
User Manual for

GPRS Modem Gateway

for DeltaLINK-Cloud



AT

DLC-GPRS -UM-1.1

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	FTX009	Refer to pages 109,110,116 & 117 of AirLink FXT Series Manual v6.1 on the Delta-T Software and Manuals DVD
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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Contents

Contents	3
Scope of This Document	4
Introduction	5
DeltaLINK-Cloud	5
Support for GP1, DL6 or GP2 loggers	7
Health and Safety	8
Installation	8
Batteries	8
Install GPRS Modem Gateway with a GP1, DL6 or GP2 logger	9
Requirements	9
Modem Parts	10
Parts and wiring used with GP2 Loggers	11
Parts and wiring used with GP1 and DL6 loggers	13
1: Ensure SIM Card is properly installed	14
2: Ensure the modem is powered.	15
3: Set up DeltaLINK-Cloud	18
Wiring	25
GPRS Modem Cable Harness for GP2 logger	25
GP2 Network cabling Options with GPRS Modem	25
System Wiring for GP2 Logger with GPRS modem gateway in M-ENCL-B2 metal enclosure	26
GPRS-BX1 Modem Box Wiring Harnesses	27
GPRS-DLC-BX1-SP System Wiring with GP1 Logger	28
Warranty and Service	28
Terms and Conditions of Sale	29
Service, Repairs and Spares	30
Technical Support	30

Scope of This Document

These instructions describe the use of a modem that communicates with the DeltaLINK-Cloud in the following systems: _

GPRS DeltaLINK-Cloud Gateway for GP2 loggers:

MD-GPRS-DLC: GPRS cloud modem kit for mounting with GP2 Logger into the M-ENCL-B2 metal enclosure.

The GP2 logger is mounted *inside* the metal enclosure.

GPRS DeltaLINK-Cloud Gateway for GP1 and/or DL6 loggers:

GPRS-DLC-BX1/B: polymer Modem Box with DeltaLINK-Cloud enabled GPRS and battery.

GPRS-DLC- BX1/SP: polymer Modem Box with DeltaLINK-Cloud enabled GPRS plus solar power & battery.

The GP1 or DL6 logger(s) are mounted *outside* the box.

Other Documents

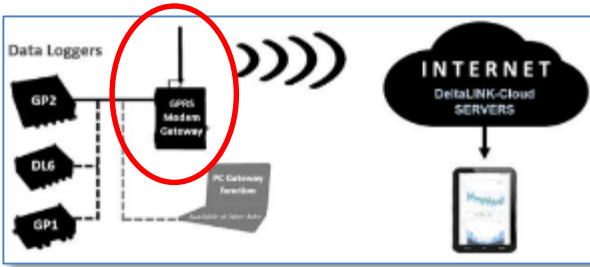
You may also need to refer to the following:

- GP2 User Manual
- GP1 Quick Start Guide
- DL6 Quick Start Guide
- Network Cabling for GP1 and DL6
- Deltalink 3.1 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 AirLink FXT Series User Guide v6.1

See also <http://www.delta-t.co.uk/DeltaLINK-Cloud.asp>

To log in go to www.deltalink-cloud.com

Introduction



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

DeltaLINK-Cloud

DeltaLINK-Cloud is a free¹ 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 with project collaborators/stakeholders. Website functionality comes for free and is accessible from most modern internet capable devices (phone, tablets and computers).

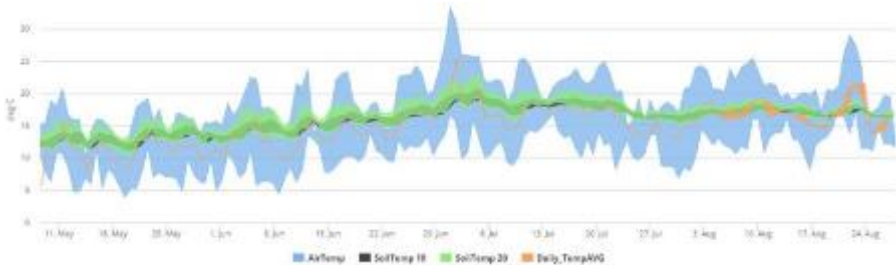
Charges do apply to data transferred via the GPRS modem SIM card. For information about SIM card data service charges contact Delta-T

¹ Data service charges apply to data sent via the GPRS modem gateway.

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

Gateway upload schedules can be customised from DeltaLINK-Cloud. The SIM cards provided by Delta-T for the GPRS Cloud modem 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.



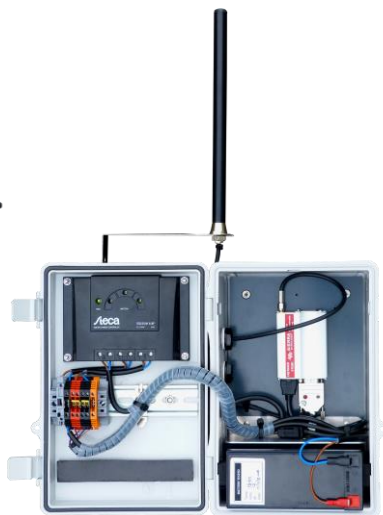
See <http://www.delta-t.co.uk/DeltaLINK-Cloud.asp>
and www.deltalink-cloud.com

Support for GP1, DL6 or GP2 loggers



MD-GPRS-DLC

DeltaLINK Cloud - enabled modem with GP2 logger controller in an M-ENCL-B2 metal enclosure with SOL-4 solar power charger/regulator and LBAT4 battery.



GPRS-DLC-BX1/SP

DeltaLINK Cloud - enabled modem installed in a polymer Modem Box with 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 you registered with the cloud you first create your own gateway and then tell it which loggers are attached, and 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

The solar panels should be covered 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 GPRS Modem Gateway with a GP1, DL6 or GP2 logger

Requirements

1 MD-GPRS-DLC: GPRS cloud modem kit for mounting with GP2 Logger into M-ENCL-B2 metal enclosure

or

GPRS-DLC-BX1/B: polymer Modem Box with DeltaLINK-Cloud – enabled GPRS and battery

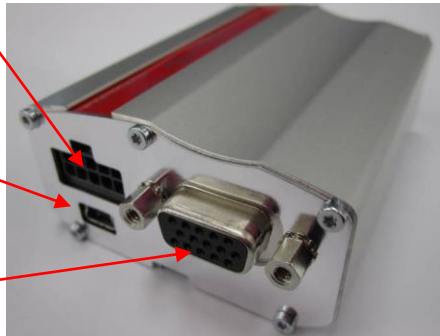
or

GPRS-DLC- BX1/SP: polymer Modem Box with DeltaLINK-Cloud enabled GPRS modem plus solar power & battery.

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

At 13.2V the modem's average consumption is up to 166mA (1.2A peak) when communicating with the DeltaLINK-Cloud servers, and 3-8mA otherwise.

Modem Parts



10 pin Microfit connector for power supply and reset signal

Mini USB interface to connect to PC. Its use may be requested by Delta-T Technical Support if diagnosing faults

SUB-D 15 pin serial connector

SIM card slot with sliding latch

Figure 1 Modem parts

Parts and wiring used with GP2 Loggers

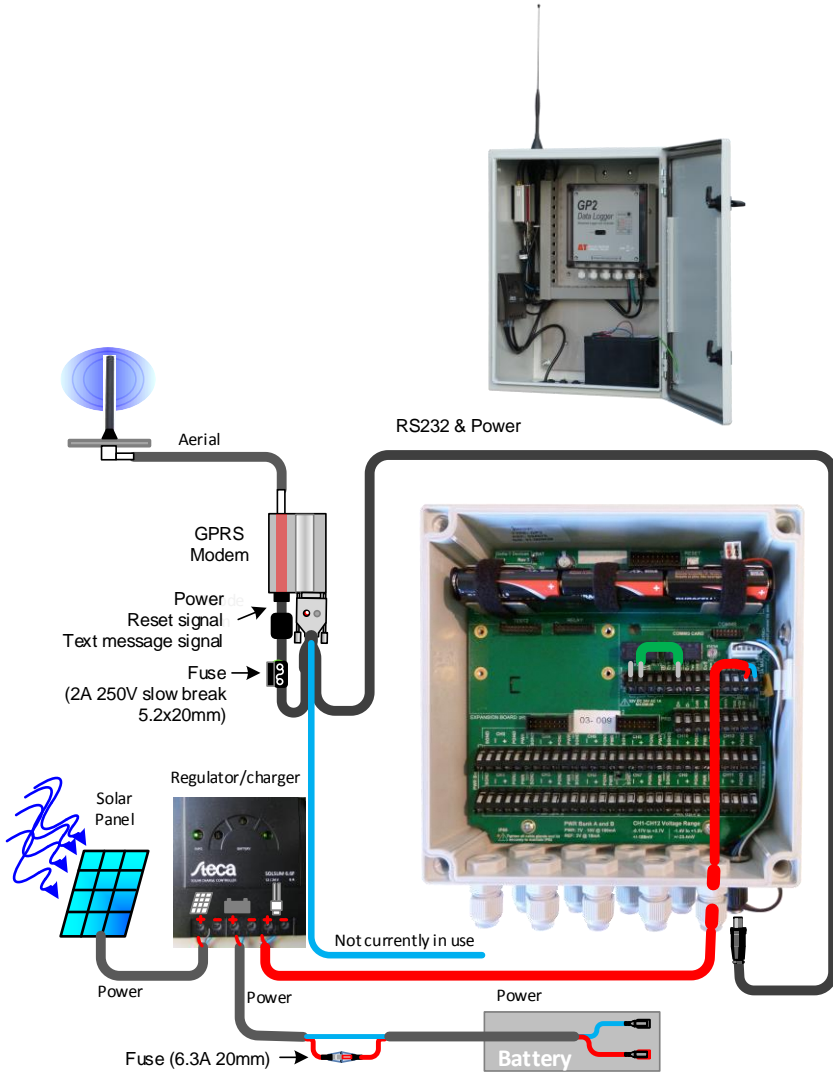


Figure 2 GP2 Logger/Controller in MD-GPRS-DLC enclosure with GPRS modem, cabling, aerial, SOL4 solar power regulator and LBAT4 battery. Wiring scheme: see also page 25.

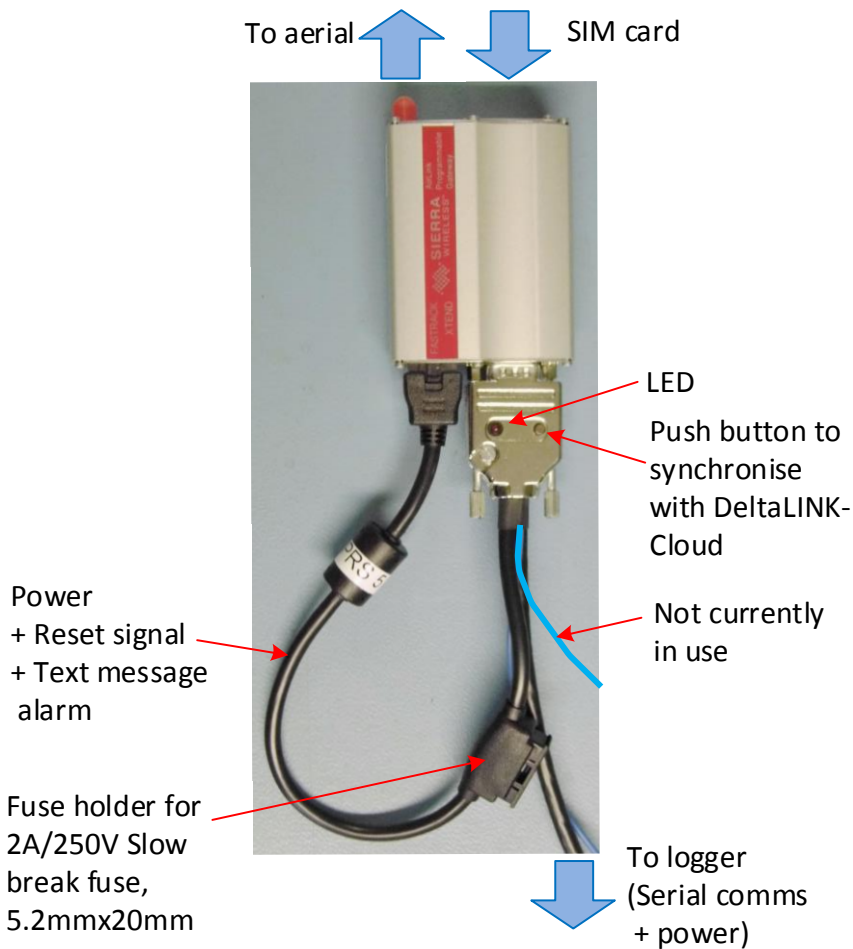


Figure 3 GP2-GPRS Cable harness functions.
See also Fig 1 and page 26.

Note : The cable harness is different for GP1 and DL6 loggers using the GPRS DLC Modem Box, see page 27.

Parts and wiring used with GP1 and DL6 loggers

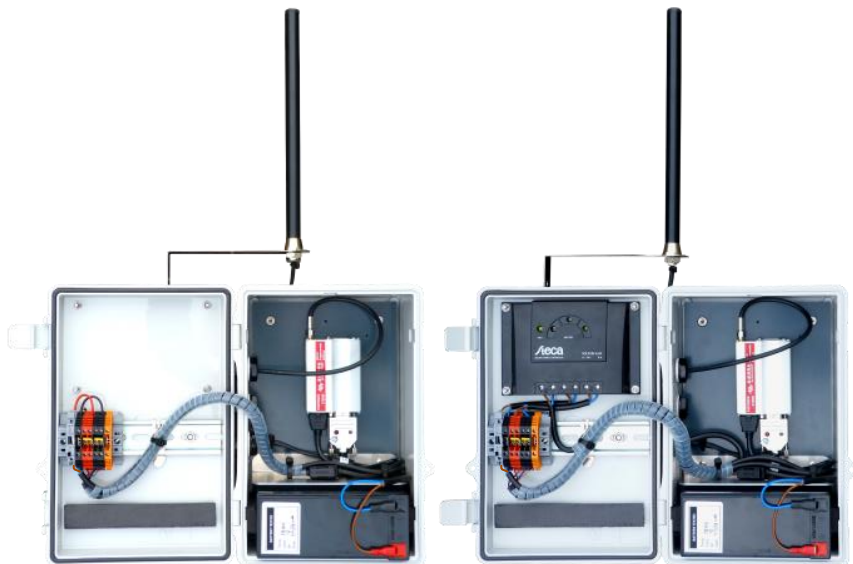


Figure 4 Showing the layout of the GPRS modem in the GPRS Modem Box options, with or without solar power.

Left : GPRS-DLC-BX1/B with battery.

Right: GPRS-DLC-BX/SP solar power option, with solar power regulator /charger, solar panel (not shown) and battery.

These DeltaLINK-Cloud GPRS Modem Box systems are used with one or more externally connected GP1 or DL6 loggers via a GP1 network cable.

See also ***GPRS-BX1 Modem Box Wiring Harnesses*** on pages 27 & 28 .

1: Ensure SIM Card is properly installed

The Smart SIM card provided for the DeltaLINK-Cloud Modem gateway has no particular label on it, so all you can do is to check it (apart from actually using it) – is to check the SIM card actually is present in the modem.

The GPRS modem is attached inside the box with Velcro and so can be easily removed.

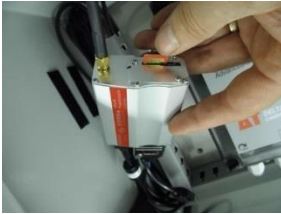


Figure 5 Location of the SIM card

Figure 6 Removal



Figure 7 Insertion



Note the slider used to keep the SIM card in place

2: Ensure the modem is powered.

Connect the battery to provide power to the modem.

Powering the modem when using GP2 Logger

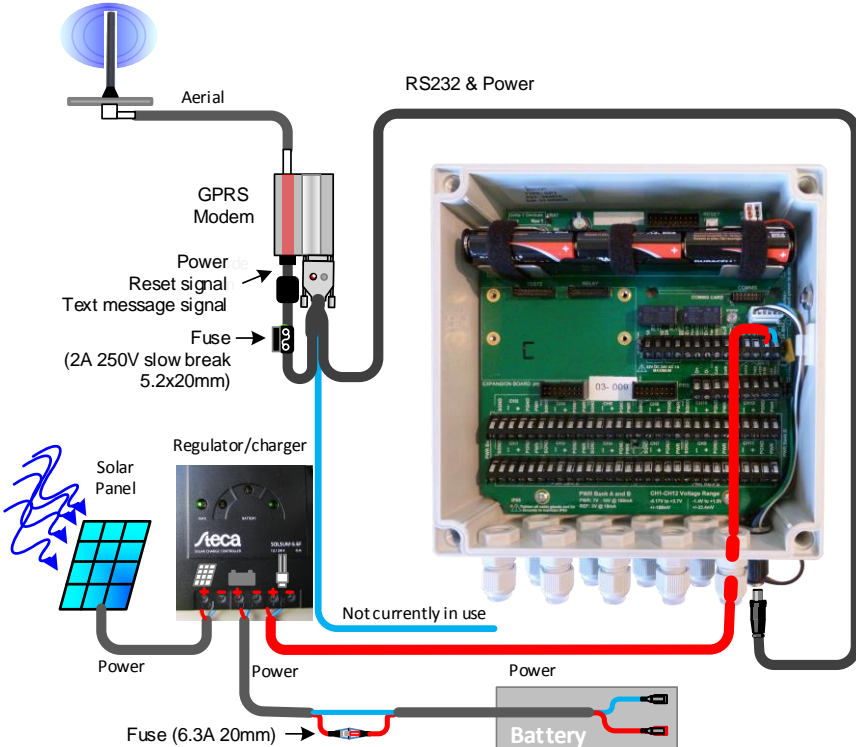


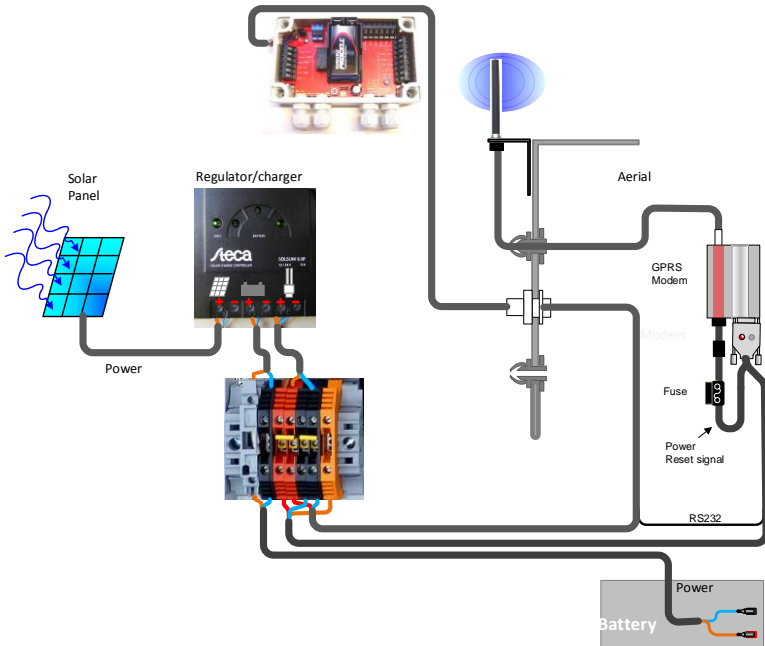
Figure 8 Typical power and signal cabling scheme for use with a GP2 logger controller.

Figure 8 shows the GPRS modem powered by a GP2 logger via the GP2 serial cable. This particular GP2 is being itself powered 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 25.

Powering the modem when using GP1 or DL6 Loggers



Power to the GPRS modem is supplied via the cable harness in

Figure 9 Cabling scheme in GPRS Gateway Box type GPRS-DLC-BX1/SP for use with GP1 or DL6 loggers.

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 also to the external 8-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 or DL6 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 27).

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


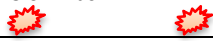


2.1 Check the Modem Flashes.

Check to see the Modem LED start to flash next to the SIM card. This indicates that the modem is powered and it is trying to connect to the DeltaLINK-Cloud.

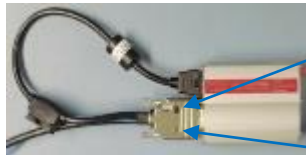
Modem LED Flashing Codes



Modem LED

LED state	Flash rate	Meaning
Permanently ON 	ON continuously	Modem is ON but not registered on a network
Slow flash 	ON 200ms, OFF 2s	Modem is ON and registered on a network (idle mode)
Very quick flash 	ON 100 ms, OFF 200 ms	Modem is ON, but the software downloaded is corrupted or incompatible (BAD software)
OFF 	OFF	Modem either OFF, or Flash disabled when modem is asleep.






Serial Connector LED Flash Codes



Serial connector LED

Modem LED

Reset button

LED state	Flash rate	Meaning
	On 0.5s, OFF 10s	Idle, waiting for next job
	On 0.5s, OFF 5s	Executing a job
	On 0.5s, OFF 2s	Connected, no job executing
	On 0.5s, OFF 1s	Connecting
	OFF	Modem software is not running correctly, or power is off.

3: Set up DeltaLINK-Cloud

Requirements

By this stage you should have achieved the following:-

- Obtained a Delta-T logger
- Obtained a DeltaLINK-Cloud GPRS Modem Gateway, including GPRS modem and SIM card with a data package.
- 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 mobile phone, a tablet or a PC or Chrome device.

It needs to be running a recent internet browser such as Internet Explorer version 9 or above.

You also need an email address.

3.1: 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

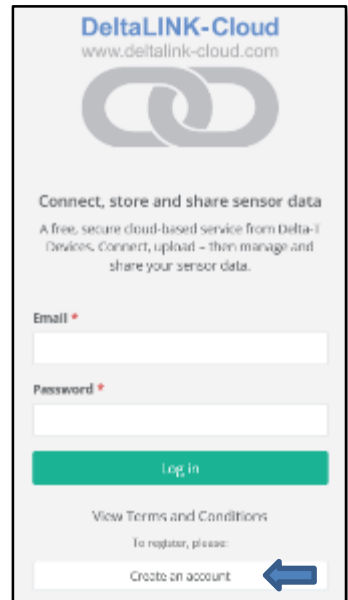


Figure 10
DeltaLINK-Cloud

Figure 11
The registration form for
DeltaLINK-Cloud.

DeltaLINK-Cloud
www.deltalink-cloud.com

Register for DeltaLINK-Cloud

A free, secure cloud-based service from Delta-T Devices. Connect, upload - then manage and share your sensor data.

First name *

Last name *

Email *

Notifications will be sent to this email address.

Password *

Confirm password *

Phone number

+44 7707 123456

[View Terms and Conditions](#)

Accept Terms and Conditions *

Register

If you already have an account, please:

Log in

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

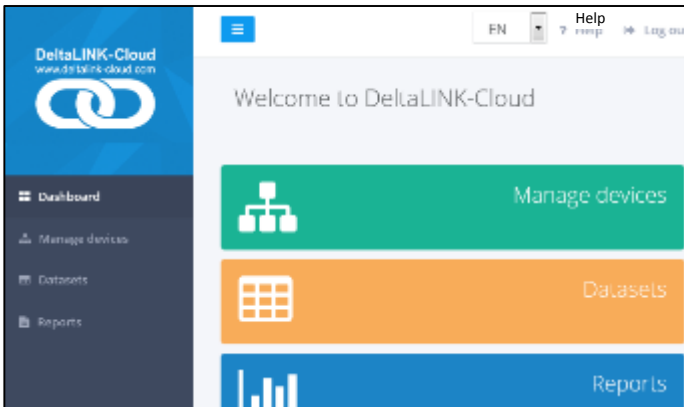


Figure 12 Welcome page. The actual layout will change depending on the size of your screen.

3.2 Add Gateway

3.2.1 Click on Manage Devices

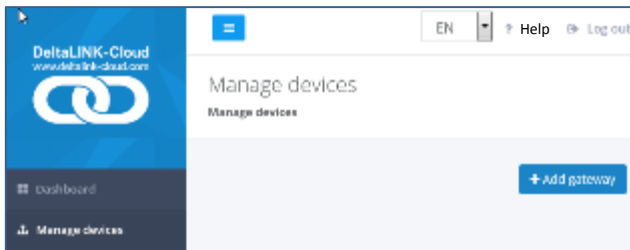


Figure 13 Manage Devices page

3.2.2 Click on Add Gateway

3.2.3 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 – e.g. DLC GPRS modem or DLC desktop

Serial Number: Enter the serial number. For the DeltaLINK-Cloud GPRS modem this is written on the side of the modem- see below. (This may not be required for the desktop gateway

Access Code: Enter the Access Code for the gateway. For the DeltaLINK-Cloud GPRS modem this is written on a label - see below

The screenshot shows a web form titled "Add gateway". It contains the following fields:

- Name***: A text input field with the placeholder "Give your gateway a name".
- Description**: A text area with the placeholder "Tell us a bit about your gateway".
- Gateway type ***: A radio button selection for "GPRS-BX1/B modem".
- Serial Number ***: A text input field with the placeholder "BH1234567890123".
- Access Code ***: A text input field with the placeholder "BH1234567890123".

At the bottom right of the form are "Close" and "Save" buttons.



Figure 14 The Add Gateway form and the location of serial number and access code for the DeltaLINK-Cloud

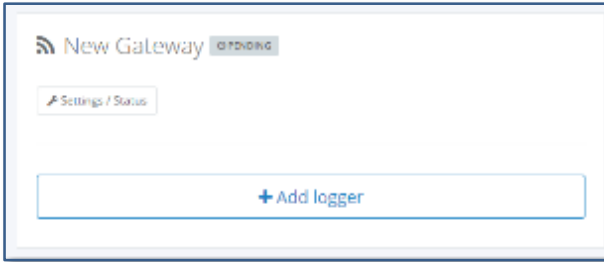


Figure 15 Waiting for a new gateway to open

3.3 Add a Logger to the new Gateway

3.3.1 Click on Add Logger.

The image shows a form titled 'Add logger' with a router icon above the title. The form contains the following fields and options:

- Name ***: A text input field with the placeholder text 'Give your logger a name'.
- Description**: A text area with the placeholder text 'Tell us a bit about your logger'.
- Logger type ***: Three radio button options:
 - GP2 (Product info)
 - GP1 (Product info)
 - DL6 (Product info)
- Serial number ***: A text input field with the placeholder text 'e.g. GP1 01 254'.

At the bottom right of the form, there are two buttons: 'Close' and 'Save'.

Figure 16 The Add Logger form.

Information needed on the Add Logger Form

Name:

In the **Add Logger** 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 DeltaLINK-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**.

3.4a 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.

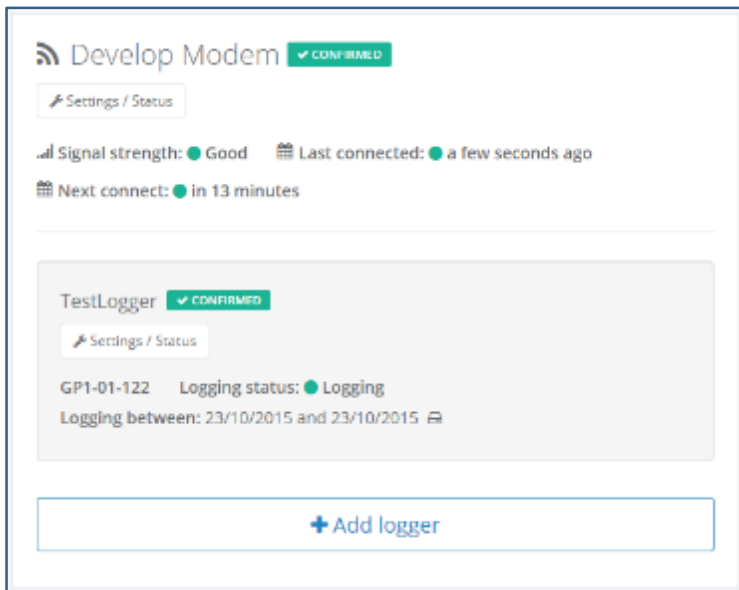


Figure 17 Showing the Gateway and Logger Status

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 see
DeltaLINK-Cloud online **Help**
<http://www.delta-t.co.uk/DeltaLINK-Cloud.asp>
To log in go to www.deltalink-cloud.com
To contact Delta-T see page 30.

Wiring

GP2 Network Cabling Options

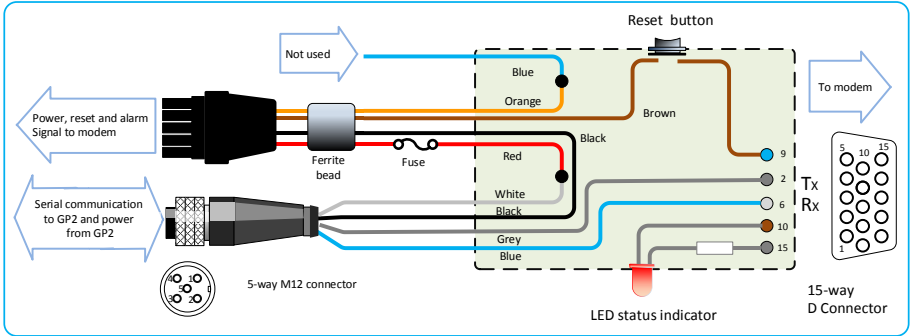


Figure 18 GP2 to GPRS Modem Gateway wiring harness

GP2 Network Cabling Options

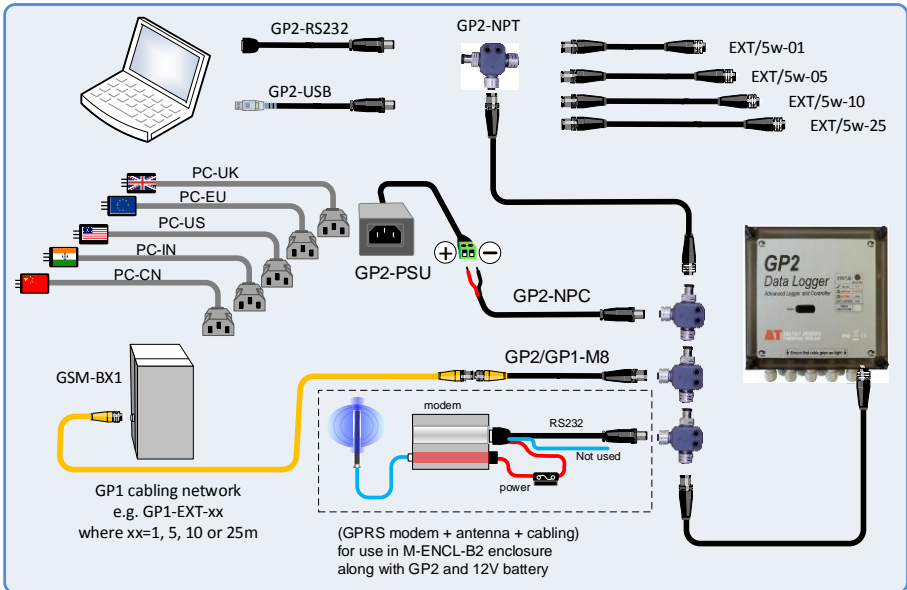


Figure 19 GP2 Network Cabling Options

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

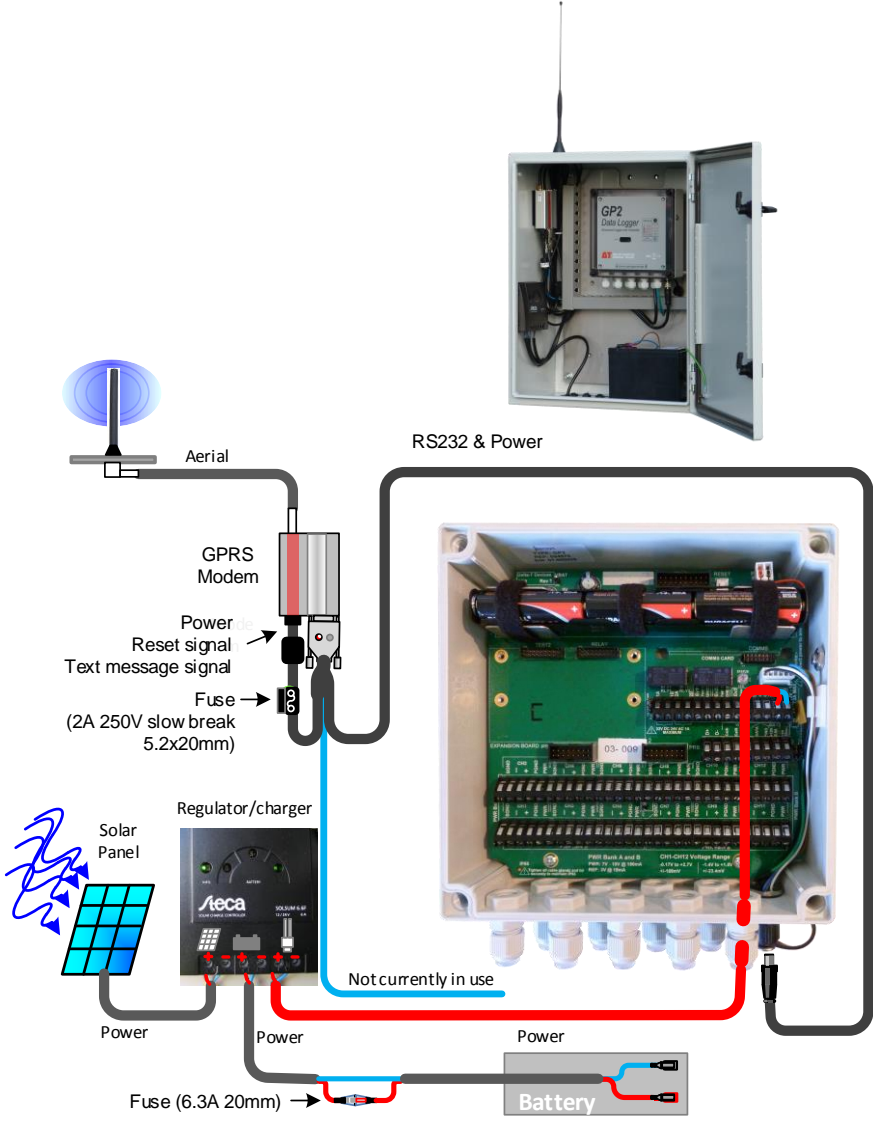


Figure 20 GPRS Modem Gateway wiring with a GP2 logger

GPRS-BX1 Modem Box Wiring Harnesses

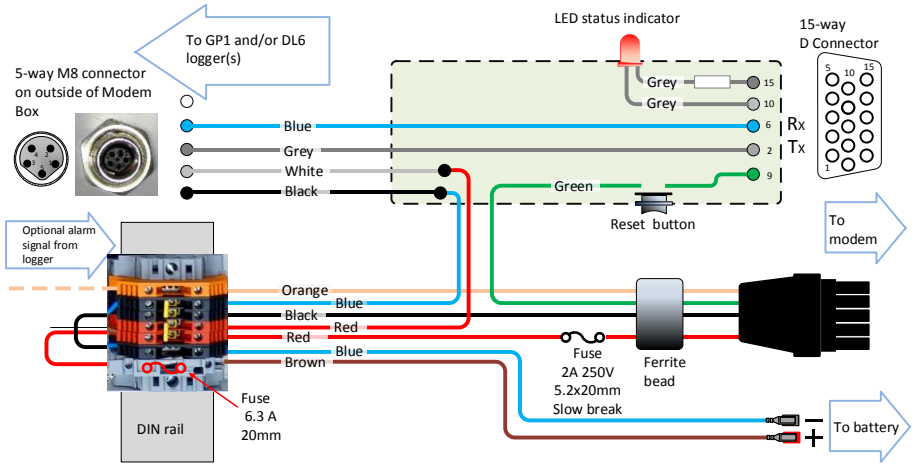


Figure 21 Cable harness wiring scheme for Modem Box **GPRS-BX1/B**. This connects to an LBAT4 battery for power via a fuse on the DIN rail.

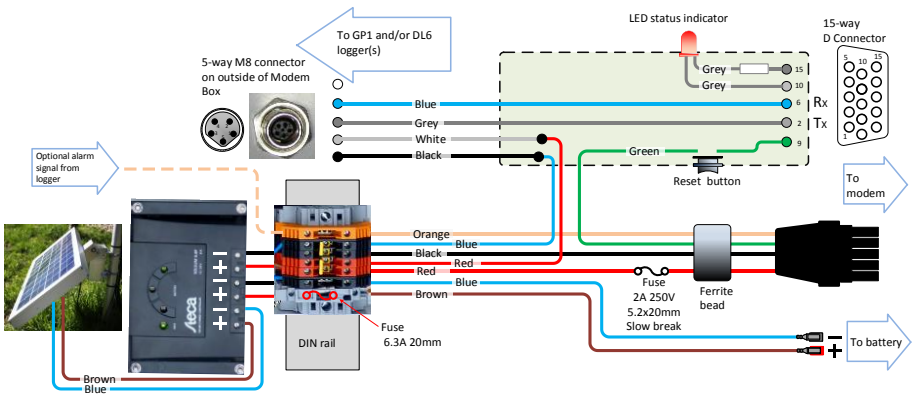


Figure 22 Cable harness wiring scheme for Modem Box **GPRS-BX1/SP**. This has a fuse and the solar regulator/charger between the battery and the modem.

GPRS-DLC-BX1-SP System Wiring with GP1 Logger

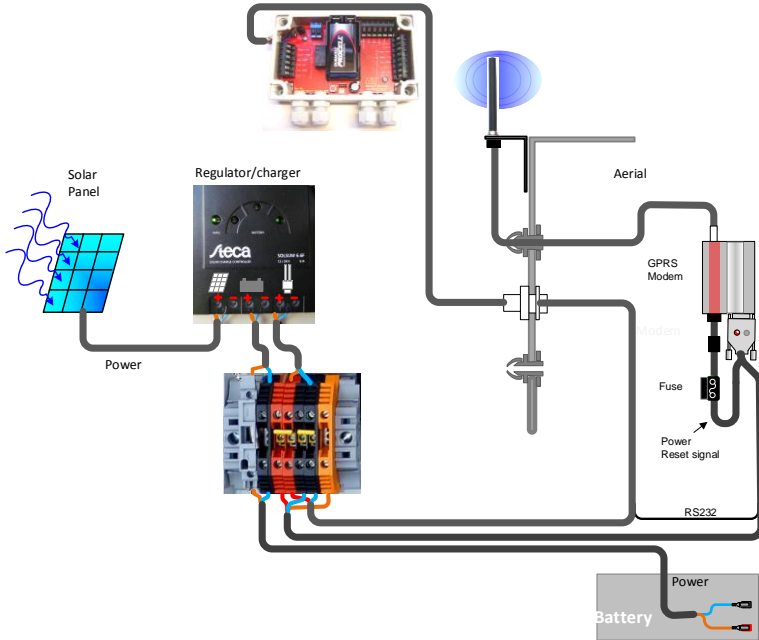


Figure 23 Wiring Scheme using Modem Box GPRS-DLC-BX1-SP which includes solar power, showing a GP1 logger connected

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