



Inspired Wireless M2M Technology



# linkCONNECT

Cellular Wireless Cable Replacement

## Software Manual

Rev 7.1

## Table of Contents

	<b>Page</b>
<b>Introduction</b>	<b>3</b>
About linkCONNECT	3
<b>About Siretta</b>	<b>4</b>
<b>General Description</b>	<b>5</b>
Features	5
Ordering Information	6
<b>Configuration Tool</b>	<b>7</b>
Setting up The Configuration Tool	7
Editing the linkCONNECT Device Parameters	11
Configuration Tool Command Description	13
Manage Settings	19
<b>SMS Configuration</b>	<b>22</b>
SMS Command Description	22
Setup Considerations	25
SMS Confirmation	25
<b>Usage Mode Examples</b>	<b>26</b>
Client Mode	26
Server Mode	28
Client / Server Communications Test	30
Application Development Test	31
<b>General Considerations</b>	<b>37</b>
Ping Reboot	37
Network Timeout	37
General Notes	38
<b>Disclaimer</b>	<b>39</b>
<b>Definitions</b>	<b>40</b>

## Introduction

This document describes the setup and configuration procedure for the Siretta linkCONNECT products.

Please note that the setup procedures explained in this document apply to all Siretta linkCONNECT modem products unless otherwise stated.

### About linkCONNECT

linkCONNECT is both an automated and managed hardware solution to provide a serial link across a mobile data network. No knowledge of how modems, the AT commands that control them, or how mobile data networks work is required. No drivers are required, nor is any reconfiguration of the equipment connected required in order for linkCONNECT to replace an existing serial cable.

linkCONNECT automatically manages the serial link, reconnecting automatically and transparently if there are any dropouts on the mobile network to maintain 24/7 connectivity.

Because linkCONNECT connects over the Internet, usage costs are based on the amount of data transferred, not the link duration. This makes linkCONNECT ideal for applications that have low data usage but require always on connectivity.

Setup of the product can be done either with a PC, or a mobile phone using SMS text messaging.

## About Siretta

Siretta, located in Reading, United Kingdom have been manufacturing antennas, cable assemblies and cellular terminals for over 10 years. We supply our products globally to many of the world's leading organisations.

Whether you require an off the shelf or custom solution, Siretta has a wide portfolio of antenna, RF cable assemblies and terminals to fit your application.

Our extensive knowledge and experience in the wireless market allows us to support a wide range of customer applications, focusing on frequencies typically within the 75MHz - 5.8GHz range. These encompass the HF, VHF, ISM, GSM/GPRS/3G/4G and GPS frequencies as well as industrial WLAN and VHF/UHF antenna/Wi-Fi antenna solutions.

With a heavy emphasis on design, we have a team of dedicated Application Engineers and Product Managers, backed up by Field Sales Engineers, who specialise in wireless applications.

We have made significant investments in R&D facilities which boast GPS hardware development equipment and a GSM Pico Cell on site, as well as development software and a comprehensive suite of Industrial, Scientific and Medical band, and non ISM band frequency products. We have many technology partners enabling us to keep at the forefront of the communications industry and offer class leading wireless solutions.

## General Description

Siretta linkCONNECT is a serial cable replacement solution, sending serial data over a TCP/IP data pipe.

Siretta linkCONNECT is designed to connect remote devices together as if they were physically connected in the same location via a serial cable. The software can be configured to allow remote devices to connect into a server or a server to connect into a remote device.

linkCONNECT can be used in multiple remote access applications and is also completely configurable in the field via SMS commands, or locally using our configuration tool via RS232 serial.

### Applications include:

- » Remote diagnostics of site equipment
- » Gathering of data from remote equipment
- » Vending machine administration
- » Control and monitoring of remote equipment
- » Serial cable replacement
- » Dial-in services
- » Lighting control systems
- » Temperature monitoring
- » Burglar Alarm / Fire Alarm / PIR Alarm panel trigger monitoring
- » Daily data transmission automation
- » Land-line not present / available replacement services

### Features

- » Remote SMS configuration
- » Multiple Server Ping
- » Automatic reboot timer
- » Configurable connection timeout
- » GSM keepalive
- » CSD backup if GPRS fails

## Ordering Information

	LC	X00	-	XXXX (EU)
<b>Range Identifier</b> LC = linkCONNECT software				
<b>Modem Identifier</b> 200 = linkCONNECT 200 Series 300 = linkCONNECT 300 Series 400 = linkCONNECT 400 Series				
<b>Product Module Version</b> GPRS (EU) = GPRS Technology with EU Coverage UMTS (EU) = UMTS Technology with EU Coverage				

## Part Numbering Example

- » LC200-GPRS (EU) = linkCONNECT 200 series 2G / GPRS solution with EU coverage

# Configuration Tool

## Setting up the Configuration Tool

Step 1. Download the configuration tool using the following link:

[http://www.siretta.co.uk/downloads/config\\_utility.exe](http://www.siretta.co.uk/downloads/config_utility.exe)

Step 2. Download the RS232 Gateway Tester tool using the following link:

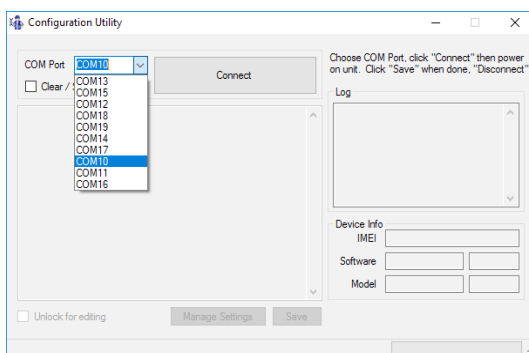
[http://www.siretta.co.uk/downloads/rs232\\_gateway\\_tester.exe](http://www.siretta.co.uk/downloads/rs232_gateway_tester.exe)

Step 3. Download the RS232 Gateway Tester Client tool using the following link:

[http://www.siretta.co.uk/downloads/rs232\\_gateway\\_tester\\_client.exe](http://www.siretta.co.uk/downloads/rs232_gateway_tester_client.exe)

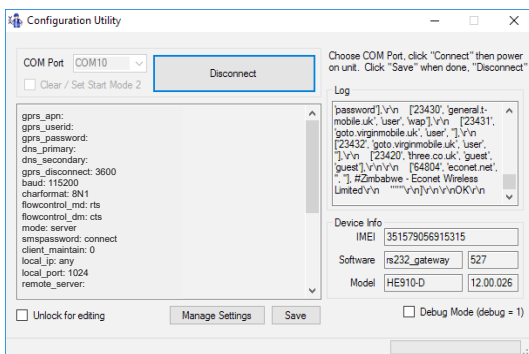
Step 4. Open the configuration utility tool 'config\_utility.exe' and select the correct COM port for your system and click 'Connect' in the configuration tool window.

Figure 1. Set device COM port



**Step 4.** Power on your linkCONNECT device\*. On successful connection, figure 2 below will be displayed.

Figure 2. Set device COM port

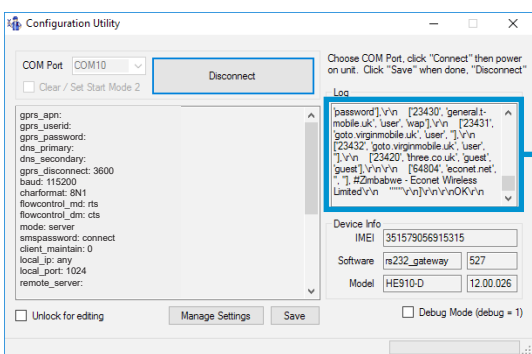


\*For more information on powering on your linkCONNECT device, see relevant Quick Start Guide for your device.

### Log

The log box displays the communication between the software and the modem.

Figure 3. Log box



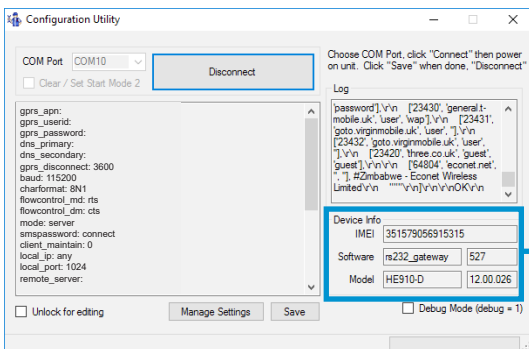
Modem serial communication log window



### Device Info

Information about the connected device.

Figure 4. Device information



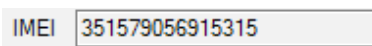
Information window showing modem firmware and software versions installed

### IMEI

International Mobile Equipment Identity (IMEI) number of the device.

**NOTE:** this number can't be changed.

Figure 5. IMEI number



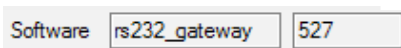
IMEI number of the device

### Software

The current software type / software number on the device.

**NOTE:** this number can't be changed.

Figure 6. Device software



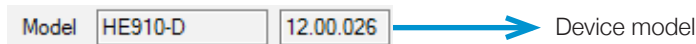
Software / software number of the device

### Model

The model name of the device.

**NOTE:** this number can't be changed.

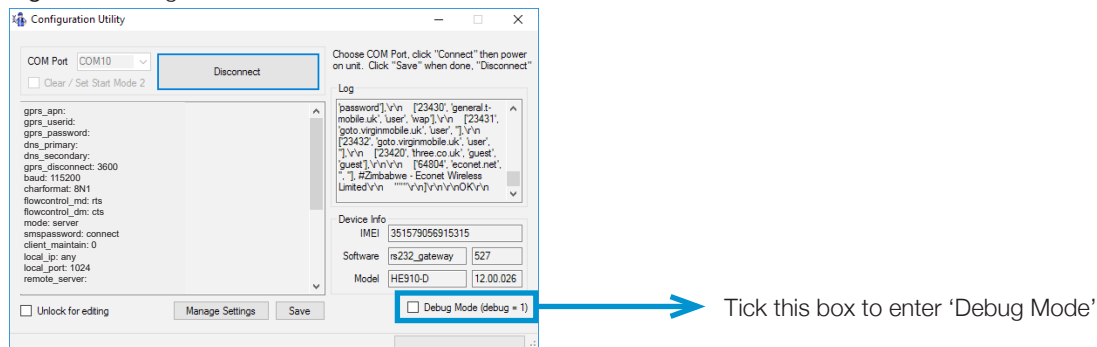
Figure 7. Device model



### Debug Mode

The device streams debug information about what it is doing over the serial port, rather than functioning autonomously. You can read back the log to see what problems are occurring.

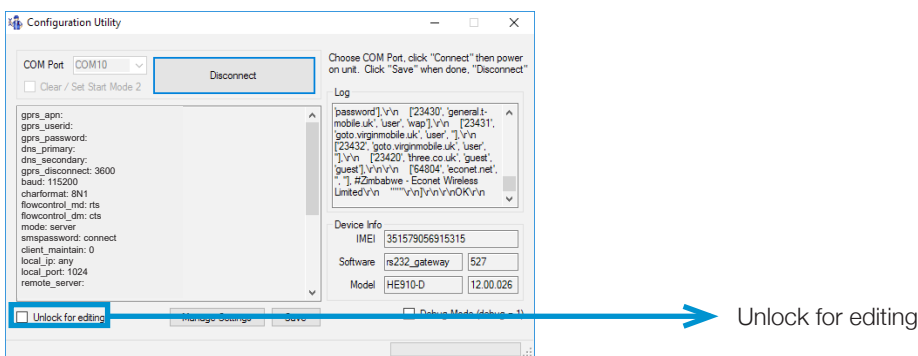
Figure 8. Debug mode



### Editing linkCONNECT Device Parameters

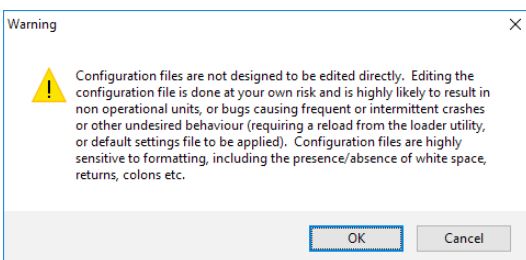
**Step 1.** To change the parameters for your device, select the 'Unlock for editing' check box to allow changes to be made

Figure 9. Change device parameters



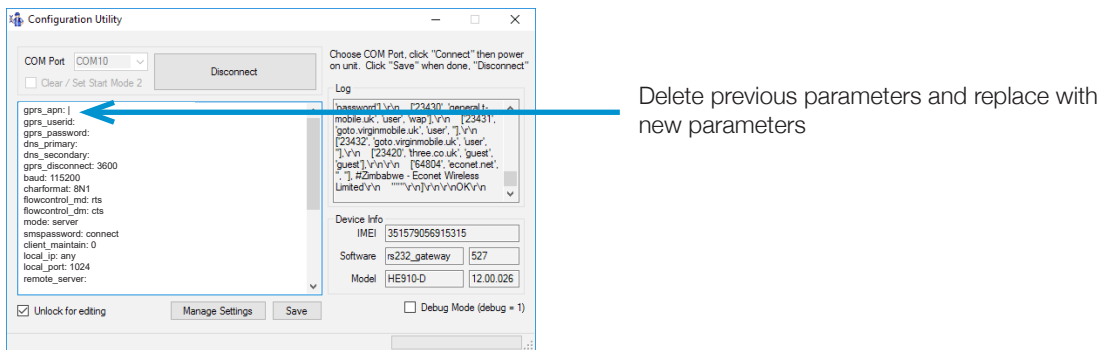
**Step 2.** A warning message will appear. Please read this carefully and make sure you understand the points made before clicking 'OK'.

Figure 10. Accept warning message



**Step 3.** To change the parameters select the text you wish to edit and replace it with new parameters (*follow this step for all parameters that are required to be changed*)\*

Figure 11. Edit parameters



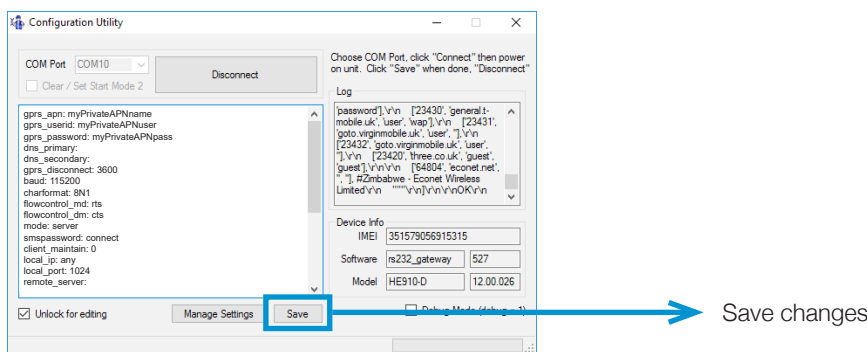
**NOTE:** Be careful with parenthesis and white spaces as the information entered must be entered accurately.

There must be a white space between the ':' and the value, for example - gprs\_apn: value

There must not be a white space after the value, for example - gprs\_apn: value<no white space>

**Step 4.** Once the relevant changes have been made, click 'Save' to commit the changes to the modem.

Figure 12. Save changes



\*Please see all commands and syntax from the "Configuration Tool Command Description" section overpage.

### Configuration Tool Command Description

#### gprs\_apn

**Format:** APN name (As obtained by the network service provider)

*For example Vodafone has a Public APN of 'internet'*

**Example:** apn\_name: internet

Allows setting of the GPRS APN for the SIM card. These must be obtained from the SIM card provider.

#### gprs\_user

**Format:** APN username (As obtained by the network service provider)

*For example Vodafone has a Public APN username of 'web'*

**Example:** apn\_user: web

Allows setting of the GPRS APN username for the SIM card. These must be obtained from the SIM card provider.

#### gprs\_pass

**Format:** APN password (As obtained by the network service provider)

*For example Vodafone has a Public APN password of 'web'*

**Example:** apn\_pass: web

Allows setting of the GPRS password for the SIM card. These must be obtained from the SIM card provider.

#### dns\_primary

**Format:** Primary DNS address for the network (As obtained by the network service provider)

*For example Vodafone has a primary DNS address of '212.183.137.012'*

**Example:** connect mode server any 1024

Allows setting of the GPRS primary DNS settings for the network SIM card. These settings must be obtained from the SIM card provider. The primary DNS parameter is generally not required for normal use and should only be used if standard device configuration does not work.

#### dns\_secondary

**Format:** Secondary DNS address for the network (As obtained by the network service provider)

*For example Vodafone has a secondary DNS address of '212.183.137.012'*

**Example:** dns\_secondary: 212.183.137.012

Allows setting of the GPRS secondary DNS settings for the network SIM card. These settings must be obtained from the SIM card provider. The secondary DNS parameter is generally not required for normal use and should only be used if standard device configuration does not work.

### gprs\_disconnect

**Format:** Disconnect the gprs session after timeout (As required by the application)

**Example:** gprs\_disconnect: 3600

Allows a default no activity timeout on the cellular connection. After this timeout has elapsed the gprs connection will be closed and if required a new connection will be established. This is to prevent stale sockets and unresponsive connections. Value is measured in seconds. Default setting is 3600 (60 minutes).

### baud

**Format:** Baud rate (As required by the connected equipment)

**Example:** baud: 115200

Allows setting of the serial port speed used to communicate with the attached serial device. Accepted values are: 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.

### charformat

**Format:** Character format (As required by the connected equipment)

**Example:** charformat: 8N1

7 / 8 - Data Bits

N / E / O - No Parity / Even Parity / Odd Parity

0 / 1 / 2 - Stop Bits

Allows setting of the serial port data bits, parity, stop bits used to communicate with the attached serial device. Accepted values are 8N2, 8E1, 8O1, 8N1, 7E1, 7O1.

### flowcontrol\_md

**Format:** Device hardware flow control modem to attached device (As required by the application)

**Example:** flowcontrol\_md: rts

Allows setting of the request to transmit signal for serial hardware flow control. Valid values are rts and none (none = disables hardware flow control)

### flowcontrol\_dm

**Format:** Device hardware flow control from attached device to modem

**Example:** flowcontrol\_dm: cts

Allows setting of the clear to send signal for serial hardware flow control. Valid values are cts and none (none = disables hardware flow control)

### mode

**Format:** Mode of operation (As required by the device)

**Example 1:** mode: server

Allows setting of the software into server mode where the device listens for a connection from a remote client on a specified port (additionally a source IP can be specified, and only connections from this IP will be accepted). See command 'local\_ip' for more information.

**Example 2:** mode: client

Allows setting of the software into client mode where the device remotely connects to a server at a specified IP address and port. It can either connect when data is received on the serial port and then disconnect or permanently maintain a connection to the specified server reconnecting if it is disconnected. See command 'client\_maintain' for more information.

### smspassword

**Format:** smspassword (As required for device authentication)

**Example:** smspassword: connect2

Allows setting of a new SMS authentication password. This password is required for use in all SMS command messages sent to the unit. The default password is "connect". Valid values are 1-12 characters of 0 - 9, a - z only.

**NOTE:** If you forget the SMS password which is set in the unit, the only way to reset it is by using this configuration tool.

### client\_maintain

**Format:** Client maintain (The device maintains a permanent connection with the server)

**Example:** client\_maintain: 0

0 – Only send data when available

1 – Always stay connected to the server

Allows the device to only send data when it is presented on the serial port or to try and maintain a permanent connection with the server so that any data presented on the serial port is routed directly to the server address.

### local\_ip

**Format:** In 'server' mode this setting is used for the IP address accepted by the local unit (As required for device authentication)

**Example 1:** local\_ip: any

Allows setting up a firewall for incoming socket connections to the device. When set to 'any' then an incoming connection from any IP address will be accepted. When set to an IP address, only this IP specific address will be accepted by the device for incoming socket connections. Valid values are IPv4 in the following format: xxx.xxx.xxx.xxx separated by commas.

**NOTE:** If you set the local\_ip to a specific server value and your server IP address changes the device will no longer accept incoming connections from this server.

### local\_port

**Format:** In 'server' mode this setting is used for the Incoming IP port accepted by the local unit (As required for device authentication)

**Example:** local\_port: 1024

Allows setting up the specific port for incoming data socket connections to the device. Only connections to this specific port will be accepted. Valid values are standard port values up to 65000.

**NOTE:** Many SIM card providers block port ranges below port 1024. This is for security reasons and is designed to prevent using ports which are allocated to specific web enabled services.

### remote\_server

**Format:** In 'client' mode this parameter is used to set the server IP address that is dialled by the local unit (As required by the application)

**Example:** remote\_server: xxx.xxx.xxx.xxx

The server address specified here is dialled by the device when the device has information to send to the remote server. The device can only connect to one server at a time and the server must be online and able to accept incoming connections for the device to successfully connect.

**NOTE:** If the server address changes then this setting must be changed to match the new server address settings.

### remote\_port

**Format:** In 'client' mode this parameter is used to set the outgoing IP port dialled by the local unit (As required by the application)

**Example:** remote\_port: 51024

Allows setting up the specific port on the server used for remote for incoming data socket connections from the device. Only connections to this specific port will be accepted by the server. Valid values are standard port values up to 65000.

**NOTE:** Many SIM card providers block port ranges below port 1024. This is for security reasons and is designed to prevent using ports which are allocated to specific web enabled services.



### sock\_timeout

**Format:** Server socket timeout (As required by the application)

**Example 1:** sock\_timeout: 300

Allows a default no activity timeout on the socket connection. After this timeout has elapsed the socket connection will be closed and if required a new connection will need to be established. This is to prevent stale sockets and unresponsive connections. Valid values are 0 - 65535 (0 = no timeout, specified in seconds) and the default value is 5 minutes.

### send\_timeout

**Format:** Packet send timeout (As required by the application)

**Example:** send\_timeout: 300

Allows you to set a time to wait for the next packet to be filled with valid data. After this timeout the packet is sent whose size is less than the 'packet\_size' default. Valid values are 0 - 255 (0 = no timeout means wait for packets to reach max size specified by the 'packet\_size' value). It is specified in 100ms units, i.e. a value of "10" is 1 second

### packet\_size

**Format:** Set packet size (As required by the application)

**Example:** packet\_size: 0

Allows you to set the size in bytes for the next packet to be filled with valid data. After this packet size is reached the packet is sent assuming that this packet is filled before the 'send\_timeout' value expires. Valid values are 0 - 512 (0 = chosen automatically by device). It is specified in bytes.

**NOTE:** The customer is advised to set a socket timeout value which balances their need for fast detection of a network condition causing a TCP connection to improperly close (i.e. availability of the RS232 Gateway for reconnection) against the increased GPRS traffic overhead incurred as the results of a lower timeout limit meaning the server must send arbitrary data at an increased frequency to keep the connection open.

### dialin\_enabled

**Format:** Set the ability to dial in to the device using CSD (As required by the application)

**Example:** dialin\_enabled: 1

0 – No dial in is allowed over CSD

1 – Dial in is allowed over CSD

Allows turning on or off support for remote dial in via a CSD (Circuit Switched Data) connection. When this setting is turned on, and the unit is in server mode, inbound connections can be accepted via either GPRS or CSD. By default this setting is turned off for security reasons. Regardless of the baud rate established by the CSD connection, the baud rate of the serial port will be the value configured by the "baud" SMS command message.

### reset

**Format:** Reset device to a schedule (As required by the stability requirements)

**Example 1:** reset: 120

Allows enabling a periodic unit reset that will automatically reset internal software and reboot the modem on a timed schedule. This value is specified in minutes. Valid values are 0 - 1440 i.e. 120 would be 2 hours and 1440 would be 24 hours (0 = reset mode is disabled).

**NOTE:** This setting is not designed to be used in normal operation, it is designed when other avenues or fault finding the cause of a reliability issue have failed.

### check\_call\_forward

**Format:** Forces device to check call forwarding status (As required by the stability requirements)

**Example:** check\_call\_forward: 300

Allows automatic checking of the call forwarding status from the mobile network on a scheduled basis. This is for situations where the network is not responding to a cellular device which is registered on the network and causes an unreliable connection. Accepted values are: 0 (0 = turn off check) and a valid number which is measured in minutes. So 120 would be 2 hours and 1440 would be 24 hours.

### ping\_hosts

**Format:** Network ping (As required by the stability requirements)

**Example:** ping\_hosts: google.com,bbc.co.uk

Allows enabling of a periodic ping made from the linkCONNECT device to a remote server. If specified the server/servers will be checked on the interval (assuming no connection is currently in progress) specified by 'ping\_check\_intv'. If the server/servers are unreachable (due to GSM failure / network failure / configuration failure condition which prevents access to the Internet) the unit will be rebooted. Valid hosts are separated by commas.

### ping\_check\_intv

**Format:** Network ping check interval (As required by the stability requirements)

**Example:** ping\_check\_intv: 300

Allows specifying the length of the periodic ping made from the linkCONNECT device to a remote server. The ping will not be performed if there is an active session open. If the ping fails and the unit is rebooted, then the software will not be reboot the device more frequently than once every 15 minutes. Interval is specified in seconds and valid values are 60 - 86400 (i.e. 24 hours).

**NOTE:** This setting is not designed to be used in normal operation, it is designed when other avenues of fault finding the cause of a reliability issue have failed.

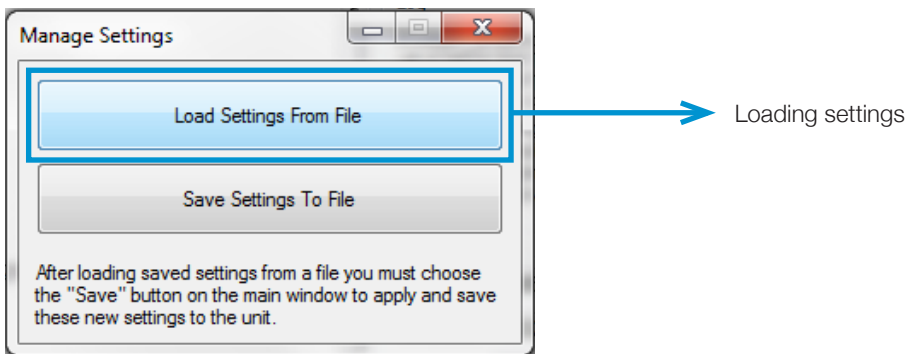
## Manage Settings

The 'Manage Settings' buttons allows you to manage the device settings.

### Load Settings From File

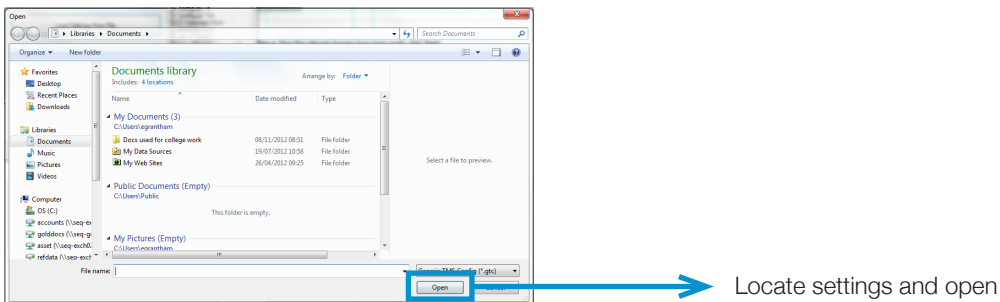
Step 1. To load settings from a current file, select the option 'Load Settings From File'

Figure 13. Load previous settings



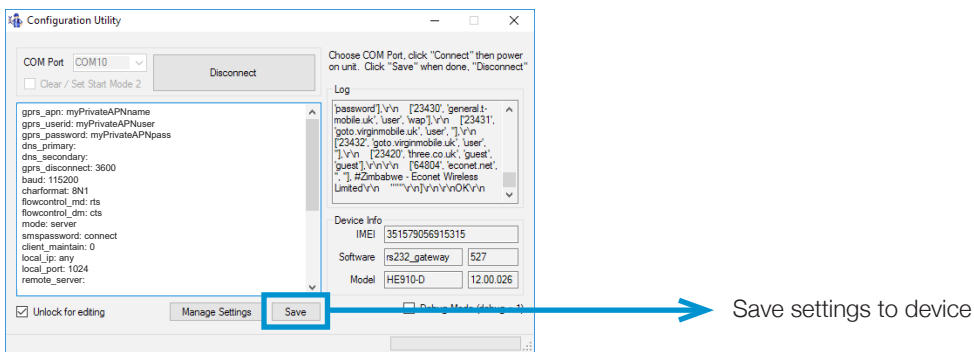
Step 2. A new window will open, find your configuration file (\*.gtc) and press 'Open'

Figure 14. Locate settings



**Step 3.** Once the configuration file settings have loaded, click 'Save' to commit the changes to the modem

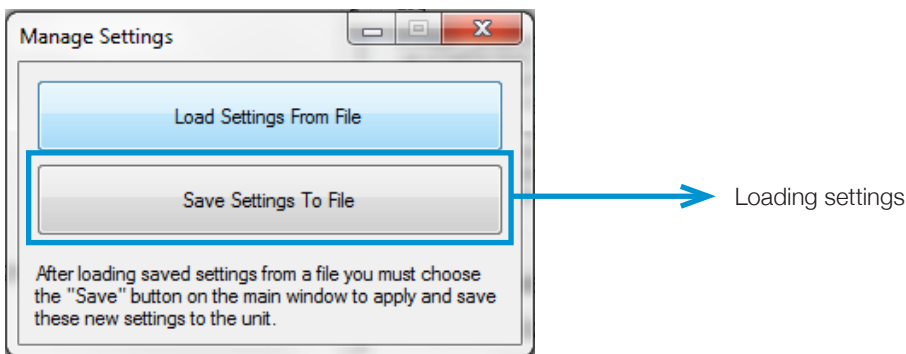
Figure 15. Save settings



### Save Settings To File

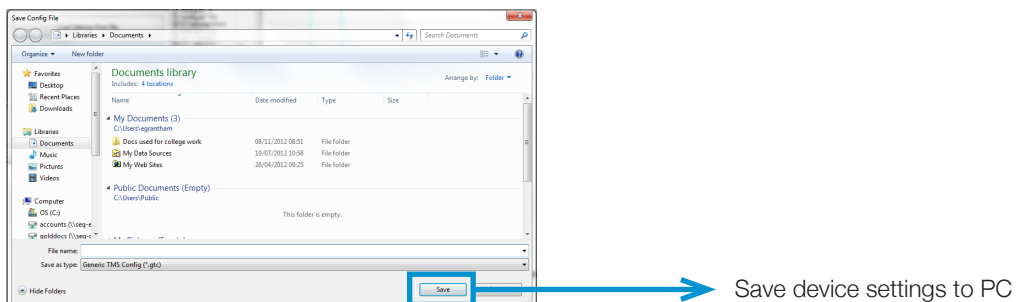
**Step 1.** To save current settings to file, select the option 'Save Settings To File'

Figure 16. Save settings



**Step 2.** A new window will open containing your documents, name your file and find the location you require to save your configuration file . Press **'Save'** to save the file to your PC.

Figure 17. Save settings



## SMS Configuration

Configuration parameters can be set up by using the configuration utility or by sending SMS text messages. In order to update the unit via SMS, a secure password (from hereon `smspassword`) is required which can also be set by using the utility. Once the settings have been successfully changed, the unit automatically replies with a confirmation of the change. Pages 22 - 25 describe the configuration parameters and commands used to set these parameters.

### SMS Command Description

Default `smspassword`: **connect**

#### GPRS

**Format:** [`smspassword`] `gprs` [`apn`] [`username`] [`password`]

**Example:** `connect gprs orangeinternet user pass`

Allows setting of the GPRS `apn`, `username`, and `password` for the SIM card. These can be obtained from the SIM card provider.

#### Baud

**Format:** [`smspassword`] `baud` [`baud`]

**Example:** `connect baud 115200`

Allows setting of the serial port speed used to communicate with the attached serial device. Accepted values are: 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.

#### Charformat

**Format:** [`smspassword`] `charformat` [`charformat`]

**Example:** `connect charformat 8N1`

7 / 8 - Data bits

N / E / O - No / Even / Odd Parity

0 / 1 - Stop bits

Allows setting of the serial port data bits, parity, stop bits used to communicate with the attached serial device. Accepted values are 8N2, 8E1, 8O1, 8N1, 7E1, 7O1.

#### Mode server

**Format:** [`smspassword`] `mode server` [`permitted ip`] [`localport`]

**Example 1:** `connect mode server any 1024`

**Example 2:** `connect mode server 192.168.0.1 1024`

Allows setting of the software into server mode where the device listens for connection from a remote client on a specified port (additionally a source IP can be specified, and only connections from this IP will be accepted).

### Mode client

**Format:** [smspassword] mode client [server] [serverport]

**Example 1:** connect mode client 192.168.0.100 1024

**Example 2:** connect mode client 192.168.0.100 1024 maintain

Allows setting of the software info client mode whereby it remotely connects to a server at a pre specified IP address and port. It can either connect only when data is received on the serial port, or permanently maintain a connection to the specified server reconnecting if it is disconnected.

### Socketsetting

**Format:** [smspassword] socketsetting [socket timeout] [send timeout] [packet size]

**Example:** connect socketsetting 300 100 0

Allows setting of timeout values, and packet size used.

**Socket Timeout** – Time after which the socket will be closed if no data is sent or received. Valid values are 0 - 65535 (0 = no timeout, it is specified in seconds)

**Send Timeout** – Time after which a packet is sent whose size is less than the default. Valid values are 0 - 255 (0 = no timeout, wait for packets to reach max size, it is specified in 100ms units, i.e. a value of “10” is 1 second)

**Packet Size** – Size of packets used by the TCP stack when sending data. Valid values are 0 - 512 (0 = chosen automatically by device, it is specified in bytes)

The customer is advised to set a socket timeout value which balances their need for fast detection of a network condition causing a TCP connection to improperly close (i.e. availability of the RS232 Gateway for reconnection) against the increased GPRS traffic overhead incurred as the results of a lower timeout limit meaning the server must send arbitrary data at an increased frequency to keep the connection open.

### Smspassword

**Format:** [smspassword] smspassword [newsmspassword]

**Example:** connect smspassword connect2

Allows setting of a new password. The pin number is required in all SMS command messages sent to the unit. The default password is “connect”. Valid values are 1-12 characters of 0 - 9, a - z only.

### Dialin

**Format:** [smspassword] dialin [status]

**Example:** connect dialin on

Allows turning on or off support for remote dial in via a CSD (Circuit Switched Data) connection. When this setting is turned on, and the unit is in server mode, inbound connections can be accepted via either GPRS or CSD. By default this setting is turned off. Regardless of the baud rate established by the CSD connection, the baud rate of the serial port will be the value configured by the “baud” SMS command message.

### Config

**Format:** [smspassword] config

**Example:** connect config

On receipt this message the software will return the current active configuration settings, when in “server” mode this includes the local IP address.

### Reset

**Format:** [smspassword] reset [reset interval]

**Example:** connect reset 120

Allows enabling of a periodic unit reset that will automatically reset internal software. Valid values are 0 - 1440 i.e. 24hr (0 = reset disabled). Note: This value is specified in minutes. This setting is not designed to be used in normal operation, it is designed when other avenues or fault finding the cause of a reliability issue have failed.

### Ping

**Format:** [smspassword] ping [ping interval] [server (s)]

**Example 1:** conenct ping 300 google.com

**Example 2:** connect ping 300 google.com bbc.co.uk

Allows enabling of a periodic ping made from the gateway to a remote server. If specified the server/servers will be checked on the interval (assuming no connection is currently in progress), and if unreachable (due to e.g. GSM / software failure condition preventing access to the Internet) the unit will be rebooted. It will not be rebooted more frequently than once every 15 minutes. Interval specified in seconds. Valid values are 60 - 86400 (i.e. 24 hours). This setting is not designed to be used in normal operation, it is designed when other avenues of fault finding the cause of a reliability issue have failed.



### Setup Considerations

To accept new commands via SMS message the unit must not have any active socket connections open. Active socket connections can be disconnected by closing them on the remote side or rebooting the unit.

### SMS Confirmation

The unit will acknowledge the receipt of the SMS and action correctly formatted command messages with a message in the format “Confirmed: [command confirmed]”. Incorrectly formatted messages will be responded to with “Error: [error message]”.

Replies are sent to the sender of the original request. The only exception is that command messages sent with an invalid password will not be responded to.

“**socket timeout**” is specified in seconds. Valid values are 0 - 65535 (0 = no timeout)

“**send timeout**” is specified in 100ms units, i.e. a value of “10” is 1 second. Valid values are 0 - 255 (0 = no timeout, wait for packets to reach max size)

“**packet size**” is specified in bytes 0 - 512 (0 = chosen automatically by device)

“**smspassword**” must be composed of 0-9, a-z, only and 1-12 characters in length.

“**dialin**” CSD dial in default setting is off for security.

“**mode client**” – the Gateway unit is configured as a client: making outbound connections to a remote server on the specified IP address / port. If the “**maintain**” keyword is used connections will be made immediately and kept open (reconnecting if a timeout or disconnect for any other reason occurs).

Without the “**maintain**” keyword connections will only be made if data is received on the serial port, and will be closed after the socket timeout is reached.

“**mode server**” – Gateway unit is configured as a server: accepting incoming connections from a remote client with the specified source IP address on the specified local port. This mode requires a fixed IP address SIM card to operate correctly.

“**baud**” - Accepted values: 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

“**config**” - Return current active configuration settings

## Usage Mode Examples

### Client Mode

**Step 1.** Select the COM port to which the linkCONNECT modem is connected and the required parameters.\*

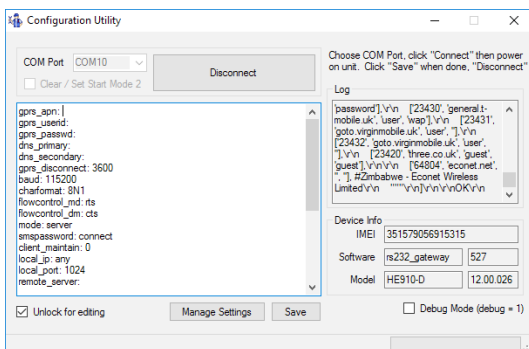
The unit is set up in client mode to connect to the Siretta server at 89.151.126.210 on port 41031 (**figure 18**). The parameters on the RS232 Gateway Tester must be set accordingly on the unit as well. The settings for client mode can be set using SMS as follows:

Default smspassword: **connect**

- » connect baud: 115200
- » connect charformat: 8N1
- » connect flowcontrol: rts cts
- » connect socksetting: 90 10 0
- » connect mode: client 89.151.126.210 41031 maintain

To set up the same parameters using the utility, enter baud, charformat, flowcontrol\_md, flowcontrol\_dm, mode, client\_maintain, remote port and remote server.

**Figure 18.** Setting parameters

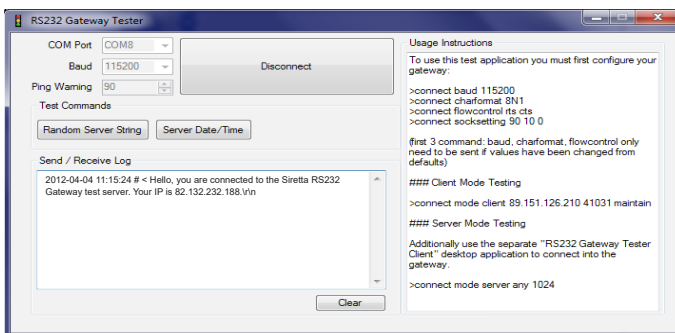


The RS232 Gateway Tester will be used to test the unit in a server environment.

\*The parameters shown in the figure above (baud rate, character formatting, flow control, socksetting) must be configured on the unit by SMS or by using the utility.

**Step 2.** Open the RS232 Gateway Tester application 'rs232\_gateway\_tester.exe' Once all the parameters have been entered correctly in the configuration tool for the linkCONNECT device from the RS232 Gateway Tester 'Usage Instructions', press 'Connect'. Upon successful connection to the Siretta server, a 'Hello' message is displayed as shown in figure 19 below

Figure 19. Connection to Siretta server



Once connected to the server, you will be able to send a date and time request or a random string to the server as shown in the figures below (figures 20 & 21).

Figure 20. Date and time response

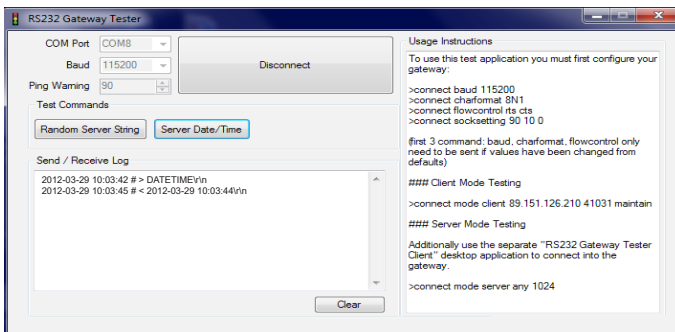
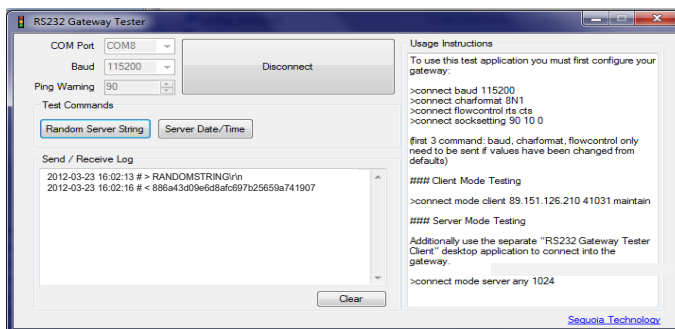


Figure 21. Sending a random string to Siretta server



### Server Mode

In order to set the unit up in server mode, it is necessary that a fixed IP address be used for a connection into the modem. Let us assume that the APN, username and password to obtain a fixed IP address are myprivateAPN, myprivateUsername, and myprivatePassword respectively.

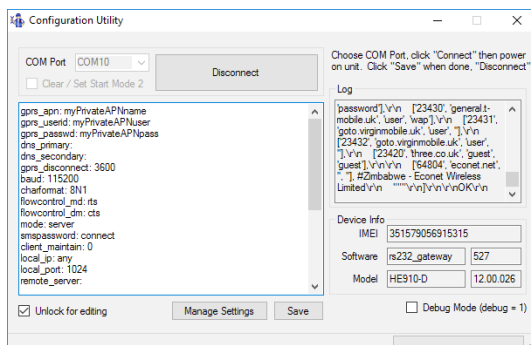
**Step 1.** The server mode can be set via SMS as follows:

Default smspassword: **connect**

- » connect mode server any 1024
- » connect GPRS myprivateAPN myprivateUsername myprivatePassword\*

To set up the same parameters using the utility, enter mode, local IP and local port as shown in **figure 22** below.

Figure 22. Setup parameters



\*In order to be able to successfully connect to the linkCONNECT modem in server mode, you must use a SIM with fixed IP which will usually have a specific APN name, Username and Password.

The RS232 Gateway Tester Client will then be used to dial into the linkCONNECT modem via the fixed SIM IP and set port.

**Step 2.** Open the RS232 Gateway Tester Client tool 'rs232\_gateway\_tester\_client.exe' and enter the correct IP address of the unit and port. It is recommended to set the Timeout value on the application to be less than the timeout of the linkCONNECT unit to avoid any clashes. The fixed public IP address of the SIM used in this scenario is 93.93.232.71

Press 'Connect' to communicate with the unit (figure 23).

Figure 23. Client mode used to dial into the linkCONNECT modem

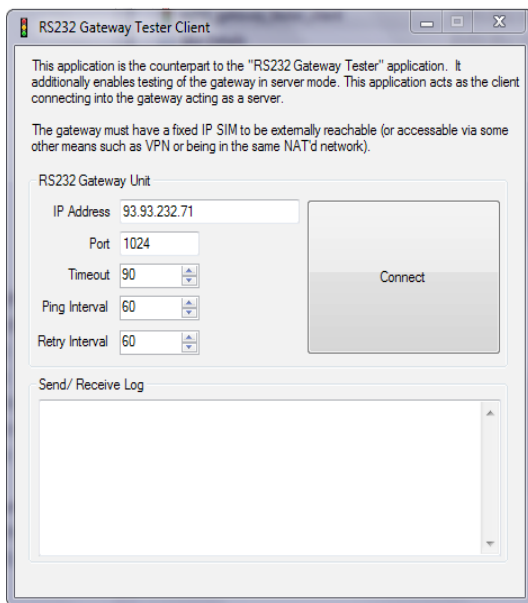
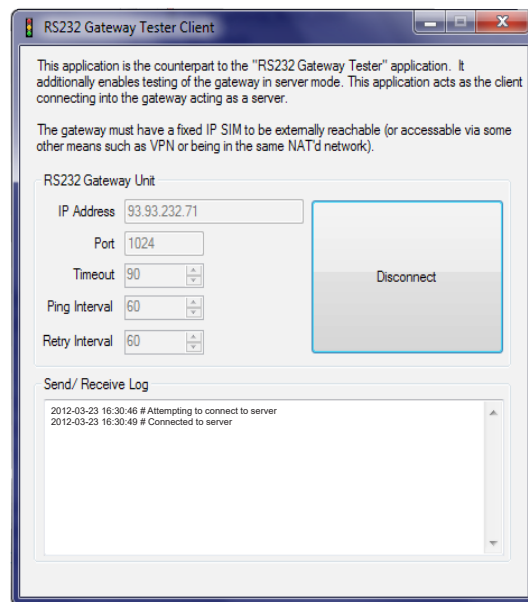


Figure 24. Parameter selection



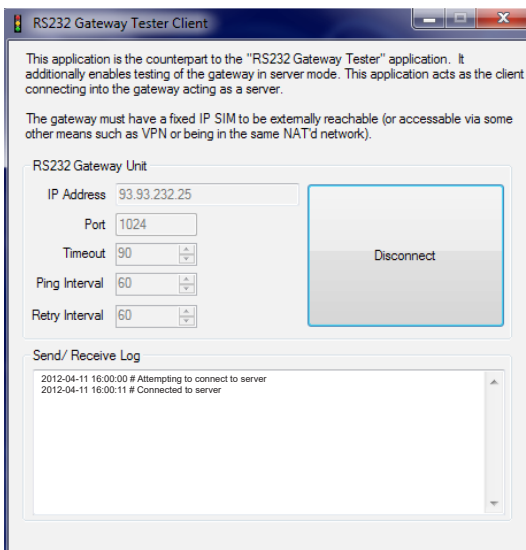
The Client tester will display a prompt as shown in figure 24 above once connected to the linkCONNECT modem server.

### Client / Server Communications Test

In this scenario we will test the client / server communications using both the RS232 Gateway Tester and the RS232 Gateway Tester Client.

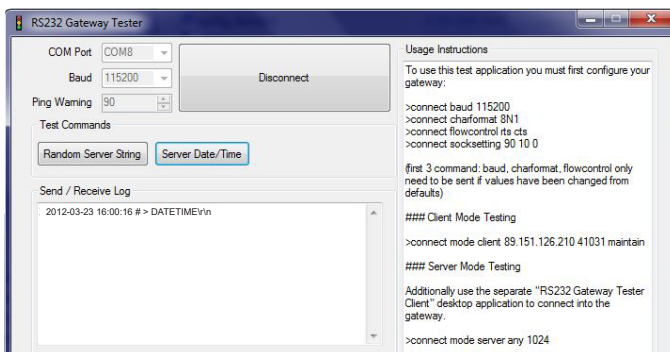
**Step 1.** Use the RS232 Gateway Tester Client to connect to the unit as explained in 'Server Mode' (see page 28). You will be prompted upon successful connection to the unit. The fixed IP address of the SIM used here is 93.93.232.25 (see figure 25 below).

Figure 25. Connected to server



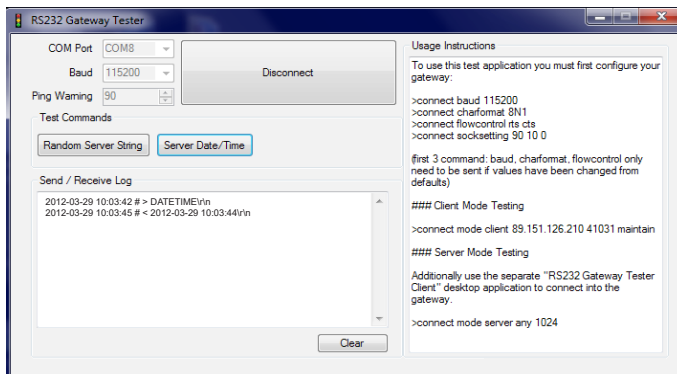
**Step 2.** Use the RS232 Gateway Tester utility to connect to the linkCONNECT modem using the RS232 port as explained in 'Client Mode' (see page 26). Once connected, send a date and time request to the server (figure 26).

Figure 26. Send date and time request



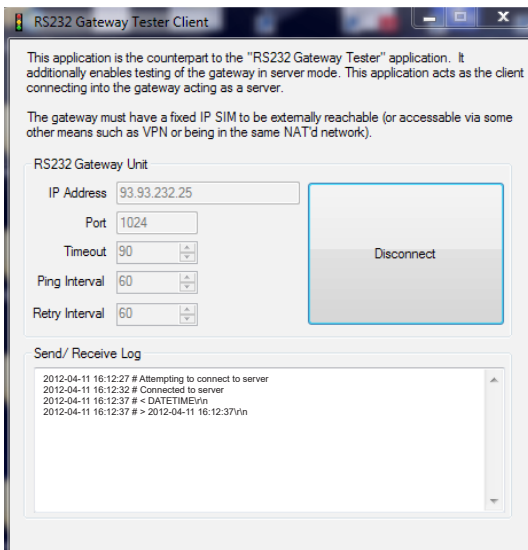
The RS232 Gateway Tester Client responds back with the requested date and time as shown in figure 27 below.

Figure 27. Server response



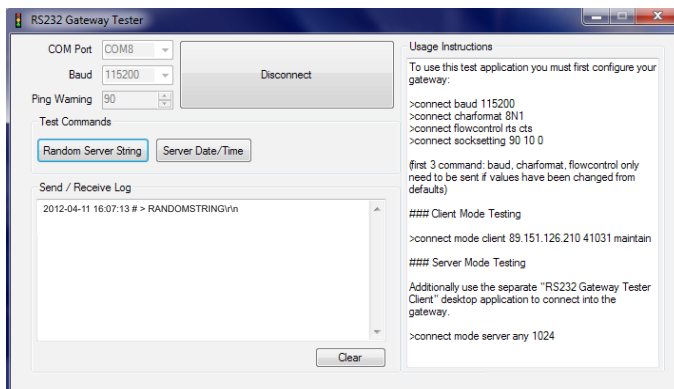
It can be observed from **figure 36** below that the RS232 Gateway Tester Client has received the date and time request and has sent the date and time back to the RS232 Gateway Tester.

Figure 28. Request and response at the linkCONNECT modem



**Step 3.** Now send a random string to the unit. The server will respond back with the random string as shown in **figure 29** below.

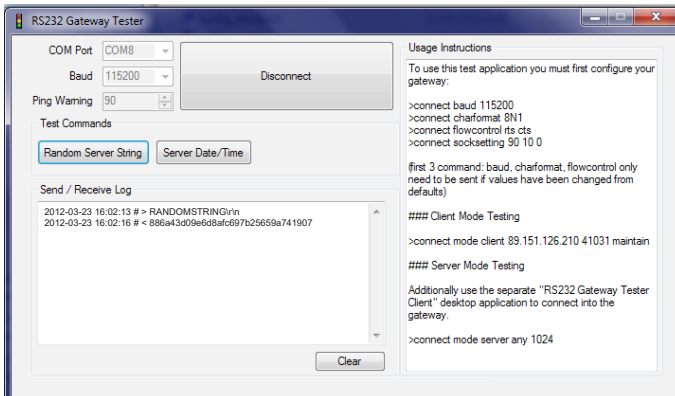
Figure 29. Random string request





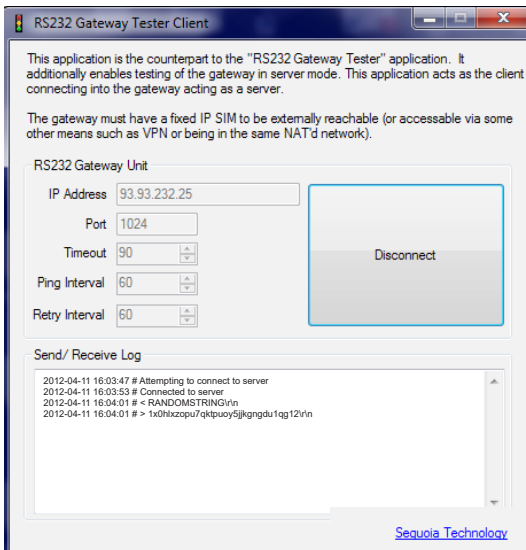
The server responds back with the requested random string see **figure 30** below.

**Figure 30.** Random string response



As seen in **figure 31** from the RS232 Gateway Client utility, the server receives the random string request and responds back with a random string.

**Figure 31.** Random string request and response



### Application Development Test

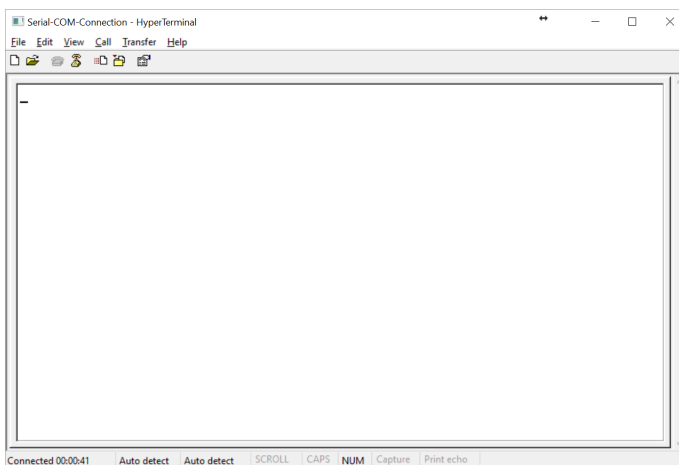
An application development tests the client / server communications using HyperTerminal. Set the unit up in server mode using the config tool as explained in 'Server Mode' (see page 28).

**Step 1.** Open a HyperTerminal session and connect to the linkCONNECT modem unit by using the correct serial COM port.

Enter the settings as follows:

- » Bits per second: 115200
- » Data bits: 8
- » Parity: None
- » Stop bits: 1
- » Flow control: Hardware

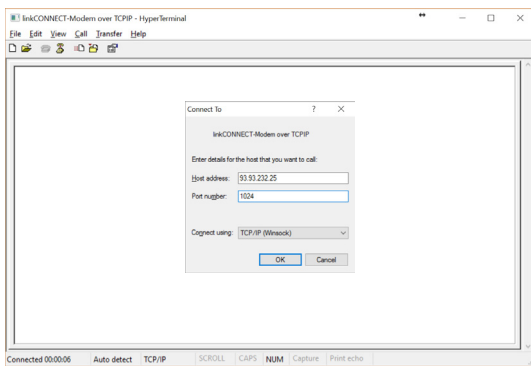
Figure 32. Connection over COM port



**Step 2.** Now open a new HyperTerminal session. This time, select Connect using: TCP /IP (Winsock). Enter the fixed IP address of the unit and the set local port. The fixed IP address of the SIM used in this scenario is 93.93.232.25 and the local port is 1024 (shown in **figure 33**).

Press 'OK' to connect to the unit over TCP / IP.

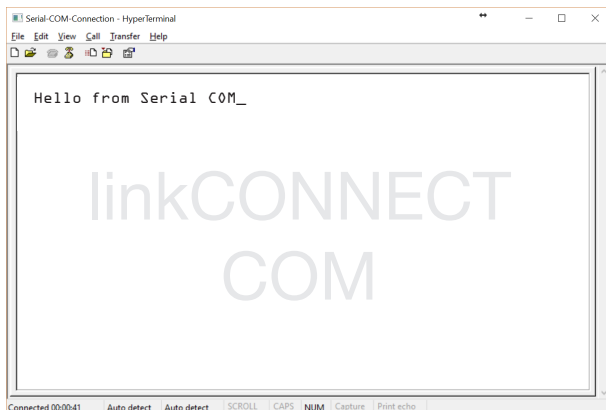
**Figure 33.** Connecting to the linkCONNECT modem over TCP / IP



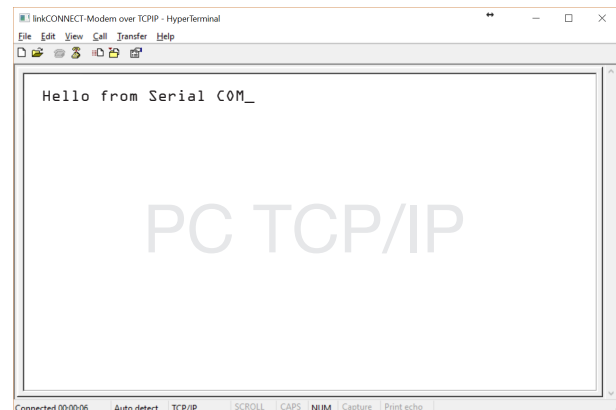
Upon successful connection, HyperTerminal will display 'connected' in the bottom left hand corner.

We can now test this scenario by typing in either one of the HyperTerminal windows. Any character that is typed in one of the windows should appear on the other window as shown in figures 34 - 37 below.

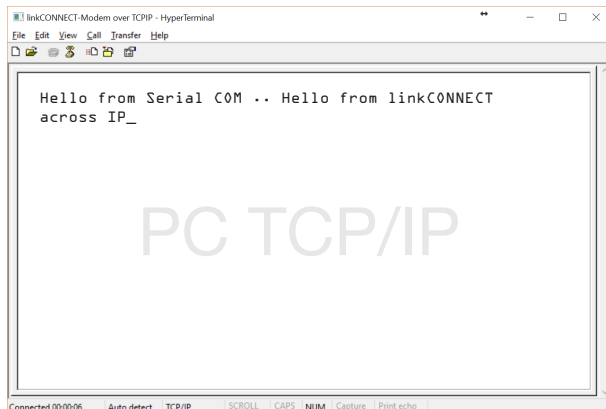
**Figure 34.** Sending a 'Hello' message from the linkCONNECT modem COM port over TCP/IP\*



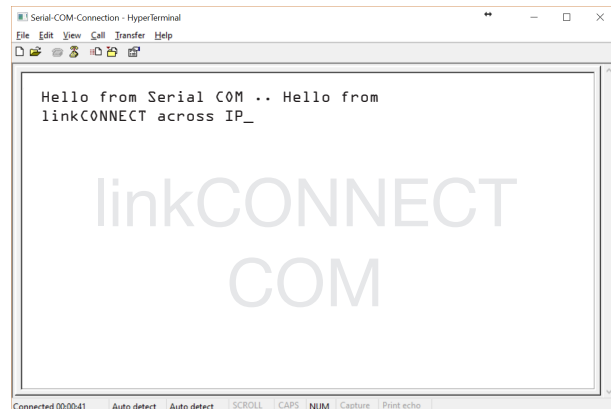
**Figure 35.** Message is received on the PC over TCP/IP



**Figure 36.** Reply message sent from the PC over TCP/IP to the linkCONNECT modem COM port\*



**Figure 37.** Message is received at the linkCONNECT modem COM port



\*Local echo is enabled for elaboration in these figures. HyperTerminal may not display characters at the Sender / Source window, however characters should be displayed at the receiving end / destination.

## General Considerations

### Ping Reboot

The ping is a standard ICMP echo request.

Multiple servers can be specified on the ping command, they will be tried one at a time in the order specified (having more servers specified means more potential delay e.g. when the unit is carrying out a ping rather than listening for a socket connection). If any server responds to the ping it stops checking further servers and takes the ping as successful (does not trigger a reboot). Only if all servers specified fail to respond to a ping will a reboot happen.

It is important to use both reliable servers, and servers you have control over. If an unreliable server is used this will only result in more downtime (while the unit constantly reboots). If a 3rd party server is used and that 3rd party decides at some point in the future to disable ping replies that will cause units to constantly reboot.

### Network Timeouts

“It’s a very common issue, when you are behind a NAT proxy or a firewall, to be disconnected without a reason. This behaviour is caused by the connection tracking procedures implemented in proxies and firewalls, which keep track of all connections that pass through them.”

<http://tldp.org/HOWTO/TCP-Keepalive-HOWTO/overview.html>

If required, it is the servers responsibility to keep alive the TCP connection to the Gateway software. i.e. if in the normal course of usage a situation may arise where no data is sent or received within 5 minutes the server should initiate sending of arbitrary data. If the server does not do this the RS232 Gateway will close the connection and start listening for a new connection.

*“Server” = Computer talking to the Gateway*

### General Notes

- » Software will acknowledge receipt / action of correctly formatted SMS command messages with a message in the format “Confirmed: [command confirmed]”. Incorrectly formatted messages will be responded to with “Error: [error message]”. Replies are sent to the sending of the original request. The only exception is that command messages sent with an invalid password will not be responded to.
- » In order to use the server mode whereby the device accepts incoming connections, a fixed public IP SIM card may be required.
- » To accept new commands via SMS the software must not have any active socket connections. Active socket connections can be disconnected via closing them on the remote side or hard rebooting the unit.
- » If the SMS password is forgotten unit software must be reloaded from the loaded utility.
- » The linkCONNECT modem will not acknowledge messages sent or received to it in either ‘Client’ or ‘Server’ mode and it is up to the connected equipment to acknowledge the message.
- » You must ensure for correct operation of the device that there is no traffic sent on the serial port when the device powers on or reboots. This will ensure that the device correctly powers up and establishes a connection with the server.
- » The linkCONNECT software takes around 60 seconds to fully initialise and complete its internal boot process. After this time, if it is setup in client mode then it will successfully establish a connection with the server and you will be able to continue bi-directional communication.

## Disclaimer

The information contained in this document is proprietary to Siretta Ltd. Siretta has made every effort to ensure that the accuracy of the information contained within this document is accurate. Siretta does not make any warranty as to the information contained within this document and does not accept any liability for any injury, loss or damage of any kind incurred by the use of this information.

Siretta does not take responsibility for any application developed using the device characterized in this document and notes that any application of this device must comply with the safety standards of the applicable country and comply with the relevant wiring rules. Siretta reserves the right to make modifications, additions and deletions to this document due to typographical errors, inaccurate information, or improvements to equipment at any time and without notice. Such changes will be incorporated into new editions of this document.

All rights reserved.

© 2016 Siretta Ltd

## Definitions

Term	Definition
APN	Access Point Name
COM	Communication
CSD	Circuit Switched Diagram
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
IMEI	International Mobile Equipment Identity
IP	Internet Protocol
SIM	Subscriber Identity Module
SMS	Short Message Service
TCP	Transmission Control Protocol
UMTS	Universal Mobile Telecommunications System (Same as 3G)





**sales** +44 (0)118 976 9014  
**fax** +44 (0)118 976 9020  
**accounts** +44 (0)118 976 9069  
**email** sales@siretta.co.uk

**[www.siretta.co.uk](http://www.siretta.co.uk)**

Siretta Ltd  
Basingstoke Road  
Spencers Wood  
Reading  
Berkshire  
RG7 1PW  
United Kingdom

Company No. 08405712  
VAT Registration No. GB163 04 0349

A member of the Olanca Group Ltd



Rev 7.1 - Dec 2016