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HidLOGGER MANUAL

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ESS Earth Sciences, reserves the right to make substitutions and modifications in the specifications of equipment that do not materially or adversely affect the performance of the equipment.

New equipment may be returned within 30 days of shipment with prior approval. New items which are less than thirty days old after shipment may be returned for credit, less a minimum restocking and testing charge of twenty percent of the list price upon factory approval only, provided the customer pays all shipping and handling charges. Specially ordered, or modified goods, or goods which have been used or have been unpacked, or goods which have been shipped more than thirty days prior are not returnable.

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Service Policy

Units within the warranty period returned for repair, test, and recalibration are serviced at no charge in accordance with the terms of the warranty policy. The Customer pays all transportation and other charges to the factory.

Units out of warranty returned for repair, test, and/or recalibration are handled on a time and material basis. If requested, or if costs exceed 50% of current list price, ESS Earth Sciences, advises the customer prior to making the repairs. Such repairs are performed at the customer's expense. Typical test, recalibration, and repairs are 25% of the instrument's current list price. Transportation charges both ways are at the customer's expense.

Please be sure all returns are shipped with the following information included:

1. Your company Name with Billing and Shipping Addresses.
2. A complete description of your problem, or re-calibration data.
3. The contact person at your company, with their telephone and facsimile numbers.
4. Non-Warranty returns additionally need your Purchase Order Number.

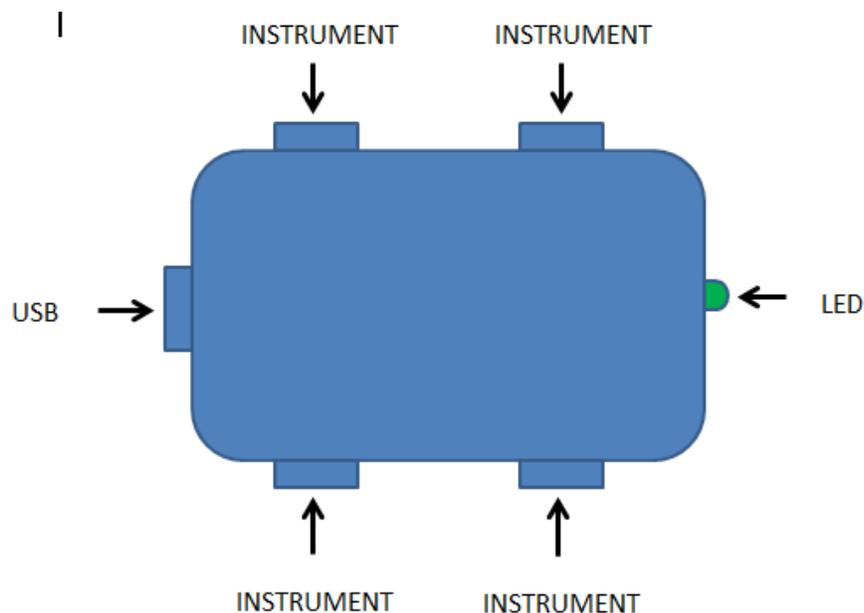
Please pack your returned instruments in their original shipping cartons, or in equivalent strong protective shipping cartons.

1. Basics

The Hid4LOGGER is a small, low cost plug-and-play data-logger that parses data from up to four (4) ESS Earth Sciences digital instruments of any kinds (that's up to 40 channels) into 32Mb of non-volatile FLASH memory which can then be downloaded later to a PC for further analysis and interpretation.



The Hid4LOGGER The 4 instrument ports are on the side of the logger while the serial communication port is at the end.



The Hid4LOGGER has no on/off switch. Once loaded with its 4 batteries, it is turned on by one of two events:

- (i) A sensor is plugged into either of PORTs 1 to 4, in which case the data-logger will wait for approximately 60s, with the LED flashing once/second, before
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reading any instruments that are plugged in. The delay is designed to allow the user to plug in multiple instruments before the first set of readings is taken.

- (ii) The USB download cable is plugged into the USB PORT. In this case the LED will flash just once for 0.5s.

Should the LED not flash then the batteries should be replaced.

In order to turn off the data-logger all plugs should be disconnected. This will not cause data nor will settings be lost.

1.1. Power Requirements

The HidLOGGER is powered from 4 x D-Cell batteries. This gives it about 8 times the autonomy of the previous 9V powered data logger. The autonomy and the device will operate for about a year with hourly samples. The 4 D-Cell batteries fit into the lid of the HidLOGGER unit.

The fit of the batteries in the black battery holder is very tight. In some cases the friction between holder and batteries is so high that one battery could have an imperfect contact with an electrode on the holder, and an intermittent electrical contact might ensue. To remedy this we insert a short section of rubber hose inside the metal spring to increase its strength. When installing batteries, simply make sure that you have good physical contact on all ends.



NOTE 1:

The Hid4LOGGER requires battery power both to log data and to download data to the PC. Data will not be lost if battery drain causes a loss of power, however a fresh battery must be installed before downloading.

NOTE 2: The batteries in the Hid4LOGGER will also serve to power a dMESH 900MHz RF telemetry node when connected to the logger.

NOTE 3: dLOG software will display battery voltage up to 6.5V even if the batteries are brand new and are delivering more. If your Battery Check reveals 5V, please replace the batteries immediately.

In between readings, when it draws 10-30mA, the Hid4LOGGER operates in SLEEP mode and only draws a current of 55µA. The Hid4LOGGER will operate with battery voltage down to **6.0Vdc**, and will not lose data even if the voltage should decline further.

We recommend the use of good brands such as Duracell and Energizer which seem to last longer.

The 3V CR1025 lithium battery provides backup power to the clock and is operational only when the main batteries are removed. If the Hid4LOGGER does not retain its date/time after a battery change then this lithium battery should be changed. The data logger will then need to be synchronized to a computer again.

1.2. Memory Size

Each Hid4LOGGER has 32Mb of Flash memory, and can store 10,000 readings or a total of 2,500 samples from the 4 ports. If the maximum number of readings is exceeded the Hid4LOGGER will stop logging and remain in sleep mode indefinitely.

2. Operation

2.1 d-LOG Software

The d-LOG software (same for Hid¹LOGGER and Hid4LOGGER) can be downloaded free-of- charge from the URL <http://geosystems.com.au/digital-data-logging/>

The software at this link is continually being upgraded and can be regularly downloaded at no charge. The program is compatible with both Windows XP (no guarantees), Windows Vista and Windows 7.0 operating systems.

2.2. USB Download Cable

Communications between the Hid4LOGGER data-logger and a PC requires a USB download cable (purchased separately).



Figure 3. The USB download cable.

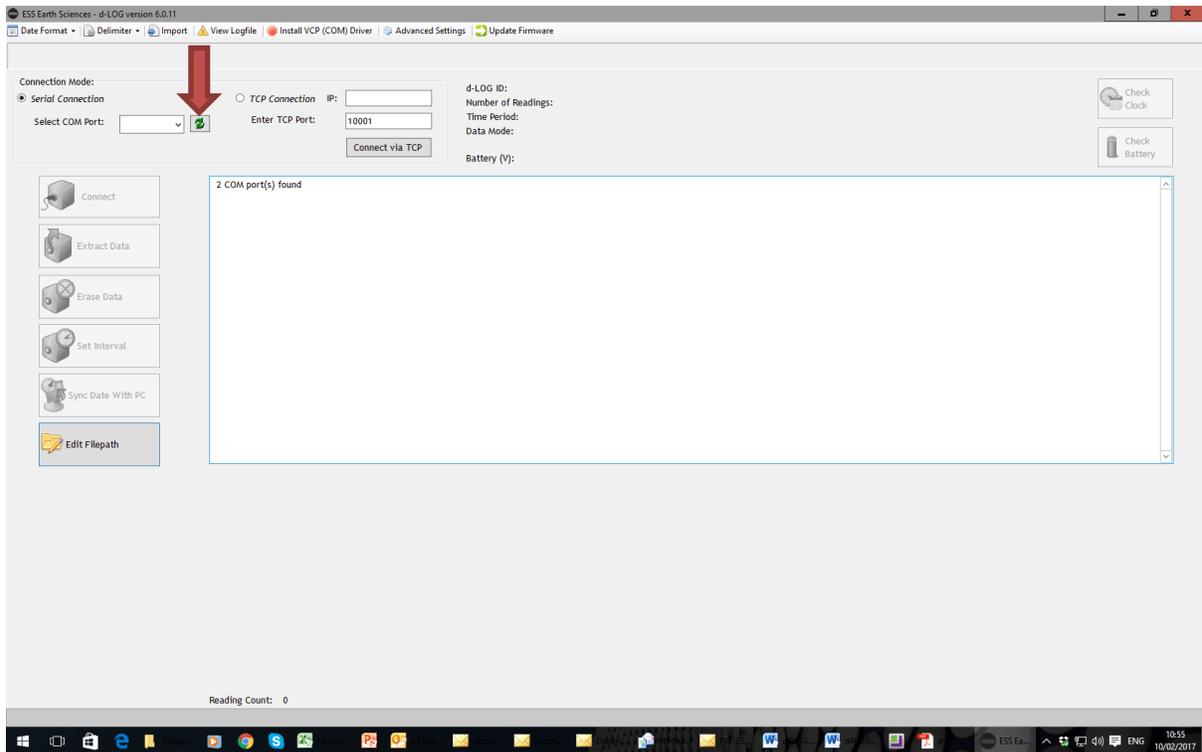
Instructions for installing the USB download cable drivers for Windows XP and Windows Vista are available at: <http://geosystems.com.au/digital-data-logging/>

Once properly installed, the driver configures the USB download cable as a virtual serial port. Depending on your computers settings the specific designation may vary between COM4 and COM99.

It is possible to determine which COM port the USB download cable has been assigned by a two step process:

- (i) Unplug the USB download cable and click on the green refresh arrows (Figure 4 STEP1). Use the Open COM Port pull-down list to determine pre-existing COM Ports.
- (ii) Plug in the USB download cable (without Hid4LOGGER) and then click the green refresh buttons. The COM Port assigned will appear.

STEP 1: USB Download Cable disconnected. Click green arrows.



STEP2: USB download cable connected (without Hid4LOGGER). Click green Arrows

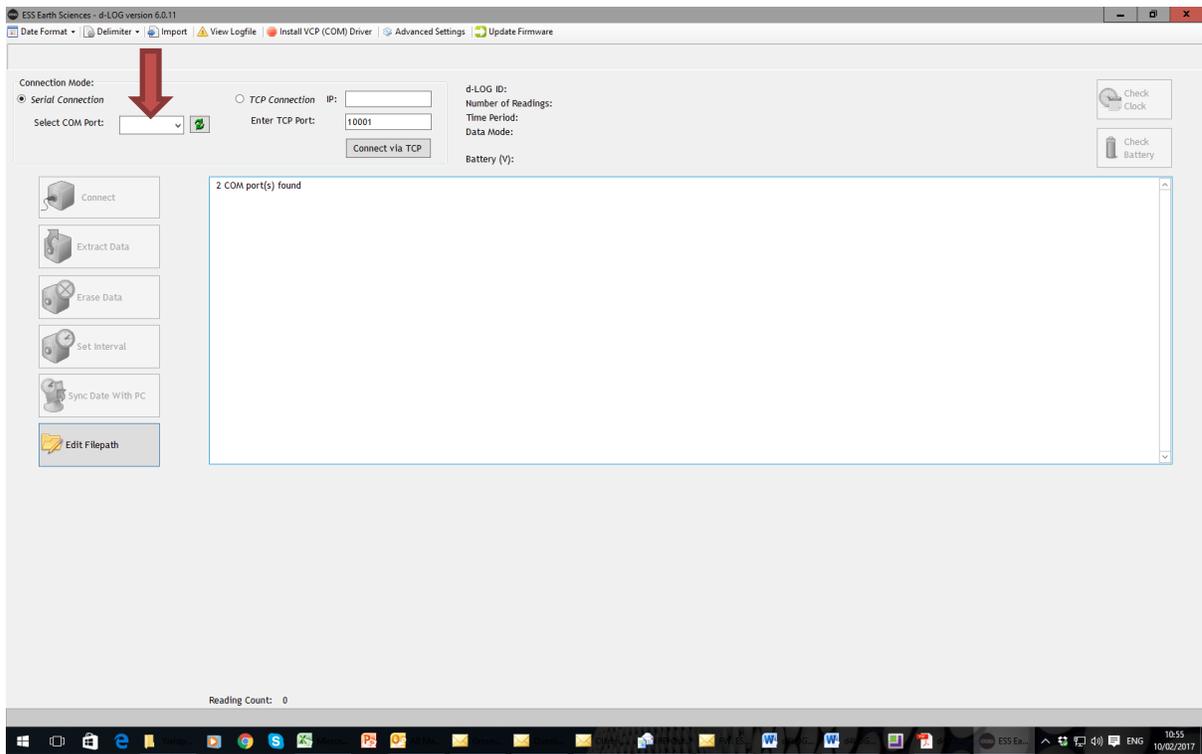


Figure 4: 2 Step COM Port determination for the USB Download cable. In this case the cable is assigned to COM67

To Open the virtual COM Port select COM5 from the pull down menu.

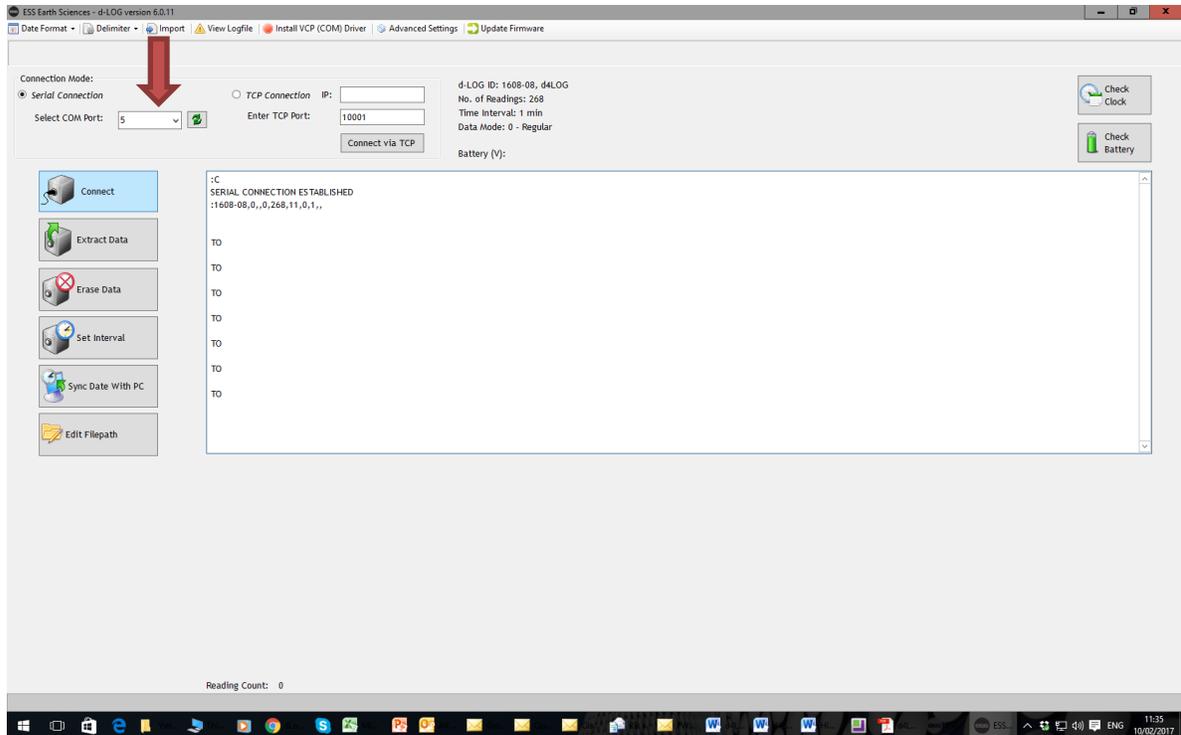


Figure 5: The USB download cable is configured on COM5 and is open. The Software automatically configures the parameters for the virtual COM Port: **9600,8,N,1**.

IMPORTANT: No instruments must be connected to the logger before the USB download cable is plugged in. It is important that the logger be powered down (OFF) so all instrument ports of the logger must be empty.

If you have issues with getting the right USB Port assigned, you can also get a driver from this page: <http://www.ftdichip.com/Drivers/VCP.htm>.

2.3 Configure the Hid4LOGGER

Next, connect the Hid4LOGGER to the 5-pin connector. The Green LED on The Hid4LOGGER will flash once, and the d-LOG software will automatically detect the Hid4LOGGER and determine its Hid4LOGGER ID (YYMM-##), the No. of Readings it contains and the Time Interval between samples. The **Select Action** icons will activate. A message will alert the user if the Hid4LOGGER time is more than 1min out of sync with the PC time, in which case the clock should be re-synchronised.

Once connected to the logger you can verify:

- Logger ID: 1608-08
- Logger type: Hid4LOGGER (it could also be d1LOGGER)
- Number of readings already in memory: 358
- Time interval: 10mn (it can be between 24hrs and 1mn)
- Data Mode: 0 = Regular (it could also be 1 = Push)

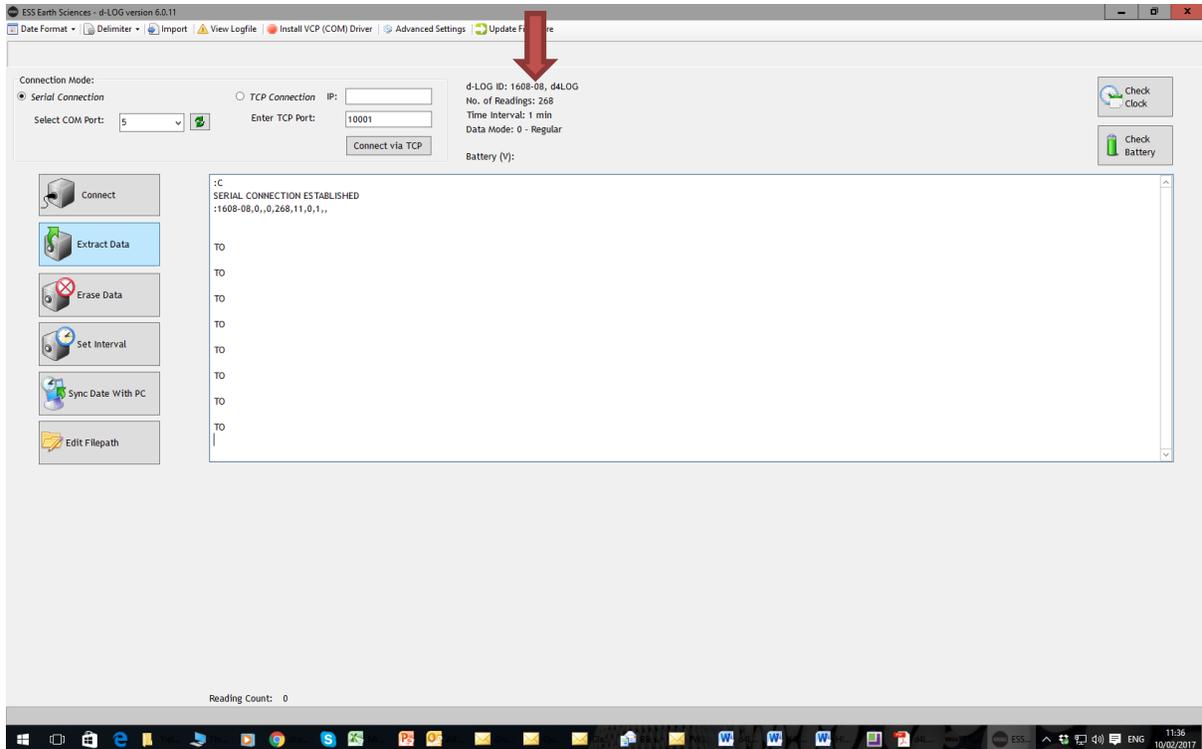
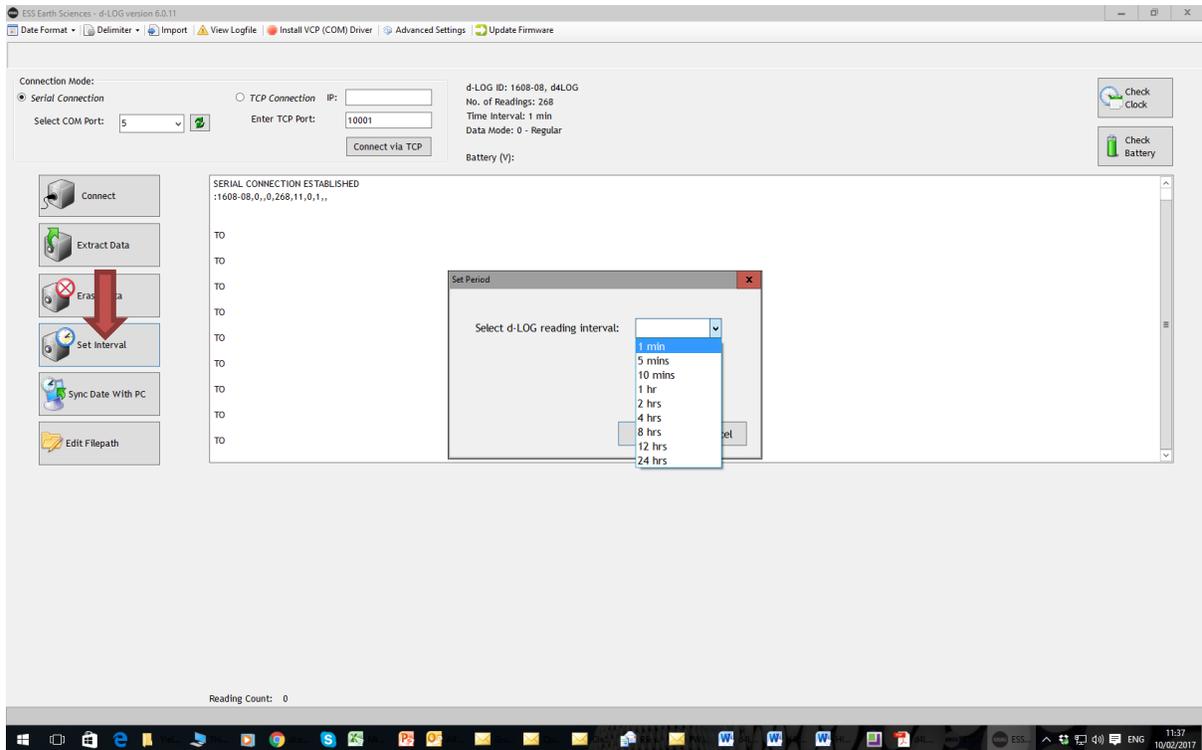


Figure 6: Hid4LOGGER number 1608-08 has been plugged into the download cable.

There are two configuration functions:

- (1) **Set Time Interval:** setting the reading interval from 1mn (or as quickly as possible with no sleep) to 24hr,
- (2) 0= Regular means that the logger is working autonomously.
1 = Push means that the logger is connected to a radio node or to an Ethernet Gateway and that it pushes every new readings toward that device.

(3) Set Logger Holdoff: time lapse before the logger pushes the data, between 0sec and 2sec.



Sync Date with PC: synchronizing the Hid4LOGGER Internal Clock with PC time stamp. Remember to synchronize, especially if you are not in the EST time zone where the loggers are manufactured and programmed.

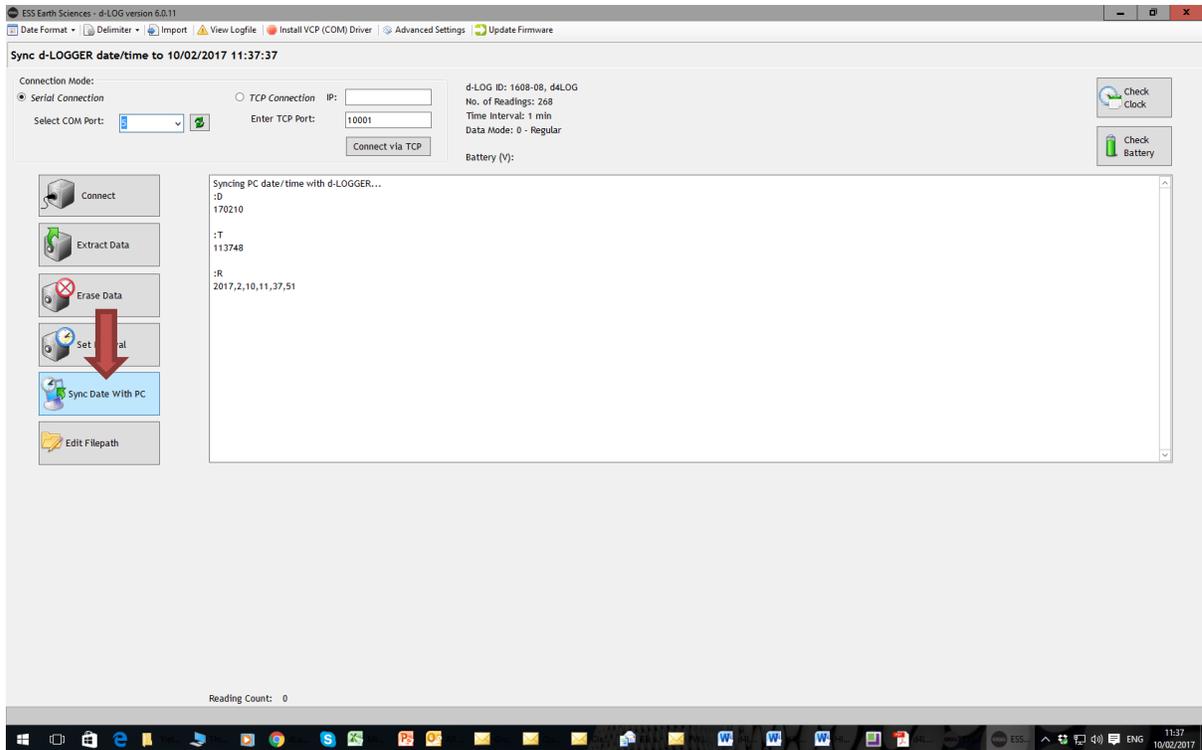


Figure 7: The two configuration functions. The Hid4LOGGER clock will be synchronized with the PC if the checkbox is checked.

2.4 Collect data with the Hid4LOGGER

It is advisable to change the batteries prior to a new data-logging session, and as described above, re-synchronise the internal with the new battery attached. If the Hid4LOGGER does not retain the time after unplugging the 6.0V batteries then the 3V CR1025 lithium battery should be replaced.

To start data-logging sessions simply plug any ESS Earth Sciences digital instrument into one of the instrument PORTs(1-4). The data-logger will wait for approximately 60s, with the LED flashing once per second, before the first sample is taken. Then the LED will generate 4 longer flashes as each of the ports are read. A 1-10 second delay may occur between these readings. It is important to verify this sequence at the beginning of a data-logging session. To save battery power the LED only flashes during the first sample.

Should it be necessary to re-check the LED sequence then the data-logger must be turned off by unplugging all the instruments and reconnecting.

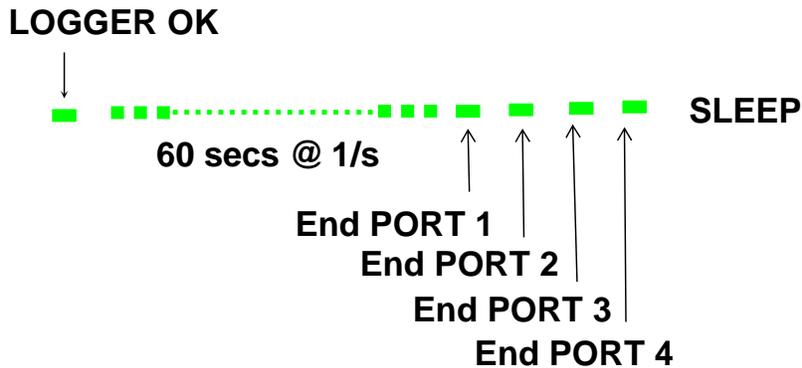


Figure 8: The HID4LOGGER LED sequence when an instrument is plugged into one of the 4 PORTs. The 60s interval allows the user to plug in multiple instruments.

The Hid4LOGGER simply writes the RS485 ASCII output string from the digital sensor into memory.

2.5. Download the Data.

After opening the appropriate Virtual COM port connect the Hid4LOGGER data-logger to the USB download cable. Serial Communication will be established and the Hid4LOGGER will inform the software of the number of readings available for download.

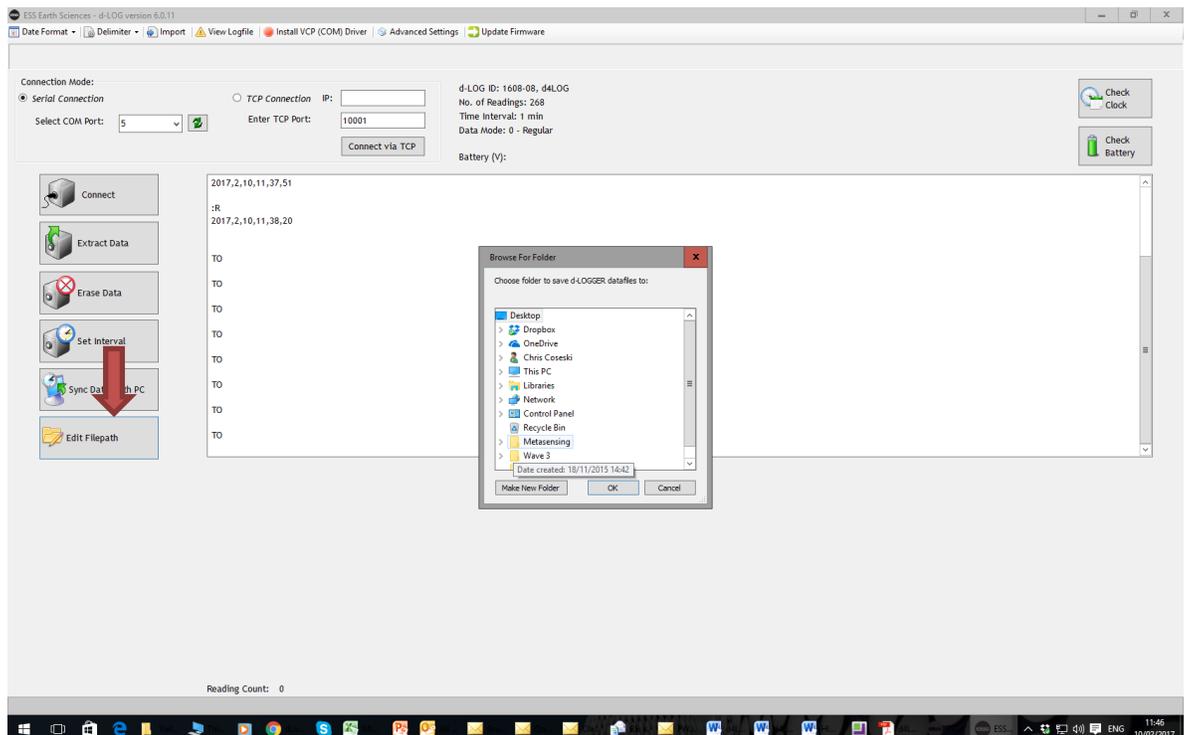


Figure 9: Asking for Date Extraction: The software offers the choice for the file location.

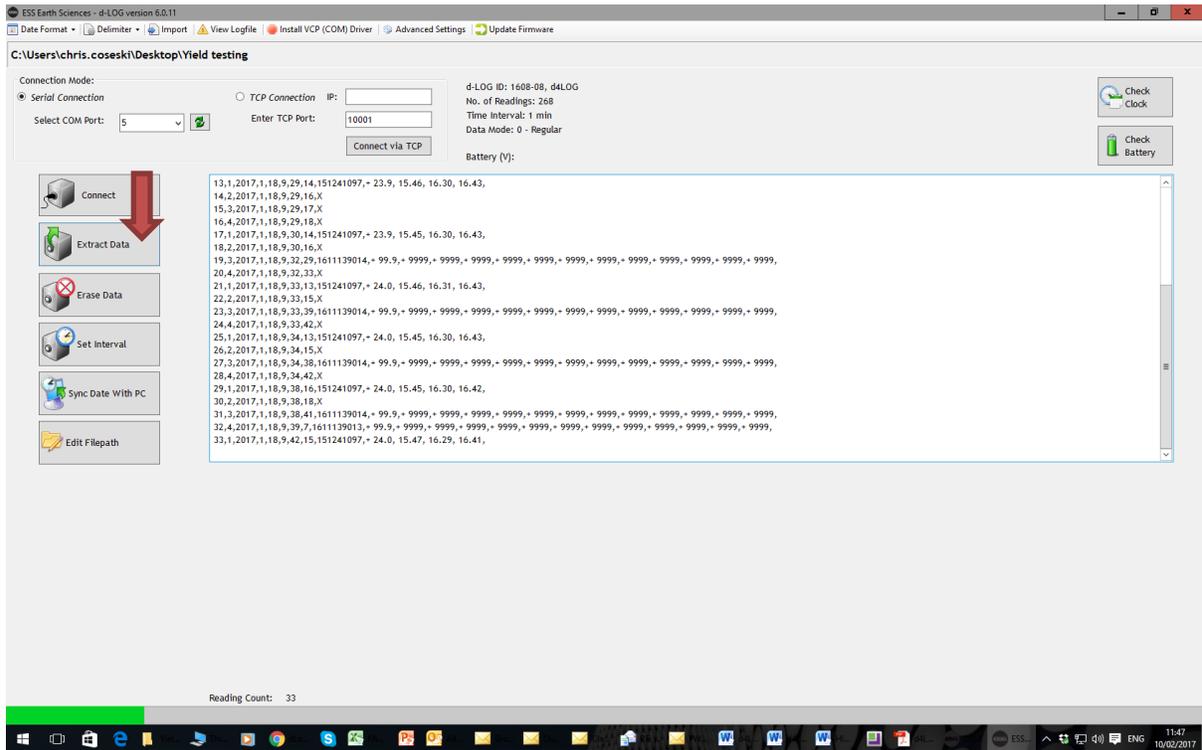


Figure 10: Data Extraction: 268 samples comprising.

Clicking on the Extract Data icon will download the data from the Hid4LOGGER. Individual samples will scroll down the text box. Using the 12th reading as an example the output string comprises:

**Reading Number(12),
 PORT ID(4),
 YYYY(2014),
 M(2),
 DD(24),
 hh (11), mm (58), ss (0),
 SensorID (120965996),
 Temp (.0C),
 Disp (24.0, 24.0, 24.0, 24.0, 24.0mm)**

These displacement values were created with a programming device and are all the same by nature but in reality they would all be different.

In this data-logging session below, measurements were taken with a HID sensor on Port 1, and PORT 2 and PORT 3 and Port 4 are vacant. It should be pointed out that no configuration was required for the instruments and that it doesn't matter at all on which port the instrument is plugged.

As an example, the readings on line 161 to

164 are: PORT 1:

265,1,2017,1,18,11,5,25,1611139011,+

99.9,+ 9999,+ 9999,+ 9999,+ 9999,+

9999,+ 9999,+ 9999,+ 9999,+ 9999,+

9999,+ 9999,+ 9999

PORT 2:

266,2,2017,1,18,11,5

,34,1611139015,-

10.0,+ 0023,- 0004,+

0054,- 0077,- 0055,-

0150,- 0035,- 0164,-

0025,- 0003,+ 0063,-

0180, (twelve comma
separated strain

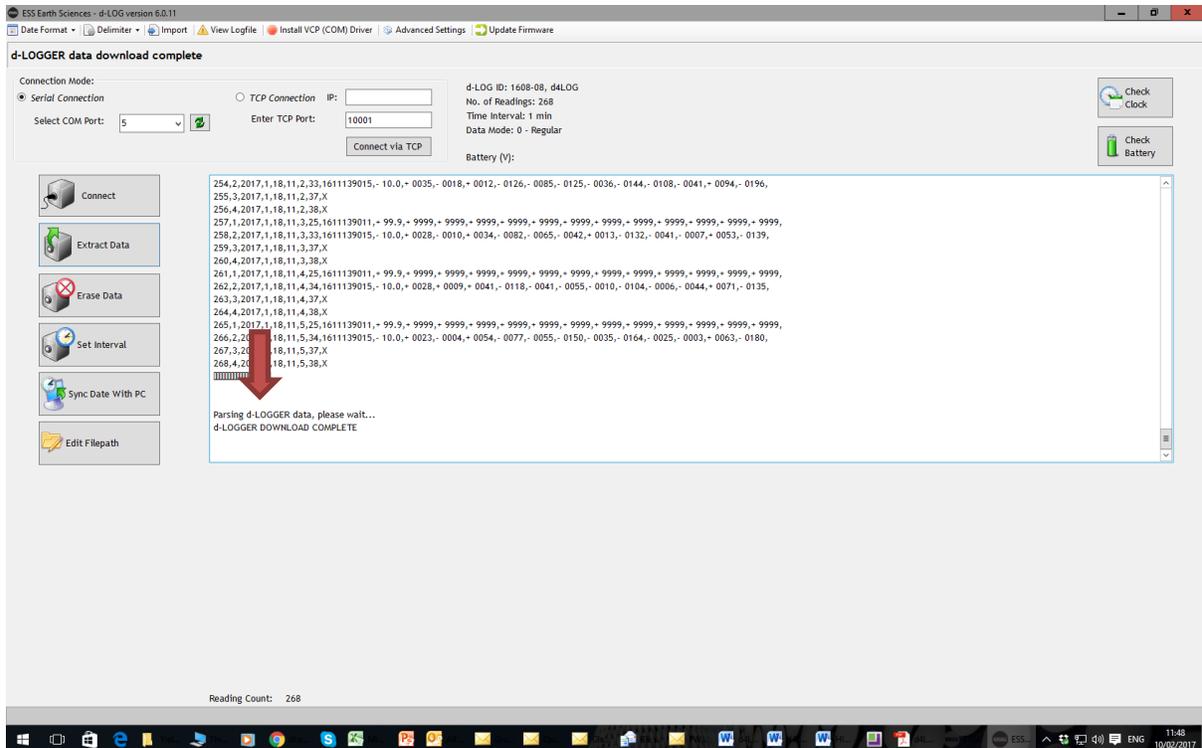
gauges in order 1-12)

PORT 3: No sensor

attached

PORT 4: No sensor Attached

The data is written into a text file with a file name corresponding to the unique Sensor ID and called SensorID.txt.



In this other data-logging session below, 32 measurements were taken from a d-micro displacement sensor on PORT 1 and a dCrack on Port 2. PORT 3 is vacant, and PORT 4 is also vacant. It should be pointed out that no configuration was required for the different instruments The readings are:

PORT 1: 120423001 (micro), 22.6C, 8397 microns

PORT 2: 080936021 (d-crack), 22.4C, 50.48mm.

PORT 3: No sensor Attached

PORT 4: No sensor attached

The data is written into a text file with a file name corresponding to the unique Sensor ID and called SensorID.txt.

The user will be prompted for a directory for file location.

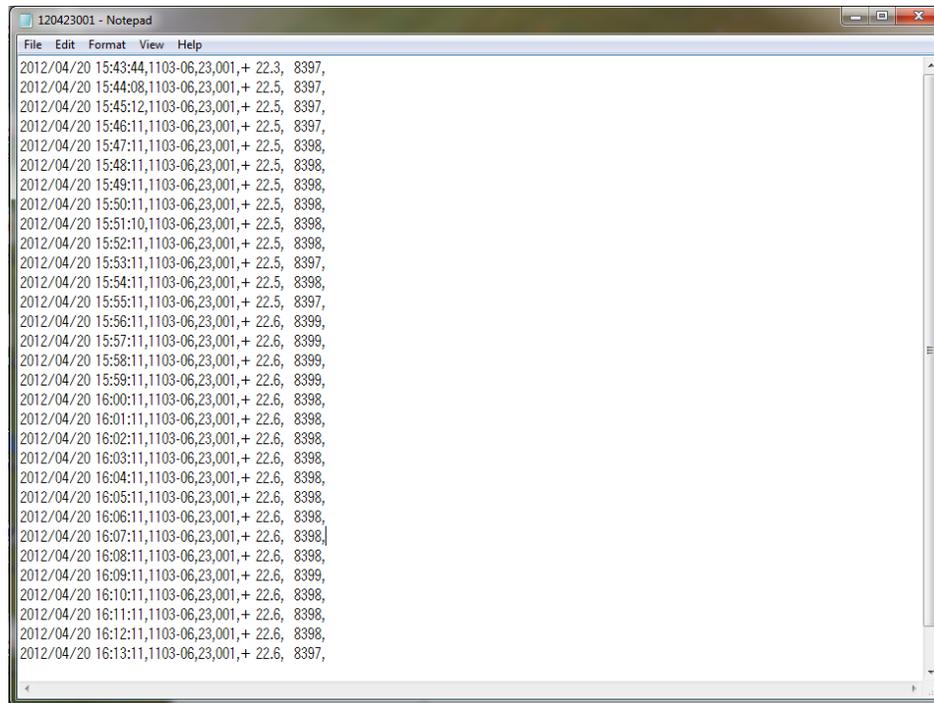


Figure 11: The csv download file opened in Notepad.

3.Troubleshooting

If any problems should arise with your Hid4LOGGER device the following sequence of events should be followed,

- (i) Replace the 4 x 1.5V and the CR1025 batteries.
- (ii) Try a different Hid4LOGGER (or SLUG) with the download cable.
- (iii) Try a different download cable if available.
- (iv) Call ESS Earth Sciences for telephone assistance or email.

d4LO

Please understand that the dLOG software will only read battery voltage up to 6.5V even if the batteries are brand new and are delivering 6.5+V. This is an internal artifact due to the fact that we operate at a very low 3.3V level. If your Battery Check reveals 5V, please replace the batteries immediately.