NephNet setup and user guide for use with Technolog Cello 4S.

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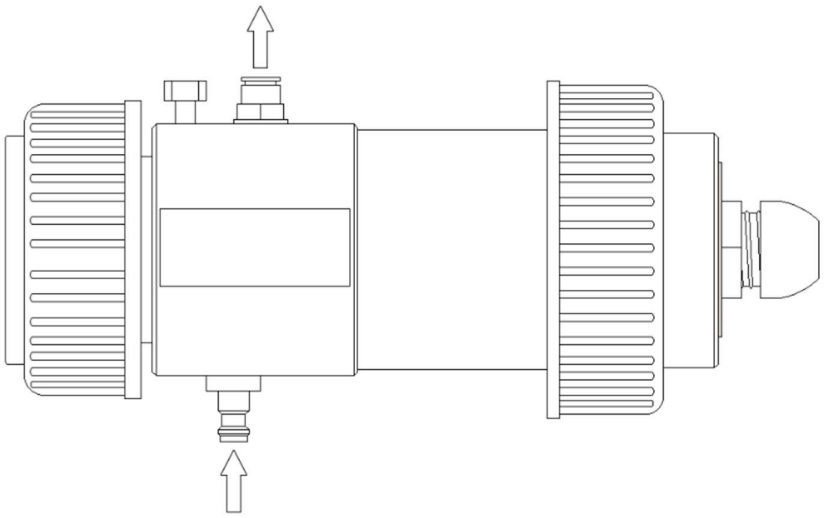
NephNet Sensor

The NephNet sensor has built in 'automatic zero' technology, meaning that the sensor will deal with a level of contamination (such as iron and manganese, silt, etc) that may build up on the lens over time. The auto zero led sits behind the main lens of the sensor and checks the strength of its signal every millisecond to maintain the overall sensitivity of the probe. When there is an obstruction, such as iron, the signal reduces, and the offset is corrected allowing for more accurate readings at lower levels. This improvement to sensing at low levels offers the user a great understanding of what happens incrementally.

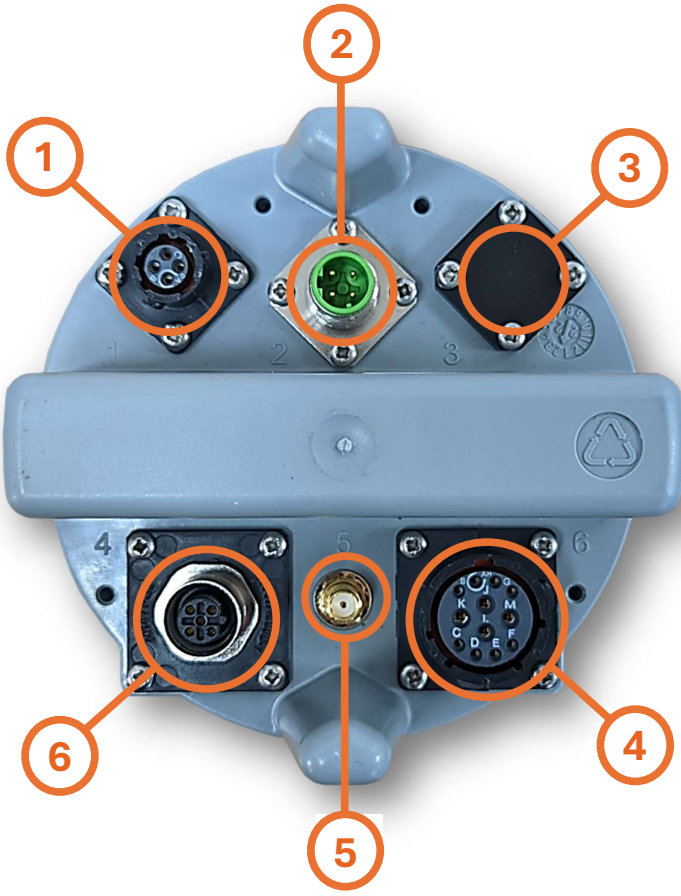
Default sensor range is set to 0-20.00 NTU, but we can change this range to suit the application if specified. The base ranges of the sensor are 0-4.000, 0-40.00 & 0-400.0 which define the available decimal places. The sensor range is then further changed using a scalable output, with the default being 0-40.00 at 50%.
The range of the sensor should be indicated on a sticker on the flowcell during assembly.

The optimal flowcell orientation is horizontal with the outlet facing directly upwards (as shown in the image below). This allows any air bubbles to freely pass through, preventing any from getting trapped by the lenses and risking false readings.



Not much maintenance is required, just regular cleaning depending on the application and the potential build-up on the lenses. Simply unscrew the cap (opposite to the cable) and wipe the inside of the flowcell and the front of the sensor using a **non-abrasive cloth** to avoid scratching and damaging the lenses. Once done, rinse out with clean water, reassemble and then continue use.

Cello 4s Datalogger



Connection	Function
1	WinGPS Prog/Debug USB cable
2	3.6V Lithium External Battery
3	N/A
4	FirstSensor – Optional Pressure Sensor
5	Optional External Aerial
6	12-Pin Sensor Cable Adaptor

Datalogger Start-Up

Requirements:

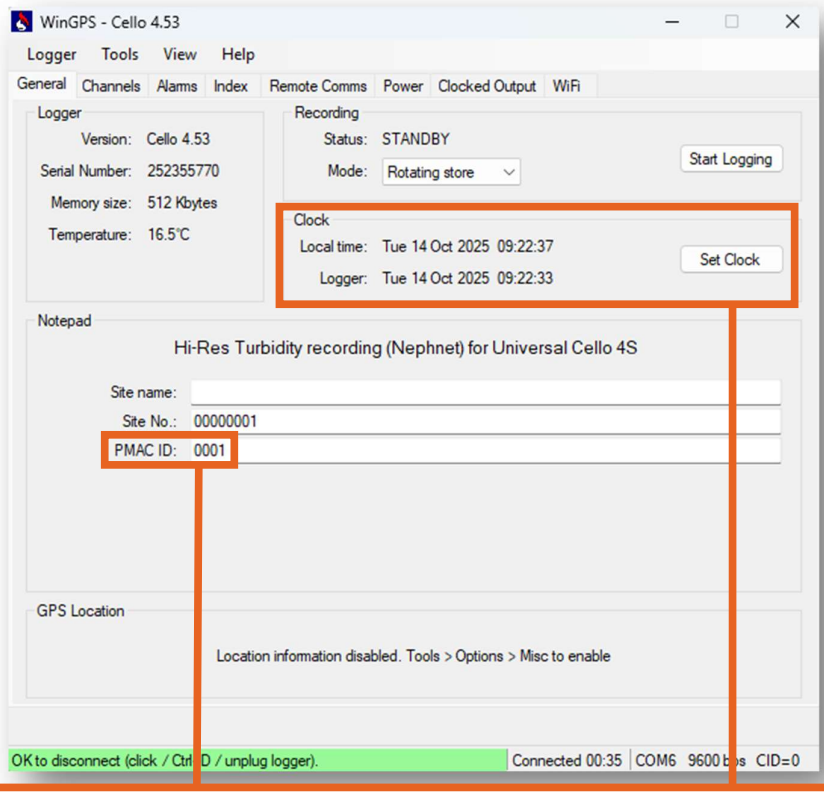
Cello

USB to 4-Pin Cello Communication cable (Pictured Below)

PC/Laptop with WinGPS software

To start the logger, connect the USB cable between the Cello and a PC with WinGPS installed.

Click “Communicate” once connected and the first page that appears will show the page

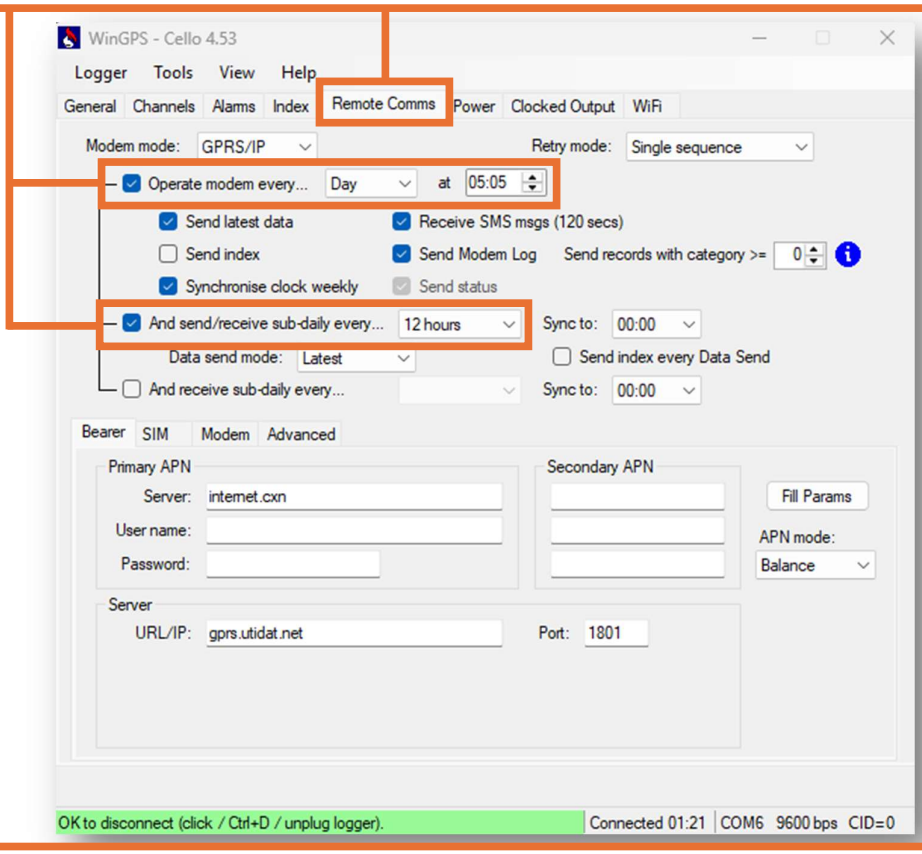


Ensure that a PMAC ID is set to an available number that can be checked in Watercore/Utilicore.

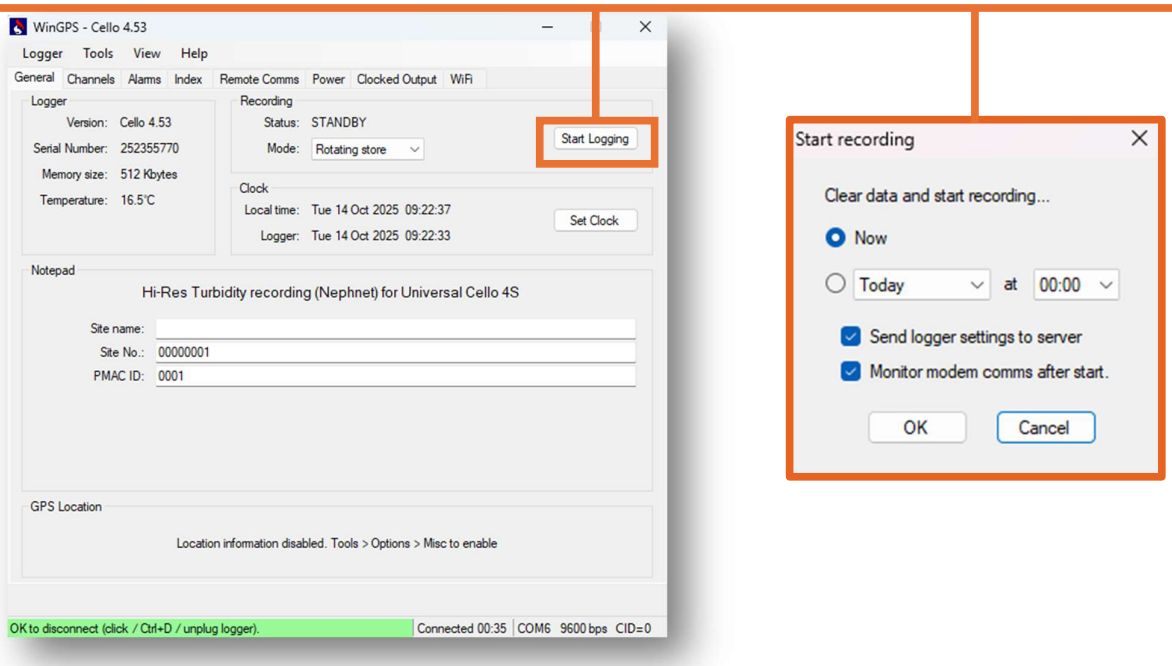
If the local time doesn’t match the set time of the logger, click “Set Clock” to align it to the same time as the PC.

Select the “Remote Comms” tab to access the settings for the reading frequency.

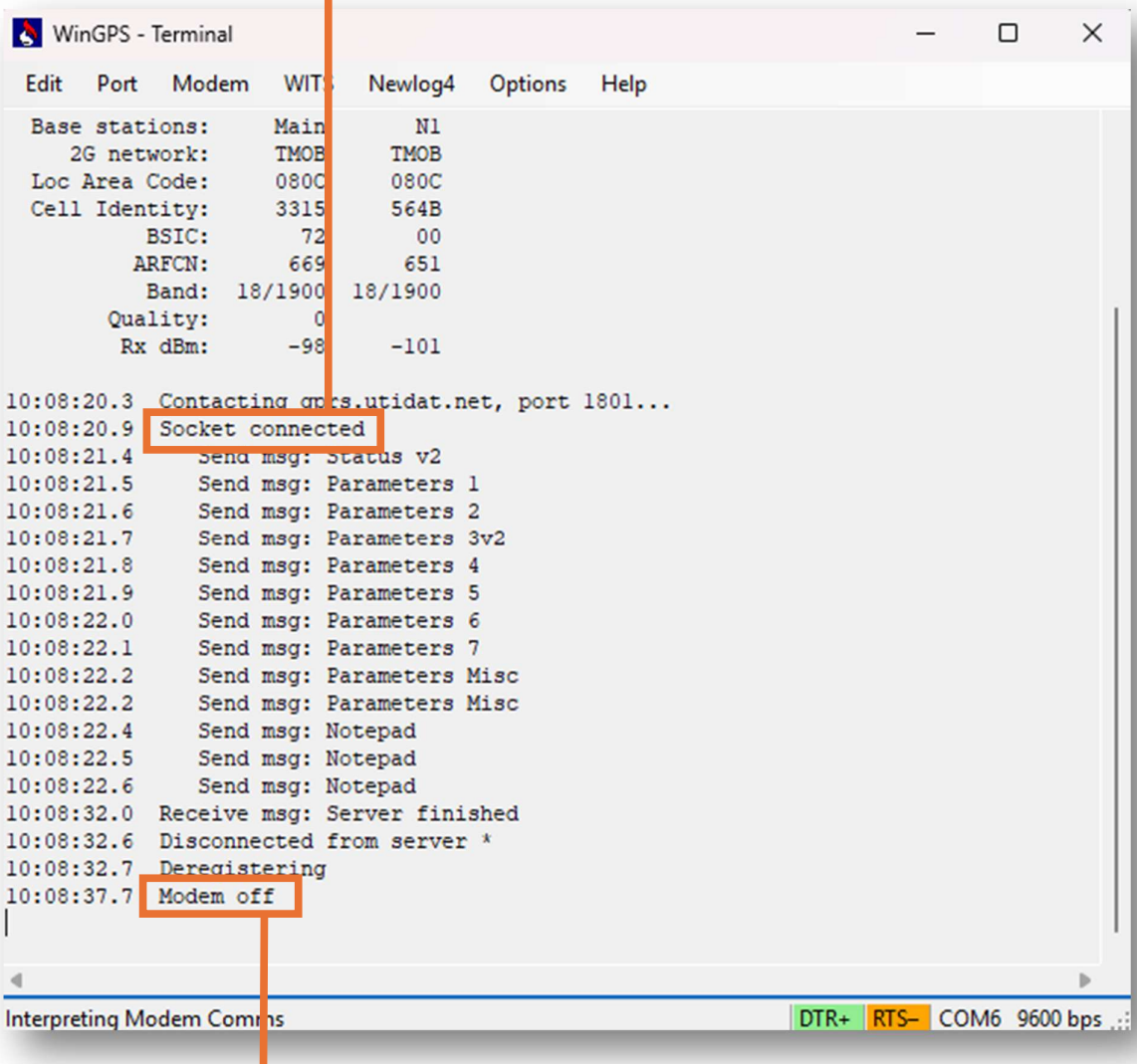
Ensure that “Operate modem every…” is checked and the timing is correct. A quicker frequency can be selected by using the “Sub-Daily” option but note that this will affect battery life.



Once all the settings are set, return to the “General” tab and click on the “Start Logging” button. This will bring up a smaller window with a delay function. Click “OK” to finalise and begin logging.



The startup process will now be carried out on the following screen and could take a couple of minutes depending on general connectivity of the area.
Look for the specific message “Socket Connected” as an indication that a successful connection has been made.



Once the process reaches “Modem Off”, the window can be closed.

Reconnect the Cello to WinGPS to check that the button has now changed to “Stop Logging”

Watercore/Utilicore

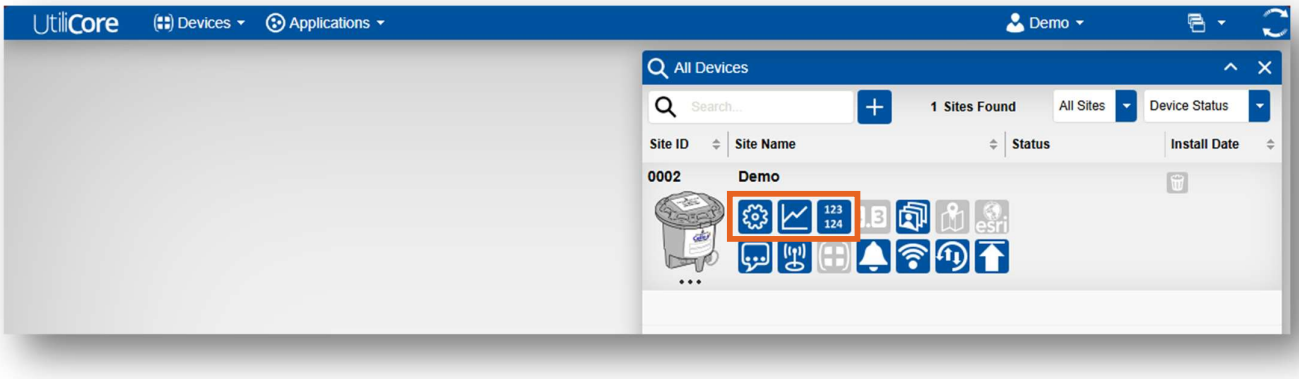
Once logging, Cellos upload data to a specific Watercore/Utilicore which is usually set during assembly when ordered through Badger Meter. Typically, the two options are:

- Hosting on our Utilicore at **atiuk.utilicore.net.** While it is a shared platform, data visibility is restricted to specific user accounts. This platform is usually used by companies with few Cellos or requiring Trials/Demos to be carried out. User account administration is carried out by us, so simply ask us if any assistance is required.

- Hosting on a company specific Watercore/Utilicore. Commonly used by companies that own a significant number of Cellos. User account administration is managed by the specific company and Technolog. We might be able to point out who to speak to in your company if required.

For demonstration here, we'll be looking at the shared Utilicore with access to a single demo Cello.

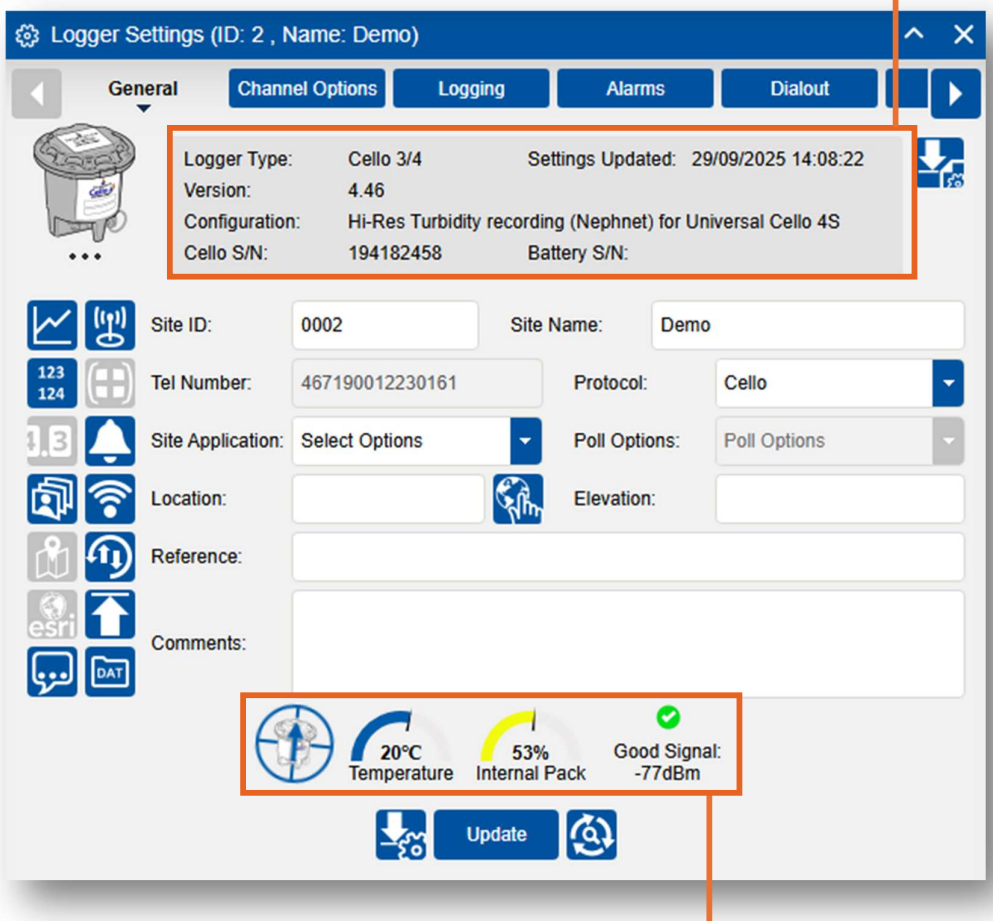
Once logged in, a list of all available devices will be displayed depending on the user account that is logged in. Selecting a specific device by clicking on it in the list will bring up further options. We'll be looking at the logger settings and data graphs as these are useful tools that are commonly used.



Logger settings provide the same functionality as the settings page used when directly connecting to the Cello.

Note that settings that are changed here are queued, and will action the changes when the Logger next reports in. Therefore, these setting can only be changed when the logging is active, and a local wired connection should be used for changing settings before logging has started.

Important logger info can be found on the main page, displaying type, version, serial number and includes a date and time for when the settings were last updated.

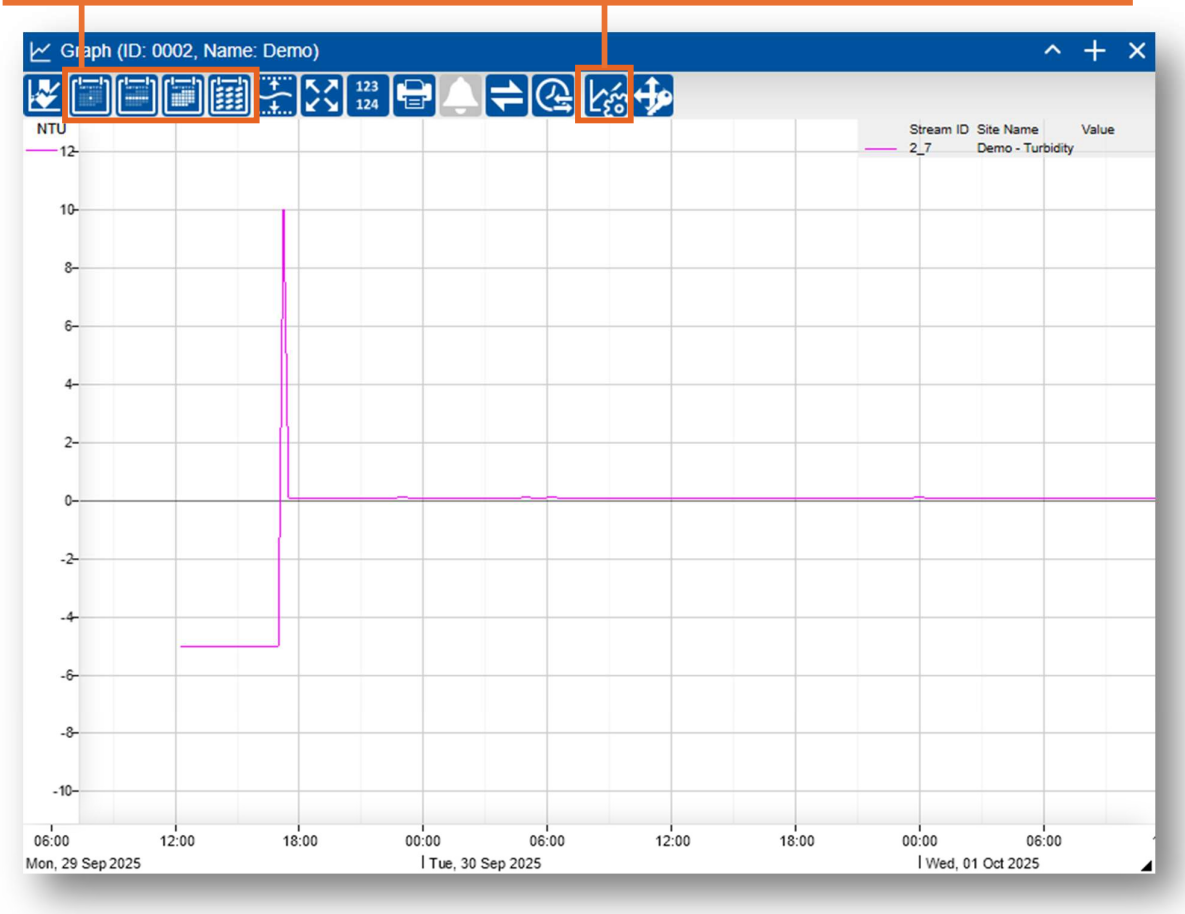


Information is displayed from the last time the equipment reported in, indicating orientation of the logger, temperature, internal battery life and signal strength.

Using the graph function will show the existing data from the Cello, the view can be freely moved by simply clicking and dragging the graph to scroll through different times. Mouse wheel up/down will also work to zoom in/out on the graph to view more data at once.

There are pre-set configurations that can be selected to display data over a day/week/month/year.

Further setting can be opened to change what channels can be viewed but typically won't be used as NephNets only use a single channel.



Note that if a logger is started before the sensor is connected, then it is normal to see a negative reading. The sensor output is 0.4V when at zero and with the sensor disconnected the value will display -25% of the range (-5NTU in this case).

Similarly, it's also normal to see a spike in readings once the sensor is connected, though depending on the reading rate it is possible that a value isn't taken while this is happening.

Parts/Spares

Included in the standard NephNet order:

Item	Part Number
Cello 4S	110-06000
6-12 Pin Interconnecting cable	110-06070
External Cello Battery	110-06080
Sensor Flowcell	93-0089
NephNet Turbidity Sensor	93-0190
NephNet Hose	93-0184
Non-Return Valve	93-01880
Pressure-Reducing Valve	93-01890
NephNet Carry Case	93-0195

Optional/Spares:

Item	Part Number
Cello 4S Mounting Bracket	110-06020
Cello 4S Comms Cable/Software	93-0614
Flowcell Regulator Valve	54-0036
Flowcell O-ring (Both ends)	42-0037

Technical Support & Returns

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