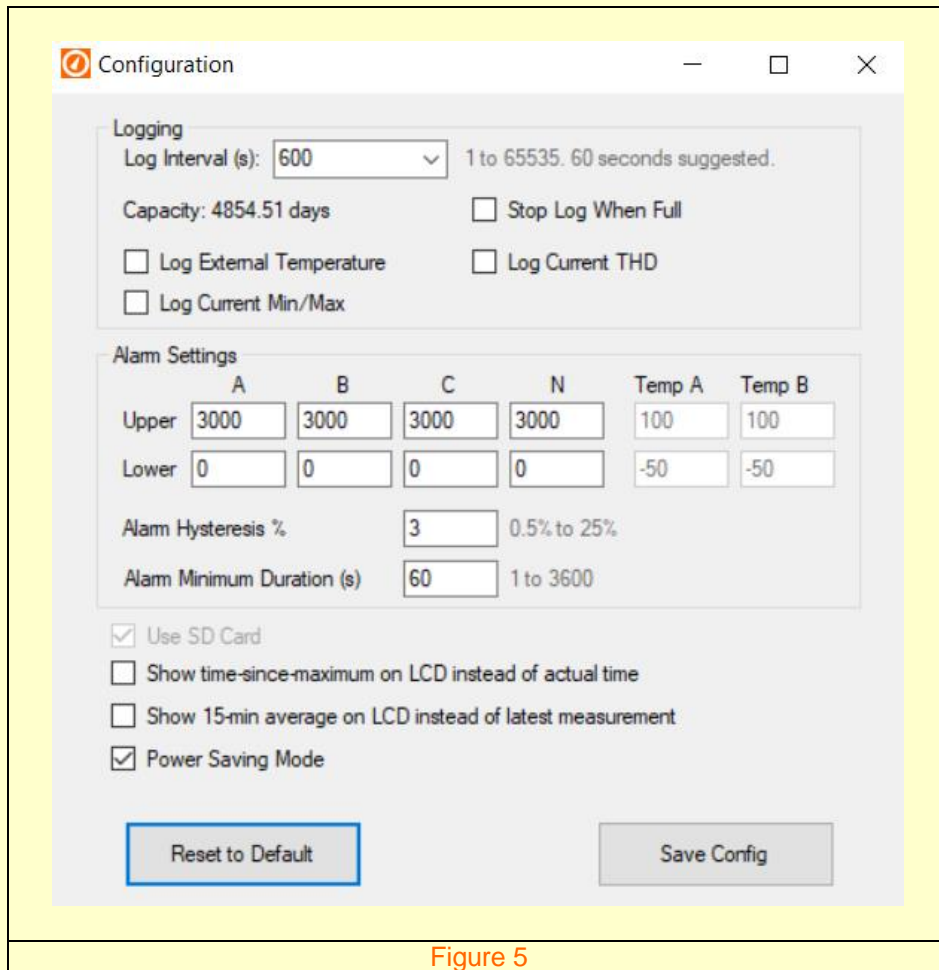


Figure 5

4. The Mirrin's default configuration is shown in **Figure 5** and is sufficient for the majority of applications. However, the user should review the configuration to ensure that the correct settings are selected for their specific application.
5. The measurement interval should be selected appropriately. The Mirrin is capable of logging data from as low as 1-second intervals. However, this should only be used for short durations as it uses a significantly larger volume of data. It is recommended to use 60-second measurement intervals, unless a shorter interval is specifically required.
6. The user can configure Alarm thresholds for each of the four current channels and two temperature channels. Setting alarms will allow the user to quickly determine if any thresholds were exceeded throughout the logged period.
7. Once the configuration is complete, press the 'Save Config' button at the bottom right-hand corner of the configuration window.

4. Connecting via WiFi

1. To turn on the WiFi module, press the button next to the LCD screen on the Mirrin unit. Please note that the WiFi module will turn on automatically if it detects external power via the USB port.
2. The WiFi module will remain on for 60-seconds and the SSID will appear as 'MIRRIN-{serial number}' as shown in **Figure 6** & **Figure 7**. Throughout this time the user can connect to the Mirrin's WiFi hotspot via a PC, smartphone or tablet. When prompted to enter a password, please enter 'mirrinpw'.

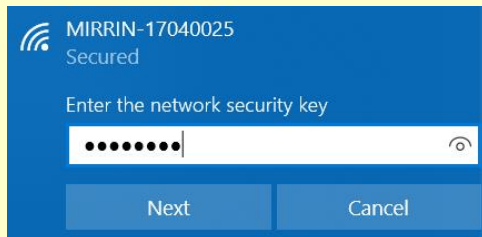


Figure 6 – WiFi connection via PC

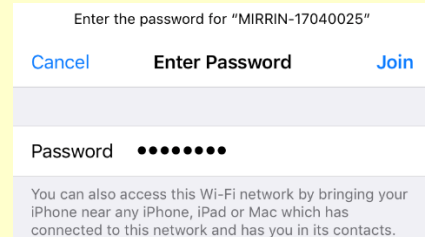


Figure 7 – WiFi connection via iOS device

3. To connect via WiFi using Citrus, the user can press the 'Connect WiFi' button as shown in **Figure 3**
4. If connecting using the Citrus Lite mobile application, the user can click the 'connect' button within the app. Once connected, the user will see a display similar to the one in **Figure 8** below which shows instantaneous values, maximum values and a live plot, as well as other general information about the Mirrin.

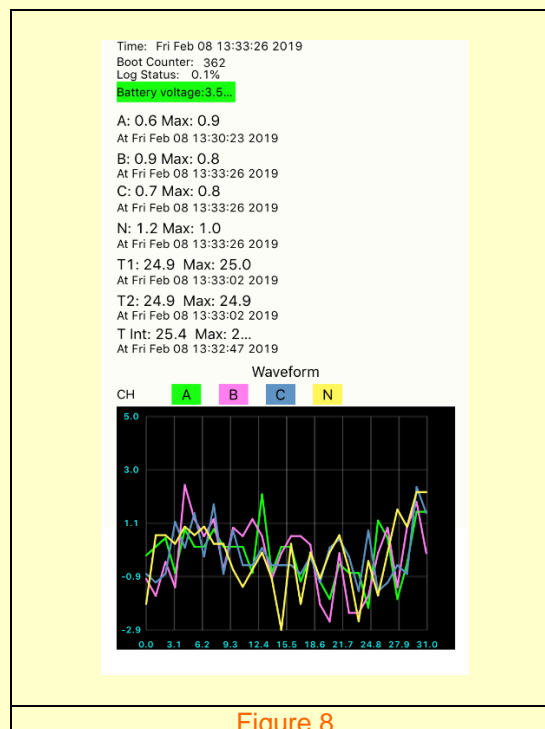


Figure 8

5. The user can also perform configuration changes via the Citrus Lite app to adjust measurement intervals and alarm settings.
6. Data can be downloaded via the Citrus Lite app as shown in **Figure 11**.

5. Installation

It is important that the Mirrin unit is installed by a qualified Electrician to ensure safe procedures are followed.

1. If required, the user should now connect the temperature sensors to the designated ports on the side of the unit.
2. Connecting the **current sensors** to the load:
 - a. Connect the current sensors to the ports on the front of the Mirrin, labelled A, B, C, N.
 - b. Every current sensor that is provided from CHK PQ will have an arrow located on it. When installing the sensor onto the conductor, this arrow should point **towards** the load.
 - c. Ensure that the current sensor on channel A is connected to the phase A conductor, and B with phase B etc.
3. There are two ways to power up the Mirrin Load Logger, depending on the version purchased:
 - a. Power upon installation of current sensor (Rogowski coils or clamp on CT) on channel A;
 - b. Power on by pressing the button located at the left-hand side of the LCD.

Please note: Pressing the button on both versions, turns on the LCD screen. The user should press the button once the unit is installed to visually inspect the LCD to ensure that each channel is reading current as expected.
4. For both versions, once the unit is powered on and a CT is detected on Channel A, the Mirrin will remain powered on until it detects that the sensor from channel A has been disconnected.
5. To reset the Maximum Demand within the Mirrin unit:
 - a. Press the button on the Mirrin to turn on the LCD screen.
 - b. Whilst the LCD is on, press the button again. This will display a message as shown in **Figure 9**.
 - c. Hold down the 'Press' button for 3 to 10seconds. Upon release of the button, the maximum demand will be reset and a message confirming the reset will be displayed, as shown in **Figure 10**. Please note that the button needs to be held down within 7 seconds after step b.



6. Log Download

To download the data from the Mirrin, the user can plug in the USB cable and select the 'Download Data' button from within the Mirrin's status window, as shown in Figure 4. The user will be prompted with a window specifying the location within their PC or server where they wish to save the data file.

Once the data file is downloaded and stored in a safe location, it is recommended that the data is then erased from the Miro. This can be done via the 'Clear Memory' button shown on Figure 4.

Users can also download the logged data directly to the Citrus Lite app. Once downloaded, it can then be sent via email straight from the tablet or smartphone.

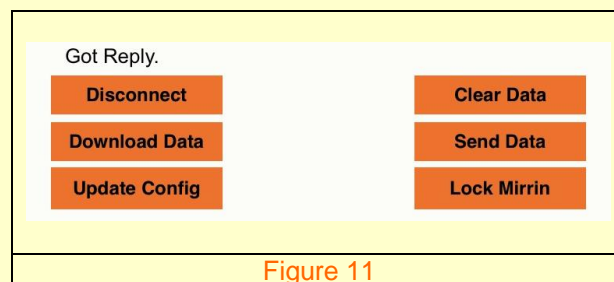


Figure 11

7. Maintenance

The Mirrin has an internal battery which can be recharged via the USB cable provided within the kit. From an empty battery, it takes between 6-8 hours to fully charge.

Please note: The Mirrin is charged at the same rate whilst being powered from a PC/Laptop or a GPO.

The Mirrin's battery life varies depending on the Log Interval that is being used. By default, the Mirrin is in 'Power Saving Mode'. Table 1 shows the approximate battery life of the Mirrin whilst in this mode and utilising various log intervals.

Log Interval (s)	Battery Life (Days)
1	29
5	100
15	167
30	200
60	222
300	244
600	247

Table 1

The latest version of Citrus and the Mirrin firmware are always free to download from the downloads section of our website. Once the firmware is downloaded onto the user's PC or server, the Miro can be updated via the 'Upgrade Firmware' button within the Mirrin's 'Status' window as shown in Figure 3.