



# Operation of RainLog 2.0 data logger and RL-Loader Software

**Wet Tropics Major Integrated Project  
Standard Operating Procedure  
WTMIP SOP 017**

Wet Tropics Major Integrated Project  
31 March 2021

# Table of Contents

---

WTMIP SOP 017: Operation of RainLog 2.0 Data Logger and RL-Loader	3
1. Purpose and scope	3
2. Training, competency and responsibilities	3
3. Workplace health and safety	3
4. Record keeping	3
5. RainWise RainLog 2.0 data logger and RL-Loader software	4
5.1 RainWise RainLog 2.0 rain gauge and logger	4
5.2 RainLog 2.0 data logger setup	6
5.3 RainLog 2.0 data logger download and export	6
5.4 RainLog QuickStart figures	7
6.0 Maintenance	7
References	9
Version Control	9

# WTMIP SOP 017: Operation of RainLog 2.0 Data Logger and RL-Loader

## 1. Purpose and scope

This document provides guidance on the process of collecting high-frequency meteorological data as part of the Wet Tropics Major Integrated Project (WTMIP).

The method outlined in this document applies to setup and operation of RainLog 2.0 data loggers and the operation of RL-Loader software for equipment initialization.

## 2. Training, competency and responsibilities

Program staff, contract staff, landholders and external stakeholders participating in water quality measurements are provided with training in measurement methods. Records of participant competency are maintained within the Terrain Natural Resource Management (NRM) file management system (SharePoint).

**Table 1 Roles and responsibilities of WTMIP program participants**

Position	Responsibilities
WTMIP Project Leader	Provide resources for the implementation and continued development of this method.
WTMIP Water Quality Project Officers (Leader/Technicians)	Ensure methods described in this method document are followed. Train new staff members in the methods. Continually review and develop the methods where appropriate.
WTMIP program staff, contract staff, landholders and external stakeholders	Follow the methods described in this document. Provide feedback to WTMIP Water Quality Project Officers for continued development of this method document.

## 3. Workplace health and safety

Field based work activities must adhere to Terrain NRM work health and safety (WHS) requirements. The following procedures and available equipment must be considered prior to undertaking fieldwork:

- Joint Corporate Nature, Terrain NRM, Cape York NRM and Northern Gulf Resource Management Group Health and Safety Policy and Procedures Manual.
- Terrain NRM Water Quality Monitoring Risk Assessment.
- Trip plan, including call-in schedule and emergency response procedures.
- Communication devices required for the trip (e.g. mobile phone, SPOT GPS device, EPIRB).
- First Aid Kit.
- Personal protective equipment (PPE), such as safety boots, pants, long sleeved shirt, hat.

## 4. Record keeping

For each instrument the following procedures and documents should be established and kept up to date:

- List of spare parts suppliers and service/repair providers.
- Written inspection, maintenance and calibration schedules.
- Download records, a detailed record of downloads performed, maintenance requirements, activity dates and people involved (**Figure 1**).

Keeping records allows determination of whether the equipment has been maintained in a sound operating condition and the recorded data is credible. This information is vital for the defensibility of WTMIP data, when undertaking investigations or if an audit is undertaken.

Maintenance sheets and calibration sheets are kept in SharePoint under MIP-Knowledge and Info – Data Storage – Local Scale Monitoring.

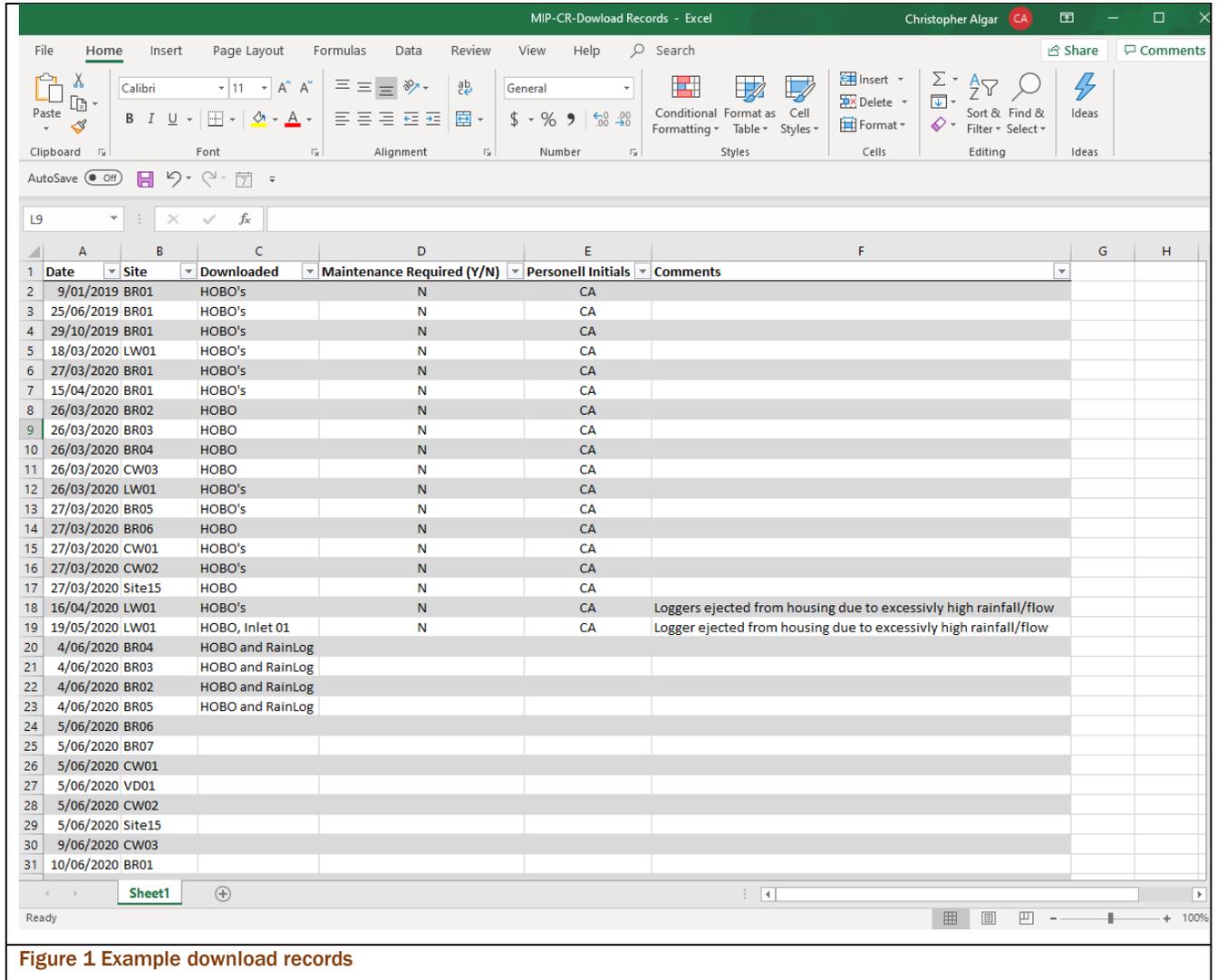


Figure 1 Example download records

## 5. RainWise RainLog 2.0 data logger and RL-Loader software

Data loggers are used to measure a range of parameters. The RainLog 2.0 (RL) is used in a tipper bucket rain gauge used to monitor and record local rainfall and is installed at five WTMIP Catchment Repair treatment systems. The tipping bucket rain gauges use calibrated volumes of the tipping bucket sensors to calculate rainfall. Each time the tipping mechanism tips, the known calibrated volume from that tip is accumulated into total rainfall volume. The WTMIP tipping bucket rain gauges are programmed to provide data on interval rainfall (individual tips at 0.2 mm), hourly rainfall and daily rainfall totals via download using RainWise's RL-Loader.

### 5.1 RainWise RainLog 2.0 rain gauge and logger

Figure 1 Shows RainLog 2.0 with data transfer cable attached. Figure 2 shows the RainLog 2.0 battery housing. Figure 3 shows fastening screws for removing the protective cone. Figure 4 shows the RainLog 2.0 rain gauge internals.

Figure 5 Shows the rain gauge data cable connected to the RainLog 2.0 logger Figure 6 Shows the RainLog 2.0 seated in its protective housing.



Figure 1 RainLog 2.0 logger with data transfer cable



Figure 1 RainLog 2.0 battery installation



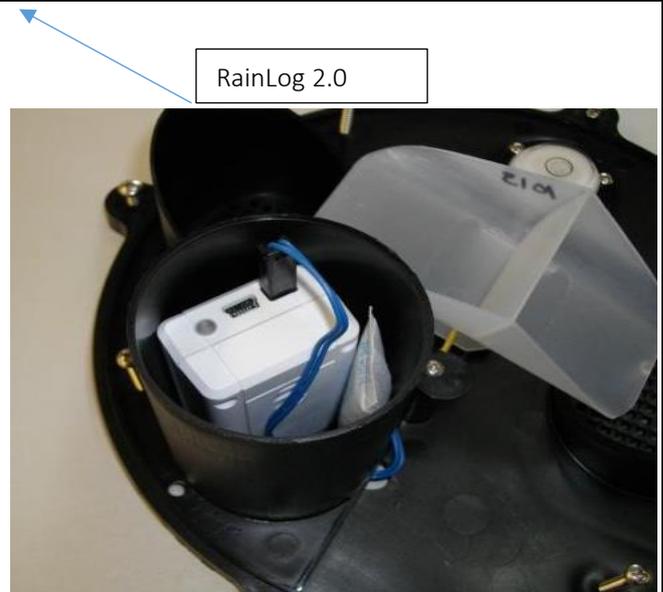
Figure 3 RainWise funnel fastening screws



Figure 4 RainWise tipper bucket rain gauge internals



**Figure 5** RainLog 2.0 data logger connector



**Figure 6** RainWise data logger housing

## 5.2 RainLog 2.0 data logger setup

The WTMIP RainWise tipping bucket rain gauges are factory calibrated to known tipping volumes and do not require further calibration once installed in the field. Once the calibrated rainfall volume has been measured, the data is logged for download. The steps outlined below explain the setup and initialisation of the RainLog 2.0 data loggers and RL-Loader software. For a visual guide see the table RainLog QuickStart figures.

1. Insert the CD-ROM and allow **CD\_Start.exe** to run. If it does not load automatically, browse the CD and run **CD\_Start.exe**.
2. Install the USB drivers: once the start program has initialised, select from the menu options Install **USB Drivers** (the installation is rapid).
3. Install the RL-Loader software: click on the install RL-Loader software in the menu options and follow the prompts to install software.
4. Install the batteries in the RainLog: two AAA batteries supplied. The green LED located to the left of the USB cable will flash rapidly as the Rainlog initialises. **(Important to note battery orientation)**
5. Connect RainLog and start RL-Loader: connect the RainLog to your computer using the data cable provided and run the RL-Loader application.
6. Connect to your logger: in RL-Loader, select the logger drop down menu at the top of the screen and select **Auto Detect**, which will automatically connect you to the RainLog.
7. Set the name/site, clock and clear: using the same logger menu outlined in step 6, select **Clear** to ensure no redundant information is left on the logger. Set your name/site, then the date, following the prompts. Your unit is now ready to collect data.
8. Check the battery voltage: with new batteries, the voltage should be above 1.5 volts.
9. Close RL-Loader and check for green light: once you have closed RL-Loader, disconnect the USB cable and verify that the green light is flashing. If it is flashing, the unit is ready to be reconnected to the rain gauge to collect data.
10. The rain gauge is now ready to be deployed. See WTMIP SOP 013 for further details on maintenance.

## 5.3 RainLog 2.0 data logger download and export

The steps below explain the collection of data from a RainLog 2.0 data logger using RL-Loader software. For a visual guide see the table RainLog QuickStart figures.

1. Remove the RainLog from the connector. Observe the LED and verify it is flashing green. Flashing red indicates low battery. No flashing indicates a battery failure.
2. Connect the RainLog data logger to your computer using the USB cable.
3. Start RL-Loader.

4. Connect the logger. **See step 6 RainLog 2.0 data logger setup.**
5. Verify device information, noting the battery voltage, available memory capacity and logger time. If the time is incorrect, some data may be compromised.
6. Download: download the data using **download** from the logger menu as outlined in **Logger setup**. Data will appear in the text and graph window.
7. Save the data: save the downloaded data using the **Save As** in the file menu. This option saves the data in the RL-Loader format so that it can be opened by RL-Loader.
8. Exporting: data can be exported to Microsoft Excel using the **Export** option in the file menu. Export locally, then store.
9. Redeploying: make sure the battery voltage is good, clear the memory to ensure sufficient space for data, then disconnect and redeploy.

## 5.4 RainLog QuickStart figures

**Figure 7** shows RL-Loader QuickStart menu. **Figure 8** shows the RainLog 2.0 connection options. **Figure 9** shows logger parameters which must be set before deployment. **Figure 10** shows an example of the RainLog 2.0 battery and memory capacity readout.



**Figure 7** RL-Loader CD\_ROM setup menu, RL-Loader and USB driver installation and relevant manufacturer information.



**Figure 8** RL-Loader logger auto and manual detect



**Figure 8** RainLog clear data, set name and clock functions. **These three items MUST be completed prior to deployment.**



**Figure 9** RainLog 2.0 logger data. Ensure battery and memory capacity is sufficient before deployment.

## 6.0 Maintenance

The steps below explain the maintenance of RainLog 2.0 rain gauges:

1. Standing above the rain gauge, inspect for any debris lodged in the rainfall inlet/mesh. Carefully remove any debris and discard it.
2. Unscrew the fastening screws (**Figure 3**) and remove the rain catcher. Inspect for debris blocking rainfall inlet internally and remove if present.

3. Inspect tipper bucket for debris/dust etc. Clean tipper bucket and document any tipping that occurs while performing maintenance.
4. Remove data logger from protective housing (**Figure 6**) and inspect operation light. The operation light should illuminate green every 10 seconds if functioning correctly. If the data logger is not functioning, remove and replace the two AAA batteries and reinitialise the unit as explained in **section 5.2**.
5. Inspect level indicator and adjust level with fastening screws at base of unit if necessary.
6. Re-attach rain catcher and fasten the screws as explained in step 2.
7. Document your maintenance actions in the maintenance sheet MIP-CR-Maintenance-Download Records located under **Catchment Repair** on SharePoint.

The data loggers can log continuously for approximately 12 months. Best practice is to perform quarterly (three-monthly) downloads to prevent large data gaps in case of an equipment fault.

## References

RainWise 2013 804-1010\_rainlog\_2.0\_manual Rev.0

RainWise 2013 804-1010\_rainlog\_2.0\_quick\_start\_guide REF: V 1.0 REV 2

## Version Control

Document History	Date	Amendment:	Amended by:	Reviewed by:	Approved by:
Version WTMIP 1.0	31 March, 2021	SOP prepared from reference documents listed above.	Chris Algar	NA	Fiona George

Terrain NRM and WTMIP partner organisations acknowledge the Water Quality and Investigations team at Queensland Government Department of Environment and Science for providing SOPs from the Great Barrier Reef Catchment Loads Monitoring Program as model documents for the development of WTMIP SOPs.