Data Acquisition Service Logged Data Format Guidelines

Version 3

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Contents

1.   Introduction

WaterNSW operates a data acquisition service (DAS) to collect, store and transmit water take data for non-urban meters across NSW.

The Water Management (General) Regulation 2018 requires water users to comply with the approved Data Logging and Telemetry Specifications 2020 by their rollout date, or earlier for new and replacement meters.

These guidelines define the data logger/modem (collectively Local Intelligence Device [LID]') configuration details to transmit data from water extraction meter sites to the DAS. They use the standardised naming convention and file format and approved data transport types and configurations to ensure data is transmitted and accepted securely into the DAS.

LID vendors must demonstrate the ability to comply with this guideline to be accepted as an authorised device under the Water Management (General) Regulation 2018.

Once DPIE list a LID (demonstrated by publishing the device to a DPIE website), the LID vendor is authorised to sell units to Duly Qualified Persons (DQP), with registration approval. Devices sold and shipped to DQPs must be:

- Pre-configured in accordance with these guidelines, and the LID Design document.
- Pre-configured with the meter specific information provided by the DAS provider (e.g. APN, unique username and password for DAS endpoint).
- Identifying sticker (With MeterSiteID and MeterID) firmly affixed.
- Configuration form (provided as part of base-typing document) as a record of all relevant configuration settings.

2.   Data transport types and configuration

There are four approved data transport methods to transmit consumption data to the DAS.

These are:

- SFTP
- FTPS
- MQTTS
- HTTPS.

Compatible LIDs must be configured to transmit data over these approved data transport methods only. Data transmitted over unsecure methods will be rejected by the DAS.

2.1.   SFTP

To act as an SFTP client, the LID must be configured using the details below. The unique username and password to be entered in the LID will be provided by the DAS provider.

Table 1. SFTP configuration details

Item	Details
DAS endpoint	sftp.das.waternsw.com.au
Port	TCP port 22

Item	Details
Username	DAS generated string, e.g. blue-water-bird
Password	DAS generated 8-character string

Note: Only one concurrent SFTP connection is allowed per device. The maximum accepted size per file is 5 MB.

2.2.   FTPS

To act as an FTPS client, the LID must be configured using the details below. The unique username and password to be entered in the logger will be provided by the DAS provider.

Table 2. FTPS configuration details

Item	Details
DAS endpoint	ftp.das.waternsw.com.au
Port	TCP port 990 for Implicit SSL
Username	DAS generated string, e.g. blue-water-bird
Password	DAS generated 8-character string

Note: Only one concurrent FTPS connection is allowed per device. The maximum accepted size per file is 5 MB.

2.3.   SSL encoded MQTT (MQTTS)

To publish data via MQTTS to the DAS, the LID must be configured using the details below. The unique topic, username and password to be entered in the logger will be provided by the DAS provider. The username and password fields should be provided in the CONNECT message.

Table 3. SSL encoded MQTT configuration details

Item	Details
Broker address	mqtt.das.waternsw.com.au
Broker port	8883
Username	DAS generated string. e.g. fruit-honey-jacket
Password	DAS generated 8-character string
Topic	DAS generated topic that uses the username defined above e.g. io/eagle/source/fruit-honey-jacket

2.4.   HTTPS

To POST data via HTTPS, the LID must be configured using the details below. The unique URL, username and password to be entered in the logger will be provided by the DAS provider. Basic Authentication is required.

Table 4. HTTPS configuration details

Item	Details
Username	DAS generated string. e.g. blue-water-bird
Password	DAS generated 8-character string
DAS Endpoint	DAS generated URL using the username defined above e.g. https://upload.das.waternsw.com.au /source/blue-water-bird
Port	443

2.5.   Network configuration

The LID modem must be configured to transmit data using the configuration details below.

Item	Details
APN Name	ipx1.m2mone

2.6.   Server certificate

The DAS server certificate will be changed regularly due to expiry. No client device should rely on a static copy of the server certificate, but should expect that the server certificate will change during the lifetime of the device.

Any authentication of the server certificate that is performed on the device must be able to work with new server certificates when they change.

3.   Data log file format guidelines

LIDs that comply with the specifications must be configured to log data according to the following standard file format guidelines. If a datalogger cannot meet the standard format guidelines, the datalogger vendor must submit a fully documented design proposal of their alternative format to the relevant authority for consideration. The relevant authority may accept or reject alternative formats at their discretion. If any modification is required to the DAS to process the proposed format, costs may apply to the LID vendor.

3.1.   Standard File name

Data log files must be saved using a CSV format. A new file must be saved per meter.

The standard file naming convention is 'YYYYMMDD_HHmmss_MeterID_Version.csv'

Where:

- **YYYYMMDD** is the date expressed as ISO8601 tokens (20190311 in the example below)
- **HHmmss** is the time expressed as ISO8601 tokens (000000 in the example below)
- **MeterID** is the unique NSW Department of Planning, Industry and Environment reference that is entered during the install process (A525 in the example below)
- **Version** is the *DAS logged data format guidelines* version number. (The current version is V1 as in the example below)

The filename timestamp must match the first record in the data log file. An example of a data log file name is:

20190311_000000_A525_V1.csv

3.2. Logging frequency

At a minimum, data must be logged hourly when extraction of water is occurring and daily in all other cases, and logged files must be transmitted at least daily.

3.3. Transmission

If HTTPS is used, the contents of the CSV file must be included as the POST body.

If MQTTS is used, the contents of the CSV file must be included as the payload.

If SFTP or FTPS is used, the complete CSV file must be transmitted.

3.4. Standard CSV file format

The file contents must be UTF–8 encoded and conform to the following format.

3.4.1. Header rows

Each file must contain three header rows:

- Row 1 contains a comma separated, variable set of attributes that must include:
    - Filename—filename of the enclosing document
- Row 2 contains the names of each logged parameter
- Row 3 contains the units of each logged parameter.

3.4.2. Data rows

Each record must be captured on a new line. Each record must contain no more than five fields: time, flow, event codes, event notes, and battery (optional). Fields must occur in the order listed, and the values of each field must conform to the Section 3.4.3.

3.4.3. Data fields

The following table summarises the required standard data fields and provides a description of the data type.

Table 5. Required data fields

Parameter	Description
time	The timestamp must conform to the format: YYYY-MM-DD HH:mm:ss. Note this is a 24-hour time format. All timestamps must be in the UTC+10 time zone (No Daylight Savings).
flow	Cumulative water consumption reported in Litres (L), Kilolitres (kL) or Megalitres (ML) with meter scaling already applied, to 0 decimal places.
eventCode	Device specific event codes. See Appendix 1 for list of events to log.
eventNotes	Device specific event notes. See Appendix 1 for list of events to log.
battery	Capacity of primary battery reported in Volts (V) or Percentage (%).
signalStrength	Signal strength of the device modem in dBm.

3.4.4. Sample of standard file format

An example of a correctly formatted CSV file is shown below.

Correctly formatted CSV file

```
filename=20190311_000000_A525_123235_V0.csv
time,flow,eventCode,eventNotes,battery,signalStrength
,ML,,,V, dBm
2019-03-11 12:15:01,012.12,,,12.0,-50
2019-03-11 12:30:04,012.14,,,12.3,-51
2019-03-11 12:38:24,012.15,1,reboot,12.4,-51
2019-03-11 12:45:09,012.20,,,11.9,-52
2019-03-11 13:00:03,012.21,,,12.6,-53
```

Time-based and event-based logs must be recorded in the same file. Not all parameters must be logged on every row. Where a parameter is not logged it must be represented by ',,'. This ensures the column order is maintained.

Appendix 1—Event type

The table below describes events WaterNSW recommends to log at a minimum. Vendors can log other events in addition to those listed.

Table A1. Events to log

Event description	Requirement
Data logger restart	Mandatory
Commencement of extraction of water	Very desirable
Conclusion of extraction of water	Very desirable
Cable tamper—disconnection of meter from datalogger	Mandatory where the installed system has exposed signals or coms cables. i.e. cables not inside a closed/tamper sealed enclosure
Tamper—enclosure open	Mandatory for the logger/modem enclosure. Not needed where pattern approved meters have built in loggers/modems.
Low battery level	Optional