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1. Introduction and scope

This procedure covers datalogger download and transfer of data from the field to final storage in the FLEObs database.

2. Principle of the method

Data is transferred from the field datalogger to a laptop or other mobile device, using the agreed naming convention for the file, area_scotx_date, the area and name will be as the description tab in the logger software as described in [SOPFL 1030](#) at 9.4.3 (where area is the main river catchment e.g. Dee, scotx denotes the logger name e.g. scot1 and the date is the date the logger is downloaded). The file should be stored in a directory set up specifically for that particular site. The laptop is taken back to the laboratory, or in the case of external bodies data files are sent via e-mail to Temperature.Data@marlab.ac.uk. The received file is then copied to the server:

[REDACTED]

where it can be uploaded into the FLEObs database.

3. Reference materials

N/A

4. Reagents

N/A

5. Equipment

- Field laptop with Tinytag Explorer software version 4.8 installed or higher installed.
- Tinytag Aquatic 2 dataloggers
- Inductive download pad ACS 3030
- Tinytag Plus 2 dataloggers
- Tinytag serial cable CAB-0007
- Computer with access to the Scots network.
- White plastic shielding
- 10mm and 13mm spanners
- Stainless steel bolts and locking nuts (M6 bolt 80mm length (X1), M8 set screw 30mm, M6 nylon self locking nuts, M8 nylon self locking nuts, M8 nuts, M8 Spring washers, M6 penny washers, M8 penny washers.
- Angle Iron
- Dexion
- Sledge hammer

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Pinch bar
 Eye protection and gloves
 MR-88 anchor system
 Hand held drive steel HDR-88
 Iron chain links (weighting)
 5mm stainless steel wire

6. Environmental control

N/A

7. Interferences

N/A

8. Sampling and sample preparation

N/A

9. Analytical procedure

9.1 Power up laptop, attach induction pad ACS 3030 to a USB port and launch the Tinytag software.

9.2 Retrieve the datalogger from the waterbody by unbolting the dexion from the angle iron. Unbolt the long bolt which will release the logger, dry thoroughly before placing on the induction pad. Failure to dry the unit properly can result in a poor or no connection. Take time to clean the white plastic shield as this will improve its ability to reflect any sunlight when reinstalled. If the datalogger has been deployed with a land anchor check the state of the wire connections and replace if necessary.

9.3 Downloading

Note that laptops should be set to GMT prior to logger download.

9.3.1 Firstly “STOP” the logger by selecting the **red X** on the toolbar.

9.3.2 You should get a message telling you the logger has been stopped, Press “Ok”.

9.3.2.1 If at this stage an error message is displayed try and continue with the download process as in 9.3.3. Whether this is successful or not the logger must be returned to MSS with a note of

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the error and a request for a replacement logger. Replace the logger as soon as is practicable and return the updated launch information on record sheet B 919 to MSS.

9.3.3 Then select the icon with the **chart and the green arrow pointing downwards which is the “Get Data from Logger”** button.

9.3.4 The data will be downloaded from the logger and will appear as a graph. Select **“Save file As”** and name and date the file and store in an appropriate place. The meaningful naming of sites and accurate saving of the data is critical. Once the data has been saved, the title on the top of the chart should have changed to the file name you have saved it as.

9.4 Relaunching the datalogger after download

Note that laptops should be set to GMT prior to logger launch.

9.4.1 Select the **green Play** button to set the logger running again. A window will appear with options for the new program.

9.4.2 Under **“Description”** you can name the logger. It is important to keep the name of the logger accurate to the site it is collecting data from.

9.4.3 Under **“Select logging interval,”** set to 15 minutes.

9.4.4 In advance of deployment, under **“Start Options”** select **“absolute start time”** and set the start time to 1.5 hours (rounded up to the nearest 15 minutes) ahead of the current time.

9.4.5 Under **“Measurements”** the default setting is Temperature and “at the end of each interval” and it should not be necessary to change this.

9.4.6 Under **“Stop Options”** “stop when full” is the default setting and should not be adjusted.

9.4.7 Under Alarms **“no alarms enabled”** is the default setting and should not be adjusted.

9.4.8 Once the correct settings have been selected the **LAUNCH** button should be selected. A summary of the program launched is displayed and you can then disconnect the logger and redeploy in the stream. With Tinytag Aquatic 2 dataloggers it is possible to check the logger program is working by looking at the base of the logger where an intermittent red flashing light should appear. With Tinytag plus 2 dataloggers a flashing green light indicates that the unit is working where as a red light indicates a fault.

9.5 The record sheet B 919 should be completed with as much of the requested information as possible at the time of download. Also remember to complete a new record sheet B 919 for

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the next deployment.

9.6 Transfer of data to laboratory

- 9.6.1 Files downloaded by FL laboratory staff will be transported to the lab and stored on the hard disc of the laptop that they were downloaded to.
- 9.6.2 Files downloaded by project collaborators will be stored on their laptop's hard drive or flash pen drive and sent via e-mail to FL at Temperature.Data@marlab.ac.uk at the earliest opportunity. Files should not be deleted but stored on the provided flash pen drive.
- 9.6.3 Once returned to the laboratory the raw files must be stored to the FL Environment groups shared server:

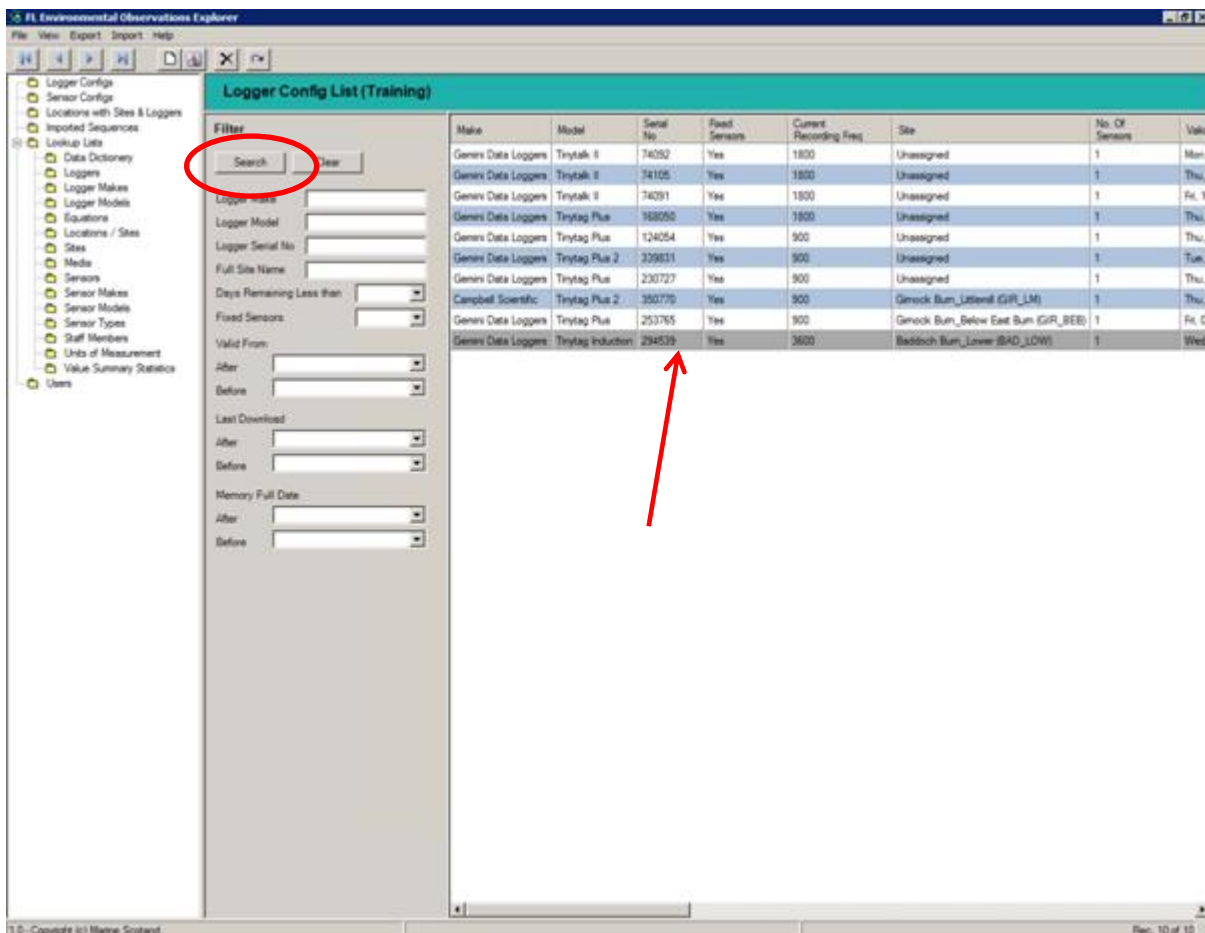
[REDACTED]

9.7 Field data Import to FLEObs database – Single Sensor Dataloggers

- 9.7.1 Before you start, the files have to be converted from TTD files to CSV files on the FL Drive. Open the file in Tinytag explorer, view the table of readings and then export (File, export) as csv with no units. This file conversion can also be completed without opening the files by selecting any files of interest , “right clicking” and then selecting “Export to CSV Table”. The files are then given the same name as the .ttd file.
- 9.7.2 When files are being opened in Tinytag Explorer it is an opportunity to do a quality control check. Check for unusual response shapes, are the Tw peaks at unusual times, do the traces differ markedly from other loggers in the same river showing up periods of exposure or burial. Note any suspected unreliable data periods. This data should be marked as unreliable in FLEObs. For how to mark data as unreliable at either end of a sequence see 9.7.16 and for how to mark data as unreliable within a sequence see 9.8.
- 9.7.3 Converted files (.csv) should then be saved to the converted files folder before transfer to the SCOTS [REDACTED]. Each site and medium (AIR / WATER) has a different directory name so that it is easier to select the correct file on import.
- 9.7.4 Once the files are transferred to the G:Drive – it is important to open each file and re-save (without changing the file name) so that the database can read in the file correctly. If this is forgotten (DON'T WORRY), the database will give you an error message and inform you that the file cannot be imported.
- 9.7.5 Open FLEObs System [REDACTED]
- 9.7.6 Open FLEObs Prod
- 9.7.7 Click Connect: then OK

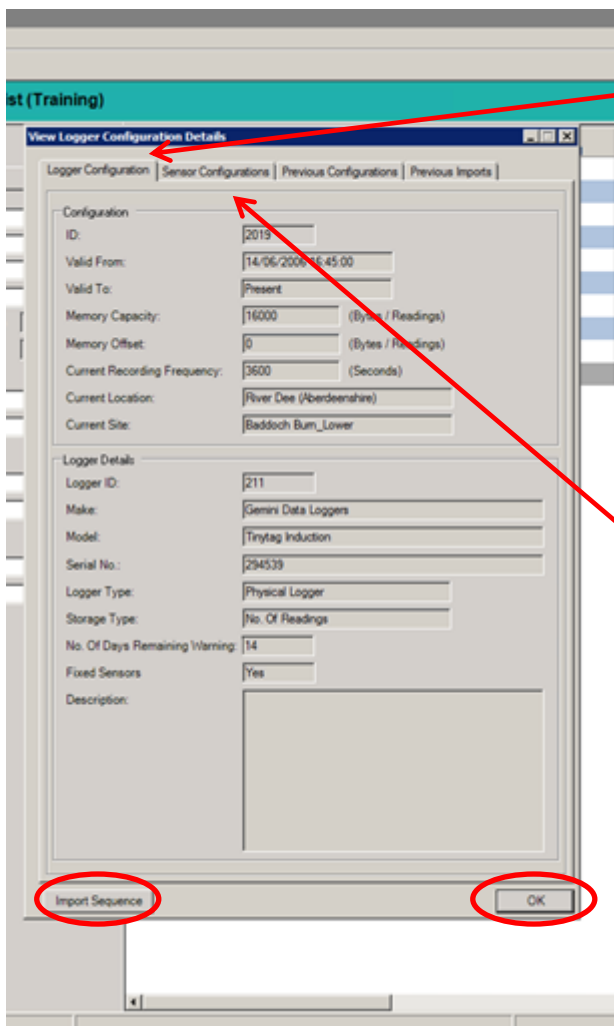
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9.7.8 In the Logger ConFigs: Click on 'Search' in order to see all logger / sensor configurations already set-up on FLEObs (see image below). You can search or sort by site, make, model or serial number, but must ensure that all of these details are correct before importing any data otherwise you could import data to an incorrect logger, a different site or medium. Please take care at this stage to ensure that all details match. You may wish to make a note of the site name and logger serial number to help you at this stage. If there are any problems please discuss with the database coordinator or the principal investigator and DO NOT import the data.



9.7.9 Double click on the configuration that you want to import data into (see image above). Another screen appears on the screen (see image below).

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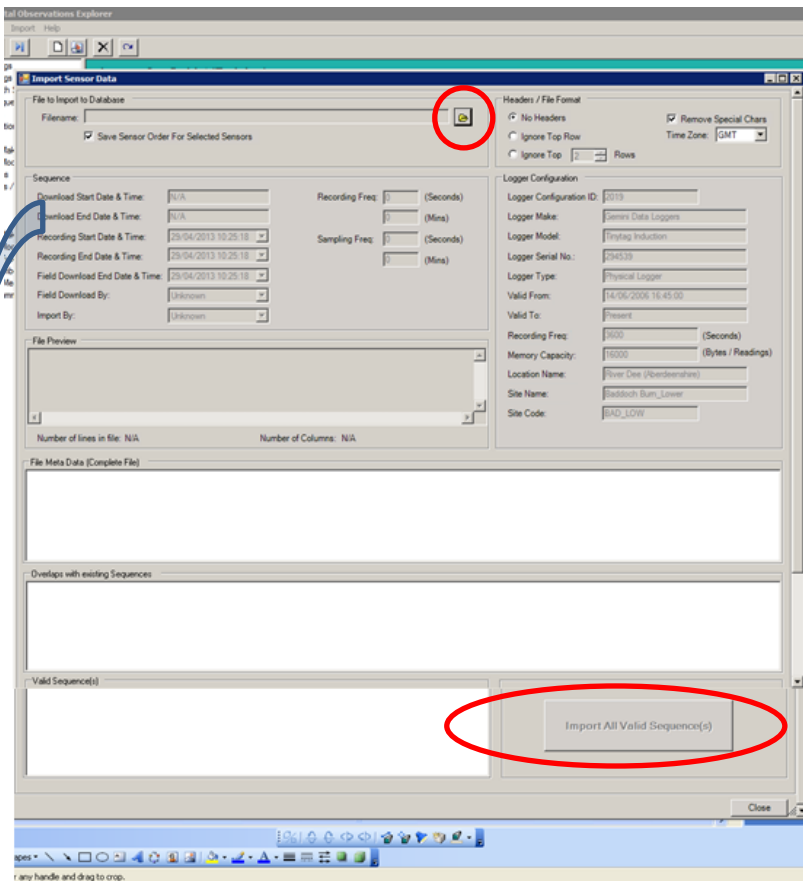


Logger Configuration tab – gives you details about the site and logger.

Sensor Configurations tab – gives you details about the sensor and medium. This is important if you have both AIR and WATER sensors at the same site name.

- 9.7.10 Check that the information shown for this configuration is correct.
- 9.7.11 Once back on the logger configuration tab, Click on the tab **'Import Sequence'**
- 9.7.12 Click **'OK'**. This opens the import sensor data window.

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- 9.7.13 If you have a header row – tick the ‘**ignore top row**’ box. If there are more than one header row, specify the number of rows to ignore (in the ‘Headers / File Format’ panel at the top-right hand corner of the screen). Note for Tynytags there are 5 header rows
- 9.7.14 If your data is in BST and you want to remove an hour, then click on the “**Time Zone**” box and change to BST.
- 9.7.15 Click on the source file box (circled in red) and browse for your file, then open
- 9.7.16 Once imported you should see the download start and end date and time. If the actual (reliable) information is later than the download start date / time or earlier than the download end data/ time then the recording start / end date and time can be changed to allow for this (click on the arrows at the right-hand side of the recording start or recording end row and select the required date, or manually type the date into the box).

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Enter the **field download end date / time** (again using the arrow or by manually typing into the box); allows the database to decide what date the logger is full.

9.7.17 Change the field downloaded by and imported by to the correct names (a list of user names appears when the arrow to the right of the **'field download by'** and **'import by'** box is clicked). If the logger has been downloaded by an external collaborator select the name **TRUST MEMBER**.

9.7.18 If you notice that the file is not the correct one – click 'Close'. The file has not been uploaded yet. Therefore, just go through the source file box again to look for the correct file. Check that there are no overlaps with other sequences, if there are overlaps ascertain why this has occurred and mark as unreliable or the recording times can be changed as in 9.7.16

9.7.19 When happy – scroll down to the bottom of that screen and click on the **'import all valid sequences'** tab at the bottom-right hand side of the screen.

9.7.20 Once you have imported the data into FLEObs – the converted data file (within the FL-Environment drive and on the G:Drive) should be changed to include _DB after its name.

9.7.21 If you have any comments that need to be added to specific imported sequences, or if you have changed a logger / sensor with a different serial number, this information should be emailed to the database coordinator so that it can be added onto FLEObs.

9.8 Marking data within the sequence as 'unreliable'

9.8.1 In the side menu panel, click on Imported Sequences

9.8.2 Scroll across to the ID column and click on it. This orders the column, and the last imported sequence is listed at the bottom

9.8.2 Double click on the sequence that needs editing

9.8.3 Change the page size from 10 (default) to All. This make the whole sequence viewable in preview window.

9.8.4 Right-click on date and times that contains unreliable data and click on 'Flag Selected as Unreliable'. This can be done for individual or blocks of rows.

9.8.5 Any notes about this sequence (i.e. why some of the data is unreliable) can be added, but this is done by right click and edit on sequence (not double clicking on sequence). The notes panel become white and can now have text inserted.

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9.9 Removing sequences after import (i.e. uploading wrong data to a site)

- 9.9.1 In the side menu panel, click on **‘Logger Configs’**
- 9.9.2 Within the **panel labelled “Filter”**, click on **Search** (all the Logger/Sensor configurations that have already been set-up are displayed)
- 9.9.3 Double-click on the logger / sensor configuration that requires a sequence to be removed
- 9.9.4 Click on the **‘previous imports’** tab
- 9.9.5 Click on the row within ‘files imported for logger configuration’ that needs removing (becomes grey)
- 9.9.6 Right-click on row and click **‘delete’**
- 9.9.7 Click yes to the message that appears on the screen. The sequence has now been removed.

9.10 Changing an existing sensor / logger configuration from a site to ‘unassigned’ when removed.

- 9.10.1 In the **Logger Configs** list **right-click** the configuration you want to unassign.
- 9.10.2 Select **Edit**.
- 9.10.3 Change the **Valid from Date** to the date and time that this was unassigned (i.e. just after you downloaded the Tinytag data).
- 9.10.4 Change the **Current Location** and **Current Site** to unassigned.
- 9.10.5 Click **OK**.
- 9.10.6 Click **Yes** to the FLEObs Message.

10. Calculation of results

Not applicable.

11. Precision, bias and limit of detection

Not applicable.



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12. Reports

Not applicable.

13. Safety

Not applicable.

14. Literature references

Not applicable.