Manual
GSM System
Model 6807

Revision History

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Contents

1. INTRODUCTION

The Model 6807C GSM 900 Modem uses the Global System Mobile (GSM) digital cellular telephone network to provide communications between a computer and any UNIDATA PROLOGGER, STARLOGGER, STARFLOW or MicroLogger product.

This system can not be used with the Model 6003 STARLOG Data Logger.

With UNIDATA V3 Software you can use any computer to review the site operation, unload data and reset the logger as though you were at the field site.

Using the Telemetry extensions to the V3 Software, you can modify dial-out alarms to a computer, pager or digital telephone in a logger scheme. You can also set-up polling schedules for automatic data recovery, and manage the recovered data and site alarms.

The Model 6703B Metal Enclosure or Model 6701C PVC Enclosure are suitable for housing the communication equipment and a data logger at a field site.

The Model 6807C GSM Data Modem is connected to the logger and to an antenna. The antenna should be selected to suit the site conditions. The modem is typically powered by a rechargeable 12 Volt battery which provides continuous service when connected to a small solar panel.

2. DIGITAL TELEPHONE COMMUNICATIONS

The reliability of this system depends on the quality of the communication link between the computer and the site. GSM services are provided by a range of suppliers however most services are concentrated on areas with high population density. The GSM system is a radio network which prefers a clear line-of-sight to a repeater for good quality communications.

The system will only work if the network of your service provider covers your site. This can be tested by taking a digital telephone to the proposed site and making a telephone call. If voice communications in both directions are clear then the telemetry system will work. It will not work reliably if communications are faint, noisy or breaking up. Wet and windy weather can affect communications quality.

2.1. Communications Services

Communications service providers operate a separate data service as well as voice, fax and short message systems. To use the GSM System, you must use a data service (currently offered in Australia by Telstra, Optus and Vodaphone). These networks generally support 9600 baud data transfer rate communications. You should request non-transparent mode RLP (radio link protocol) communications. Conditions will change but the following guidelines should be considered when you set-up a system.

Each site will have two numbers:

A normal number for the voice network (which you do not use but the supplier needs for your billing account) and,

A data number (which is the telephone number you will use).

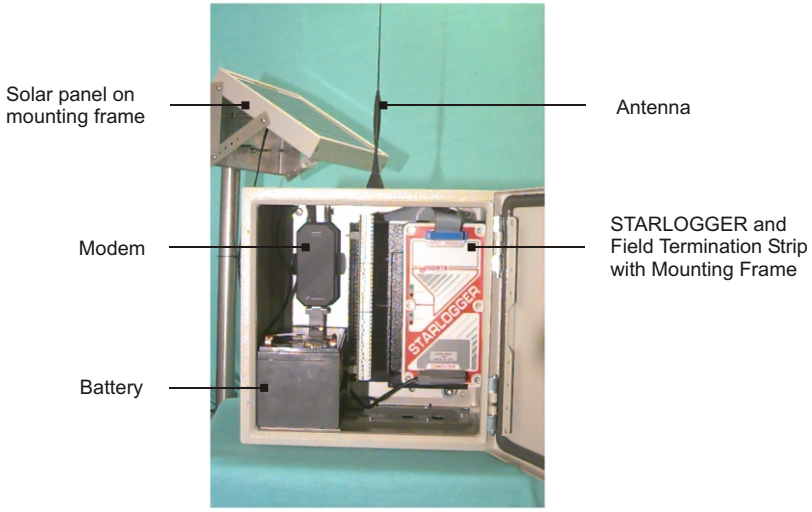
Your communication service provider will issue a SIM (Subscriber Identity Module) card for each modem. This identifies the phone number and account and has to be installed in the modem before it will work. There are two sizes of card and you will need the smaller version.

Service costs vary and change regularly. A wide range of special packages are available and it pays to shop around for one that suits you. The data service is an additional cost option over and above the normal service charges.

You can also use the Model 6807C modem system to link your computer to the GSM System. This can result in lower communication costs as all calls use the digital system of your communication provider, without PSTN (Public Switched Telephone Network) costs.

3. COMPONENTS OF THE SYSTEM

A typical logging system consists of a data logger recording information from a range of instruments. To link this to the digital telephone system you add a Model 6807 Modem. The modem will need a power supply and an antenna. All instruments should be housed to protect them from weather and interference.



3.1. MODEM Details

This small battery powered modem can be used for transferring data over a digital telephone system (GSM). It requires a small SIM (Subscriber Identification Module) Card from the service provider.

A handset is available for voice communications.

■ MODEM Specifications

Power Use:	Dialling: 110mA, Transmit: 325mA, Standby: 25mA.
Power Supply:	10.8VDC to 31.2V DC.
Available Connectors:	9 pin RS-232 plug for logger connection RJ45 plug for handset (not yet released).
Cables:	battery cable (1m) fitted with suitable connectors 900MHz antenna lead (50 , 250mm) fitted w/connector.
Size:	120mm x 90mm x 30mm.
Weight:	200g.
Enclosure:	Plastic. IP55. Not environmentally sealed. Protect from moisture.

■ Cable: MODEM to Logger

A special cable is required to connect the modem to a UNIDATA logger.

Model 6602Y/1 - Cable to connect Modem to STARLOGGER.

Model 6602Y/2 – Cable to connect Modem to STARFLOW.

■ Cable: MODEM to Computer

Model 6602I - Cable to connect Modem to computer – 25 pin,

Model 6602B – Cable to connect Modem to computer – 9 pin,

3.2. Antenna

An antenna connects to the modem and provides the signal link to a GSM repeater. A range of antennas are available to suit site conditions. If communications are good, any antenna will work well. If communications are poor, an elevated antenna will produce better results. A clear line of sight to the repeater gives best results.

■ Model 6807C/2 Low Profile Antenna

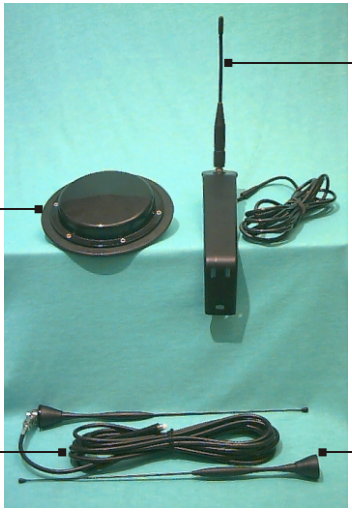
An unobtrusive antenna is recommended for sites where a conspicuous antenna may attract unwanted attention from thieves or vandals. It mounts flat on a metal surface atop an enclosure or on the side facing a telecommunications repeater. An adaptor cable with a connector for the modem is supplied.

■ Model 6807C/3 Pole Mounted, Ground Plane Independent Antenna

This is a short whip antenna supplied attached to an angle bracket suited for mounting onto a vertical surface. The antenna is fitted with a three metre coaxial cable with connecters to suit the modem.

■ Model 6807C/1 Standard GSM Antenna

This is a whip antenna with a small mounting base suited for horizontal metal surfaces. It can be mounted atop an enclosure and connected directly to the modem. Extension cables with suitable connectors are available to suit your site, if you need to locate the antenna elsewhere.



4. PREPARING AND TESTING THE SYSTEM

To test the GSM telemetry system you will need a polling computer running STARLOG Version 3 Software and a modem.

UNIDATA recommends you assemble and test the system before installing in the field. Begin by assembling the data logger system using the manuals that are provided. Ideally, you should use the same computer that you will use to install and operate the site. Prepare and load a scheme and confirm that the logger is working and logging correctly.

The next step is to prepare and test your communications system. The information that follows details how to do this and what to do in the event you encounter problems.

4.1. Installing the SIM Card

To install the SIM card into the modem:

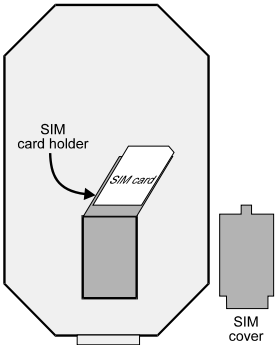
1 Locate the SIM cover on the rear of the modem and remove it.

2 Unlatch and open the SIM holder flap.

3 Insert the SIM card into the holder so that the gold side will face down and the notch will line up when the holder is closed.

4 Close the holder flap.

5 Replace the cover.



Modem Rear View

4.2. Installing the MODEM

Connect the modem as described in Chapter 5. The on-site equipment should now be ready to receive telephone calls from the digital cellular telephone systems.

4.3. Preparing the Polling Computer

Your polling computer is used to contact and operate the data collection site. This computer must have a modem that can communicate with the on-site modem to transfer data.

To prepare the polling computer to work with the Modem, you will want to select the correct Line Settings.

The Model 6807C Modem can be used as your terminal modem and this will mean all your communications are using digital systems. The correct settings for this modem can be loaded from the V3 STARLOG Software by selecting System, Test Mode, then Modem Setup.

The Model 6802B Modem may be used if you are using a conventional telephone system (PSTN). The correct settings can be loaded from the same menu as the Modem 6807C.

Many other modems may be used however, initial difficulties are frequently experienced. The following information may help.

AT Commands are sent to the modem (from the computer or Logger) to change their operating parameters. The modem must be “offline” (not communicating with another modem) to receive AT commands.

The confusing part is that modem manufacturers have not agreed on standard AT commands, so each brand modem may implement AT commands differently. Certainly, the default settings will be different between modem brands.

The settings described below, are the common AT commands that will work with most modems. If these don’t work in your application, please contact your modem supplier for advice. An example of how to set up a Banksia™ modem is included at the end of this chapter.

■ Some AT Settings for STARLOG

All modems connected to STARLOG equipment should have the following default settings:

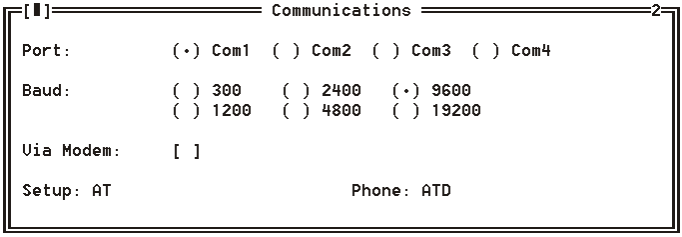
E0	Local command echo OFF
&D0	DTR ignored
&K0	Flow control ignored
-K0	NMP10 disabled
SO=2	Enable auto-answer

These are often set as factory defaults by the modem manufacturer. Check your modem's settings and adjust accordingly. Remember to save your new settings so they will be restored whenever the modem power is switched ON.

&Y0&W0	Store settings as Profile 0 and reload from Profile 0 whenever the power is switched ON

4.3.1. Modifying a Scheme for Modem Operations

Edit the Scheme for the site in the Communications window. Select Via Modem and enter the SIM card phone number for the data service in the Phone prompt. If you have purchased a MODEM from UNIDATA the correct set-up string will have already been entered so you do not need to enter it in the scheme.



4.4. Test the Scheme Communication Setup

Select the site scheme, then "Scheme Test Mode" from the Control Panel. The computer will automatically dial the logger. When it establishes contact, the logger Test Screen will appear on your computer.

Any modem or communication faults will be reported as error messages on your screen.

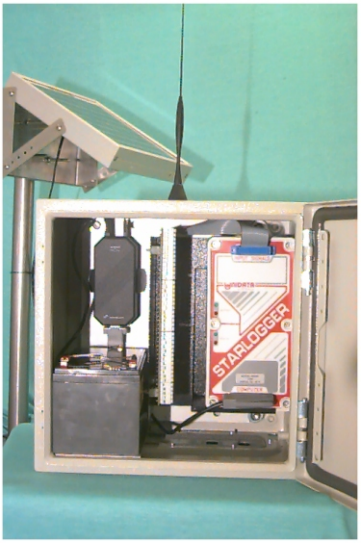
5. INSTALLING THE SYSTEM IN THE FIELD

Select a suitable housing for the site. UNIDATA offers several options, or you can use your own housing. The following is a typical installation procedure.

1 Mount the cabinet at your site and attach it to your post, wall or brackets.

2 Connect the various instruments to the termination strip. Use the cable glands provided to ensure the cabinet is sealed from moisture and dust.

3 Install the data logger and connect the input signals plug.



4 Connect your computer and confirm satisfactory operation.

5 Install the Model 6807C modem (ensuring the SIM card has been installed).

6 Clip the modem into the mounting bracket.

7 Install the antenna and connect it to the modem. Ensure it is in the best position for communications with the repeater.

8 Connect the modem to the battery.

9 Connect a recharging system to the battery. This battery may also be connected as external power to the data logger, if desired.

10 Connect the modem to the data logger with the cable supplied.

11 Have the site called by the polling computer to ensure correct operation. There is no indication of modem operation at the site, apart from the extended data logger operation while it communicates.

6. PROBLEM SOLVING

If you have problems with the GSM System there are two things you can check:

Verify that the communications timeout is long enough and change it if necessary,

Reset the modem memory.

The sections below describe how to perform these checks.

6.1. Communications Timeout

Data transfer delays can be expected with GSM systems. When you phone the site you are actually contacting a computer system that calls the site and buffers and transfers the messages and data between you and the site. There can be delays of more than 750 milliseconds (3/4 second) while this happens.

> To conserve power, UNIDATA loggers are set to switch off after a period without any detected RS-232 communications. This period is called an RS-232 timeout. The default timeout is 1 second for late model loggers, but shorter for older model loggers. Check the timeout of your logger and if necessary, change it to 1 second. The effect of increasing the RS-232 timeout is a slight increase in power consumption during communication cycles.

6.1.1. Changing the RS-232 Timeout

RS-232 Timeout settings are stored in the logger's Configuration Table. You can edit the Configuration Table in a STARLOGGER/PROLOGGER using Version 3 Software's CDT Editor and in the MACRO Logger using any text editor.

In a STARLOGGER/PROLOGGER (See the STARLOG V3 Users Manual, chapter 8):

1 Upload the CDT and check the Comms Timeout displayed in the STARLOGGER/PROLOGGER Service Information section.

2 Change the Comms Timeout to 1.

3 Download this configuration change to the STARLOGGER/PROLOGGER.

This will change the timeout in this STARLOGGER/PROLOGGER only.

■ In a MACRO Logger

Using a text editor:

1 Open the C:\STARLOG\PDL7000.CFG file.

2 For MACRO Version 30/31, add the line

```
158 65535   1000
```

3 For MACRO Version 32, add the line

```
158 65535   600
```

4 Save the file, then reload the scheme.

This will change the timeout on all MACRO loggers.

6.2. MODEM Set Up

If you have purchased the MODEM form UNIDATA the setup string to suit the digital GSM system will have already been entered. This is retained in the MODEM's non-volatile memory. If you suspect that the set-up string is not correct you can use the STARLOG V3 Software to enter a new string.

To do this:

1 Connect the Model 6807C modem directly to the computer.

2 Run the V3 Software then select System, Test Mode, Options and Modem Setup. See the V3 Users Manual for details.

3 Select For Logger or For Computer depending on what you are connecting the modem to. The correct settings will automatically be loaded into the modem. The V3 Software will recognise all modems supplied by UNIDATA.

If your version of V3 STARLOG Software does not have the Modem Setup option, you require an update which can be obtained from UNIDATA's website at:

http://www.unidata.com.au