User Manual for the

M Enclosure for GP2

*Type **M-ENCL-B2***

Delta-T Devices Ltd

Notices

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CE conformity

The CE marking identifies this product as complying with all relative directives in the European Union (EU). For the GP2 weather station this may include one or more of the following products:

Product:	Description:	Standard(s):
Modem	CT63 (CEP)	ETSI EN 301 489/EN 301 151 EN 61000-4-2 (Electrostatic discharge immunity) EN 61000-4-3 (Radio frequency immunity) EN 55022 (Radio frequency emissions)
Solar Regulator	Steca Solsum 6.6F	2004/108/EC (EMC) 2006/95/EC (Low voltage directive)
Solar Panel	BP SX series	IEC 61215
Data logger	GP2	EN 61000-4-2 (Electrostatic discharge immunity) EN 61000-4-3 (Radio frequency immunity) EN 61000-4-4 (Fast transient/burst immunity) EN 61000-4-5 (Surge immunity) EN 61000-4-6 (Conducted radio frequency immunity) EN 55022 (Radio Frequency emission)

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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Introduction

Summary of Features

The enclosure is designed for use with the M2 mast. It is an alternative to the Logger Canopy and provides greater weather protection, electrical shielding, and security for a GP2 and accessories.

- Weatherproof to IP54 standard
- Side opening door with twin locks
- Gland plate with 12 cable glands
- Two inch diameter pole mounting brackets (2 off)
- Trunking for tidy cable routing
- Earthed back plate and strap

Scope of This Manual

This manual contains details of performance and specification of the M-ENCL-B2 for use with a GP2 logger, and describes its installation with the M2 mast and with solar power and GSM modem options.

See also:
GP2 User Manual
DeltaLINK software **Help**
Using dial-up modems with DeltaLINK

Solar Panel manufacturer's instructions
Solar charge controller operating manual

Health and Safety

Manual Handling

The enclosure is quite heavy and awkward to grip. Please take extra care and follow health and safety guidelines for manual handling in all aspects of lifting or moving this product

Batteries

The M-ENCL-B2 enclosure if fitted with a SOL4 Kit at Delta-T and LBAT4 battery is designed to minimise the risk of explosion.

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

See also Warnings on page 13

Installation

Description of Equipment

M-ENCL-B2 Layout

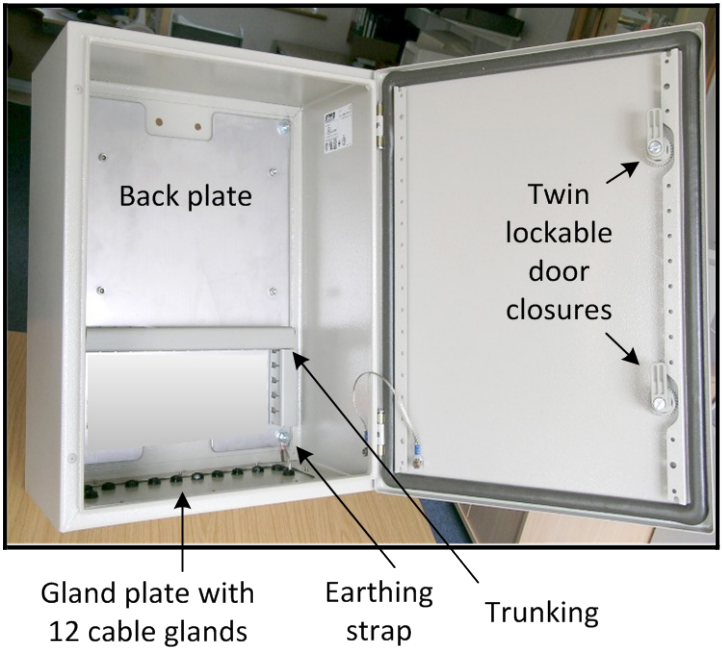


Figure 1 The M-ENCL-B2 enclosure

M-ENCL-B2 with GP2, Modem, Solar battery charger and 12V battery

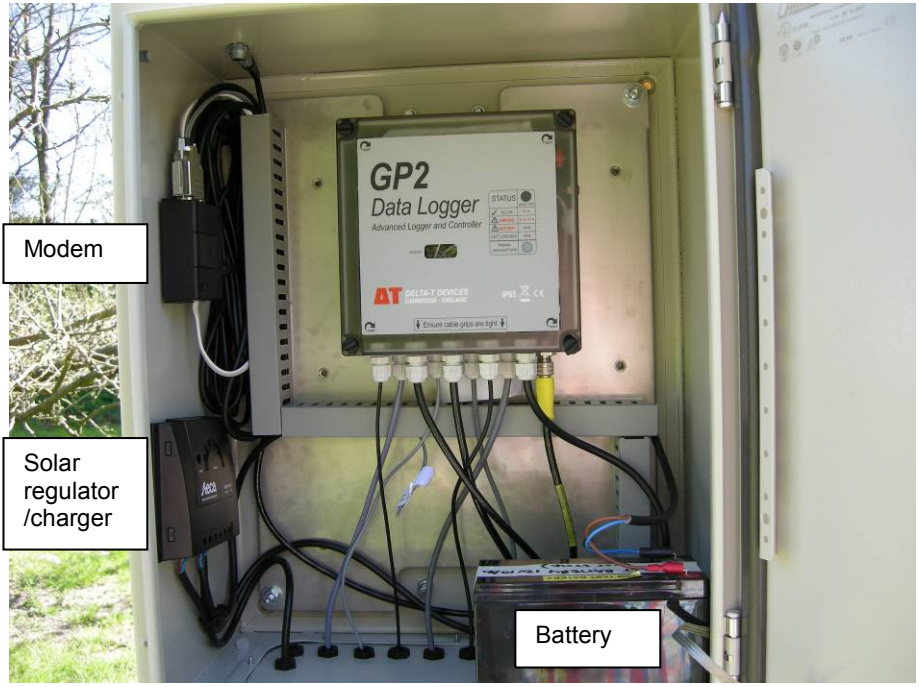


Figure 2 View inside the M-ENCL enclosure showing a GP2 logger controller, a GSM modem, a solar panel battery regulator-charger and a 10Ah LBAT4 battery

Unpacking

Check for any damage that may have occurred to the consignment in transit. Check that the contents of the consignment agree with the Packing List.

If any damage or shortage is apparent, notify the distributors and the carriers immediately.

Make a note of any equipment serial numbers, as these will be needed in any subsequent warranty claims, repairs or recalibration.

Mounting the Enclosure

Height and orientation

First determine at what height and rotation on the M2 mast or pole you want to mount the enclosure.

Electrical Shielding

Thorough shielding of all the metal components of the enclosure is achieved with low impedance earth braids fitted with ring or spade tags.

An earth cable is supplied with the enclosure to attach the case to an earth stake.
For the best earth connect it to the 1m copper Grounding Rod and Strap type WS-GRK.

Assembly to mast

The enclosure is mounted to the mast using two U bolt assemblies that will require disassembly prior fitting. It will also require extra assistance in order to make the installation process easier.

Partially assemble the top U-bolt and clamp to the mast and whilst the assistant keeps these in place, offer the enclosure over the two M8 threaded studs, and fit the two M8 nuts over the exposed threads inside the enclosure.

Warning: Please recognise Health and Safety precautions when lifting heavy and awkward loads. Also be careful that the door does not swing shut and trap fingers at this stage of installation.

Repeat the procedure for the second U-bolt assembly under the base of the enclosure. Once correct height and orientation is established then tighten all four nuts with a 15mm socket wrench.

Fitting the Logger

Most enclosure systems are assembled at the factory with the GP2 data logger fitted. The logger is mounted directly onto the plate of the enclosure using four sets of hexagonal pillars.

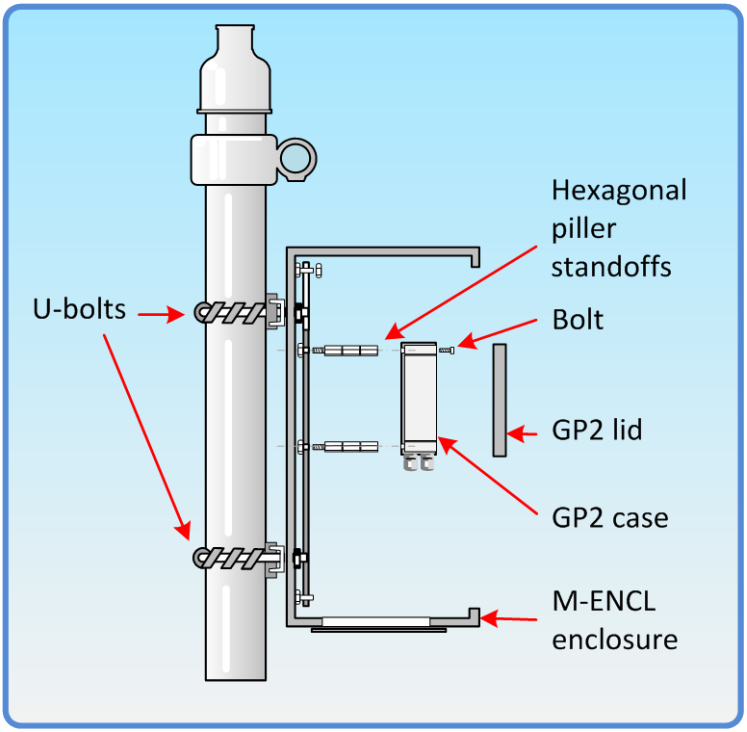


Figure 3 Mounting the enclosure on the mast and the GP2 in the enclosure

Remove the logger lid and insert an M4 bolt into each of the hollow “legs”. Offer the logger up against the back plate over the threaded inserts and tighten i using a Pozidrive no 2 screwdriver.

Complete by re-fitting the lid of the logger quickly to reduce the exposure of the desiccant bag to atmosphere.

Gland plate and sensor cables

The gland plate is screwed to the underside of the enclosure, and is sealed with a foam gasket.

Feed the sensor cables through the gland plate, and tighten up the glands to seal them. You may need to provide extra sleeves if the cables are less than about 5 mm diameter.

Extra cable glands are fitted to enable further ancillary equipment to be easily incorporated into the system. Please ensure that un-used cable glands are blocked to prevent moisture ingress and condensation.

System Earth

To comply with Health and Safety requirements the complete system should be correctly earthed.

The M2 Enclosure is provided with a 2m earth cable terminated in an M8 bolt ring for connection to an earth stake such as the optional **WS-GRK**.

Warning: If there is any doubt concerning electrical connection or earth arrangements please contact Delta-T or the local agent.

SOL4-KIT2 Solar Power Kit

This includes:

- 30 W solar panel
- Solar panel mounting bracket and U bolts
- Solar regulator/battery charger
- Cables

Figure 4 The SOL4-KIT2 items

Wiring

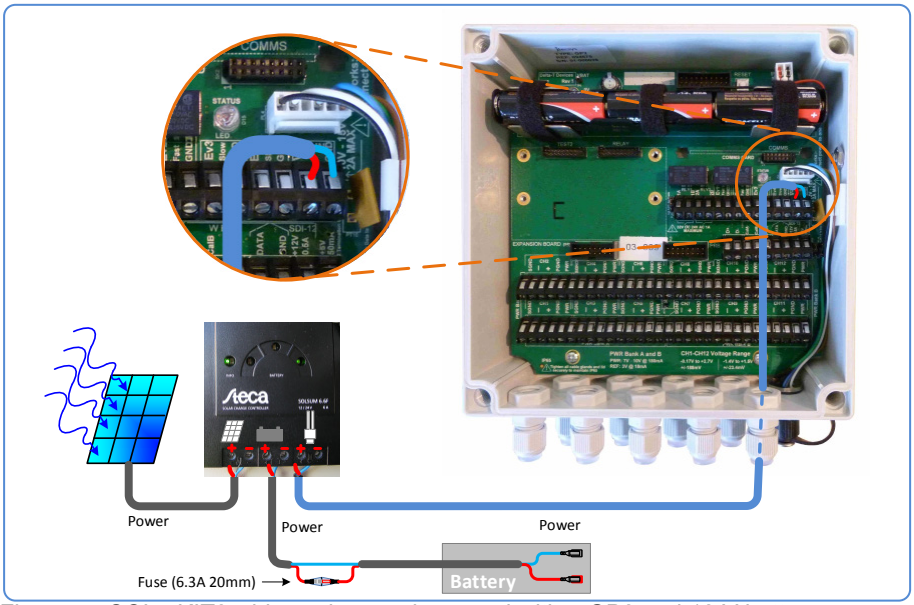


Figure 5 SOL4-KIT2 wiring scheme when used with a GP2 and 12 V battery

Warnings

Observe the warnings given in the solar panel guide and the operating manual for the solar charge controller.

Cover the panel before wiring it up to avoid electric shock from bare wires.

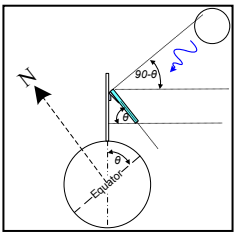
Observe the polarity requirements of both the solar panel and the solar charge controller.

Mount the charge controller vertically and *in the same chamber* as the battery.

Only used Delta-T approved sealed lead-acid batteries.

Use of other batteries or battery chargers can cause hydrogen gas production which can explode unless installed in a well-ventilated enclosure.

Considerations when mounting solar panel



Observe the warnings above, of course.

Tilt it to the angle of latitude, or in high latitudes up to 10 degrees more, to capture more light early in the day.

You may wish to place the panel to shield your logger enclosure from the sun.

Do not site an air temperature or RH sensor directly above the panel, rising hot air may distort ambient readings.

Assembly

Mounting bracket, bolts, cabling and U bolts are provided

- Assemble the two halves of the solar panel bracket with the bolts provided.
  See also the manufacturer's instructions supplied with the mounting kit.
- Attach the bracket to the mast (not provided).
- Cover the solar panel to exclude light before installing it.
- Add the solar panel.
  See also: Solar panel Instruction Sheet and a separate Appendix and Wiring diagram and any Warnings on the back of Solar Panel.
- Attach the power cable from the Solsum solar charger/regulator to the screw terminals on the back of the solar panel, as indicated in the wiring diagram on the back of the solar panel.
  Brown = positive, blue = negative.

See also: Solar Charge Controller's instructions for the Solsum 6 and any instructions supplied by the solar panel manufacturer.

GPRS Modem type MD-GPRS-1

Please refer to the **GPRS Modem User Manual**.

This is available at www.delta-t.co.uk
and on the Delta-T Software and Manuals DVD

GSM Modem type MD-GSM-2

Figure 6 The GSM modem with DB9 RS232 connector top left, antenna connector top right and a power cable at bottom

The MD-GSM-2 modem (if ordered withan M2 Enclosure) is pre-installed in the enclosure, but you will need to obtain and install your own sim card .

The modem has an Rj11 connector for power.

The modem has an RS232 (DB9) connector for communicating with the logger and a round (50 Ohm FME male) connector for attaching to the antenna cable.

An external source of 5-32 VDC power is required for the modem.
This is normally supplied via a lead acid battery such as the **LBAT4** 10Ah battery which can fit inside the M-ENCL enclosure.

The solution we provide routes the external battery power through a GP2 and onto the GP2 serial communication and power network cabling using a cable harness - which connects to the modem serial and power sockets.
See also ***Modem to GP2 cable harness*** on page 21

This means the same power is available to other loggers connected to the the GP2 via a GP2 cabling network. For further information on GP2 network cabling see the **GP2 User manual.**

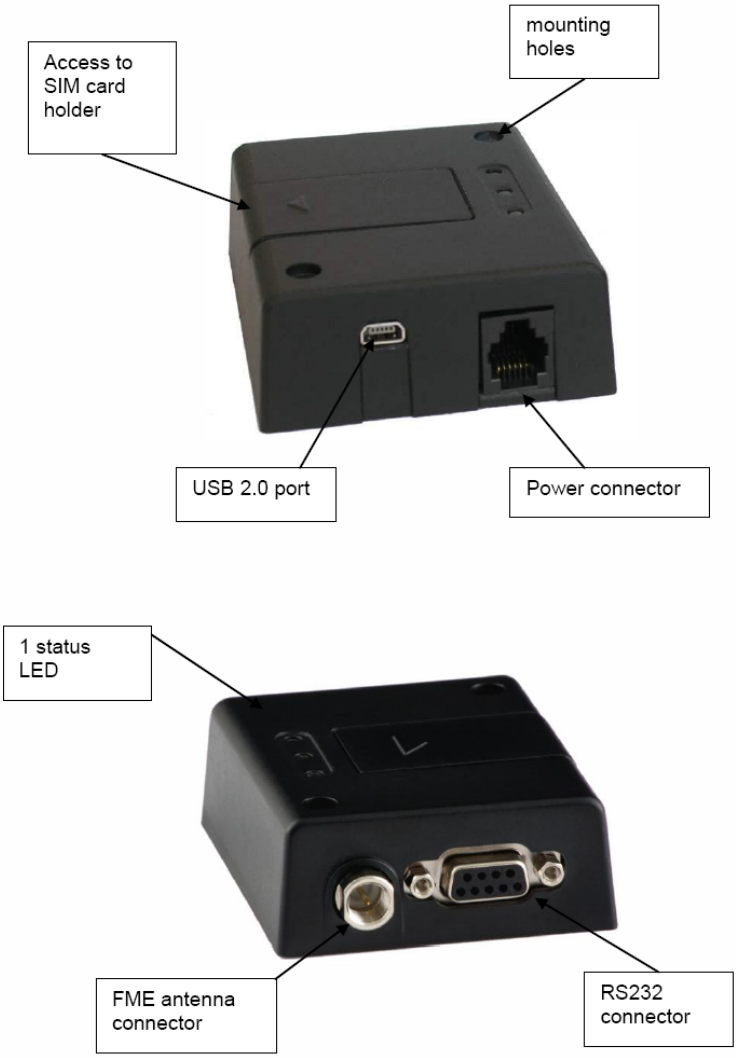
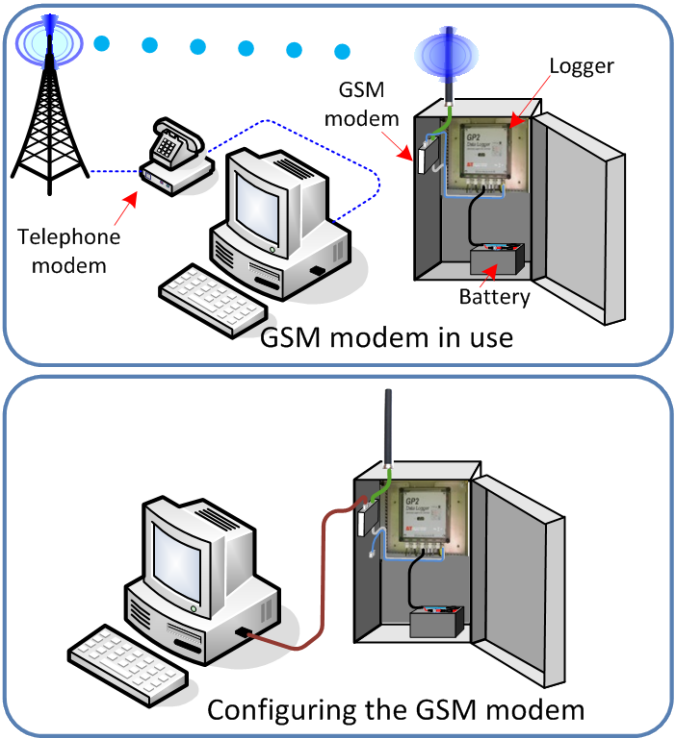


Figure 7 Modem parts

Modem communication with Loggers

To connect to a logger in the field requires two modems, one at each end of the phone line.

These instructions cover the modem used at the logger end.



If the modem and logger are ordered together from Delta-T then the modem will arrive pre-wired and configured.

The **MD-GSM-2** modem includes accessories for use at the logger end.

A modem configured for use with a GP2 logger will also work GP1 and DL6 loggers but not DL2e Loggers[1].

Figure 8 Upper diagram shows the modem in normal use, the lower diagram shows it connected directly to a PC while it is being configured using the **GSMConfig** software. All Delta-T supplied modems come pre-configured.

[1] (DL2e loggers need to communicate at a different speed, and also you need different cables – contact Delta-T for help)

An RS232 cable is provided to temporarily connect the GSM modem (at the logger) directly to a PC. This needs to be done just once when configuring the modem.

We provide configuration software **GSMConfig** to configure the modem and describe how to do it in the following pages.

Note: Once the MD-GSM-2 modem has been configured to work with your logger, the internal non–volatile memory ensures that these settings will remain even if the unit is removed, or power is removed

Wiring

A cable harness is provided with an M12 5-way connector for connecting to the GP2 logger, and a DB9 connector for connecting to the modem. The DB9 connector also has a 2 wire cable with bare leads which can be connected to a GP2 relay for triggering a text message stored in the modem.

A separate RS232 cable is provided for connecting the modem to a PC when configuring the modem.

The aerial if installed by Delta-T is mounted through the enclosure top.

Modem with solar charger and battery wiring

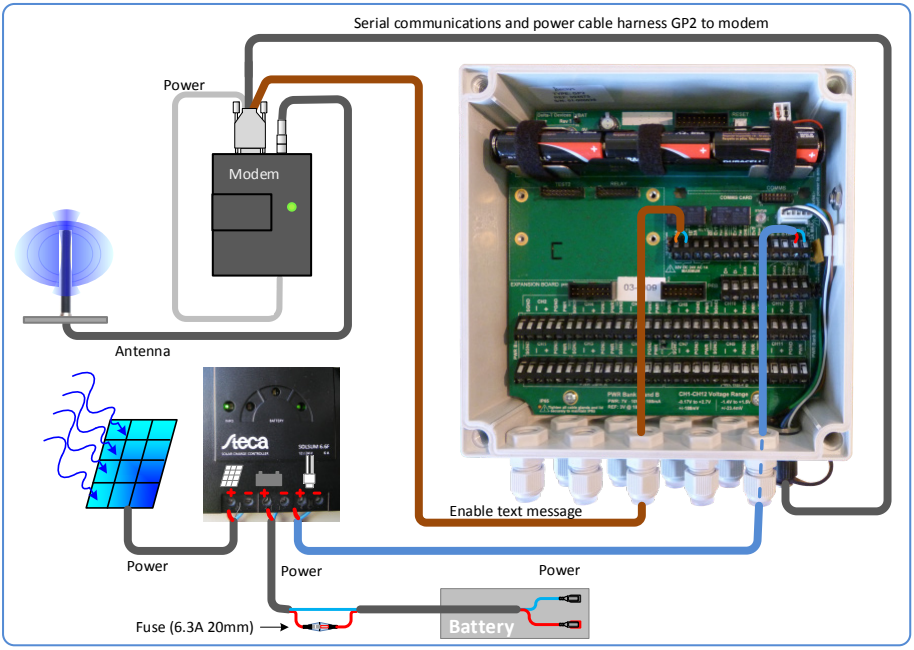


Figure 9 The wiring scheme for a GP2 data logger controller with a **SOL4-KIT2** solar powered charging system, an **LBAT4** 10Ah battery and an **MD-GSM-2** modem system

Modem to GP2 cable harness

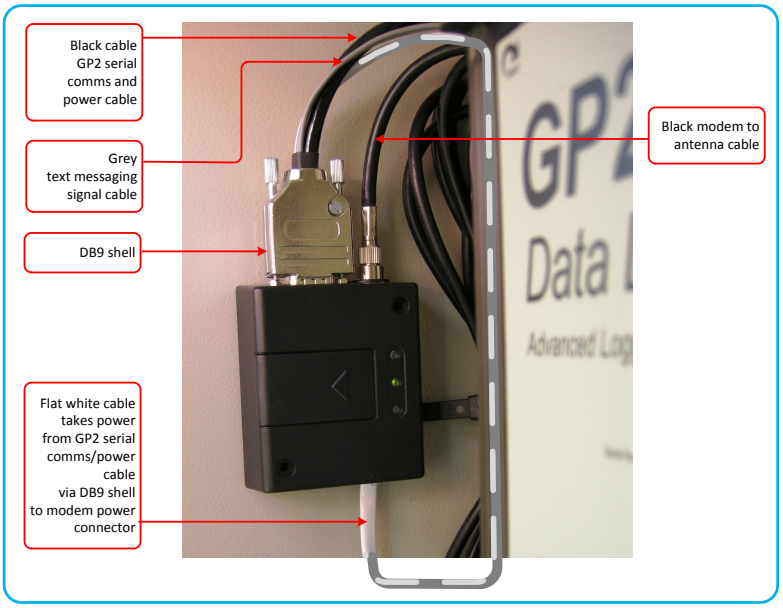


Figure 10 The cable harness used to connect the modem to the GP2

Modem cabling when configuring it

Whether in use or being configured, the modem will need 5 - 32 V DC power via the Rj11 connector.

At some stages during the configuration the software tells you to remove or apply power to the modem.

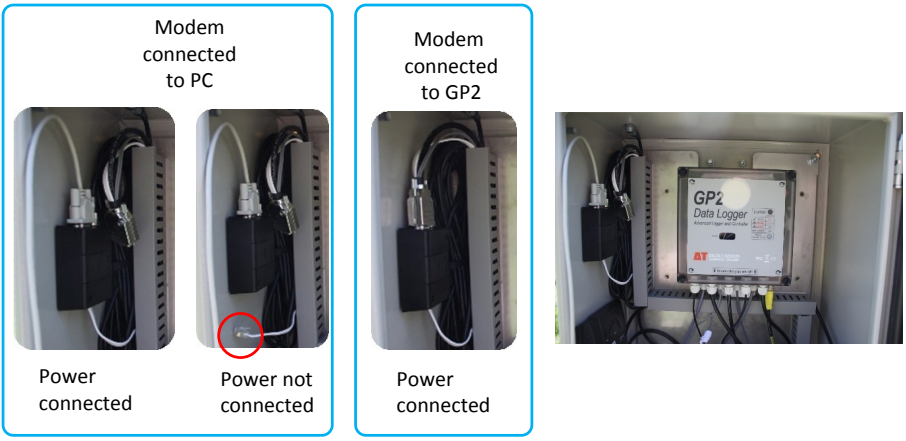


Figure 11 Modem connections while being configured (left) and in use (centre).

Figure 11 shows how to apply and remove power to the modem. You can be told to do this if using the GSMConfig software.

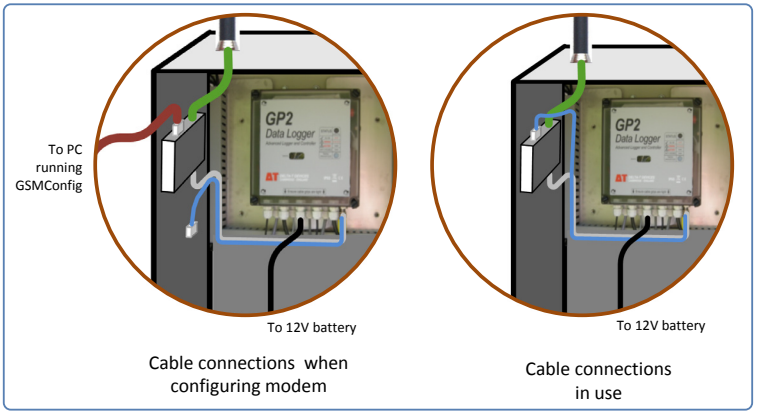


Figure 12 Modem cable connection diagrams during configuration ()left) and when in normal use (right).

Obtain a SIM card

The modem is supplied without a SIM card. It is the choice of the user to determine the most appropriate GSM network. There are also two frequencies used in the UK, 900MHz used by Vodaphone and Cellnet and 1800MHz used by One to One and Orange.

When establishing the account please ask the network provider for a Data Account, as this will be subject to a cheaper monthly rate.

Warning:
Whatever type of account is established, it is vital that the SIM card is "Data Enabled for GSM". This can also be called "Circuit Switched Data Enabled".
Note this is different from being enabled for internet data i.e. as used in mobile phones and GPRS. Please make sure that when ordering that the network provider confirms this requirment

The modem will not function correctly if this requirment is not met.

Normally three telephone numbers are received with each account, Audio, Fax and Data.

The Data phone number is the one to use, but check with the network provider if there is no separate Data number.

Check that the SIM card PIN number is not enabled by placing the SIM card in a normal GSM phone. Switch on the phone and if *"need to insert the PIN number"* message appears, use the phone's menu to disable this function. If there is no message then it has already been done.

Fit SIM card

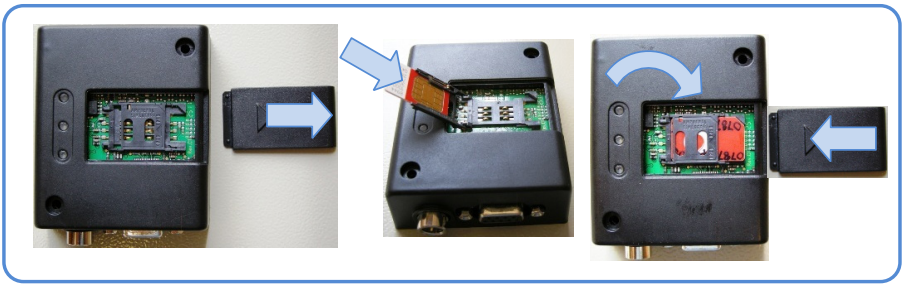


Figure 13 Fitting a SIM card

Place the SIM card in the modem as shown in Fig 13.

Warning: Take care to fit the SIM card the right way up, ensure the card holder slides freely into the modem.

Connect the battery or power supply to power the modem up and check the network connection.

Power up LED (green LED in the middle)

The modem has a green power up LED, as depicted below, which is used to indicate various operating states. These states are described in following table.

Operating state of CT63 Terminal	Power up LED state
Device off	Permanently off
net search / not registered	Fast blinking
registered full service	Slow blinking
A call is active	Permanently on

Configure, Test or Add Text Message to modem

If your modem is supplied by Delta-T it will have already been preconfigured and is ready to use.
If you have no need for the text messaging option then you may skip this section and go to ***Create a modem connection in DeltaLINK*** on page 29.

This section describes how to use the GSM modem configuration software **GSMConfi**g to:

- Configure the modem
- Test your modem connection
- Add a text message for sending to a mobile phone

See also the complete sequence of ***Appendix GSMConfig*** Screenshots on page 30.

To configure the modem:

You do not need to do this if you obtained your modem from Delta-T. Go to ***Create a modem connection in DeltaLINK*** on page 29.

You need a PC with RS232 serial port or USB RS232 adapter.

1. Disconnect the modem from serial cable in the M-ENCL enclosure and connect it directly to your PC serial port using PC-modem serial cable **GSM-RS-DB9** as shown in Figure 11.
2. From the PC **Start** menu select **Programs, Delta-T Devices, DeltaLINK**, **GSMConfig** utility.

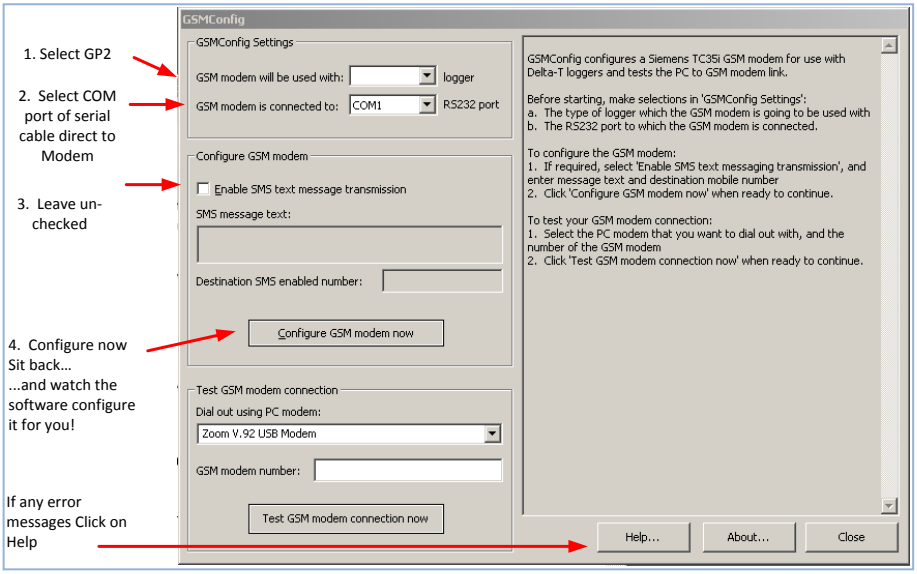


Figure 14 The **GSMConfig** program.

3. Set **GSM Modem will be used with:** to GP2.
4. **Set GSM modem is connected to:** the PC COM port that you are using.
5. Click **Configure modem now**.

Click **Help** for additional on-screen instructions.

To test your modem connection:

Complete stage 1-4 on page 26 then

5. Connect your PC modem to a telephone line, and enter the connection details as shown.
6. Turn your modem power off then on again.
7. Click **Test GSM modem connection now**

Watch as the program runs through its test sequence and reports its progress.

See ***Appendix GSMConfig*** Screenshots on page 30.
Click **Help** for additional on-screen instructions.

To set up text messaging:

The Modem System uses the logger's relay channel to trigger transmission of a text message to the mobile number (This section assumes you have programmed the message and number into the modem using **GSMConfig** as described above.)

See ***Appendix GSMConfig*** Screenshots on page 30.

A Enable text messaging

Complete stage 1-4 on page 26 then

1. Click **Enable SMS text message transmission**, and enter text messaging settings.
2. Click **Configure GSM modem now**.
   Click **Help** for additional on-screen instructions.

B Test the text message configuration

1. Reconnect the GSM modem to the Modem system cable as shown on page 22 and ensure it is powered up.
2. Briefly connect together the two wires of the text message control cable. This can be found connected to the modem via the DB9 connector on the Modem System cable – see Figure 9.

C Program the logger's relay

Refer to the GP2 User Manual and DeltaLINK online Help for information about programming the logger.

D Connect the logger's relay

Connect one of the GP2 logger relay terminals to the 2-wire text message control cable which connects via the DB9 connector on the modem cable harness to the modem serial port.

E Test the program and relay connection:

Before starting logging:

1. Connect the logger to your PC, start **DeltaLINK** and select the **Sensors** window
2. Connect up and place sensors in conditions which should cause a text message transmission.
   You should hear the relay click and receive a text message shortly after.

Notes on Text Messaging behaviour

GP2 loggers have between 2 and 6 relays so it is possible to use one for text messaging and the remainder for, say, irrigation control.
You can only send one text message.

For detailed information on how the control logic works see the **DeltaLINK** Help.

Create a modem connection in DeltaLINK

1. Connect the GP2 to the modem using the cable harness provided as shown in Figure 9.

2. Start **DeltaLINK** and click **Cancel** when it tries to connect to a logger.

3. Select **File, New, Connection**.

4. In the **Connection** dialog, click **Add**…

5. In the **Connection Properties** dialog, enter a descriptive name for your connection, e.g. “GP1 logger on 07890 123456” and select **Dial-up Telephone modem** in the **Connect to logger using** list.

6. If you are intending to network more than one logger to the Modem System, enable **Networked**, and enter the logger’s type and serial number.

7. In the **Details** tab, select the name of your PC modem, enter the telephone number of your Modem System, and click **OK**.

8. Click on OK in the **Connections** screen.
   DeltaLINK will now dial and connect to your logger

9. If usisng several loggers on a nCreate a *connection* in DeltaLINK for each logger connected to the Modem System.

   .

   You can later select the connection that you have just created to connect to the same logger again.

How to automate data retrieval

GP2 Loggers: see ***Command line utility for automating dataset retrieval.*** This can be found Installed on your the desktop in the DeltaLINK Program group under **Start, All Programs, DeltaLINK, Documents** and on the Delta-T software and manuals DVD.

Appendix

GSMConfig Screenshots

The following series of screenshots show you what to expect to see on your PC when configuring your GSM modem using the **GSMConfig** program:

See also ***Configure, Test or Add Text Message to modem*** on page 25

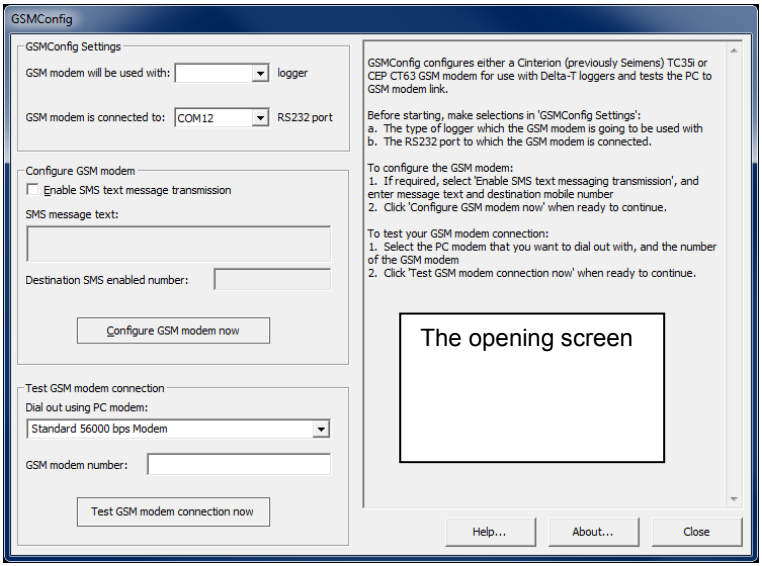
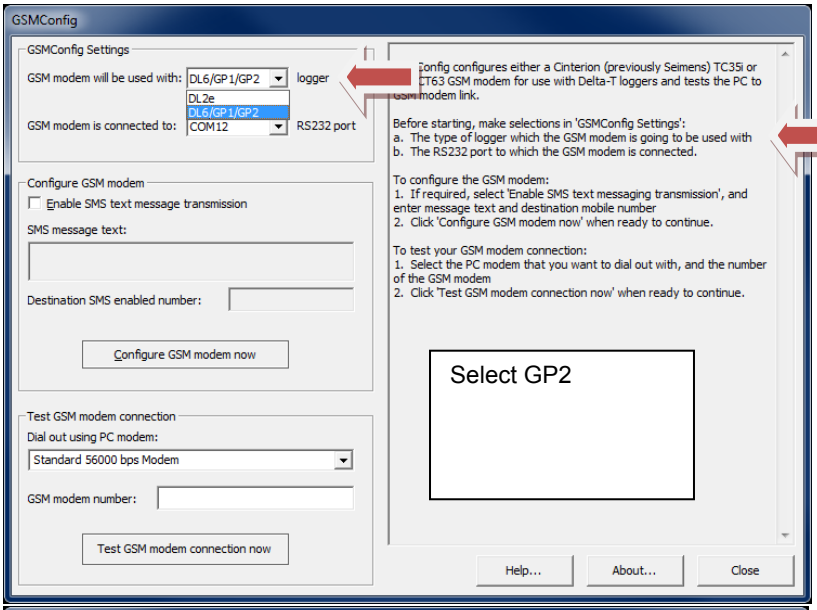
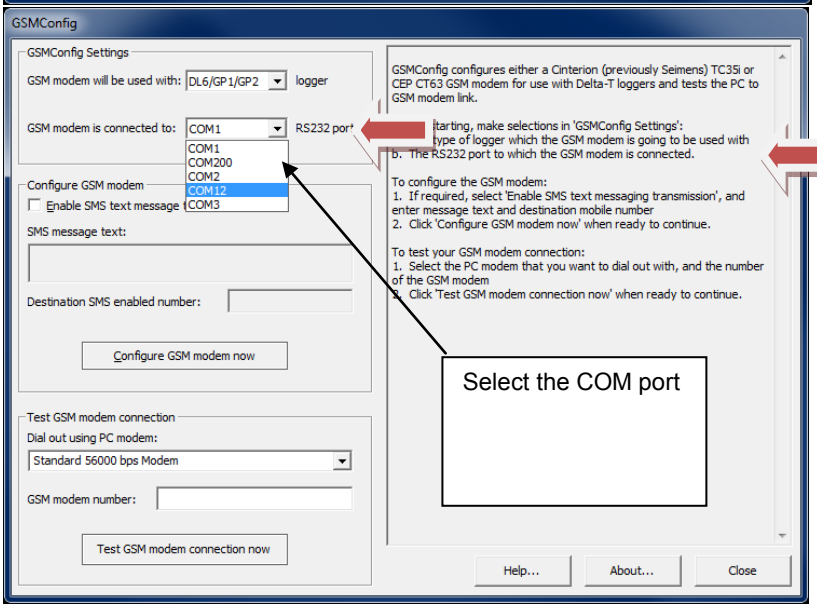
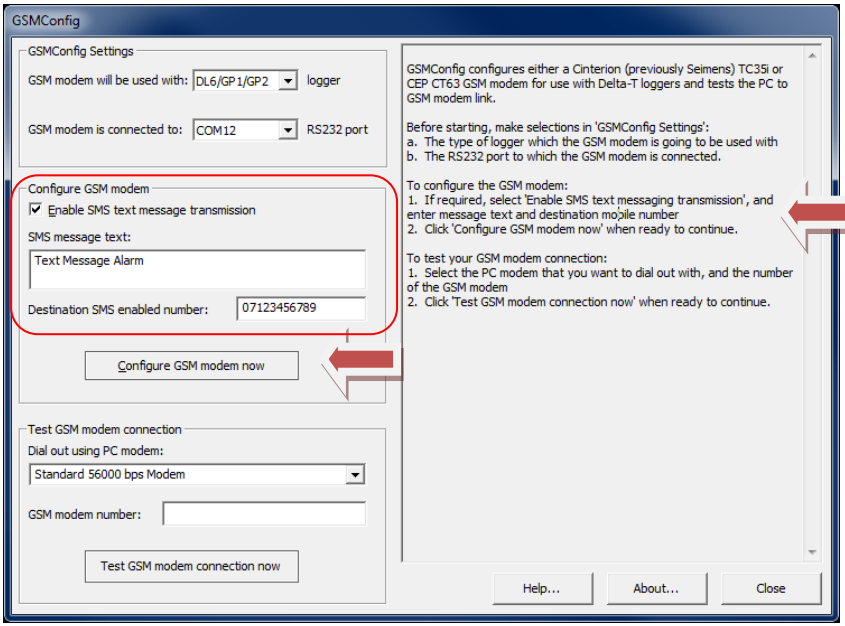


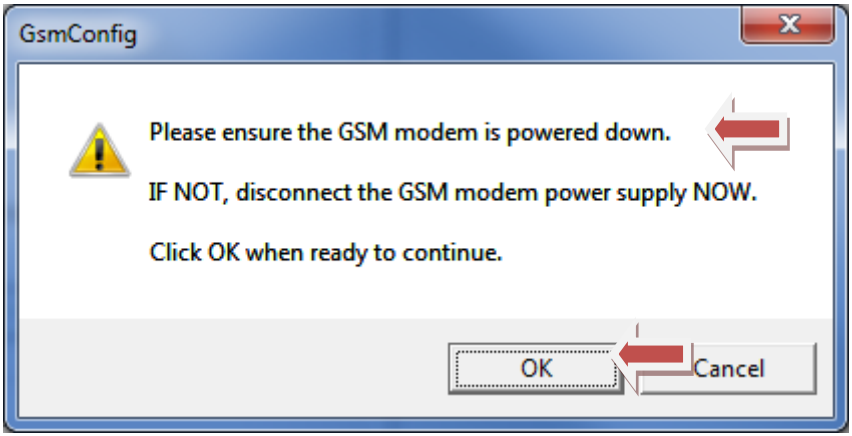
Figure 15 The opening screen of GSMConfig.

Configuring GSM Modem.

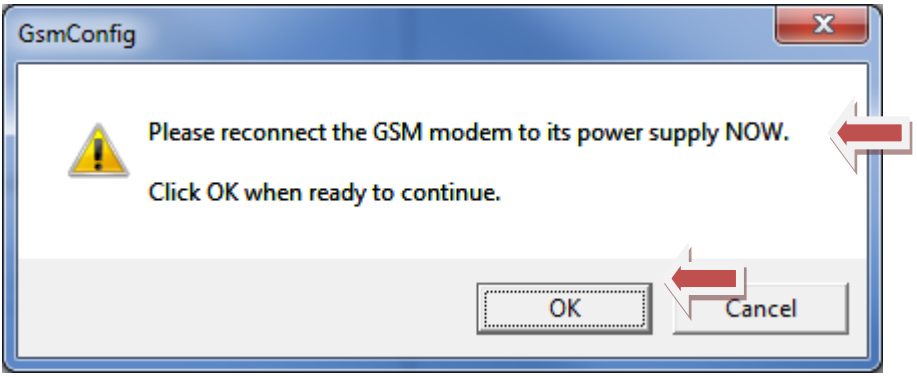


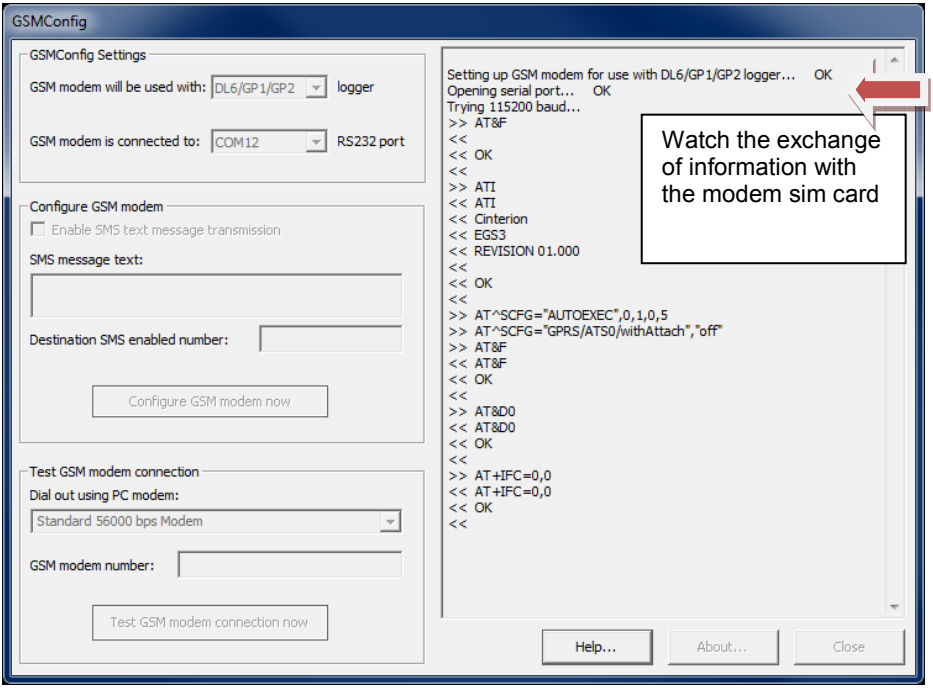


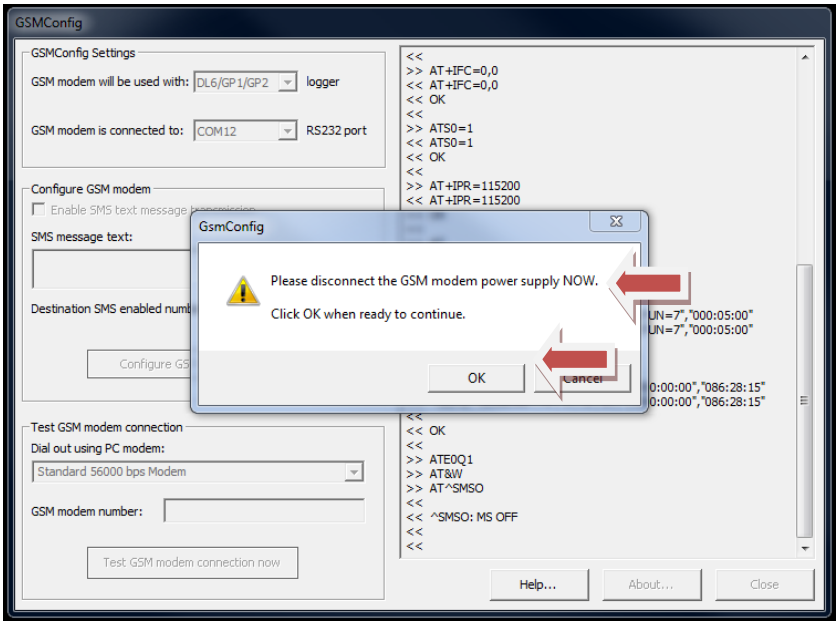


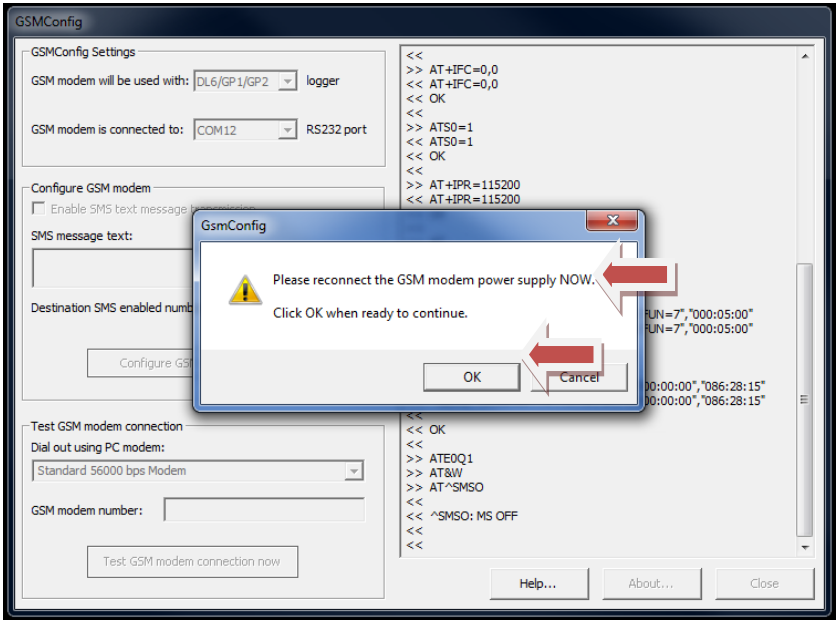


To power down the modem see **Modem** on page 22.


GsmConfig
Please reconnect the GSM modem to its power supply NOW.
Click OK when ready to continue.
OK
Cancel


GSMConfig
GSMConfig Settings
GSM modem will be used with: DL6/GP1/GP2 logger
GSM modem is connected to: COM12 RS232 port
Configure GSM modem
Enable SMS text message transmission
SMS message text:
Destination SMS enabled number:
Configure GSM modem now
Test GSM modem connection
Dial out using PC modem:
Standard 56000 bps Modem
GSM modem number:
Test GSM modem connection now
Setting up GSM modem for use with DL6/GP1/GP2 logger... OK
Opening serial port... OK
Trying 115200 baud...
>> AT&F
<<
<< OK
<<
>> ATI
<< ATI
<< Cinterion
<< EGS3
<< REVISION 01.000
<<
<< OK
<<
>> AT^SCFG="AUTOEXEC",0,1,0,5
>> AT^SCFG="GPRS/ATS0/withAttach","off"
>> AT&F
<< AT&F
<< OK
<<
>> AT&D0
<< AT&D0
<< OK
<<
>> AT+IFC=0,0
<< AT+IFC=0,0
<< OK
<<
Help...
About...
Close
Watch the exchange of information with the modem sim card


GSMConfig
GSMConfig Settings
GSM modem will be used with: DL6/GP1/GP2 logger
GSM modem is connected to: COM12 RS232 port
Configure GSM modem
Enable SMS text message transmission
SMS message text:
Destination SMS enabled numb
Configure GS
Test GSM modem connection
Dial out using PC modem:
Standard 56000 bps Modem
GSM modem number:
Test GSM modem connection now
<<
>> AT+IFC=0,0
<< AT+IFC=0,0
<< OK
<<
>> ATS0=1
<< ATS0=1
<< OK
<<
>> AT+IPR=115200
<< AT+IPR=115200
GsmConfig
Please disconnect the GSM modem power supply NOW.
Click OK when ready to continue.
OK
Cancel
UN=7","000:05:00"
UN=7","000:05:00"
0:00:00","086:28:15"
0:00:00","086:28:15"
<<
<< OK
<<
>> ATE0Q1
>> AT&W
>> AT^SMSO
<<
<< ^SMSO: MS OFF
<<
<<
Help...
About...
Close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Click OK when ready to continue.
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Cancel
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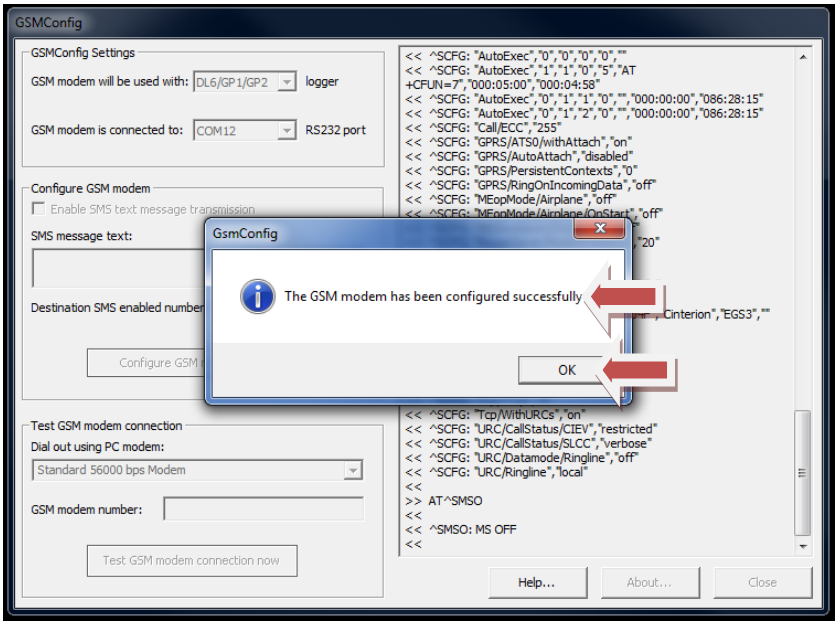
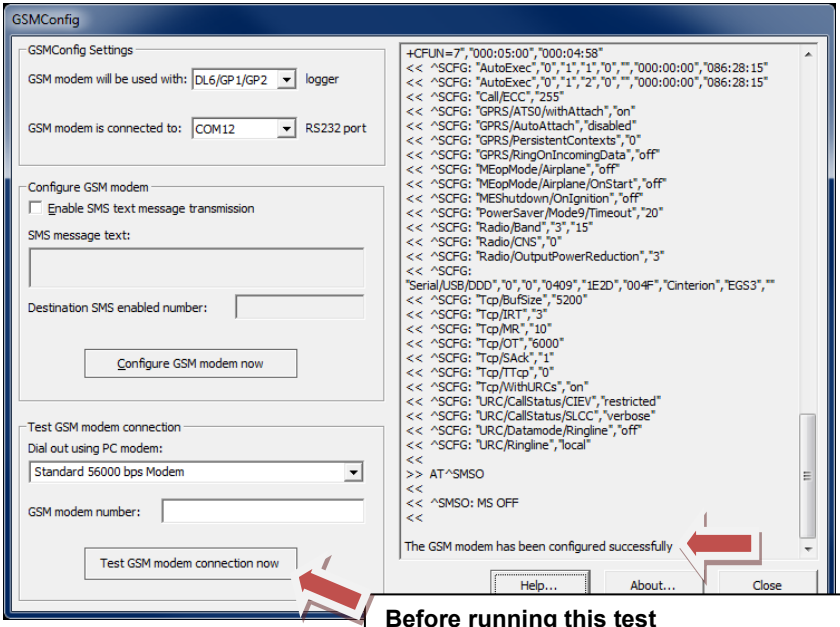
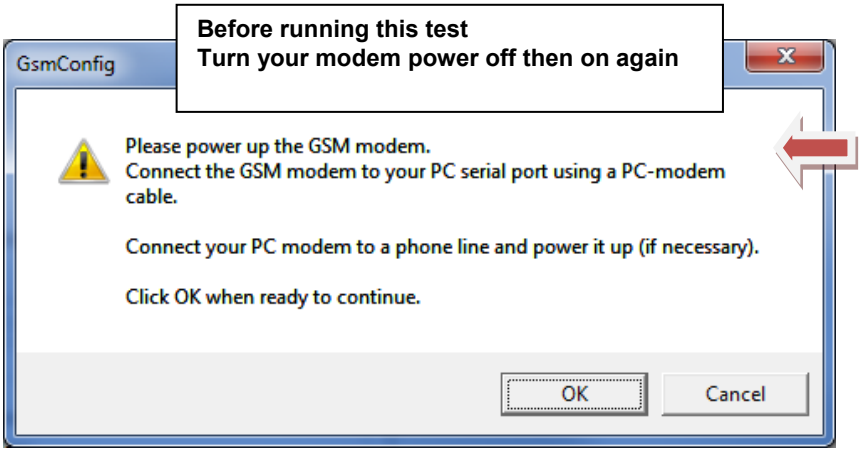
UN=7","000:05:00"
0:00:00","086:28:15"
0:00:00","086:28:15"
<<
<< OK
<<
>> ATE0Q1
>> AT&W
>> AT^SMSO
<<
<< ^SMSO: MS OFF
<<
<<
Help...
About...
Close

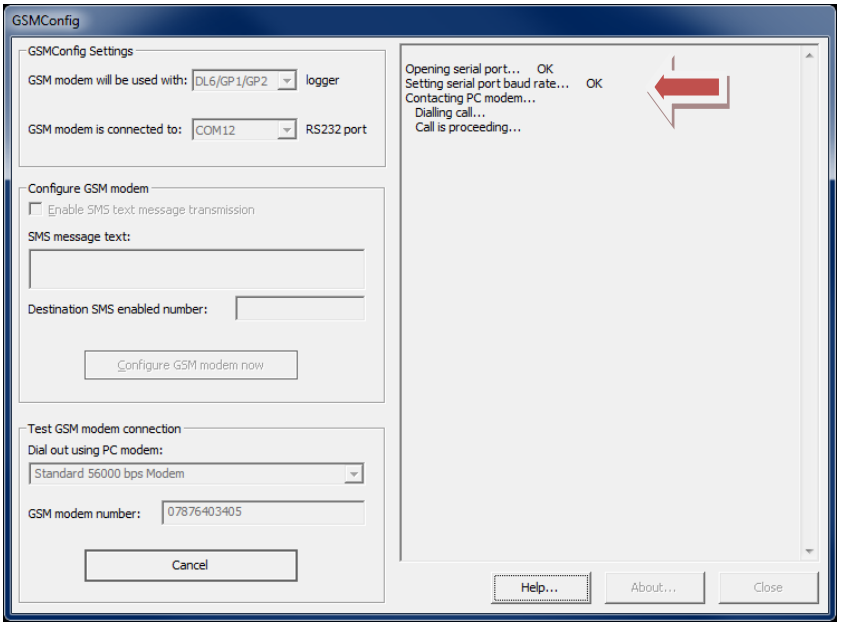


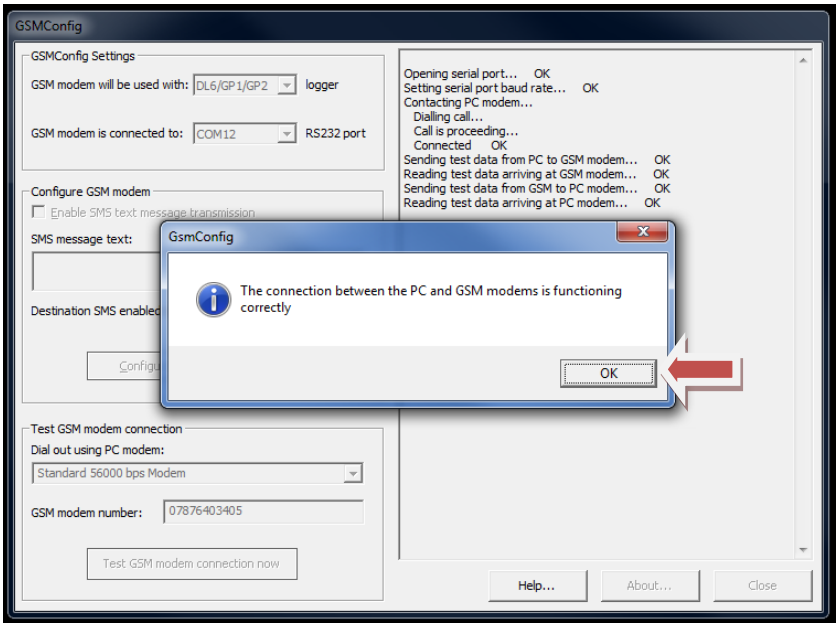


Before running this test
Turn your modem power off then on again

Test Modem (and SIM Card and Phone Line)



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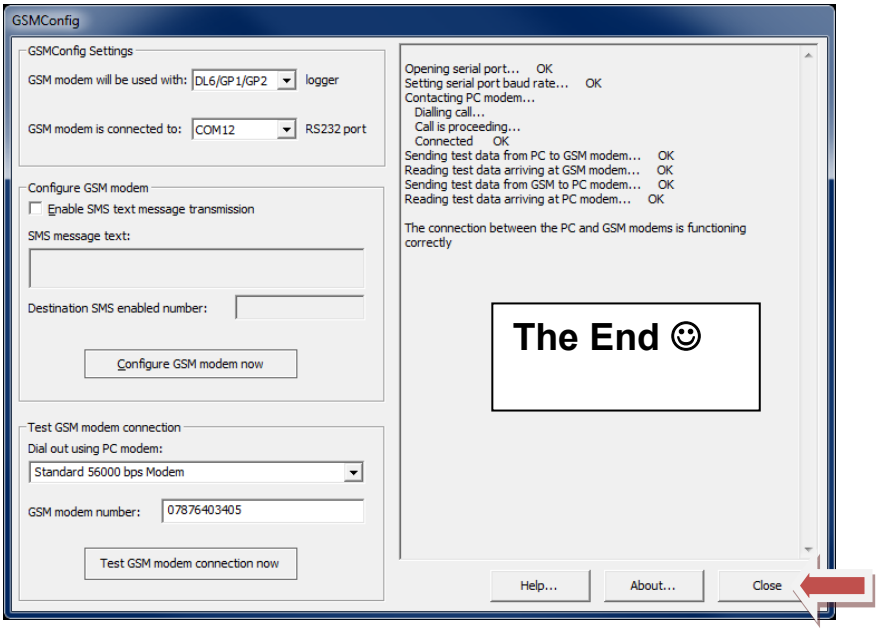
GSMConfig Settings
GSM modem will be used with: DL6/GP1/GP2 logger
GSM modem is connected to: COM12 RS232 port
Configure GSM modem
Enable SMS text message transmission
SMS message text:
Destination SMS enabled
Test GSM modem connection
Dial out using PC modem:
Standard 56000 bps Modem
GSM modem number: 07876403405
Test GSM modem connection now
Opening serial port... OK
Setting serial port baud rate... OK
Contacting PC modem...
Dialling call...
Call is proceeding...
Connected OK
Sending test data from PC to GSM modem... OK
Reading test data arriving at GSM modem... OK
Sending test data from GSM to PC modem... OK
Reading test data arriving at PC modem... OK
GsmConfig
The connection between the PC and GSM modems is functioning correctly
OK
Help...
About...
Close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SMS message text:
Destination SMS enabled number:
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Setting serial port baud rate... OK
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Connected OK
Sending test data from PC to GSM modem... OK
Reading test data arriving at GSM modem... OK
Sending test data from GSM to PC modem... OK
Reading test data arriving at PC modem... OK
The connection between the PC and GSM modems is functioning correctly
The End ☺
Help...
About...
Close

***The End**…*

Environmental specifications

	Min °C	Max °C	IP rating	Notes
M-ENCL box	-	-	IP54	
CEP CT63 modem	-40	80	IP40	Operational
	-40	85		Storage temperature
Lead acid battery				25-85%RH
Charge	0	40		
Discharge	-15	50		
Storage	-15	40		
Solar Panel	-40	85	IP54	Junction box IP54
Solar charger/regulator	-25	50	IP22	
Extension Cabling				
Static	-30	90	IP68	Black PUR cable
when flexing	-5	90	IP68	

Maintenance

Leakage and condensation

The greatest danger to instrument enclosures is from water.

Any signs of moisture ingress from leakage should be tracked down and eliminated as soon as they appear.

Keep the desiccant in a sealed container until you have installed all the equipment and wiring in the enclosure, and blocked off all unwanted holes. Then place the desiccant inside the enclosure before shutting the door.

Desiccant

Condensation in the enclosure is likely to occur if the desiccant becomes exhausted. Refresh it from time to time by heating the desiccant packs to 150°C for 4 hours, and then allow them to cool in a sealed (heat proof) container.

Repairs and Spares

In instances of damage or wear, some components are available as replacement parts. Check with Delta-T.

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 **twelve months** 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

Troubleshooting

Problems

The Enclosure

- **Condensation** can occur inside the enclosure and lead to corrosion or electrical shorting. Please make sure that there is adequate desiccant that has been refreshed mounted inside. See the maintenance section for guidance.
- **Cable Glands** need to be tightened adequately and be aware that the cable diameter needs to be between 4 and 8mm in order for them to seal to specification. Please add sleeves to increase the diameter around the sealing area or fit different glands to accommodate larger diameters of cable.
- **Locks and keys** are sources of difficulty if they are allowed to corrode. Please ensure that water repellent is applied inside the lock when there is a risk of corrosion. All locks and keys are the same and interchangeable. In the event of loss or damage please contact your local representative for replacement(s).
- Heat from solar radiation can be problem; with the inside of the enclosure reaching 30°C greater than the outside air temperature. Extra shading for the enclosure can help reduce the effects of the sun at its most powerful.

The Data Logger

See the GP2 User Manual, the **DeltaLINK Help** and/or contact us at **www.delta-t.co.uk/techsupport**

The Modem

- **SIM Card** needs to be “Data enabled for GSM use” in order to function correctly. This can also be called “Circuit Switched Data Enabled”. Note this is different from internet data used in mobile phones and GPRS. Please make sure that when ordering that the network provider confirms this.
- **Modem Power.** The modem needs 5-32 VDC and consumes up to 60mA at 12V when talking.
- **LED status.** The green LED indicates if the modem is working - as follows:

Operating state of CT63 Terminal	Power up LED state
Device off	Permanently off
net search / not registered	Fast blinking
registered full service	Slow blinking
A call is active	Permanently on

- **Network problems** associated with low signal strength and coverage are linked to some network providers and geographical locations. Please check using a mobile phone or call the provider if there is a particular coverage problem. Mounting the enclosure in a different location away from obstructions such as trees and tall buildings can prevent or reduce such occurrences.
- **Aerial/antennae** This comes mounted on the M-ENCL enclosure. Mounting can be very important for the correct functioning of the modem. Please make sure that all connections to the aerial are correctly made and that it is mounted as high as possible to maximise its ability to transmit and collect data.

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