User Manual for

Modem Gateway

for DeltaLINK-Cloud

DLC-UM-1.2

Delta-T Devices Ltd

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CE conformity

The CE marking identifies this product as complying with all relevant directives in the European Union (EU). For use with the GP1, DL6 or GP2 Logger this may include one or more of the following products:

Product	**Description**	**Standards**
Modem	FX30	Refer to Sierra Wireless FX30 Hardware User Guide.
Solar regulator	Steca Solsum6.6F	2004/108/EC (EMC) 2006/95/EC (Low voltage directive)
Solar panel	BP SX series	IEC 61215

If the equipment is used with any non Delta-T products it is the responsibility of the user to ensure the EMC compliance of any such measuring systems.

Design changes

Delta-T Devices Ltd reserves the right to change the designs and specifications of its products at any time without prior notice.

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Scope of This Document

These instructions describe the use of a modem that communicates with the DeltaLINK-Cloud in the following systems:_
MD-3G-DLC: Cloud modem kit for mounting with GP2 Logger into the **M-ENCL-B2** metal enclosure.
The GP2 logger is mounted *inside* the metal enclosure.

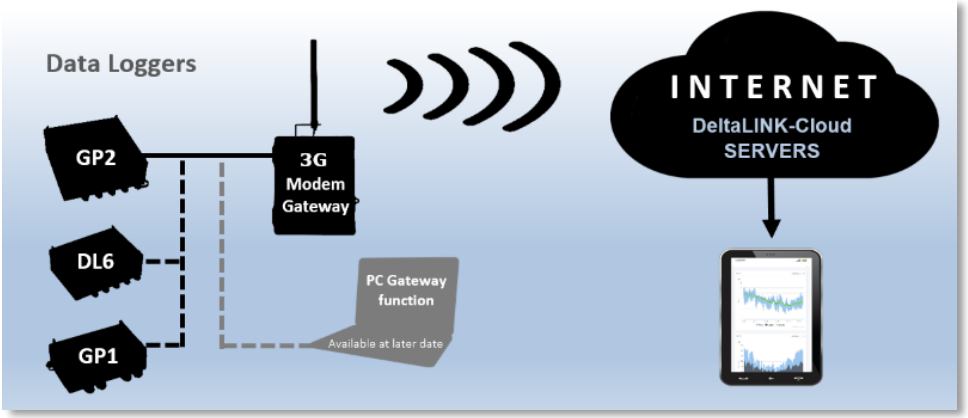
3G-DLC-BX1/B: polymer Modem Box with DeltaLINK-Cloud enabled modem and battery.
3G-DLC- BX1/SP: polymer Modem Box with DeltaLINK-Cloud enabled modem plus solar power & battery.
The GP1, GP2 or DL6 logger(s) are mounted *outside* the box.

Other Documents

You may also need to refer to the following:
- GP2 User Manual
- GP1 Quick Start Guide
- DL6 Quick Start Guide
- Network Cabling for GP1 and DL6
- Deltalink 3.8 or later on-line Help
- Steca Solsum 6.6F Operating Manual
- Solar Panel Manufacturer's Instructions
- SOL 4 Solar Panel Mounting Bracket Assembly Notes
- Sierra Wireless FX30 Hardware User Guide.

See also http://www.delta-t.co.uk/DeltaLINK-Cloud.asp
To log in go to www.deltalink-cloud.com

Introduction



The Delta-T Modem Gateway is used to connect GP2, GP1 and DL6 loggers to the DeltaLINK-Cloud.

DeltaLINK-Cloud

DeltaLINK-Cloud is a free[1] secure cloud-based service from Delta-T Devices which allows you to upload, monitor, manage and share your sensor data with speed and ease.

- Remote data monitoring
- Share data and collaborate
- Automatic upload
- Mobile, tablet and PC compatible
- Flexible charting and reporting
- SIM card provided
- Secure and encrypted

DeltaLINK-Cloud is a secure cloud connectivity, data management and automatic data retrieval solution. The website lets you monitor the status of your loggers and modem gateways, graph and export the uploaded data and share access to data reports with project collaborators/stakeholders.

[1] Data service charges apply to data sent via the 3G modem gateway.

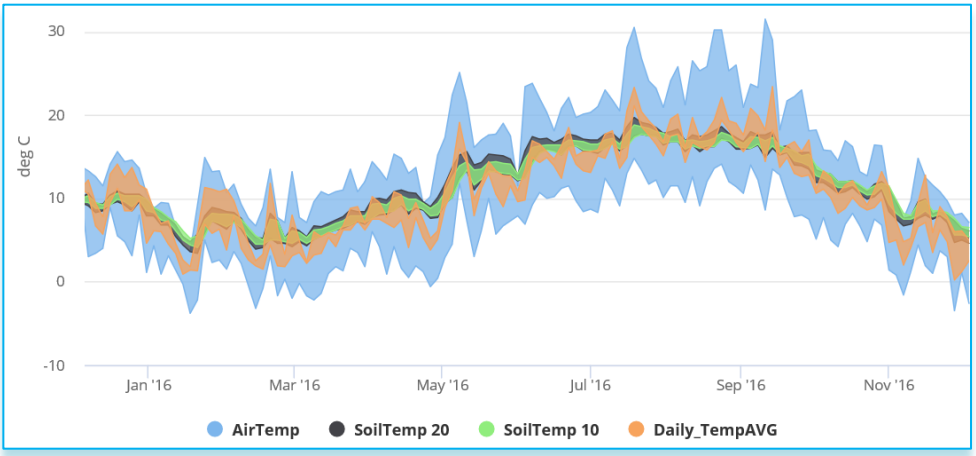
Website functionality comes for free and is accessible from most modern internet capable devices (phone, tablets and computers).

Delta-T's GP2, GP1 and DL6 data loggers can be connected to DeltaLINK-Cloud using the modem gateways described in this user manual or via PC based gateway software (Windows).

Charges do apply to data transferred via the modem SIM card.
For information about SIM card data service charges contact Delta-T

Gateway upload schedules can be customised from DeltaLINK-Cloud.
The SIM cards provided by Delta-T enable us to provide an optimum user experience and support service.
These Smart SIM cards can connect to multiple network providers, which improves the chance of you having a stable connection.

Logger status can be monitored and program-setting changed remotely. Data generated by the loggers can be charted per logger or aggregated and charted for multiple loggers. Charting is customisable and can be saved as reports for future use – which can be shared via a link.



See https://www.delta-t.co.uk/deltalink-cloud/
and www.deltalink-cloud.com

Support for GP1, DL6 or GP2 loggers

MD-3G-DLC DeltaLINK-Cloud - enabled 3G modem installed with A **GP2** logger controller in an **M-ENCL-B2** metal enclosure. A **SOL-4** solar power charger/regulator and **LBAT4** battery are also shown.

3G-DLC-BX1/SP
DeltaLINK- Cloud - enabled modem installed in a polymer Modem Box This includes a **SOL-4** solar power charger/regulator and **LBAT4** battery.

Delta-T supplies these systems fully wired up so you don't have to worry about wiring. The modem firmware and SIM card are preconfigured at Delta-T with the system ready to automatically connect to the DeltaLINK-Cloud as soon as it is powered up.

When you have registered with the cloud you first create your own gateway and tell it which loggers are attached. Then it is ready to use.

The modem power comes from an LBAT 4 battery shown in the bottom of both boxes. The wiring arrangements of the two systems shown above are slightly different. This is covered in later sections of this manual.

Health and Safety

Installation

Cover the solar panels to exclude light before starting the installation.

Batteries

Batteries that are prone to give off explosive gases at any stage of their charge or discharge cycle must not be mounted in the enclosure without sufficient additional ventilation.

Do not use non-approved batteries or other battery charger/regulators in un-ventilated enclosures.

For optimum thermal protection the Solsum solar charger/regulator should be installed in the same housing as any external battery.

See also Warnings in the M-ENCL-B User Manual

Install Modem Gateway with a GP1, DL6 or GP2 logger

Requirements

MD-3G-DLC: Cloud modem kit for mounting with GP2 Logger into M-ENCL-B2 metal enclosure
or
3G-DLC-BX1/B: polymer Modem Box with DeltaLINK-Cloud – enabled modem and battery
or
3G-DLC- BX1/SP: polymer Modem Box with DeltaLINK-Cloud enabled modem plus solar power & battery.

A source of power is required for the modem, such as the **LBAT4** and **SOL4** solar power system.

At 12V the modem's maximum consumption is up to 600mA when connecting and 212mA when communicating with the DeltaLINK-Cloud servers, and 74mA maximum otherwise. The typical value would be a lot lower than this.

Modem Parts

Figure 1 Modem parts

Parts and wiring used with GP2 Loggers

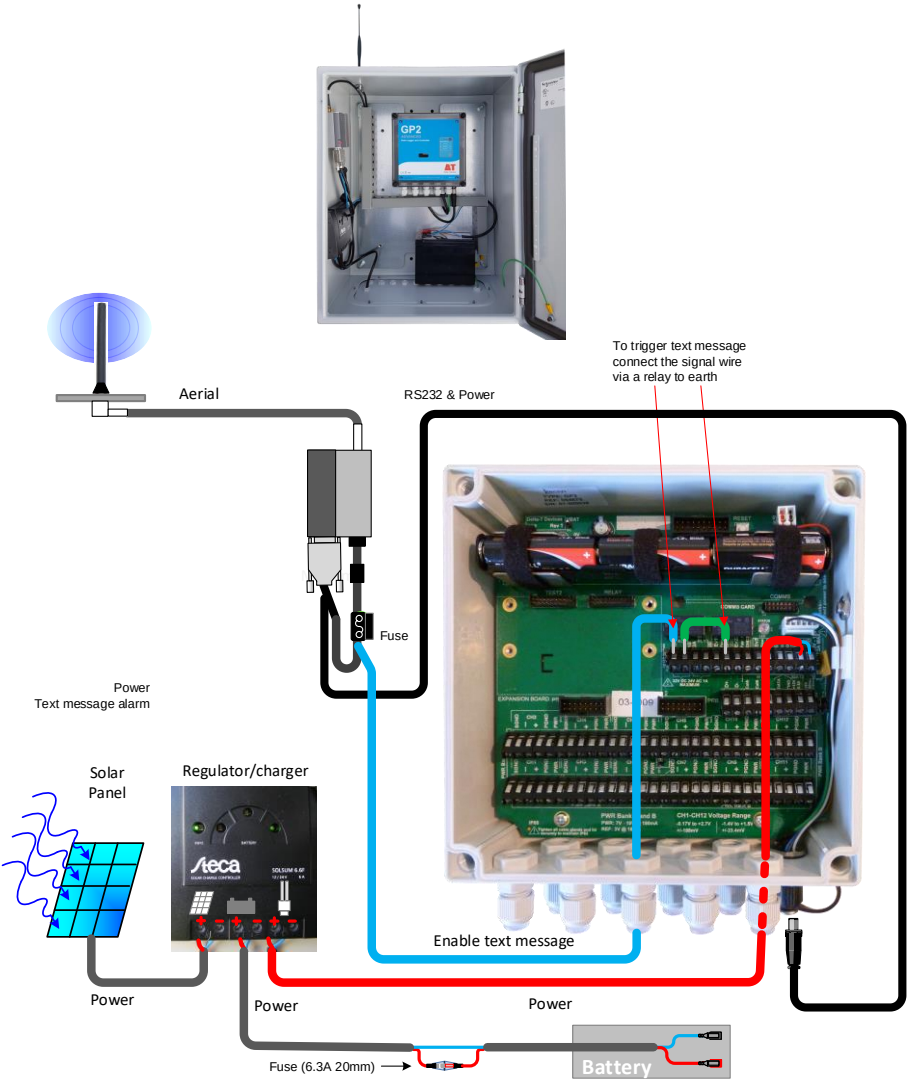


Figure 2 GP2 Logger/Controller in M-ENCL-B2 enclosure with modem, cabling, aerial, SOL4 solar power regulator and LBAT4 battery. Wiring scheme: see also page 26.

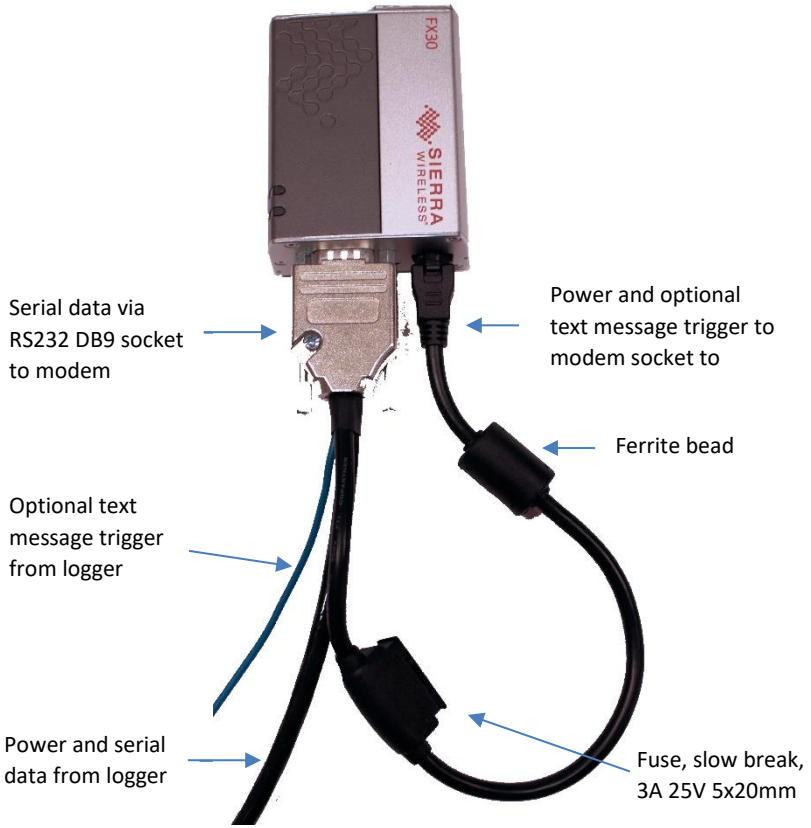


Figure 3 GP2-Modem Cable harness functions.
See also page 27.

Note : The cable harness is different for GP1 and DL6 loggers using the DLC Modem Box, see page 28.

Parts and wiring used with GP1 and DL6 loggers

Figure 4 Showing the layout of the Modem Box options, with and without solar power.
Left : DLC-BX1/B with battery.
Right: DLC-BX/SP solar power option, with solar power regulator /charger, solar panel (not shown) and battery.

These DeltaLINK-Cloud Modem Box systems are used with one or more externally connected GP1 or DL6 loggers via a GP1 network cable.
See also ***BX1 Modem Box Wiring Harnesses*** on pages 28 & 29 .

1: Ensure the modem is powered.

Connect the battery to provide power to the modem.

Powering the modem when using GP2 Logger

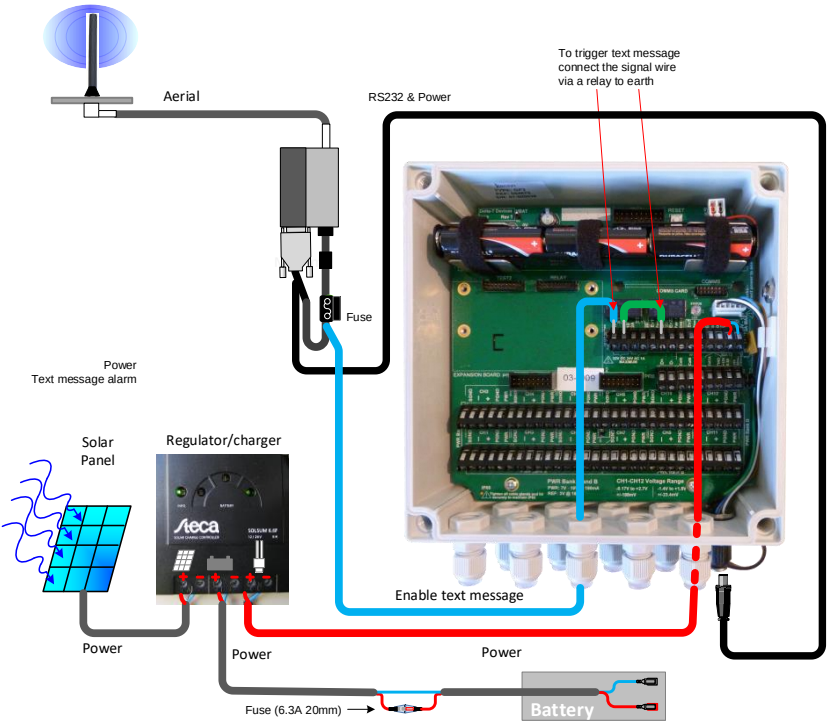


Figure 6 Typical power and signal cabling scheme for use with a GP2 logger controller.

Figure 6 shows the modem powered from a GP2 logger via its 5-way M12 serial cable connector. This GP2 itself is receiving power from an external battery via a solar power regulator.

WARNING: Cover the solar panel when wiring up the system, as it will be live.

Power may also be supplied directly to the GP2 serial cable as shown in the GP2 network cabling diagram on page 26.

Powering the modem when using GP1 or DL6 Loggers

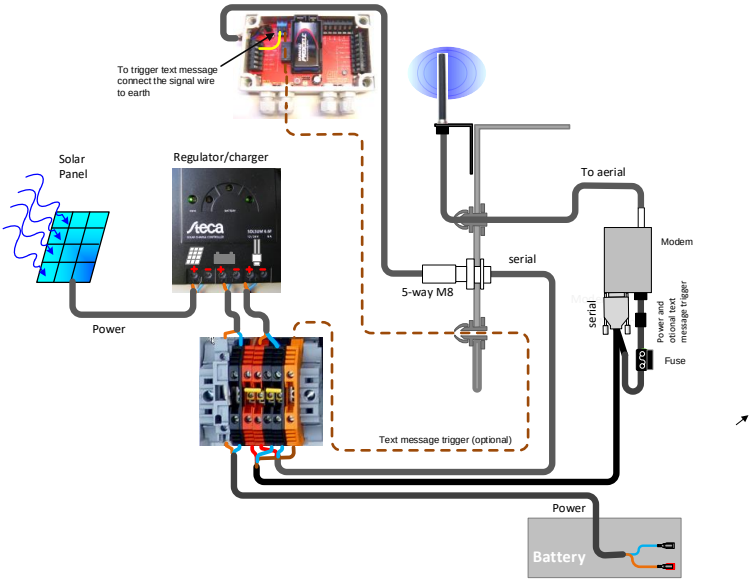


Figure 7 Cabling scheme in the Modem Gateway Box type 3G-DLC-BX1/SP for use with GP1 or DL6 loggers.

Power to the modem is supplied via the cable harness in the Modem Box. Power is brought to the DIN rail either directly from the battery via a fuse or indirectly via the solar regulator charger. From the DIN rail it connects to both the modem and to the external 5-way GP1 network cable socket built into the side of the Modem Box.

This means that the battery power is also accessible to any GP1 logger externally connected on the GP1 cabling network. If you don't want this to happen, the wiring at the DIN rail can easily be altered (see cable harness wiring scheme on page 28).

WARNING: Cover the solar panel when wiring up the system, as it will be live.

1.1 Check the Modem Power LED.

Modem Power LED Behaviour

Figure 5 LED behaviour

LED state	Flash rate	Meaning
	Off	No power or input voltage ≥ 32 VDC or ≤ 4.75 VDC
	Solid Red	Modem powered but not attached to cellular network.
	Solid Amber	Modem powered and attached to cellular network.

Note- we do not use the “User LED”

2: Set up DeltaLINK-Cloud

Requirements

By this stage you should have achieved the following:-

- Obtained a Delta-T logger
- Obtained a DeltaLINK-Cloud Modem Gateway, including modem and SIM card with a data package[2].
- Connected logger to modem
- Powered up logger and modem.
- Checked modem lights are flashing correctly

You also need an internet connection.
This can be a smart phone, a tablet or PC.
If using a PC, it needs to be running a recent internet browser, such as Internet Explorer version 9 or above.
You also need an email address.

[2] The data package is an allowance to transmit a certain number of megabytes across the cellular network

2.1: Go to DeltaLINK-Cloud and Create an Account

Go to www.deltalink-cloud.com and register as a DeltaLINK-Cloud user with your email address and password.

If you have not yet registered click on **Create an account** to display the Registration page

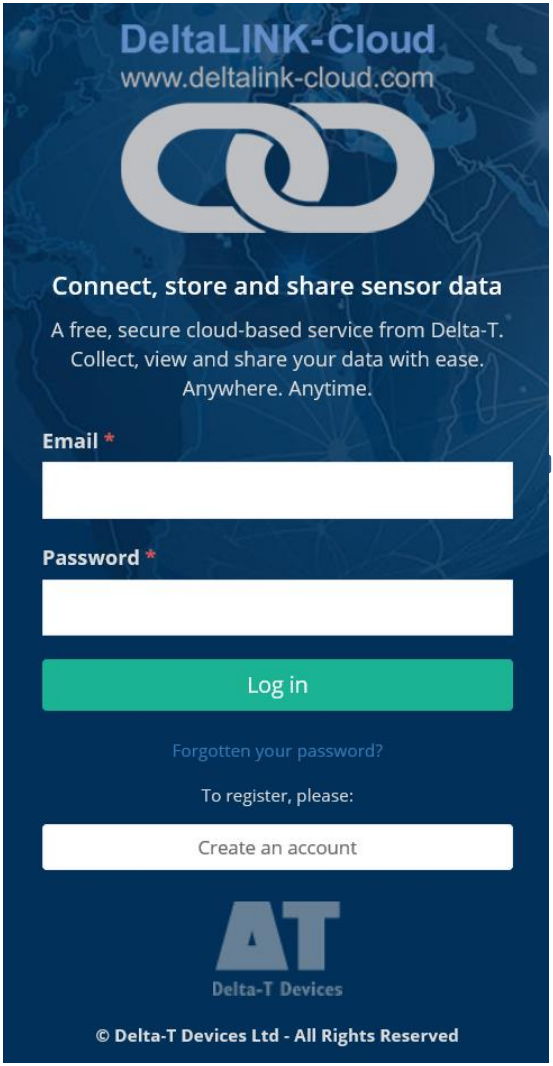


Figure 8
DeltaLINK-Cloud

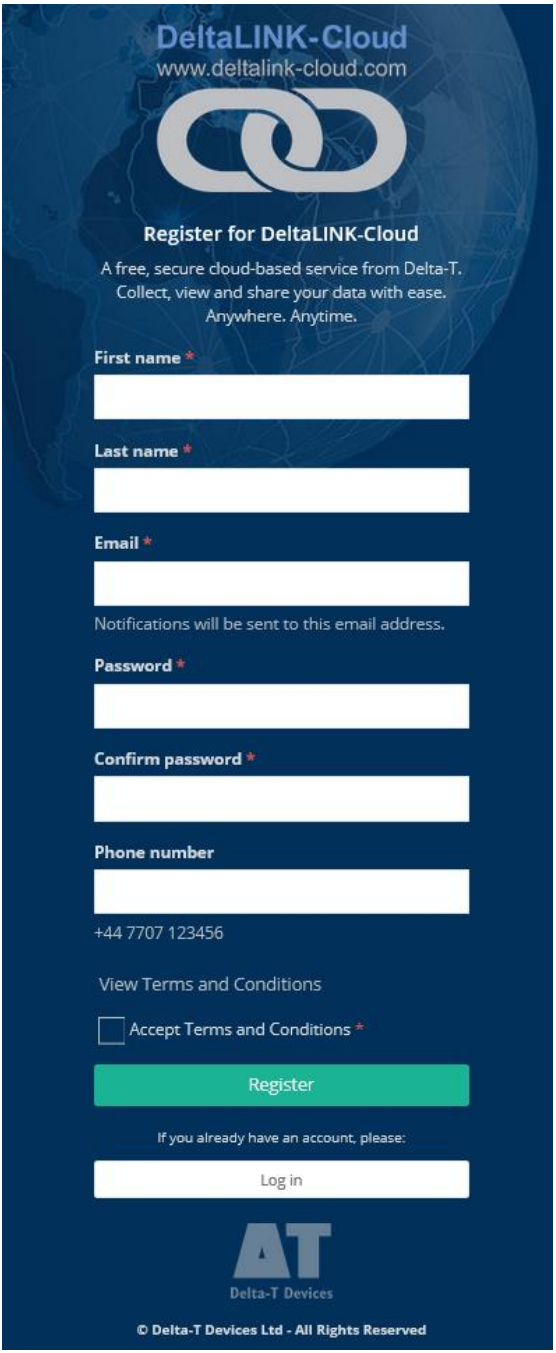


Figure 9
The registration form for DeltaLINK-Cloud.

Once registered the DeltaLINK-Cloud Welcome page should appear:-

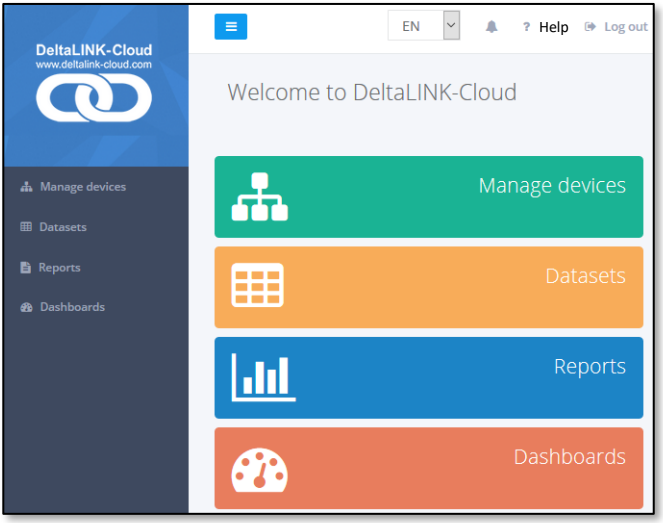


Figure 10 Welcome page. The actual layout will change depending on the size of your screen.

2.2 Add Gateway

2.2.1 Click on Manage Devices

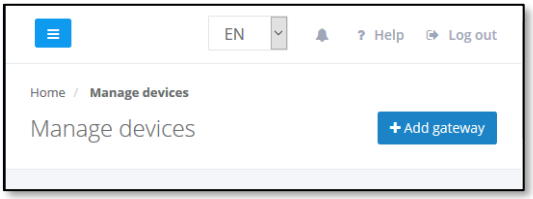


Figure 11 Manage Devices page

2.2.2 Click on Add Gateway

2.2.3 Fill in the Add Gateway form

Name: Give your gateway a name, e.g. MyGateway:
Description: Add something about your gateway,
e.g. My Backyard.
Gateway Type: Select from the list: –
2G Modem Gateway (FXT009) or
3G Modem Gateway (FX30)
Serial Number: Enter the serial number written on the side of the DeltaLINK-Cloud modem- see below.

Access Code: Enter the Access Code written on the side of the DeltaLINK-Cloud modem- see below.

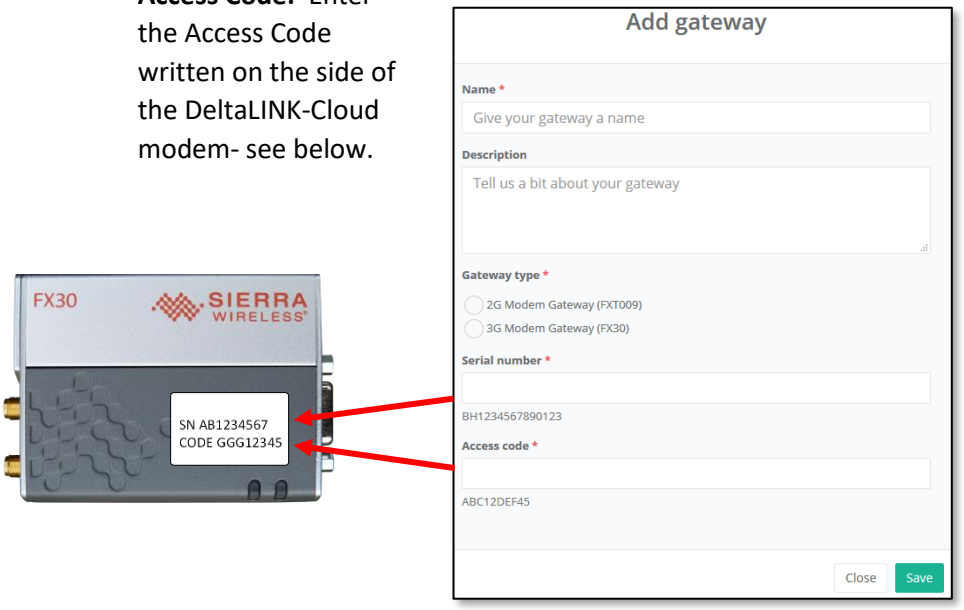


Figure 12 The Add Gateway form and the location of serial number and access code for the DeltaLINK-Cloud 2G or 3G modem

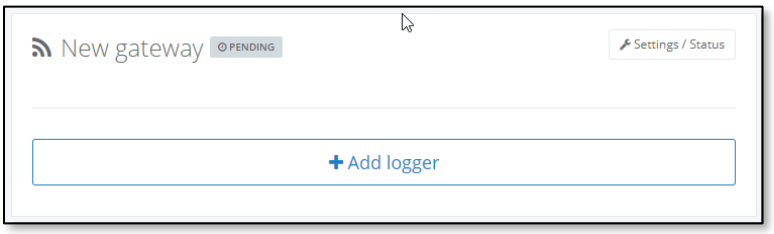


Figure 13 Waiting for a new gateway to open

2.3 Add a Logger to the new Gateway

2.3.1 Click on Add Logger.

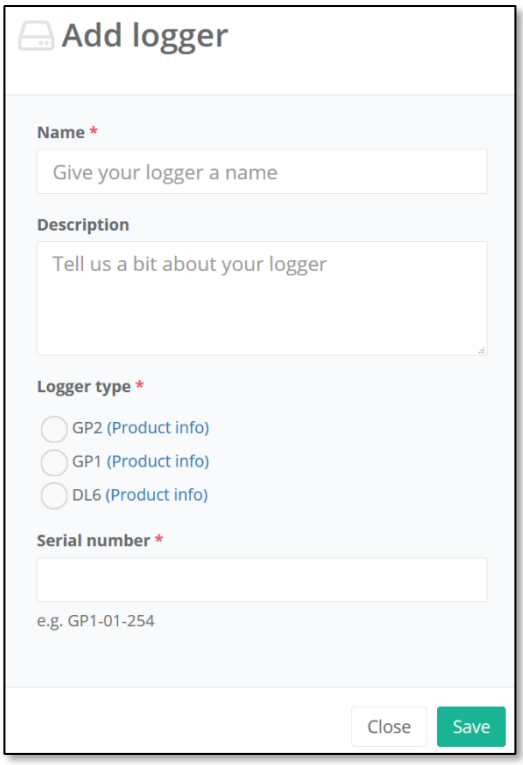


Figure 14 The Add Logger form.

Information needed on the Add Logger Form

Name:

In the **Add Logge**r form give your logger a name.
This name will appear in DeltaLINK-Cloud when selecting which logger to connect to and when looking at the list of datasets saved to the cloud. It does not appear within the downloaded data file.

Description:

Tell us a bit about your logger.
This information will appear in the Managed Devices list in DetaLINK-Cloud.

Logger type:

Select one from the list provided.
This information is needed so that the DeltaLINK-Cloud server knows how to interact with the logger correctly.

Serial Number:

This is required for DeltaLINK-Cloud to connect to the logger
e.g GP1-01-024
This information is written on the logger and can also be obtained by connecting directly to the logger from a PC using DeltaLINK.

Once you have you have entered this information Click on **Save.**

2.4 Check logger and gateway status

Once both the gateway and logger have been added and they have successfully connected to the server, the user should see status information, as shown below.

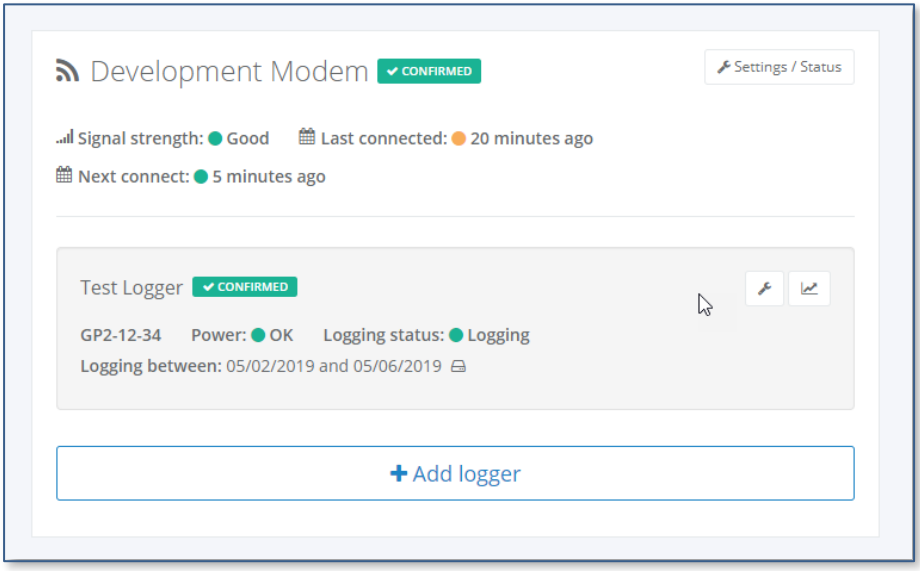


Figure 15 Showing the Gateway and Logger Status

Your logger is now added to DeltaLINK-Cloud and will automatically update once a day.
The schedule can be changed by going to the gateway **Settings/Status** page.

For further assistance log in at www.deltalink-cloud.com to see DeltaLINK-Cloud online **Help.**

See also https://www.delta-t.co.uk/deltalink-cloud/
contact Delta-T see page 32.

Wiring

Modem Cable Harness for GP2 logger

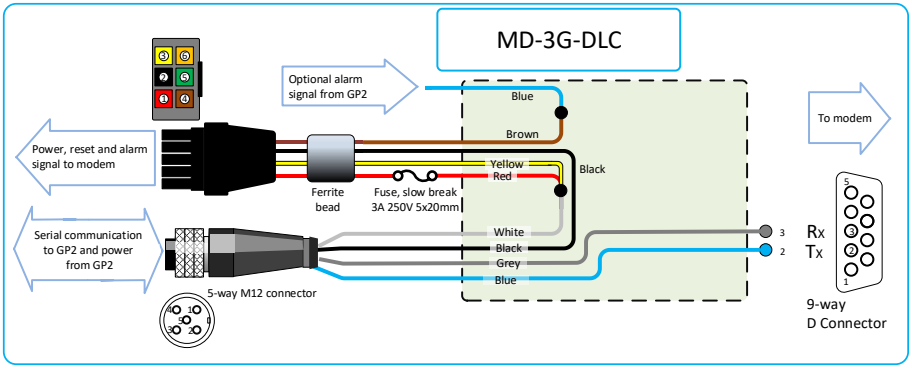


Figure 16 GP2 Modem Gateway wiring harness

GP2 Network cabling Options with Modem

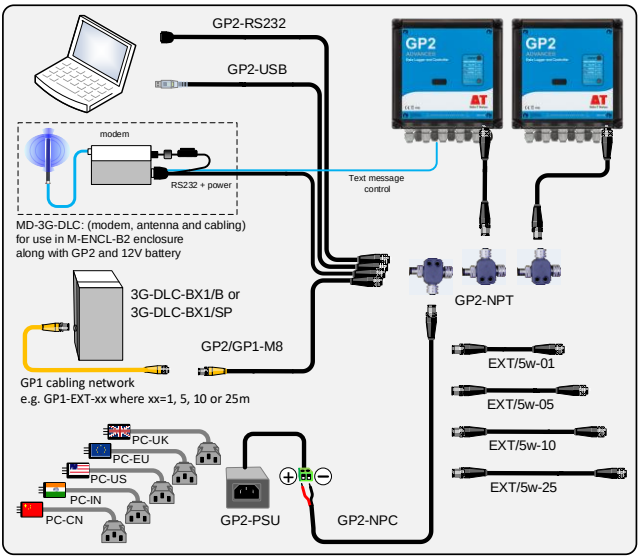


Figure 17 GP2 Network Cabling Options

System Wiring for GP2 Logger with modem gateway in M-ENCL-B2 metal enclosure

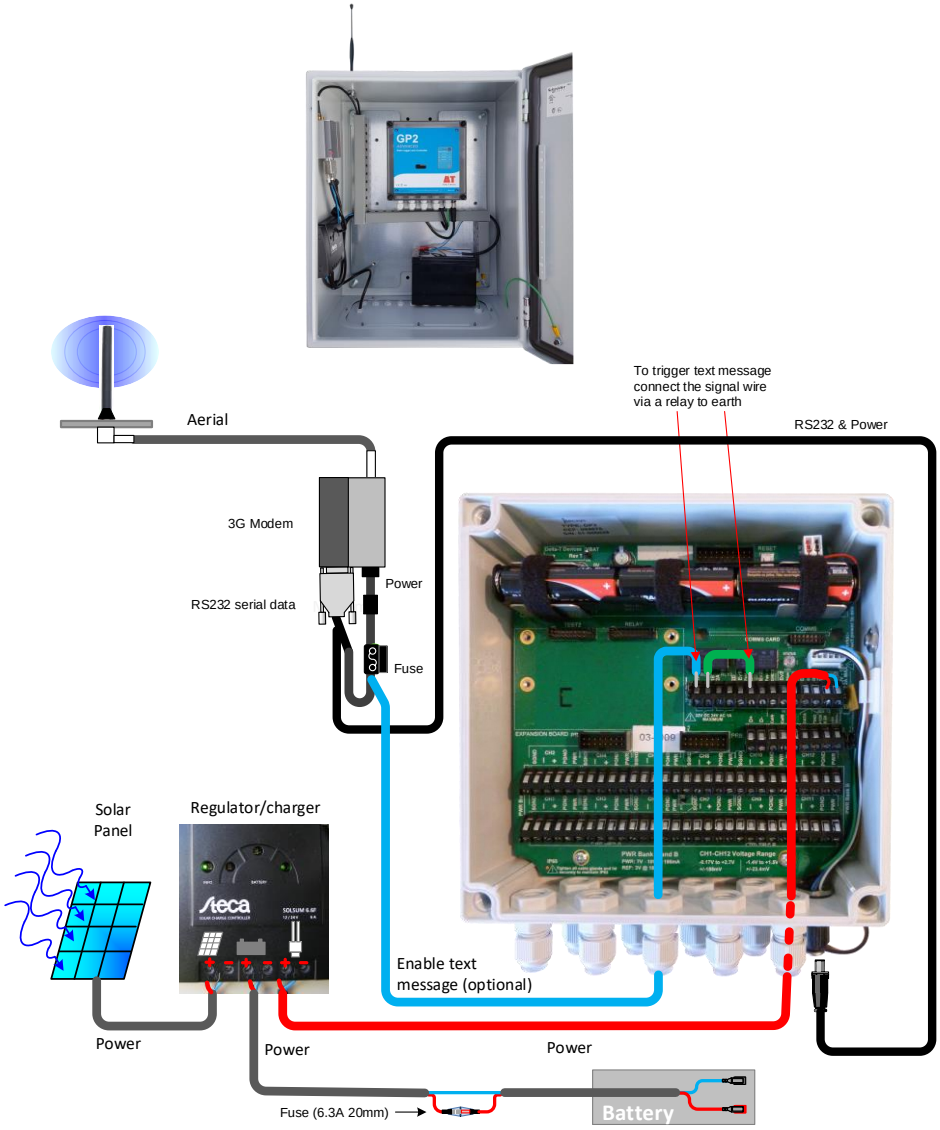


Figure 18 3G Modem Gateway wiring with a GP2 logger

BX1 Modem Box Wiring Harnesses

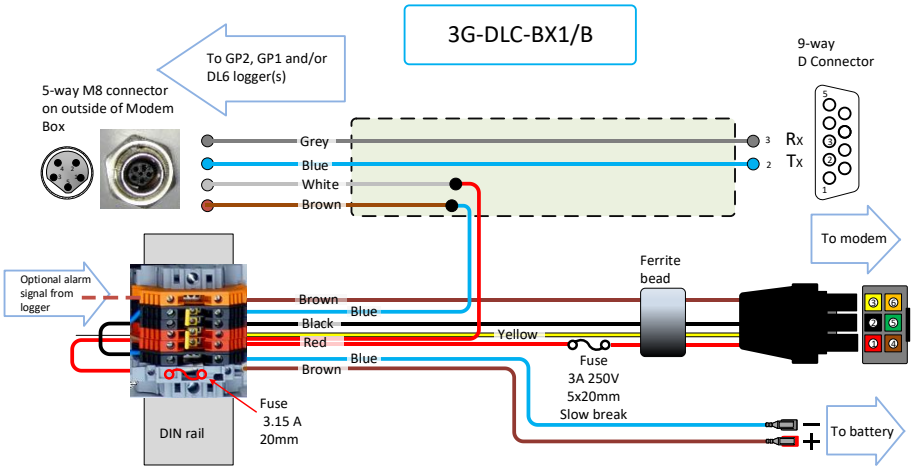


Figure 19 Cable harness wiring scheme for Modem Box **3G-DLC-BX1/B.** This connects to an LBAT4 battery for power via a fuse on the DIN rail.

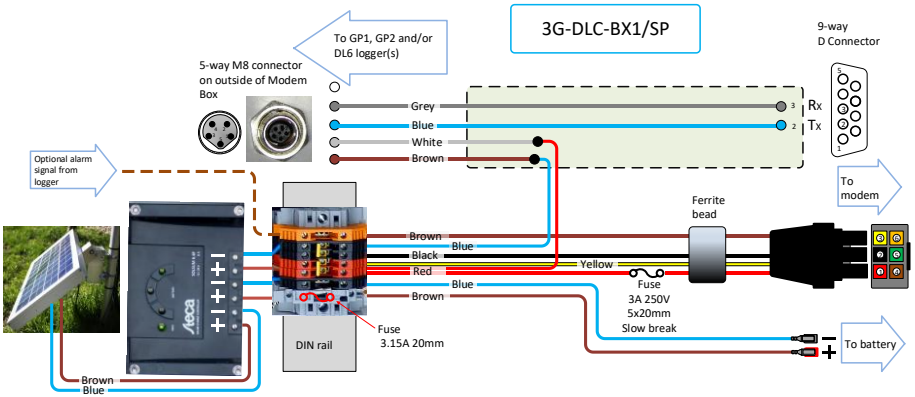


Figure 20 Cable harness wiring scheme for Modem Box **3G-DLC-BX1/SP**. This has a fuse and the solar regulator/charger between the battery and the modem.

DLC-BX1-SP System Wiring with GP1 Logger

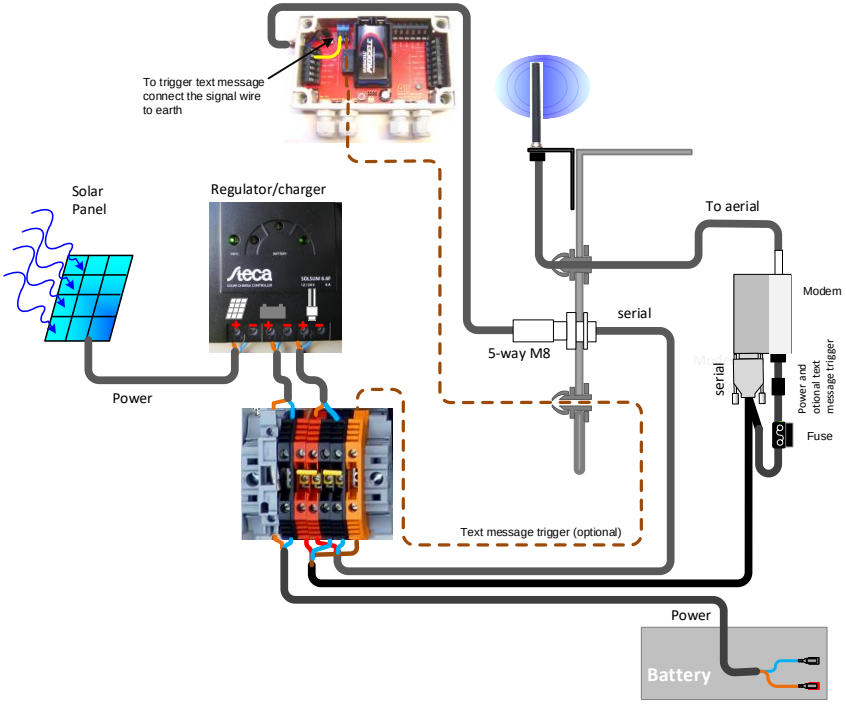


Figure 21 Wiring scheme with a GP1 logger using the cable harness used in Modem Box **3G-DLC-BX1/SP.**
See alo Fig. 22

SIM Card replacement

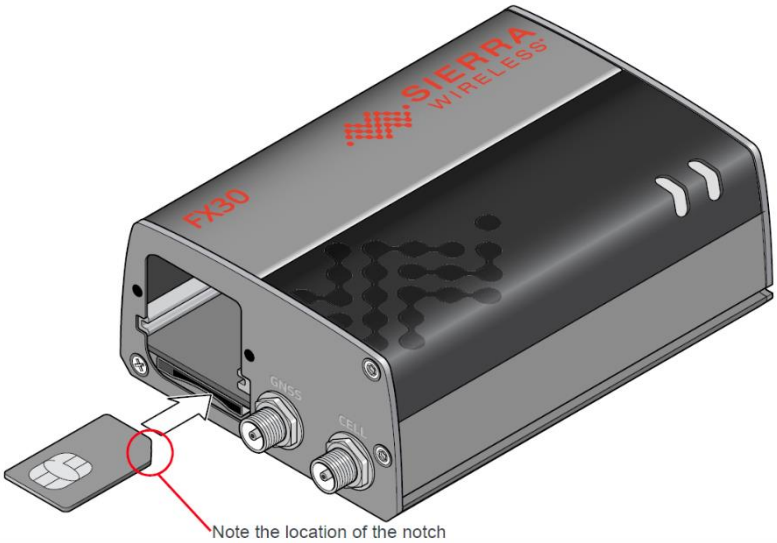


Figure 22 Sim card installation

The SIM card is supplied pre-installed with a screw cover. You should not need to open this up - unless requested by Technical Support.

To remove the SIM card:

1. Use a Phillips screwdriver to remove the cover.
2. Press in the SIM card, and release it.
3. Gently grip the SIM card and pull it out.

Te reinstall

1. Orient the SIM card, as shown, with the gold contacts on the SIM card facing up.
2. Gently slide the SIM card into the slot until it clicks into place.
3. Replace the cover

Warranty and Service

Terms and Conditions of Sale

Our Conditions of Sale (ref: COND: 1/07) set out Delta-T's legal obligations on these matters. The following paragraphs summarise Delta-T's position but reference should always be made to the exact terms of our Conditions of Sale, which will prevail over the following explanation.

Delta-T warrants that the goods will be free from defects arising out of the materials used or poor workmanship for a period of **two years** from the date of delivery.

Delta-T shall be under no liability in respect of any defect arising from fair wear and tear, and the warranty does not cover damage through misuse or inexpert servicing, or other circumstances beyond their control.

If the buyer experiences problems with the goods they shall notify Delta-T (or Delta-T's local distributor) as soon as they become aware of such problem.

Delta-T may rectify the problem by replacing faulty parts free of charge, or by repairing the goods free of charge at Delta-T's premises in the UK during the warranty period.

If Delta-T requires that goods under warranty be returned to them from overseas for repair, Delta-T shall not be liable for the cost of carriage or for customs clearance in respect of such goods. However, Delta-T requires that such returns are discussed with them in advance and may at their discretion waive these charges.

Delta-T shall not be liable to supply products free of charge or repair any goods where the products or goods in question have been discontinued or have become obsolete, although Delta-T will endeavour to remedy the buyer's problem.

Delta-T shall not be liable to the buyer for any consequential loss, damage or compensation whatsoever (whether caused by the negligence of the Delta-T, their employees or distributors or otherwise) which arise from the supply of the goods and/or services, or their use or resale by the buyer.

Delta-T shall not be liable to the buyer by reason of any delay or failure to perform their obligations in relation to the goods and/or services if the delay or failure was due to any cause beyond the Delta-T's reasonable control.

Service, Repairs and Spares

Users in countries that have a Delta-T distributor or technical representative should contact them in the first instance.

Spare parts for our own instruments can be supplied and can normally be despatched within a few working days of receiving an order.

Spare parts and accessories for products not manufactured by Delta-T may have to be obtained from our supplier, and a certain amount of additional delay is inevitable.

No goods or equipment should be returned to Delta-T without first obtaining the return authorisation from Delta-T or our distributor.

On receipt of the goods at Delta-T you will be given a reference number. Always refer to this reference number in any subsequent correspondence. The goods will be inspected and you will be informed of the likely cost and delay.

We normally expect to complete repairs within one or two weeks of receiving the equipment. However, if the equipment has to be forwarded to our original supplier for specialist repairs or recalibration, additional delays of a few weeks may be expected. For contact details see below.

Technical Support

Users in countries that have a Delta-T distributor or technical representative should contact them in the first instance.
Technical Support is available on Delta-T products and systems. Your initial enquiry will be acknowledged immediately with a reference number. Make sure to quote the reference number subsequently so that we can easily trace any earlier correspondence.
In your enquiry, always quote instrument serial numbers, software version numbers, and the approximate date and source of purchase where these are relevant.

Contact Details:

Tech Support Team
Delta-T Devices Ltd
130 Low Road, Burwell, Cambridge CB25 0EJ, UK
email: tech.support@delta-t.co.uk
email: repairs@delta-t.co.uk
web: www.delta-t.co.uk
Tel: +44 (0)1638 742922
Fax: +44 (0)1638 743155