Manual

Neon 2000 Family

Neon Remote Terminals (NRT) &

Neon Remote Modules (NRM)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules in the U.S.A. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This equipment has been tested for compliance with European regulations as follows:

Application of Council Directive:
2004/108/EC

Standards to which Conformity is declared:
EN-61000-6-1:2001
EN-61000-4-2:1995
EN-61000-4-3:1995
EN-61000-4-4:1995
EN-61000-4-6:1996
ENV-50204:1995

Any changes or modifications to this equipment not expressly approved by the manufacturer Unidata Pty Ltd could void the user's authority to operate this equipment.

Revision History

File name / Revision	Date	Authors
Previous version BX	2004	RS/ JH
Unidata Manual - 2001 2002 NRT Issue 2.2	2007	AB/CB/JH/MS/KC
Unidata Manual - 2001 2002 NRT Issue 2.3	2008	AB/CB/JH/MS/KC
Unidata Manual - 2001 & 2002 NRT Issue 2.4.doc	2008	DM
Unidata Manual - Neon 2000 Series Remote Terminals and Modules issue 3.0	2010	DM/MS/KC
Unidata Manual - Neon 2000 Family Remote Terminals and Modules issue 3.1	2010	DM/MS/KC
Unidata Manual - Neon 2000 Family Remote Terminals and Modules issue 4.0	25/09/2013	MP

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References

This manual should be read in conjunction with the associated Starlog 4 User Manual which describes the setting up of logging schemes for NRT/NRM terminals as well as all other Unidata Data loggers.

This manual should also be read in conjunction with the Neon Server Documentation which is in paper / PDF form and is also available as help screens within the Neon Server system.

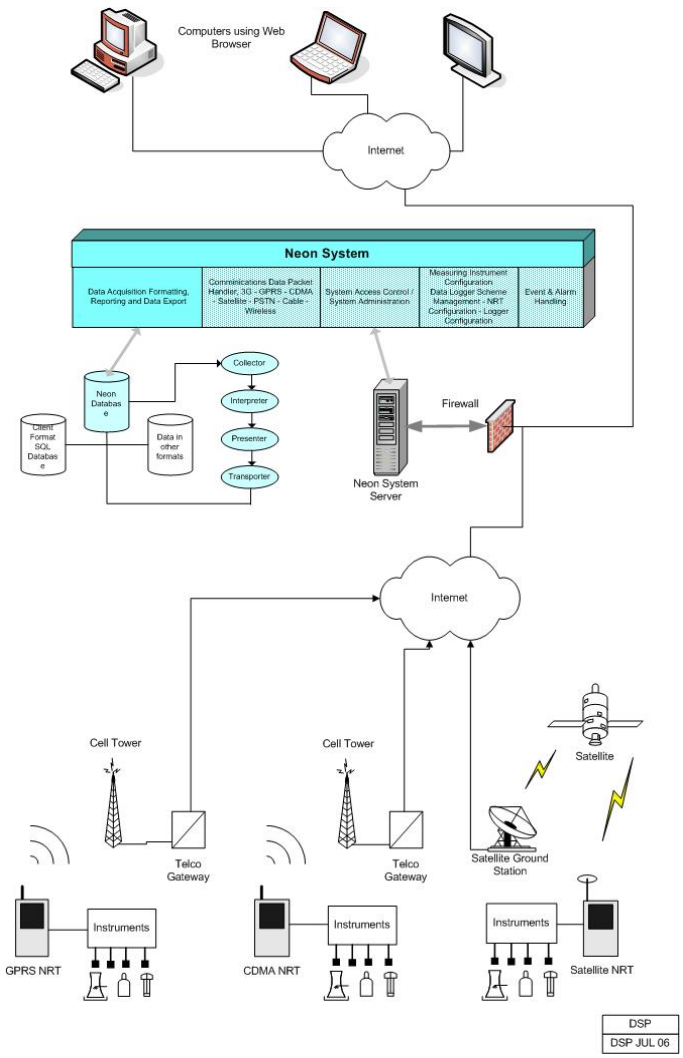
The NRT/NRM Terminal User Manual, the Starlog 4 User Manual and the Neon Server User & Administrator Documentation form part documentation suite for the overall Neon System.

1.0 NEON TECHNOLOGY AND MODULES OVERVIEW

Neon is a system for collecting measurements from field instruments and transmitting the measurements to a central system for data recording, analysis, reporting and data transfer to other external systems.

The Neon system also provides facilities for data collection, analysis, reporting and field measurement equipment and management within specified areas as defined by the system. Examples of this include country wide access, regional access and different access levels according to the rights and privileges of users, e.g. supervisor level, manager level, coordinator level and read only user level. The Neon System is suited to a range of uses such as environmental monitoring of remote instrumentation and automated industrial and utility metering.

The Neon system may be offered on a system basis, with the customer purchasing the server and a software license from Unidata, or is can be provided on an application service basis where the customer pays a service fee for Unidata to run the application on a Unidata central server.

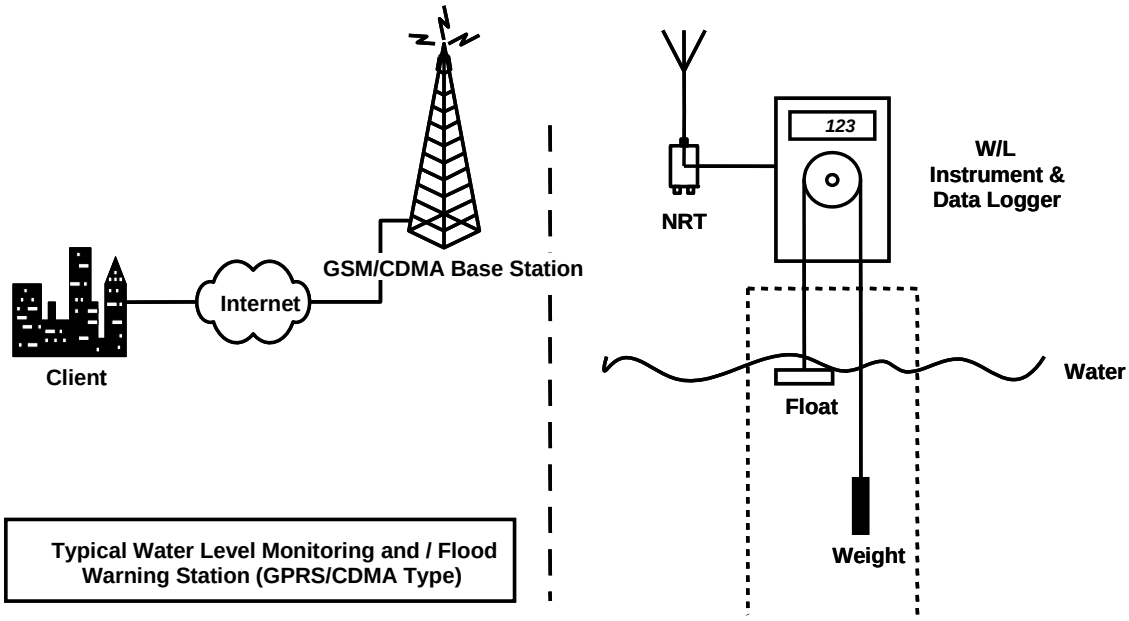


Overview of the Neon System

1.1 Neon Remote Terminals and Modules

There is a range of different Neon Remote Terminals and Modules available and the details of these different models are detailed within this manual. While the models may be different, and the interfaces available in various models are different, the basic operation of all Neon Terminals and Modules is the same

Neon Remote Modules and Terminals



Typical Neon Measurement System

1.2 Typical Neon Measurement System

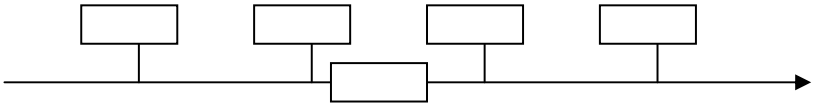
The figure above is an example of a Neon installation showing an NRT/NRM connected to a Water Level Instrument. Every day the NRT/NRM will send, via GPRS to the Neon server, a “packet” of information containing the data in raw format. The Neon server extracts the raw data from the packet. The data is then stored on a secure server until the client accesses the data using a standard Web Browser.

1.3 The Internet

The Internet provides the transport mechanism between the Neon Servers and the telecommunication provider gateways. This means that NRT/NRM units can be used anywhere in the world.

1.4 GSM

GSM (Global System Mobile) is a cell phone standard in most of the world. GSM provides the “backbone” upon which GPRS, voice and data communication travel.



1.5 GPRS

GPRS is an IP-enabled cellular solution for urban communications. The power requirements are low and the GPRS electronics are fully integrated within the NRT/NRM. GPRS communications are generally available wherever GSM communications are available.

By this means a logger or field instrument connected to a GPRS-enabled communications device (such as a Neon NRT/NRM) can deliver data to any Internet connected computer. GPRS provides an always-connected service – i.e. there is no dial up required. Typically the user pays for data use and not for time.

1.6 Satellite Packet Data Service

There are several low earth orbit and equatorial orbit packet data service providers. The NRT/NRM Satellite uses the Globalstar system which is provides a service very similar to the Cellular based GSM GPRS service over the Globalstar Satellite network

1.7 NRT/NRM Internal Architecture

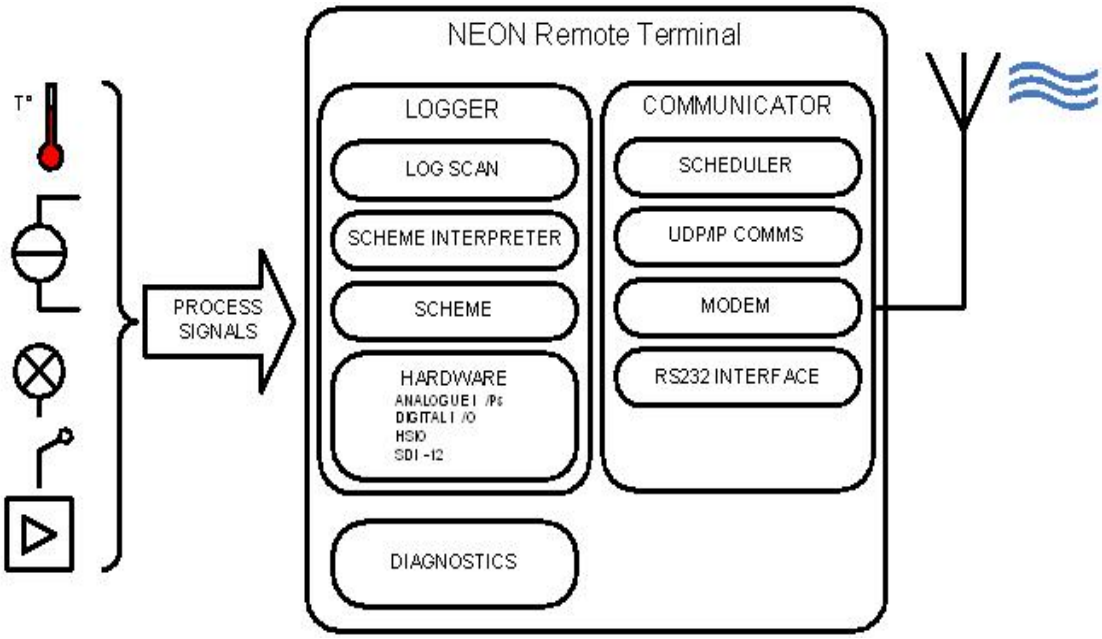
The NRT/NRM Internal architecture is shown below. It contains two discrete sections,

A LOGGER section where the terminal connects to the field transducers and the logging scheme, scan rates and diagnostics are managed.

The Starlog 4 support software allows a user to generate a logger scheme which defines transducer information, logging scan rates, logger interval etc and various engineering unit definitions. These files are called, for example the LDR and KBD files.

A COMMUNICATOR section which deals with communications to the server. This section contains, for example, a scheduler component and the modem component, either a Cellular Network modem or a Satellite Network modem. In the communicator section functions such as the reporting interval, the number of communications attempt per communications session etc are managed.

The Starlog 4 support software allows a user to generate a configuration file for the Communicator section, called an FPO file in which the user sets the required communications parameters.



2.0 SUMMARY OF NEON REMOTE TERMINALS AND MODULES

There are many different models of Neon Remote Terminals and Modules. The main models are summarised below and a full list of all models is included in the Appendix of this manual.

2.1 2011D Neon Metering Module - GSM

The 2011D NMM GSM is a small self-contained unit in a compact case which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central computer system to monitor and receive data from many NMM units in the field.

The 2011D NMM GSM terminal is designed to automate collection of remote data from environmental monitoring, industrial measurements, and utility metering via GSM/GPRS cellular networks from any location within the cellular network coverage area.

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the 2011D NMM GSM can be programmed from any internet connection.

The 2011D NMM GSM supports integrated logging or automated collection of data from an external data logger.

Its built-in modem supports packet data, and SMS communications. It has long battery life and low operating costs through use of advanced microcontroller technology.

2.2 2011D Neon Remote Module – GSM

The 2011D NRM GSM is a small self-contained unit in a compact case which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.

The 2011D NRM GSM has a small LCD display and buttons to check signal strength and perform limited functions including initialization.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central computer system to monitor and receive data from many NRM units in the field.

The 2011D NRM GSM terminal is designed to automate collection of remote data from environmental monitoring, industrial measurements, and utility metering via GSM/GPRS cellular networks from any location within the cellular network coverage area.

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the 2011D NRM GSM can be programmed from any internet connection.

The 2011D NRM GSM supports integrated logging or automated collection of data from an external data logger.

Its built-in modem supports packet data, and SMS communications. It has long battery life and low operating costs through use of advanced microcontroller technology.

2.3 2014D Neon Remote Terminal – GSM

The 2014D NRT GSM is a small self-contained unit which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central computer system to monitor and receive data from many NRT units in the field.

The 2014D NRT GSM terminal s designed to automate collection of remote data from environmental monitoring, industrial measurements, and utility metering via GSM/GPRS cellular networks from any location within the cellular network coverage area.

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the 2014D NRT GSM can be programmed from any internet connection.

The 2014D NRT GSM supports integrated logging or automated collection of data from an external data logger.

Inputs include analog, digital and SDI 12 data logger interface standard. There is also Modbus support, a partial implementation of the Modbus protocol which allows for extract data (get) and place data (put) from/to a specific register within the Modbus RTU on an RS485 connection. Further details are available on request.

2.4 2013D Neon Metering Module - NextG

The 2013D NMM NextG is a small self-contained unit in a compact case which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central computer system to monitor and receive data from many NMM units in the field.

The 2013D NMM NextG terminal is designed to automate collection of remote data from environmental monitoring, industrial measurements, and utility metering via NextG/GPRS cellular networks from any location within the cellular network coverage area.

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the 2013D NMM NextG can be programmed from any internet connection.

The 2013D NMM NextG supports integrated logging or automated collection of data from an external data logger.

Its built-in modem supports packet data, and SMS communications. It has long battery life and low operating costs through use of advanced microcontroller technology.

2.5 2013D Neon Remote Module – NextG

The 2013D NRM NextG is a small self-contained unit in a compact case which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.

The 2011D NRM GSM has a small LCD display and buttons to check signal strength and perform limited functions including initialization.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central. The 2013D NRM NextG is a small self-contained unit in a compact case which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.

The 2011D NRM GSM has a small LCD display and buttons to check signal strength and perform limited functions including initialization.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central programmed from any internet connection.

The 2013D NRM NextG supports integrated logging or automated collection of data from an external data logger.

Its built-in modem supports packet data, and SMS communications. It has long battery life and low operating costs through use of advanced microcontroller technology.

2.6 2016D Neon Remote Terminal – NextG

The 2016D NRT NextG is a small self-contained unit which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central computer system to monitor and receive data from many NRT units in the field.

The 2016D NRT NextG terminal is designed to automate collection of remote data from environmental monitoring, industrial measurements, and utility metering via NextG/GPRS cellular networks from any location within the cellular network coverage area.

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the 2016D NRT NextG can be programmed from any internet connection.

The 2016D NRT NextG supports integrated logging or automated collection of data from an external data logger.

Inputs include analog, digital and SDI 12 data logger interface standard. There is also Modbus support, a partial implementation of the Modbus protocol which allows for extract data (get) and place data (put) from/to a specific register within the Modbus RTU on an RS485 connection. Further details are available on request.

2.7 2012D Neon Remote Module – Satellite

The 2012D NRM Satellite is a small self-contained unit which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via satellite.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central computer system to monitor and receive data from many NRM units in the field

The 2012D NRM Satellite is designed to automate collection of remote data from environmental monitoring, industrial measurements, and utility metering via the international Globalstar LEO Satellite network from any location on the globe, except the Arctic, Antarctica, and Africa.

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the 2012D NRM Satellite can be programmed from any internet connection.

The 2012D NRM Satellite supports integrated logging or automated collection of data from an external data logger.

The 2012D NRM Satellite's built-in modem supports packet data, switchboard circuit data, and SMS communications. Long battery life and low operating costs are made possible through use of advanced microcontroller technology and an efficient protocol that takes advantage of Globalstar's packet transfer capability.

2.8 2015D Neon Remote Terminal – Satellite

The 2015D NRT Satellite is a small self-contained unit which connects to sensors in the field, collects readings from those sensors, and transmits the collected data to a central server via satellite communications.

The Neon central server system is provided on a Neon Data Service basis and on a Neon Client System basis and provides a central computer system to monitor and receive data from many NRT units in the field.

The 2015D NRT Satellite is designed to automate collection of remote data from environmental monitoring, industrial measurements, and utility metering via the international Globalstar LEO Satellite network from any location on the globe, except the Arctic, Antarctica, and Africa.

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the NRT can be programmed from any internet connection.

The 2015D NRT Satellite supports integrated logging or automated collection of data from an external data logger.

The 2015D NRT Satellite's built-in modem supports packet data. Long battery life and low operating costs are made possible through use of advanced microcontroller technology and an efficient protocol that takes advantage of Globalstar's packet transfer capability.

The 2015D NRT Satellite supports integrated logging or automated collection of data from an external data logger.

Inputs include analog, digital and SDI 12 data logger interface standard. There is also Modbus support, a partial implementation of the Modbus protocol which allows for extract data (get) and place data (put) from/to a specific register within the Modbus RTU on an RS485 connection. (Further details on request)

2.9 2500A Neon Display Unit

The Neon NRT Display Unit is a compact display and operating button unit designed to connect to existing Neon Remote Terminals (NRTs) and Neon Remote Modules (NRMs) to assist with field operations internet connection.

The display provides a limited subset of indicators available via the Starlog 4 support software.

The display unit connects to the RS232 port on the NRT or NRM. The buttons and the corresponding sample displays available are detailed below.

3.0 NRT/NRM GETTING STARTED

Neon Terminals (NRT/NRM units) are small, ultra-low power microprocessor-based devices designed to collect data from data loggers and SDI-12 instruments. This data is then sent via GPRS Cellular Networks or Satellite packet data to a Neon server on a programmed schedule, or as required for alerts.

The NRT/NRM also incorporates a fully-programmable data logger, so that simple analogue and digital signals may be directly connected and recorded.

There are two models of the NRT/NRM Terminal

3.1 NRT/NRM Terrestrial

This is an NRT/NRM with a cellular based modem for use with cellular networks. These networks may be GSM/ GPRS, CDME or Wideband CDMA (sometimes called Next G or 3G).

3.2 NRT/NRM Satellite

This is an NRT/NRM with a Globalstar Low Earth Orbit Satellite modem used on the Globalstar Satellite Network. The service is a very similar service to GPRS in regard to data.

3.3 NRT/NRM LED indicators

The simplest indicator is the red LED which is visible in the window of the unit.

On first power on the LED will be brightly on (not flashing) for 10 seconds indicating the unit is in the process of being reset. Do not interrupt this initial start up process. If the initial start up is interrupted you should power down, wait a few minutes, and then power up again.

- **Slow brightly flashing LED**, one flash per second approx indicates the NRT/NRM is now communicating AT commands for setup with the internal modem. This process takes approximately 10 to 20 seconds.
- **Fast brightly flashing LED**, 3 to 5 flashes per second, indicates the PPP session is running and the NRT/NRM is communicating through the internal modem to the host server. If the NRT/NRM is programmed to holds the PPP session open all the time, i.e. .the always on mode, the LED will continue to flash at this rate.
- **Slow (once per second) dimly flashing** LED indicates the NRT/NRM is operating, normal operation, sleeping, but no communication is in progress, i.e. The NRT/NRM has been programmed to log data and only establish communications at the defined reporting interval which is set up in the Scheme / FPO file.
- **Very occasional bright single flash** indicates the scheme is active / logging rather than sleeping at that particular time, i.e. If you have a scheme which has a 5 second scan rate you will see 4 dim flashes indicating asleep then one bright flash indicating a scan is in progress, then another 4 dim led flashes, hence the LED will have a bright flash every 5 seconds.

3.4 Neon (NRT) Display Unit

The Neon Display Unit is built into some models of NRT/NRM and is also available as a standalone unit to be used as a field setup tool. There are info and signal strength indicator/buttons and the facility to initialise an NRT/NRM in the field.

The NRT Display unit allows the user to obtain limited status information from the NRT/NMM/NRM by pressing the appropriate buttons, for example pushing the NRT Display Unit Info Button should display server information for approximately 10 seconds and then turn off.

To conserve battery power, the display only is visible for approx 10 seconds, after which time the button need to be pressed again to re display the information.

Each button initiates a task for NRT display unit to start a task of interrogating the NRT/NMM/NRM. The task of interrogation of the NRT/NMM/NRM starts and completes after the information is obtained and displayed. Hence the message “ending task” will be displayed from time to time, indicating the interrogation is complete and the information is available to view.

One of the key uses for the NRT Display unit is to automate and assist with / automate the initialization process in the field, especially for satellite based units.

3.4.1 NRT Display Unit- Satellite Initialization

Hold down Initialize button on the NRT Display unit and observe the count down to zero and the display “initializing please wait” This requirement to hold the button down is to make sure accidental initializations do not occur. The system will then attempt to acquire a Satellite for the initialization process. Depending on the time of day, the location and the field of view of the sky this process can take 15 to 60 minutes, but typically is less than 30 minutes.

It will display the following messages while attempting to acquire satellite

`Retry Attempts.....`	This is the number of satellite communication attempts.
`Service Available NO`	NO Satellites in View.
`Waiting Initialization attempting 50`	This is the number of seconds before the next retry.
OR	
`Retry Attempts.....`	This is the total number of satellite communication attempts before the initialization was successful.
`Initialized OK`	

Once initialization has occurred, the unit can then be closed

The LCD has 60 retry attempts, to ensure there are satellites available for initialization.

If initialization has not occurred keep waiting for one or two hours, or try the next day, for the first initialization to complete. If you can't complete the first initialization, there could be a problem with the satellite system or the Satellite modem equipment and you should check with Unidata. Unidata will then check with the Satellite provider to see if there are any problems reported with the satellite system.

Below are a number of possible messages/ situations which may be noted when first initialization is required. These will be displayed when any button is pressed when the LCD turns itself off to conserve power. The LCD message is held in memory, and pressing any button "wakes up" the display for a few seconds so the message can be viewed.

`Retry Attempts xx`	E.g. 10
`Initialised OK`	This shows that the system has been initialized successfully; this statement always needs to be seen to show that the unit has correctly connected to the system.
`Retry Attempts xx`	E.g. 10
`No Satellites`	This shows that the system has tried to initialize but then lost satellites half way through, the initialize button needs to be held down continuously again for 5 seconds to restart the Initialization process.
`Retry Attempts xx`	E.g. 10
`Initialize Failed 00002`	This shows that the system has failed to due to a server issue, the initialize button needs to be held down continuously again for 5 seconds to restart the Initialization process.
`Retry Attempts xx`	E.g. 10
`Initialize Failed 00008`	This shows that the system has failed to due to a server issue; the initialize button needs to be held down again for 5 seconds to restart the Initialization process.
`Retry Attempts xx`	E.g. 10
`Initialize Failed 00004`	This shows that the system has failed due to a server issue, usually the server has been setup incorrectly, and the initialize button needs to be held down again for 5 seconds to restart the Initialization process. If this same error occurs again Neon support should be contacted.
`NRT is not Responding / NRT is not Responding please cycle the power`	This requires the removal of power (both backup battery and main power for 5 minutes

4.0 NRT/NRM TERRESTRIAL SETUP AND TEST

The NRT/NRM Terrestrial has a SIM card which needs to be installed and the NRT/NRM should on power up and connect to the Cellular network within a few seconds.

Note the SIM card must have the security PIN number switched off or disabled. This needs to be done by using the SIM card in a normal mobile phone.

4.1 Observing the Detailed status of an NRT/NRM using Starlog 4 Setup Software

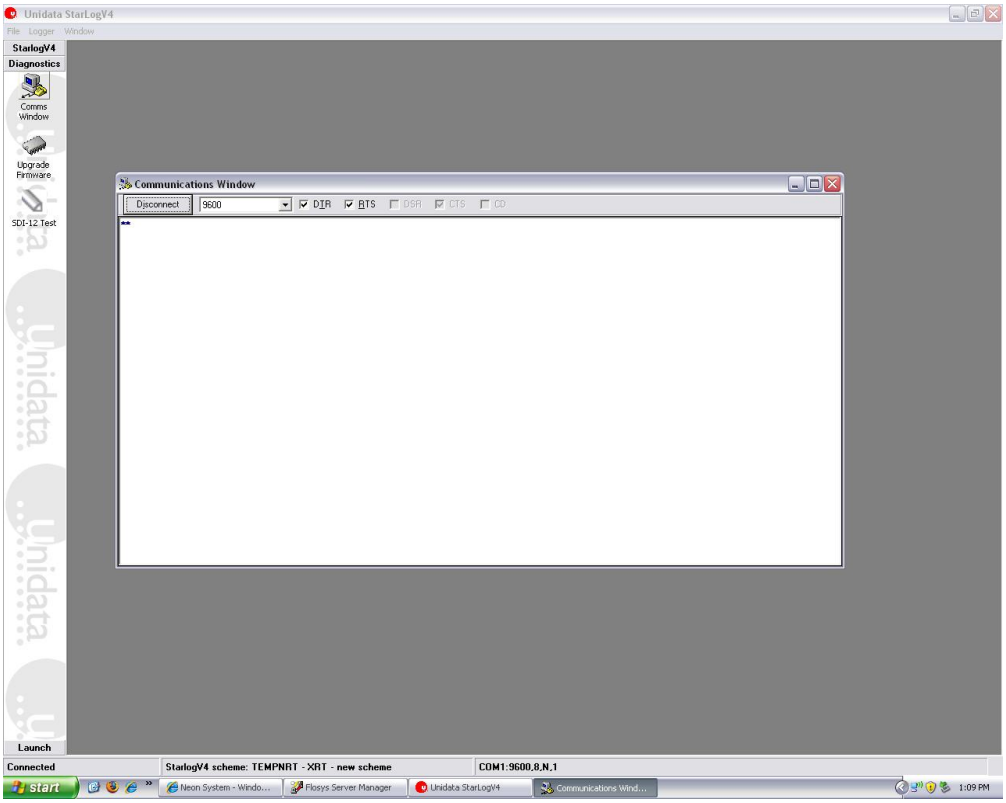
To observe the internal operation / status of the NRT/NRM you can connect up a laptop computer running Starlog 4 Setup software and run the diagnostic / communications channel (which is only available if you have selected an NRT/NRM setup scheme) to observe several more parameters.

The Starlog 4 setup software has a Terminal / Hyper Terminal like mode where you can communicate directly with the NRT/NRM and set various engineering settings and observe detailed status using a series of prompts and menus

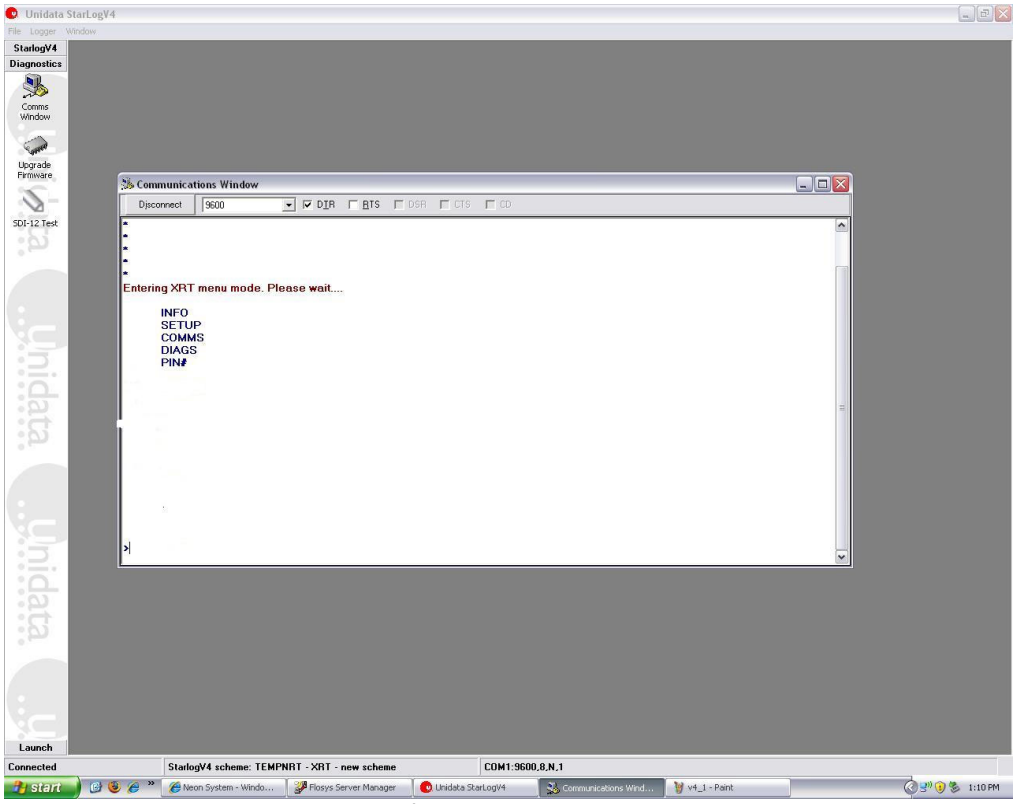
The screen shots on the following page indicate some of the parameters which can be checked using Starlog Version 4 support software.

4.1.1 Communicating with the NRT/NRM Using a Laptop Computer

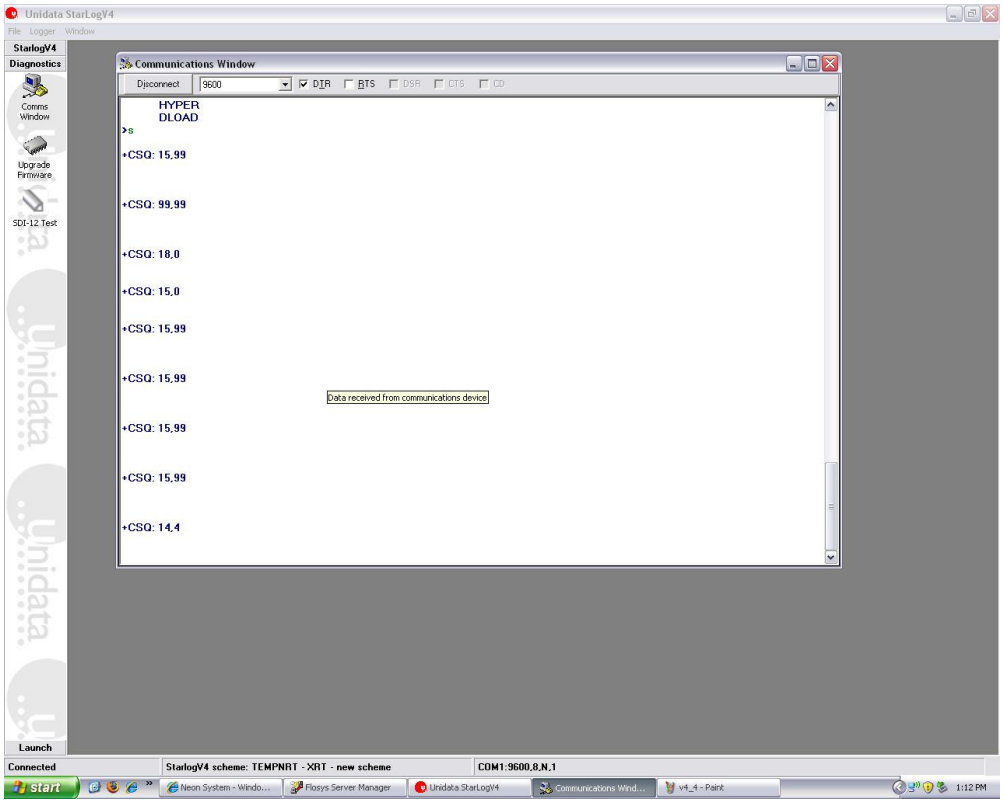
1. If the NRT/NRM has already been initialised go directly to step 12.
2. Start Starlog 4 Software and open the scheme you have set up previously for this NRT/NRM.
3. Go to the Diagnostics tab in Starlog 4.
4. Click on the COMMS window.
5. Click on the CONNECT button.
6. You should see the star * prompt indicating the NRT/NRM is now communicating with the laptop computer.
7. In the COMMS window type Alt M to invoke the menu within the NRT/NRM.
8. The NRT/NRM Main Menu will then appear.
9. Type S for setup, and await the next menu.
10. Type I for initialise, and await the completion of the initialisation process.
11. If the initialisation process passes (wait 2 to 4 minutes- please be patient) there will be a PASS message from the NRT/NRM displayed on the screen.
12. Then press ESC and another ESC to exit the menu system. You should see the message EXIT on the screen. If there is no response the RTS button at the top of the screen will have been disabled and you will need to re tick the RTS button.
13. Go to the Starlog Button and then click “Test Mode” button and the FTU screen will appear showing live data from the NRT/NRM depending on logger scan and log rates.



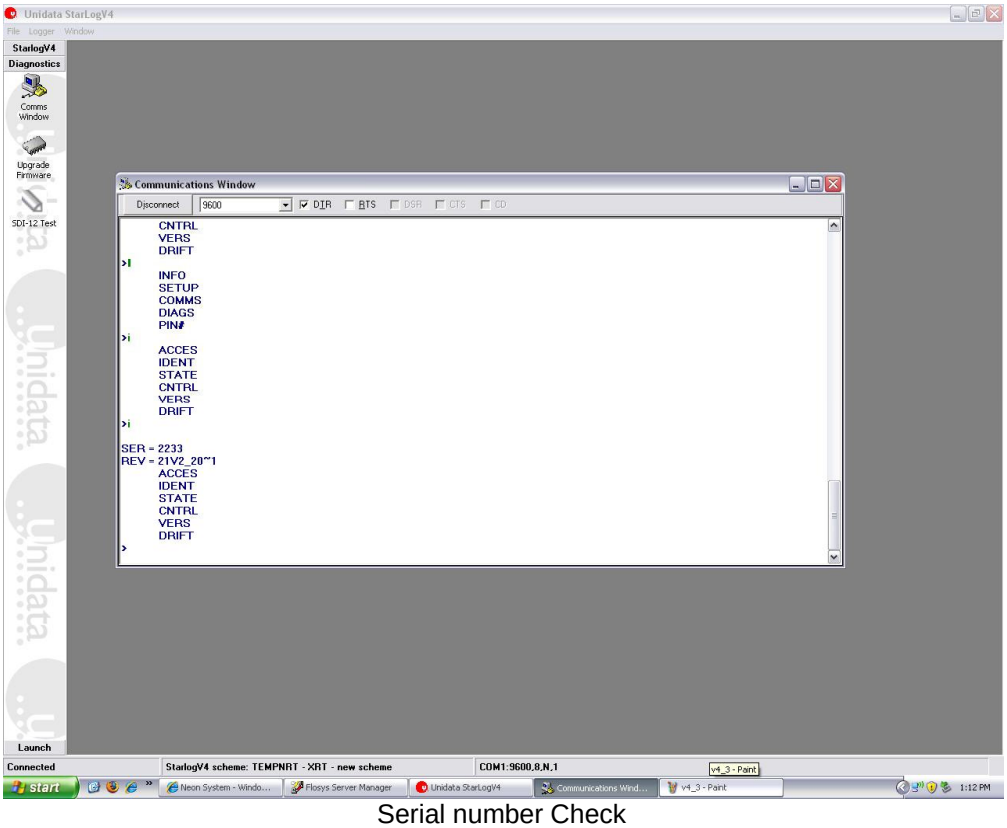
Communications Window



NRT/NRM Access Screen



Received Signal Indicator



Serial number Check

5.0 NRT/NRM SATELLITE SETUP AND TEST

The NRT/NRM Satellite has an internal Globalstar/ Qualcomm Satellite modem specifically for use on the Globalstar Satellite system. You will need to contact Globalstar in your region and set up an account for use of the Globalstar service.

The Globalstar regional office will require the Electronic Serial Number of the modem and may need to have the modem set up for the regional operating parameters Once the Globalstar modem has been registered with Globalstar and the account has been set up and the Electronic Serial number registered it is ready for use.

Attach receive and transmit antenna cables taking care not to bend / distort them to the Globalstar satellite Modem. Note the antenna is an active one and is clearly marked with TX and RX as are the cables. If you mix up the TX and RX cables you can damage the antenna and modem, so take great care to check this.

5.1 NRT/NRM Satellite Site Installation

Take the complete NRT/NRM Satellite unit out of the building and set it up with a laptop computer where there is a clear view of the sky. The installation site needs to be selected to give the best unobstructed view of the sky as possible with a minimum of trees / buildings restricting the clear view of the sky.

The Globalstar satellites cross from one horizon to the other horizon in approximately 20 minutes, assuming a coverage view of the sky of 160 degrees, i.e. 80 degrees each side of the vertical.

If you only have an 80 degree view of the sky, i.e. 40 degree look angle from the vertical, you may not see satellites for some time. Also you will only see a passing satellite for half the horizon to horizon transit time, so you will only be able to see that particular satellite for 10 minutes. These important factors need to be considered when installing the NRT/NRM Satellite.

5.2 NRT/NRM Satellite Communications Parameters

Setting up the NRT/NRM communications parameters, in particular the NRT/NRM retry time also needs careful consideration based on the NRT/NRM Satellite installation site.

In a clear field on an open plain without trees or buildings you should always have a few satellites in view and the satellite you use will be available on the same transit for 20 minutes, and you should pick up a satellite very quickly, hence a long NRT/NRM communications retry interval, and only 2 or 3 retries would be more appropriate.

In a valley, with some trees, or in a built up area, with a restricted view of the sky you will have limited views of the satellite and for much shorter periods and you should expect to be waiting a long time before you have a satellite in view, hence a short NRT/NRM communications retry interval, and 10 or more retries would be more appropriate.

5.3 Installation Location and Coverage

The Globalstar.com website has tools, e.g. the Location Prediction Tool, available to determine coverage in various regions

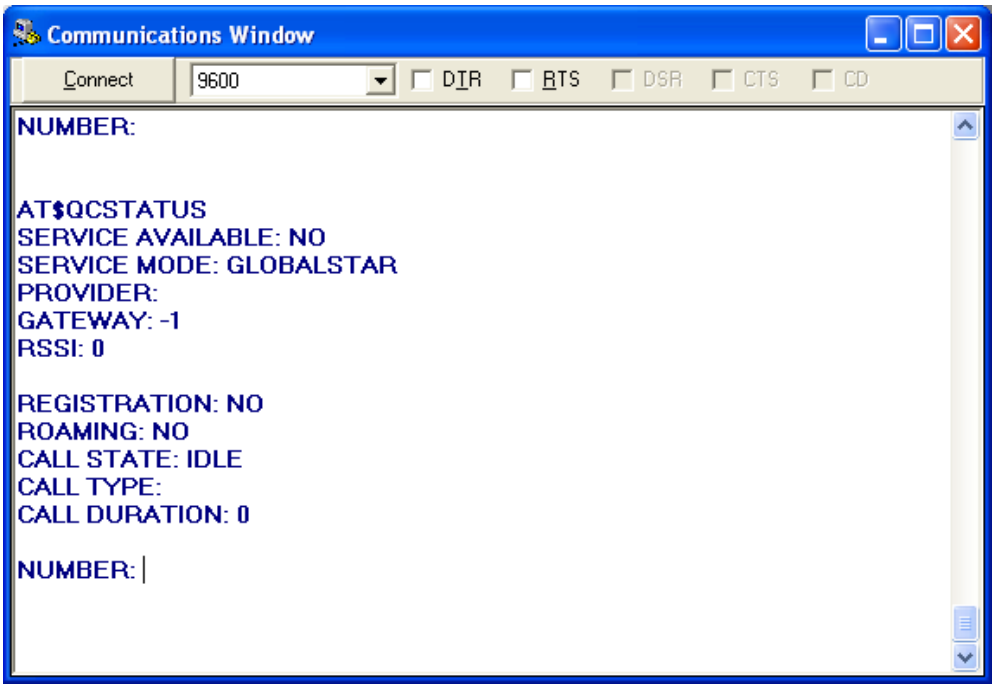
The screen shots below indicate some of the parameters which can be checked using Starlog version 4 support software using the communications window.

Press “C” to enter communications window and then press “S” to select signal mode. A number of parameters are displayed.

The parameter RSSI is an indicator of signal strength from the Satellite.

You may need to leave the NRT/NRM satellite for 10 minutes for the Satellite modem to acquire one of the satellites and report the RSSI signal strength reading.

The reading needs to be 3 or above, typically 4, maximum of 5.



When the Globalstar modem is receiving satellite transmission then exit the menu system by pressing escape and then re enter the menu system again, selecting S for setup, and then I for Initialise (INIT).

Then wait until you receive a pass message on the laptop screen indicating the initialization was successful. The Unit will now have its scheme loaded and the test mode screen can then be accessed using Starlog Version 4.

6.0 NRT/NRM POWER REQUIREMENTS

6.1 Internal Power

The NRT/NRM Terminals can be powered by internal batteries and / or with an external battery supply. The recommended batteries are SAFT Lithium batteries which are specified in this manual. The Lithium batteries provide high inrush current required for modern cellular hand phones.

The NRT/NRM Terrestrial has one Lithium Battery and the NRT/NRM Satellite has three Lithium Batteries for the internal battery supply.

6.2 External Power

If required the NRT/NRM can be powered by an external supply of 6 to 16VDC @ 2A (peak – while transmitting) and 25mA (receive) and 30uA standby. Unidata recommends 12AH 6V Gel Cell-type recharge storage batteries as a good external supply. External instrumentation must be separately powered if more than 500uA is required. The download schedule is the largest consumer of power.

The Continuous Drain Equivalent rating can be used to size the external power requirements and duration of external power supplies. However, external power sources should have an additional 100uA at 12V or 50uA at 6V continuous drain added, (due to parasitic losses in the NRT/NRM circuitry).

The decision to use an external power supply should be based on the projected or known frequency of battery changes, i.e. if a high download schedule is required and frequent battery replacement is going to prove difficult or expensive, then an external power supply is desirable.

6.3 Battery Life Table

Approximate NRT/NRM Terrestrial Battery Life	Approximate Download Schedule	Approximate Scan Rate	Approximate Log Interval	Approximate Continuous. Drain Equiv
5 years	1 per day	5 secs	15 minutes	0.12 mA
4 years	4 times per day	5 secs	15 minutes	0.21 mA
1 year	1 per hour	5 secs	15 minutes	0.53 mA
52 days	1 per 5 minutes	5 secs	1 minute	5.2 mA
10 days	1 per minute	5 secs	5 seconds	26 mA

7.0 NRT/NRM INSTALLATION

The following section describes the NRT/NRM installation procedure, using Model 2001-811 as an example. The installation process is similar for all models.

7.1 NRT/NRM Installation Kit

The NRT/NRM installation kit supplied by Neon may include the following:

- GPRS NRT/NRM Model 2001-811
- Weatherproof enclosure Model 2701B
- Field termination strip Model 2103B

NRT/NRM pole mounting kit.

An optional whip antenna is available for areas of low signal-strength.

Required Equipment

The following equipment will be required for field installation of the NRT/NRM:

- Laptop computer with the STARLOG 4 application installed.
- Serial cable (for laptop communications).
- Tools - Philips screwdrivers, wire cutters, power/ cordless driver, wire-crimping tool, cable ties.
- A mobile phone on the same carrier network as the NRT/NRM is recommended, as this can be a useful signal strength testing tool.
- The NRT/NRM PIN# required for field commissioning of the NRT/NRM.
- NRT/NRM enclosure mounting equipment. (If the Pole Mounting Kit is not going to be used).

7.2 SIM Card Recommendations

It is highly recommended that the SIM is installed in the NRT/NRM before going to site. Refer to sections 9.0 and 10.0 for detailed SIM setup installation.

It is also recommended that the contents of the NRT/NRM installation kit are checked, and that the NRT/NRM is tested and confirmed as working before going to site. Even if wireless communication cannot be verified (for example due to coverage issues), the NRT/NRM can still be checked to ensure it has a battery and is powered on, and that communication with a laptop computer is possible.

Note that high signal strength for the NRT/NRM will minimise current drain – and prolong battery life.

7.3 Neon Setup Recommendations

The NRT/NRM should be registered as part of a scheme before being installed in the field. This will allow for commissioning of the NRT/NRM and verification that communications can be established between the NRT/NRM and the Neon server.

Once in the field the NRT/NRM should be placed in the area of greatest signal strength. A good test for this is to use a mobile phone using the same carrier as the NRT/NRM, as the signal strength indicator will show the best location.

Note that due to the slow refresh rate of the mobile phone signal strength indicator, it is necessary to hold the mobile phone in place for between 30 to 60 seconds to obtain an accurate reading. If a mobile phone on the same carrier network is not available it is possible to use the NRT/NRM itself to determine signal strength. .

Avoid installing the NRT/NRM enclosure in direct sunlight, as cool operating temperatures will aid longevity of the internal components.

Avoid placing the NRT/NRM enclosure inside a metal box, or in an area with large amounts of metal around the NRT/NRM enclosure, as this can adversely affect the communication abilities of the NRT/NRM. If the NRT/NRM must be located within a metal enclosure, an external antenna will be required.

Install the NRT/NRM enclosure in a secure location to avoid tampering and vandalism.

Position the enclosure to ensure cables from NRT/NRM to field device(s) are as short as practical.

If the NRT/NRM is to be used for real-time communication, or for a higher than usual download schedule (refer to Table 1), an external power supply may be required to avoid frequent battery replacement. Provision for this should be considered during the installation, such as installing the NRT/NRM within range of a mains power outlet.

7.4 NRT/NRM Connections

As there are many models of NRT/NRM, the wiring connections are listed in the Appendices of this manual by product number.

7.5 Field Installation of an NRT in a Weatherproof Enclosure

Determine the location for the NRT based on site requirements as well as the installation recommendations stated on the previous pages.

Loosen the four plastic cover screws at the front of the weatherproof enclosure and remove the cover.

For the purpose of this section, it is assumed that the NRT is operational as described in Installation Recommendations.

Fit the aluminium NRT mounting plate onto the base of the weatherproof enclosure, aligning horizontally so that the four threaded inserts are uppermost and to the right-hand side. Align the drilled mounting holes in the plate with four fixing points, to position the NRT in the upper part of the enclosure once mounted. Secure using the four short thread-cutting screws, taking care not to over-tighten.

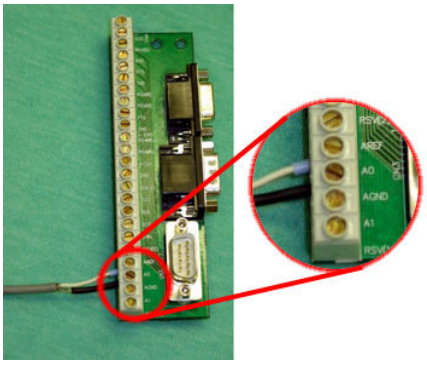
NRT Example which is secured within a Weatherproof Enclosure

Mount the NRT onto the plate, securing it with the four short machine screws as shown in the figure above.

Rubber self-sealing glands are provided in the base of the enclosure for external wiring connections. To keep the enclosure weatherproof, all wires leading to the NRT must pass through these glands.

After feeding the wires from the external device through the rubber gland(s), connections to the field termination strip (FTS) are required. Refer to the external device documentation to determine the exact connections.

For example: A temperature sensor, which is an analogue device, should be connected to an analogue channel (A0 or A1) as shown below.



Field Termination Strip with Analogue Device Connected

Once the field devices have been connected to the field termination strip mount it firmly onto the NRT as shown below.

An NRT installed with FTS connected

Pole Mounting

The weatherproof enclosure can be pole-mounted using the supplied kit. First secure the pressed-steel backing plate to a suitable pole with the u-bolts, clamp plates, nuts and washers. Next, attach the weatherproof enclosure to the plate with the four 20mm machine screws through the casing corners, into the threaded holes in the plate. Do not over-tighten.

Surface Mounting

Alternatively, the weatherproof enclosure can be mounted directly to a surface, attached with suitable screws through the casing corner holes.

The weatherproof enclosure can be closed once the NRT has passed field commissioning.

8.0 NRT/NRM COMMISSIONING

Once the NRT/NRM has been installed and all connections made, field commissioning can be conducted. If any of the commissioning tests fail, more information may be found in the appendix. Commissioning tests are as follows:

8.1 NRT/NRM Powered On

Confirm that the status LED, visible through the infra red window on the front of the unit, is flashing. With the NRT/NRM in an idle state the LED will flash faintly once every second.

8.2 NRT/NRM Initialised

- Confirm proper functioning by connecting the NRT/NRM to a laptop computer.
- Launch the STARLOG 4 (laptop computer) application.
- Launch the Test window.
- Check the file and firmware version number.
- If the NRT/NRM returns a value then the NRT/NRM has firmware installed as well as all required files.
- NRT/NRM Field Signal Verification.
- Connect a laptop computer to the NRT/NRM.
- Launch the STARLOG 4 application.
- From the STARLOG 4 menu select the scheme corresponding to the NRT/NRM.
- Select the test Mode
- The Com window will be displayed showing communications with the NRT/NRM.
- Press ALT+M to enter the NRT/NRM menu.
- Press P and then E.
- Enter 1234 then press Enter, then press ESC.
- Press C, then S for signal it must be 16 or higher, if it is 99.99 then there is no connection to the cellular network.
- If there is sufficient signal, press ESC and ESC to exit.

8.3 NRT/NRM Initialisation

- Reconnect to the NRT/NRM if not already connected.
- Launch STARLOG 4 (laptop computer) application.
- Select the test Mode.
- Select toe diagnostics in the COMMS window and press CONNECT.

- The COMMS window will be displayed showing communications with the NRT/NRM.
- Press ALT+M to enter the NRT/NRM menu.
- From the main menu select Setup.
- From the Setup menu select Init.

The NRT/NRM will initialise itself and attempt to communicate with the Neon server. Once communications have been established the NRT/NRM will download any required files and complete the initialisation process. The NRT/NRM will, after 2 or 4 minutes respond with a PASS message. Please be patient waiting for this message.

Once all commissioning tests have been completed successfully, the NRT/NRM is field-commissioned and ready for use.

9.0 2001 SIM CARD INSTALLATION

The following section describes the procedure for installing a SIM into an NRT/NRM. This section only needs to be performed if the SIM within the NRT/NRM needs replacing, or if it is known that the NRT/NRM does not contain a SIM.

Unscrew the ¼ wave helical stub antenna attached to the top of the NRT/NRM as shown

NRT/NRM with ¼ Wave Helical Stub Antenna Removed

Remove the four end plate screws at the side of the NRT/NRM unit. Note: Remove the antenna first.

NRT/NRM Main casing end plate Screws

After removing the four screws, hold the end plate and carefully slide the casing away from the end plate. If necessary push down gently on the antenna stub to release it from the casing aperture.

Opening the NRT/NRM Casing

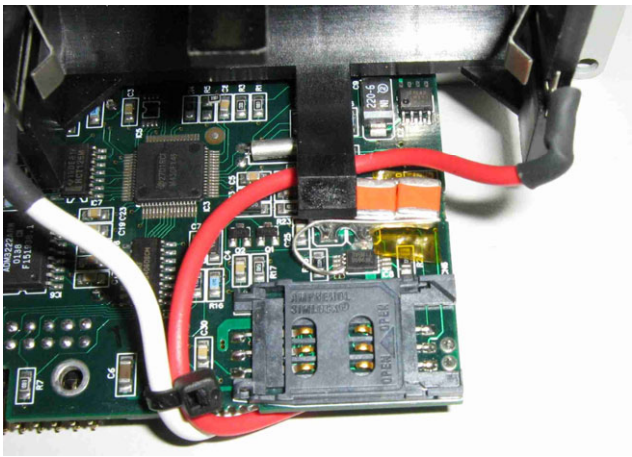
With the casing removed, hold the end plate and turn over the assembly to reveal the battery.

WARNING: Care should be taken when handling lithium batteries as misuse may cause damage to the NRT/NRM or, the battery cells may explode.

Ensure that the battery terminals are NOT shorted and that there are no loose wires in the vicinity the battery.

Remove the battery from its holder.

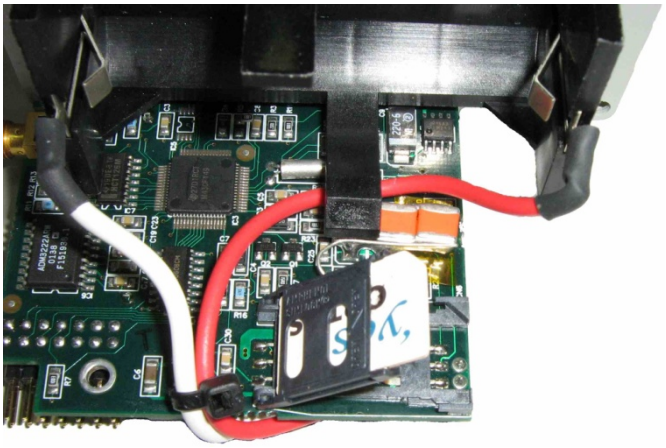
With the end plate facing away from you, the SIM socket is located on the right-hand corner of the main board.



NRT/NRM main board; battery removed, showing SIM cover/socket

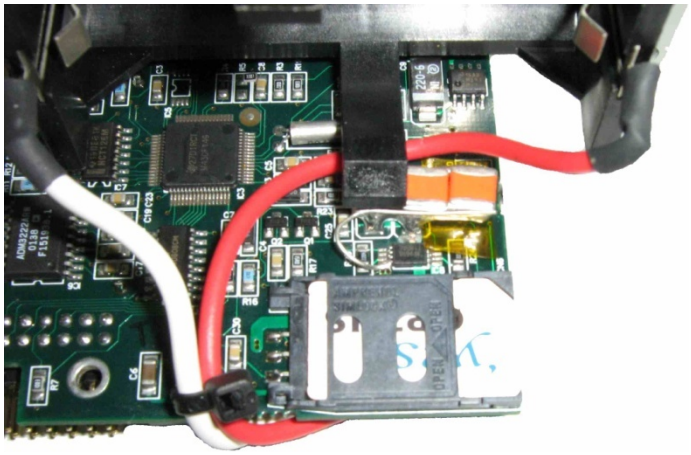
Slide the SIM cover gently to the left with a fingernail or matchstick until it clicks. The SIM cover can now be lifted gently and hinged open.

Insert the SIM with the gold contacts away from you and the cut corner at the top right as shown below



SIM card inserted.

Close the SIM cover and slide it into place until it clicks.



SIM card installed.

Replace the battery, ensuring correct polarity.

Return the NRT/NRM assembly carefully to the case, ensuring the antenna stub is correctly located in its aperture.

Secure the NRT/NRM end plate with the four screws. Re-attach the antenna.

10.0 2011, 2013, 2014, 2016 SIM CARD INSTALLATION

The following section describes the procedure for installing a SIM into an NRT/NRM. This section only needs to be performed if the SIM within the NRT/NRM needs replacing, or if it is known that the NRT/NRM does not contain a SIM.

Remove the lid screws (either two or four screws depending on model).

WARNING: Care should be taken when handling lithium batteries as misuse may cause damage to the NRT/NRM or, the battery cells may explode.

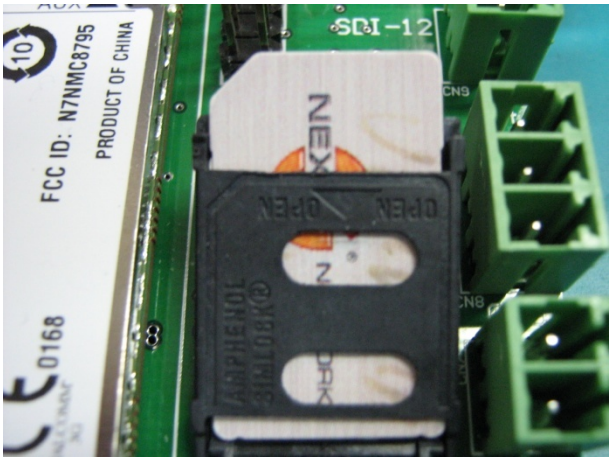
Ensure that the battery terminals are NOT shorted and that there are no loose wires in the vicinity the battery.

Remove the battery from its holder.

Locate the SIM socket.

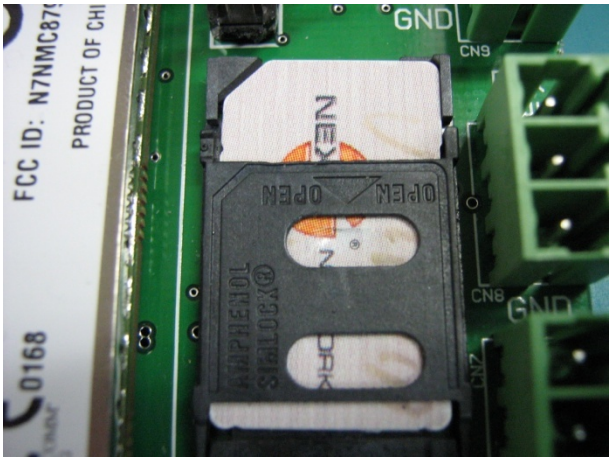
Slide the SIM cover gently with a fingernail or matchstick until it clicks. The SIM cover can now be lifted gently and hinged open.

Insert the SIM with the gold contacts away from you and the cut corner at the top left as shown below



SIM card inserted.

Close the SIM cover and slide it into place until it clicks.



SIM card installed.

Replace the battery, ensuring correct polarity.

Return the NRT/NRM assembly carefully to the case, ensuring the antenna stub is correctly located in its aperture.

Secure the NRT/NRM end plate with the four screws. Re-attach the antenna.

11.0 BATTERY TESTING

11.1 Battery Check

The presence of a battery can be verified without opening the NRT/NRM.

Look for the flashing LED through the window on the front of the NRT/NRM unit.

If the NRT/NRM is in an idle state the LED will flash faintly once every second.

If the LED is not flashing, you will need to open the NRT/NRM and verify the presence of a battery:

If a battery is installed, the NRT/NRM may be in sleep mode.

To wake the NRT/NRM, remove the battery, leave it out for 3 minutes, then re insert the battery.

11.2 Battery Replacement

Wait for 3 minutes to allow any residual charge within the NRT/NRM to dissipate.

Replace the battery

The NRT/NRM battery should only be replaced with a SAFT LSH20. This is a spiral wound Lithium Thionyl Chloride [Li-SOCl2] battery with a terminal voltage of 3.6 volts.

Failure to replace the battery with the correct type may cause communication failure.

For further information on the battery and where to purchase replacements, please refer to www.saft.com

WARNING: Care should be taken when handling lithium batteries as misuse may cause damage to the NRT/NRM or, the battery cells may explode.

Ensure that the battery terminals are NOT shorted and that there are no loose wires in the vicinity the battery.

12.0 ATTACHING AN EXTERNAL POWER SUPPLY

This section describes the procedure for attaching an external power supply to the NRT/NRM.

Remove the cover of the weatherproof enclosure and remove the NRT/NRM if a weatherproof enclosure is provided.

Rubber self-sealing glands are provided in the base of the weatherproof enclosure for external wiring connections. To keep the enclosure weatherproof, all wires leading to the NRT/NRM must pass through these glands.

Connect the wires from the external power supply to the field termination strip. The connection points are +12V and GND.

Ensure all wires are firmly attached to the field termination strip and return the NRT/NRM to the weatherproof enclosure.

Replace the cover of the weatherproof enclosure.

13.0 NRT/NRM TERRESTRIAL EXTERNAL ANTENNA

This section describes fitting of an external antenna to the NRT/NRM Terrestrial

Unscrew the ¼ wave helical stub antenna from the NRT/NRM unit.

Rubber self-sealing glands are provided in the base of the weatherproof enclosure for external wiring connections. To keep the enclosure weatherproof, all wires leading to the NRT/NRM must pass through these glands.

Feed the cable from the external antenna through a rubber gland and into the weatherproof enclosure if a weatherproof enclosure is provided. Carefully attach the end to the NRT/NRM antenna socket, screwing it firmly into place.

Find a suitable location for the external antenna and secure it firmly in place. Note that some antennas require a ground plane mount (refer antenna information).

14.0 NRT/NRM SATELLITE ANTENNA INFORMATION

(Limited extracts from Qualcomm 1620 manual- permission granted by Qualcomm)

14.1 Mounting Antennas On-Site

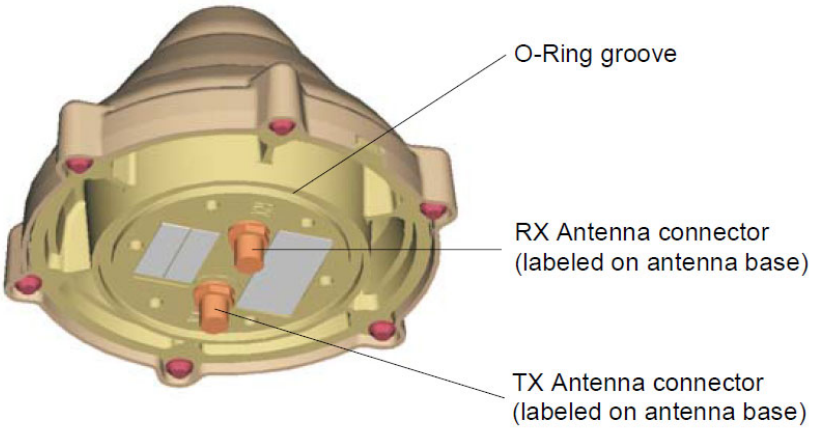
This section describes the Dielectric Resonator Antenna (DRA, also called an Outdoor Unit or ODU) hardware, including specifications for antennas and antenna cable. It also describes how to calculate antenna cable length and mount antennas.

14.2 Modem Antenna Specifications

The GSP-1620 modem is to be used with an aluminium Dielectric Resonator Antenna (DRA), as shown in the figures below. The modem DRA has a passive transmit and an active receive section. The transmit (Tx) and receive (Rx) connectors are labelled on the antenna.

Caution: You must be careful to connect the Tx connector on the DRA to the Tx connector on the modem, and the Rx connector on the DRA to the Rx connector on the modem. Crossing the Tx and Rx cables can damage the modem.

DRA Side View



DRA View Showing Connectors

14.3 Antenna Dimensions and Weight

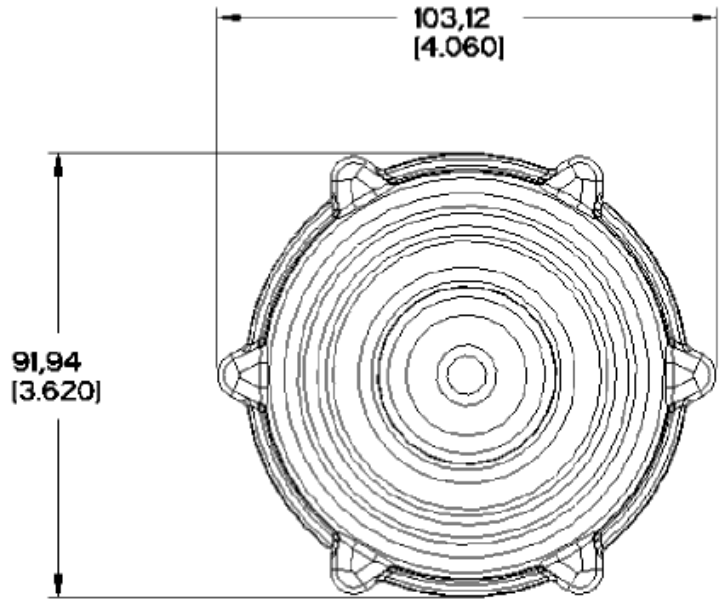
The DRA antenna is 103 millimetres diameter by 63 millimetres tall (4.1 inches diameter by 2.5 inches tall).

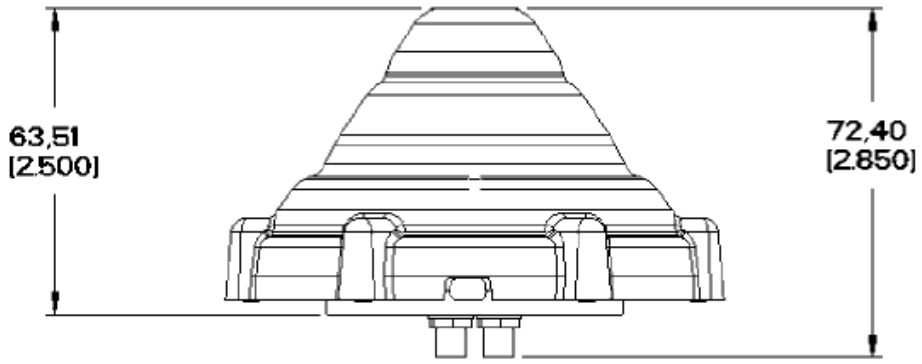
The weight for the antenna is less than 250 grams (8.8 ounces).

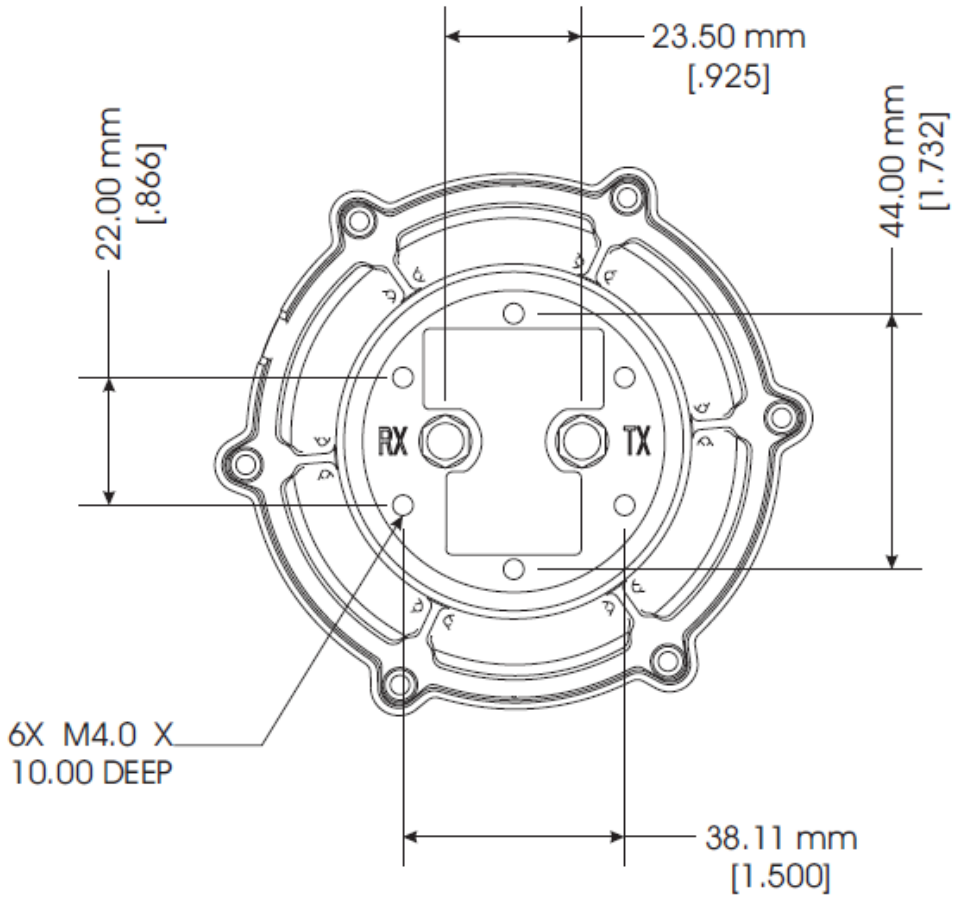
14.4 Antenna Depiction

This section includes the following technical drawings that depict the antenna:

- GSP-1620 Antenna: DRA Top and Side Views (below)
- GSP-1620 Antenna: DRA Bottom View (overleaf)







Note In the two figures above, dimensions are shown as: millimetres [inches]. Millimetres are the controlling dimensions on these drawings.

Inch dimensions are for reference only.

14.5 Antenna Cable Specifications

The DRA antenna requires two (2) cables, one for transmit and one for receive:

- The required connectors are plug SMA (DRA bulkhead) to plug MCX (modem).
- Transmit cable maximum 0.6 dB insertion loss @ 1618 MHz is required for the cable.
- Receive cable maximum 3.0 dB insertion loss @ 2492 MHz is required for the cable.

QUALCOMM does not provide cables for OEM bulk applications since OEMs may need cables of different lengths for particular applications. Listed below are potential suppliers of RF and microwave connectors and cable assemblies.

Volex Inc.

1 Batterymarch Park,

Quincy, MA 02169

USA

Tel: +1 617 376-0555

Fax: +1 617 376-0590

Email: jim_stout@volexna.com

Web: http://www.volex.com/

Times Microwave Systems

358 Hall Avenue

P.O. Box 5039

Wallingford, CT 06492-5039

Tel:1(800)TMS-COAX

(867-2629)

Tel: +1 203 949-8400

Fax: +1 203 949-8423

JPM Corporate

155 North 15th Street

Lewisburg, PA 17837

USA

Tel: +1 570 524-8225

Fax: +1 570 524-5660

Web: http://www.jpmco.com/

14.6 Calculating Antenna Cable Length

The maximum loss for an antenna cable of any length is 0.6 dB at 1.6 GHz for modem transmit and 3 dB at 2.5 GHz for modem receive.

You must take these losses into accountwhen calculating antenna lengths for a GSP-1620 modem installation. For example, the GSP-1620 Modem Integrator's Kit utilizes three feet of LMR 195 cable, which has a loss of 0.6 dB at 1.6 GHz.

14.7 Mounting Antennas at the Field Site

When mounting an antenna on-site, you must position it properly to obtain Globalstar satellite signals. You can mount the antenna on a flat surface or on a pole. In either case, you should seal the antenna connectors against dirt and moisture.

Caution: The ODU antenna must be installed in a configuration that ensures a minimum line-of-sight separation distance of 21.5 centimetres (8.5 inches) is maintained at all times between the ODU antenna and any personnel.

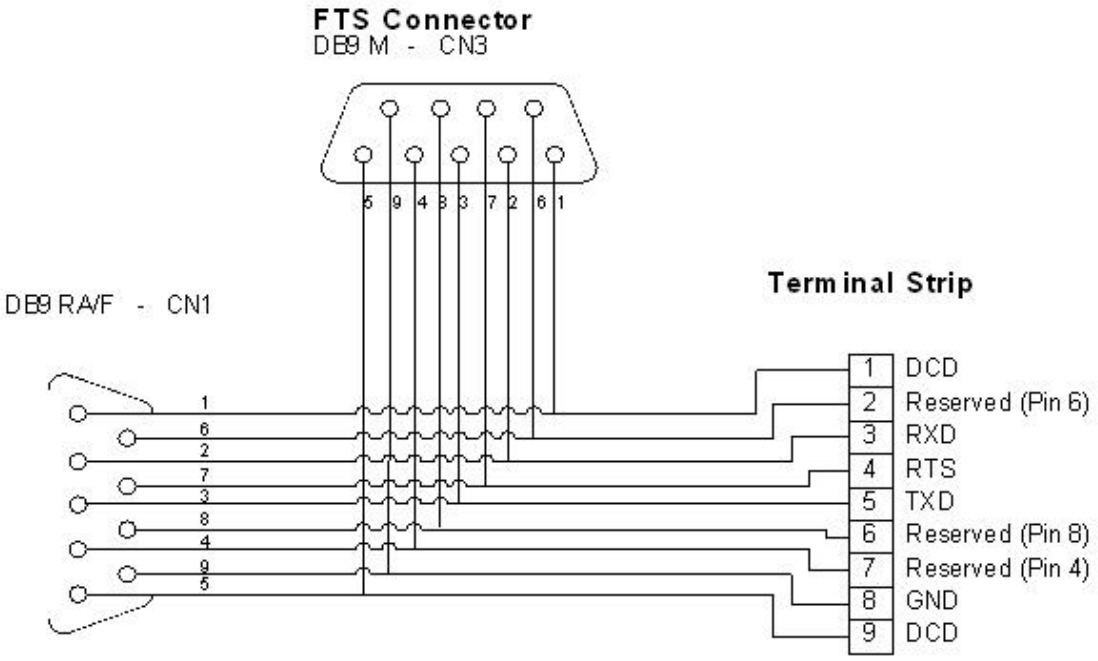
14.7.1 Finding a Good Antenna Location

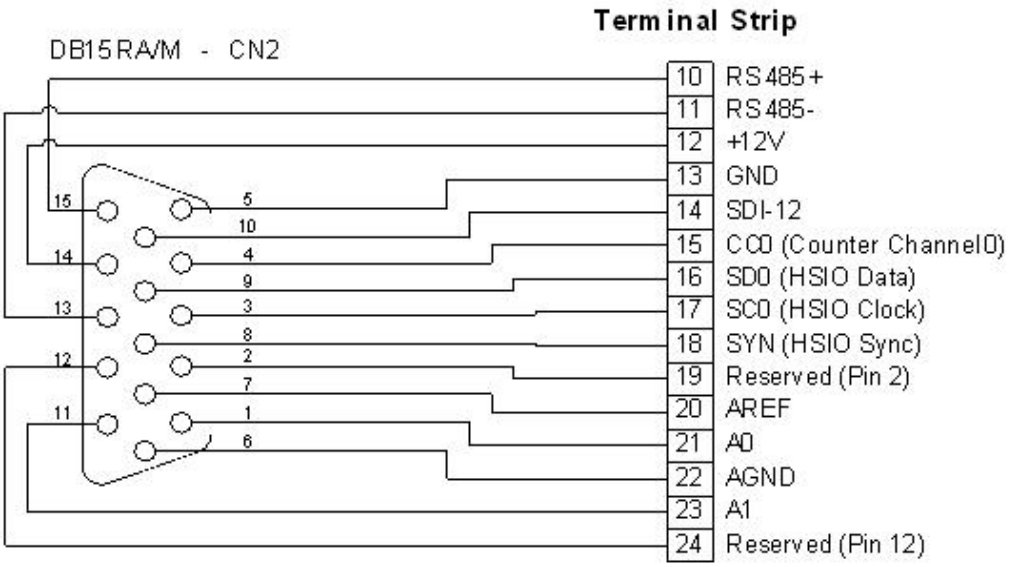
When installed in the field, the antenna of a GSP-1620 modem product must have a direct line of sight to the Globalstar satellites. Keep in mind that Globalstar satellites follow different paths across the sky, and you cannot predict where they will be.

Position the DRA antenna outdoors where it has a clear view of the sky, unimpeded by tall obstacles such as buildings and trees.

Signal fading associated with trees, buildings, and other obstacles that prevent a clear line-of-sight to the satellite can cause degraded operation in a mobile environment.

15.0 APPENDIX A – 2001, 2002 CONNECTIONS





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16.0 APPENDIX B – 2014D, 2015D, 2016D 25 WAY SIGNAL CONNECTOR CONNECTIONS

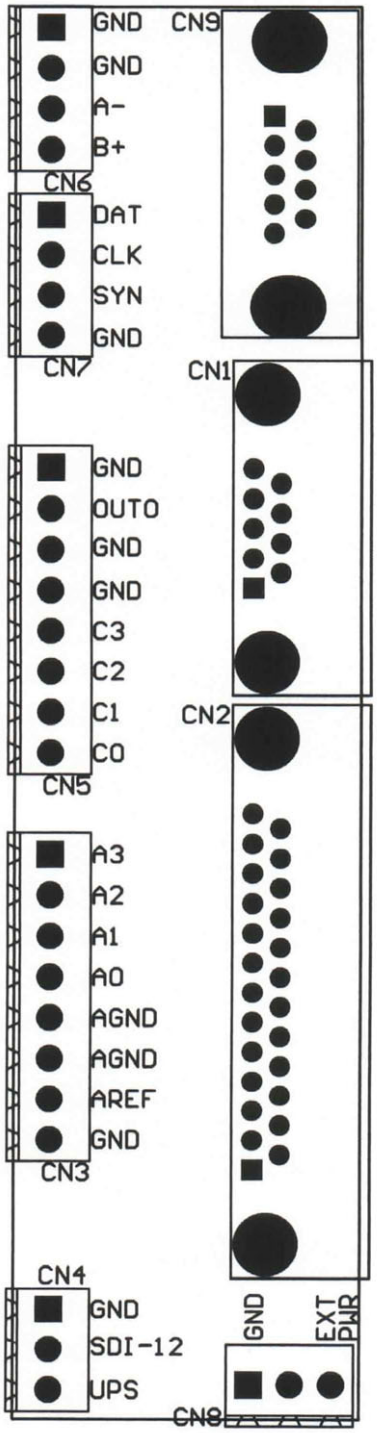
Pin No.	Signal
1	Analog 0 Input
2	Analog 1 Input
3	Analog 2 Input
4	Analog 3 Input
5	Digital Ground
6	Modbus A-
7	Modbus B+
8	AREF Output
9	HSIO Clock
10	Digital Ground
11	Counter 0 Input
12	Counter 2 Input
13	External Power Input
14	Analog Ground
15	HSIO Sync
16	External Power Input
17	OUT 0 Output
18	External Power Input
19	Digital Ground
20	SDI-12
21	HSIO Data
22	External Power Input
23	Digital Ground
24	Counter 1 Input
25	Counter 3 Input

17.0 APPENDIX C – 2011D, 2012D, 2013D, 2014D, 2015D, 2016D 9 WAY RS232 CONNECTOR CONNECTIONS

Pin No.	Signal
1	No Connect
2	TXD (OUT)
3	RXD (IN)
4	FTU (IN)
5	Ground
6	No Connect
7	DCD (IN)
8	RTS (OUT)
9	No Connect

18.0 APPENDIX D – 2103D FIELD TERMINATION STRIP CONNECTIONS

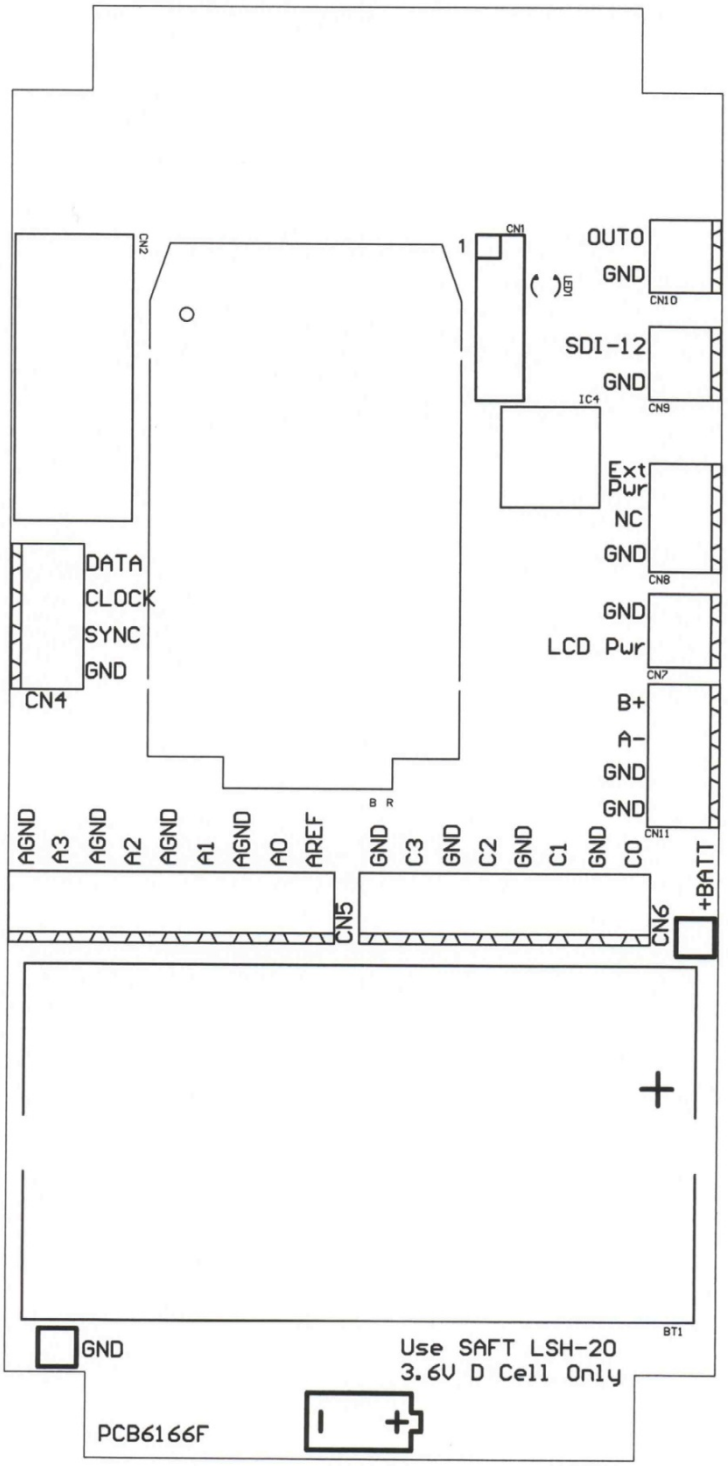
Connector	Name	Signal
CN6	GND	Digital Ground
	GND	Digital Ground
	CMB-	Modbus A-
	CMB+	Modbus B+
CN7	DAT	HSIO Data
	CLK	HSIO Clock
	SYN	HSIO Sync
	GND	Digital Ground
CN5	GND	Digital Ground
	OUT0	OUT 0 Output
	GND	Digital Ground
	GND	Digital Ground
	C3	Counter 3 Input
	C2	Counter 2 Input
	C1	Counter 1 Input
	C0	Counter 0 Input
CN3	A3	Analog 3 Input
	A2	Analog 2 Input
	A1	Analog 1 Input
	A0	Analog 0 Input
	AGND	Analog Ground
	AGND	Analog Ground
	AREF	AREF Output
	GND	Digital Ground
CN4	GND	Digital Ground
	SDI-12	SDI-12
	UPS	5V UPS Output (when fitted)
CN8	GND	Digital Ground
	EXT PWR	External Power Input



2103D Field Termination Strip

19.0 APPENDIX E – 2011D NEON METERING MODULE - GSM SIGNAL CONNECTIONS

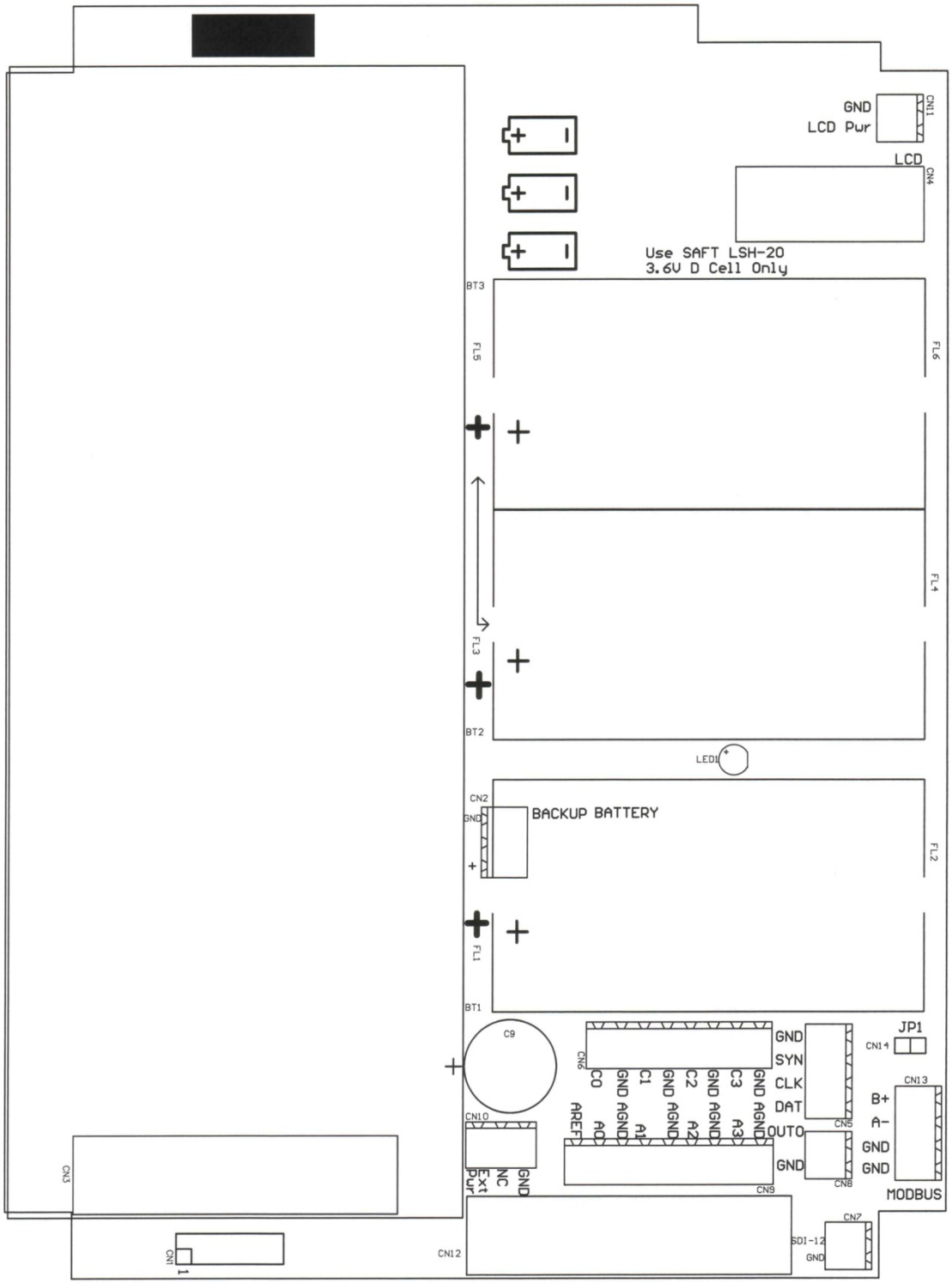
Connector	Name	Signal
CN4	DATA	HSIO Data
	CLOCK	HSIO Clock
	SYNC	HSIO SYNC
	GND	Digital Ground
CN5	AGND	Analog Ground
	A3	Analog 3 Input
	AGND	Analog Ground
	A2	Analog 2 Input
	AGND	Analog Ground
	A1	Analog 1 Input
	AGND	Analog Ground
	A0	Analog 0 Input
	AREF	Analog Reference Out
CN6	GND	Digital Ground
	C3	Counter 3 Input
	GND	Digital Ground
	C2	Counter 2 Input
	GND	Digital Ground
	C1	Counter 1 Input
	GND	Digital Ground
	C0	Counter 0 Input
CN11	B+	Modbus B+
	A-	Modbus A-
	GND	Digital Ground
	GND	Digital Ground
CN7	LCD PWR	LCD Power Output
	GND	Digital Ground
CN8	EXT PWR	External Power Input
	NC	No Connect
	GND	Digital Ground
CN9	SDI-12	SDI-12
	GND	Digital Ground
CN10	OUT0	Out 0 Output
	GND	Digital Ground



2011D Neon Metering Module - GSM

20.0 APPENDIX F – 2012D NEON SATELLITE MODULE SIGNAL CONNECTIONS

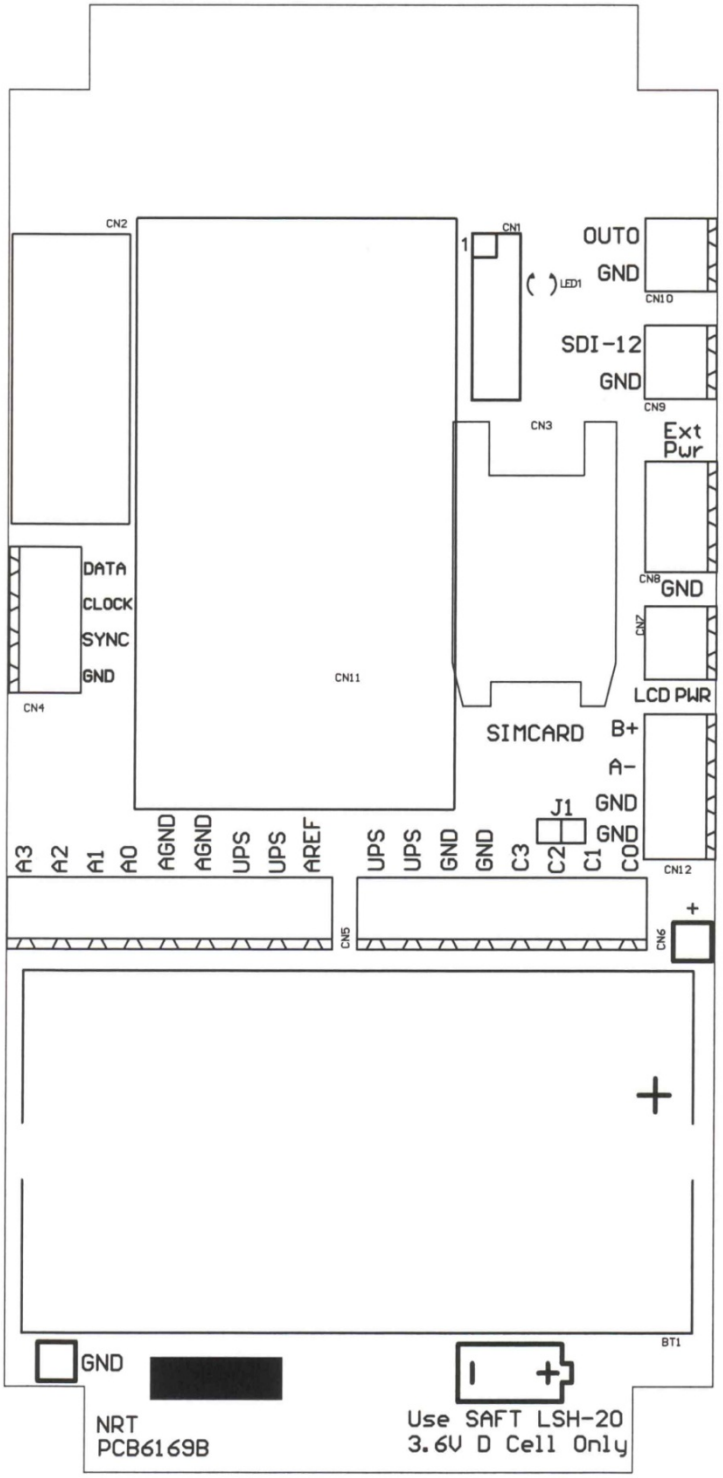
Connector	Name	Signal
CN10	EXT PWR	External Power Input
	NC	No Connect
	GND	Digital Ground
CN6	GND	Digital Ground
	C3	Counter 3 Input
	GND	Digital Ground
	C2	Counter 2 Input
	GND	Digital Ground
	C1	Counter 1 Input
	GND	Digital Ground
	C0	Counter 0 Input
CN9	AGND	Analog Ground
	A3	Analog 3 Input
	AGND	Analog Ground
	A2	Analog 2 Input
	AGND	Analog Ground
	A1	Analog 1 Input
	AGND	Analog Ground
	A0	Analog 0 Input
	AREF	Analog Reference Out
CN5	DATA	HSIO Data
	CLOCK	HSIO Clock
	SYNC	HSIO SYNC
	GND	Digital Ground
CN8	OUT0	Out 0 Output
	GND	Digital Ground
CN7	SDI-12	SDI-12
	GND	Digital Ground
CN13	CMB+	Modbus B+
	CMB-	Modbus A-
	GND	Digital Ground
	GND	Digital Ground
CN11	LCD PWR	LCD Power Output
	GND	Digital Ground



2012D Neon Satellite Module

21.0 APPENDIX G – 2013D NEON METERING MODULE - NEXT G

Connector	Name	Signal
CN4	DATA	HSIO Data
	CLOCK	HSIO Clock
	SYNC	HSIO SYNC
	GND	Digital Ground
CN5	A3	Analog 3 Input
	A2	Analog 2 Input
	A1	Analog 1 Input
	A0	Analog 0 Input
	AGND	Analog Ground
	AGND	Analog Ground
	UPS	+5v Instrument Power Supply
	UPS	+5V Instrument Power Supply
	AREF	Analog Reference Out
CN6	UPS	+5V Instrument Power Supply
	UPS	+5V Instrument Power Supply
	GND	Digital Ground
	GND	Digital Ground
	C3	Counter 3 Input
	C2	Counter 2 Input
	C1	Counter 1 Input
	C0	Counter 0 Input
CN10	OUT 0	Out 0 Output
	GND	Digital Ground
CN9	SDI-12	SDI-12
	GND	Digital Ground
CN8	EXT PWR	External Power Input
	NC	No Connect
	GND	Digital Ground
CN7	LCD PWR	LCD Power Output
	GND	Digital Ground
CN12	B+	Modbus B+
	A-	Modbus A-
	GND	Digital Ground
	GND	Digital Ground



2013D Neon Metering Module - Next G

22.0 APPENDIX H – 2001, 2002 TO LAPTOP COMPUTER CABLE CONNECTIONS

The NRT/NRM can connect to a laptop computer for setup and configuration using Starlog 4 Software.

When this connection is required the cable below is required.

If you are using a computer without a DB9 RS 232C connector / Serial interface a USB to RS 232 C adaptor will be needed.

Please contact Unidata for some brands of USB to RS 232 C adaptors which we have tested and found to work correctly with the NRT/NRM and a laptop computer.

NRT/NRM to Laptop Computer Cable

NRT/NRM Connector - Pin		Laptop Computer Pin	
RXD < Red	2	TXD	3
TXD > Yellow	3	RXD	2
GND Green	5	GND	5
DCD < Purple	1	RTS	7
RTS > Blue	7	CTS	8
FTU < Black	9	DTR	4

23.0 APPENDIX I – 2011D, 2012D, 2013D, 2014D, 2015D, 2016D TO LAPTOP COMPUTER CABLE CONNECTIONS

The NRT/NRM can connect to a laptop computer for setup and configuration using Starlog 4 Software.

When this connection is required the cable below is required.

If you are using a computer without a DB9 RS 232C connector / Serial interface a USB to RS 232 C adaptor will be needed.

Please contact Unidata for some brands of USB to RS 232 C adaptors which we have tested and found to work correctly with the NRT/NRM and a laptop computer.

NRT/NRM to Laptop Computer Cable. This is a standard 9 pin to 9 pin serial cable.

NRT/NRM Connector - Pin		Laptop Computer Pin	
RXD ←	3	TXD	3
TXD →	2	RXD	2
GND	5	GND	5
DCD ←	7	RTS	7
RTS →	8	CTS	8
FTU ←	4	DTR	4

24.0 APPENDIX J – 2001, 2002 ANCILLARY LOGGER CONNECTIONS

24.1 Ancillary Logger Setup

The NRT/NRM can use its internal Micrologger component for logging, and it can also address an ancillary logger. The procedure is detailed below

This setup is an advanced configuration and we strongly suggest you contact the support team at Unidata if you wish to use this feature to confirm the setup requirements.

In Neon update internal logger with a dummy scheme and a 1minute FPO file.

In Starlog V4 initialise the NRT/NRM.

Then once the NRT/NRM is correctly running, standalone, connect it to an ancillary logger via a NRT/NRM cable (2602C) joined to a PC communications cable.

In Neon update ancillary logger with scheme.

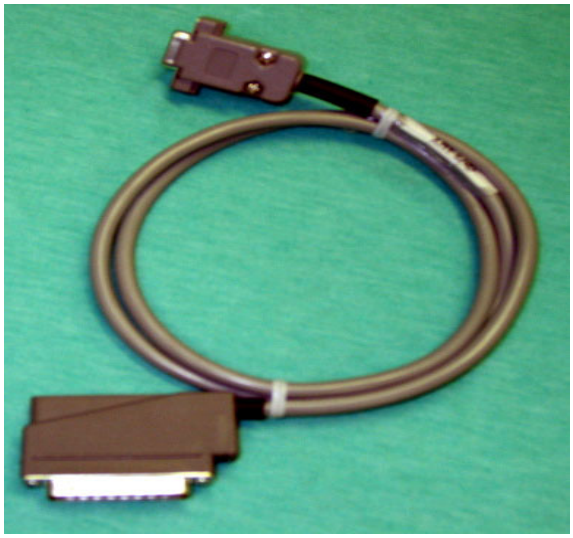
Wait…

Within a couple of minutes on next communications the ancillary logger will be initialised with the new scheme.

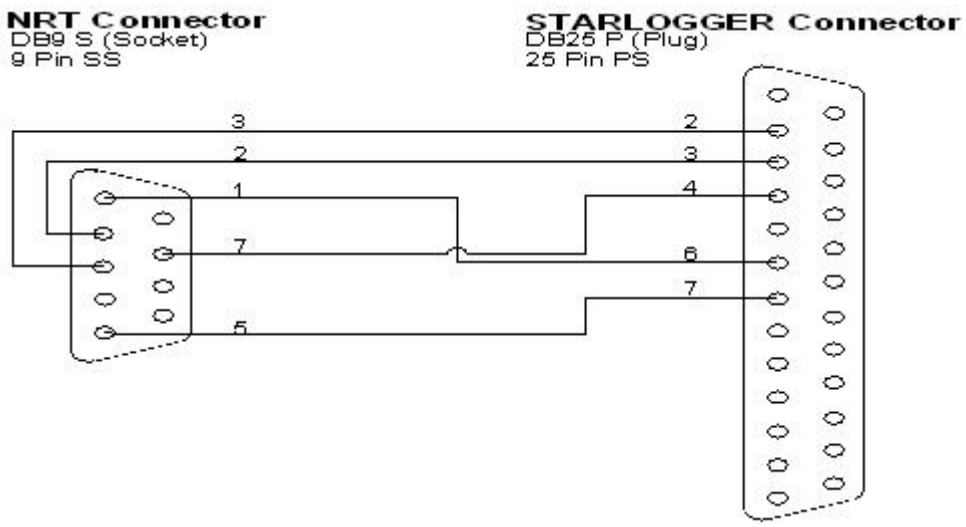
24.2 Ancillary Logger Cable

An ancillary data logger can also be connected to an NRT/NRM via a 2602A cable as shown on the next page.

The cable is connected from the computer communication port of the external logger to the RS232 serial port on the FTS.



24.3 2602A Data Cable Details



NRT/NRM Connector - Pin		STARLOGGER connector - Pin	
RxD	2	TxD	3
TxD	3	RxD	2
RTS	7	RTS	4
DCD	1	DSR	6
GND	5	GND	7

25.0 APPENDIX K – 2011D, 2012D, 2013D, 2014D, 2015D, 2016D

25.1 Ancillary Logger Setup

The NRT/NRM can use its internal Micrologger component for logging, and it can also address an ancillary logger. The procedure is detailed below

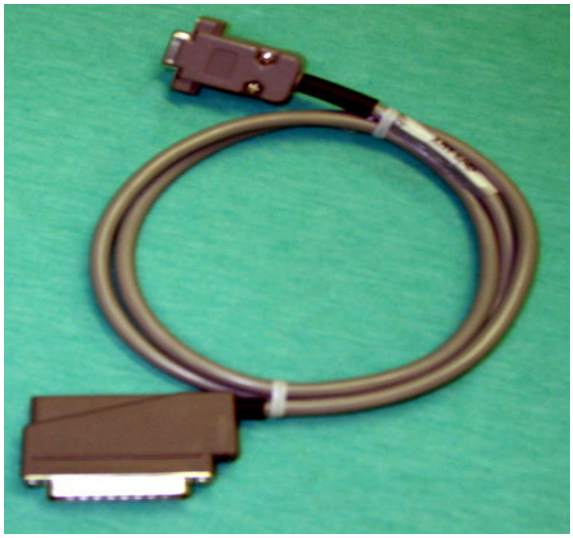
This setup is an advanced configuration and we strongly suggest you contact the support team at Unidata if you wish to use this feature to confirm the setup requirements.

In Neon update internal logger with a dummy scheme and a 1minute FPO file.

In Starlog V4 initialise the NRT/NRM.

An ancillary data logger is connected to an NRT/NRM via a 2602B-1 or 2602B-2 cable as shown on the next page.

The cable is connected from the computer communication port of the external logger to the RS232 serial port on the FTS.



In Neon update ancillary logger with scheme.

Wait…

Within a couple of minutes on next communications the ancillary logger will be initialised with the new scheme.

25.2 2602B-1 Ancillary Logger Data Cable Details - Starlogger

NRT/NRM Connector - Pin		STARLOGGER connector - Pin	
RXD	3	TxD	3
TXD	2	RxD	2
RTS	8	RTS	4
DCD	7	DSR	6
GND	5	GND	7

25.3 2602B-2 Ancillary Logger Data Cable Details - Micrologger

NRT/NRM Connector - Pin		MICROLOGGER connector - Pin	
RXD	3	TXD	2
TXD	2	RXD	3
RTS	8	RTS	7
DCD	7	DSR	6
GND	5	GND	5

26.0 APPENDIX L – SUMMARY OF 2000 FAMILY MODEL NUMBERS

Model #	Description	ANT	BAT	LCD
	Neon Metering & Remote Modules-GSM			
2011D-A00	NEON Metering Modules- GSM	YES	NO	NO
2011D-AB0	NEON Metering Module-GSM	YES	YES	NO
2011D-A0L	NEON Remote Module-GSM	YES	NO	YES
2011D-ABL	NEON Remote Module-GSM	YES	YES	YES

	Neon Satellite Modules			
2012D-A00	NEON Remote Module-Satellite	YES	NO	NO
2012D-AB0	NEON Remote Module-Satellite	YES	YES	NO
2012D-A0L	NEON Remote Module-Satellite	YES	NO	YES
2012D-ABL	NEON Remote Module-Satellite	YES	YES	YES

	Neon Metering & Remote Modules- NextG			
2013D-A00	NEON Metering Module-NEXT-G	YES	NO	NO
2013D-AB0	NEON Metering Module-NEXT-G	YES	YES	NO
2013D-A0L	NEON Remote Module-NEXT-G	YES	NO	YES
2013D-ABL	NEON Remote Module-NEXT-G	YES	YES	YES

	Neon Remote Terminal- GPRS			
2014D-A00	NEON Remote Terminal-Terrestrial	YES	NO	NO
2014D-AB0	NEON Remote Terminal-Terrestrial	YES	YES	NO

	Neon Remote Terminal - Satellite			
2015D-A00	NEON Remote Terminal-Satellite	YES	NO	NO
2015D-AB0	NEON Remote Terminal-Satellite	YES	YES	NO

	Neon Remote Terminal- NextG			
2016D-A00	NEON Remote Terminal-NextG-virtual	YES	NO	NO
2016D-AB0	NEON Remote Terminal-NextG-virtual	YES	YES	NO