# SS-10 3G

## FIXED CELLULAR TERMINAL


# USER MANUAL

Revision History:

| | | |
|---|---|---|
| Revision 01 | Original document | 12 August 2010 |

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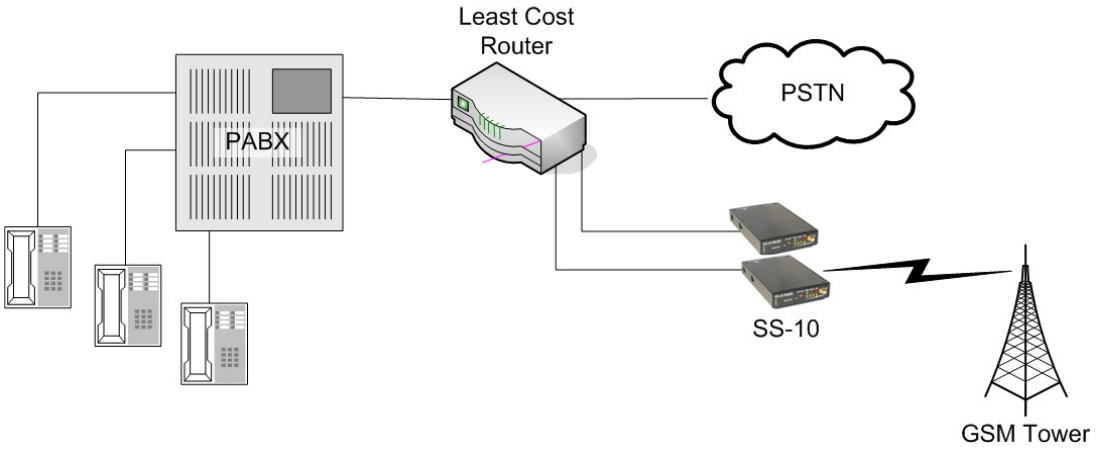
# 1 INTRODUCTION

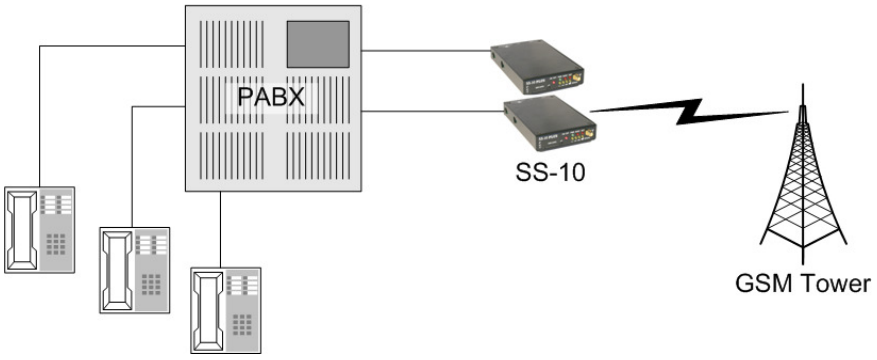
The purpose of the SS-10 3G Fixed Cellular Terminal (FCT) is to provide a means of making telephone calls where there is no fixed line infrastructure or where it may be more cost effective to use the GSM/3G infrastructure for carrying the call.

## ARCHITECTURE

Least Cost Routing




Rural Telephony



## 2 FEATURES

### 2.1 PHYSICAL FEATURES

- Matches to complex line impedance
- Power saving feed-bridge
- Signal level indicator LEDs
- Busy indicator
- Network indicator
- SMA antenna connector
- Module On/Off switch allows Network Detach
- Power supply 300mA at 12 VDC
- RJ11 connector for telephone
- DB9 connector for programming
- 900/1800 MHz operation in 2G GSM mode
- 900/2100 MHz operation in 3G UMTS mode (additional 850MHz optional)

### 2.2 SOFTWARE FEATURES

- Comfort Tone
- CLI restriction
- Settable digit count
- Settable dial timeout
- Automatic call termination
- Transmit & receive levels adjustable
- Optional reversal
- Optional line current break
- Optional periodic module reboot
- Full rate, enhanced full rate & half rate operation
- Supports Adaptive Multi-rate (AMR)
- Preferred network selection (Network locking)
- 2G, 3G or automatic network selection
- Dial-In modem functionality (2G mode only)
- 4 minute timer to reset module if not registered on the network
- 128 Programmable Call Back numbers
- Settable SIM Pin Number
- Supports International SIM card operation

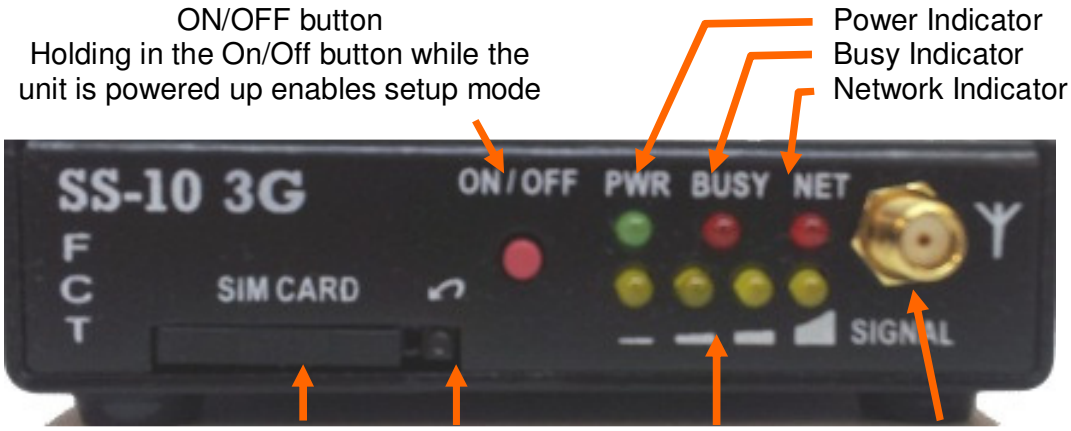
### 2.3 MAINTENANCE FEATURES

- Routine periodic SMS reports
  - Feed bridge voltages
  - Number of forcedly cut calls
  - Number of unanswered calls
  - Number of answered calls
  - Total duration of answered calls
- SMS report on zero traffic (no calls made for specified interval)
- Request reports
- Request setting information
- Change set-up information by SMS
- 2 authorized maintainers

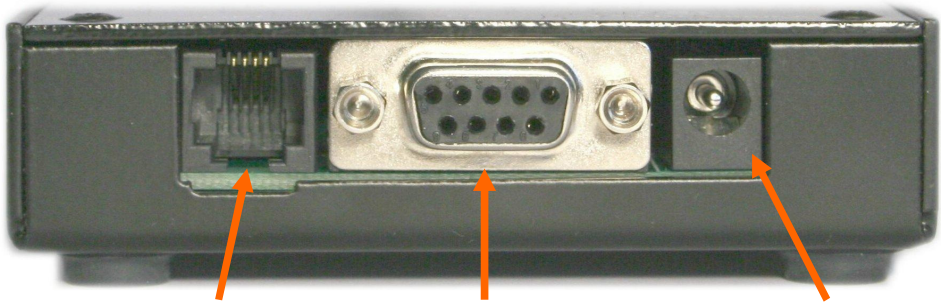
- Programmable by serial port, telephone or SMS

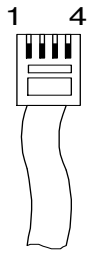
## 3 DESCRIPTION

### 3.1 FRONT VIEW




### 3.2 REAR VIEW






**Line Connector**
RJ-11 Connector

(Only pins 2 & 3 are used)

**PC Connector**
DB9 Female - Used for setup purposes
***Use a standard PC serial cable for connecting the unit to a PC***

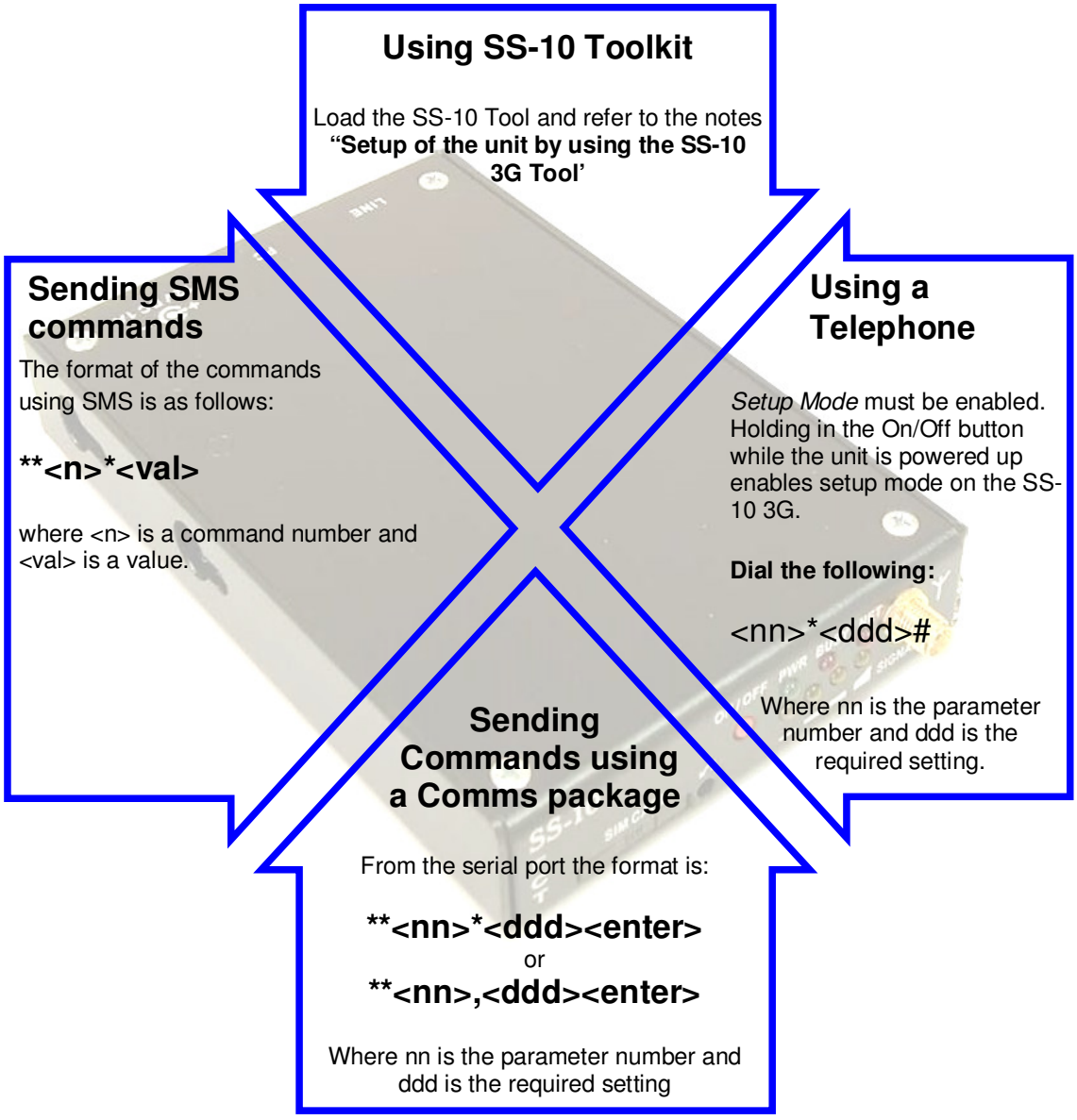
DC Connector
Connects a DC voltage between 12V and 18V to the unit

| Pin | Description |
|---|---|
| Inside | DC positive voltage |
| Outside | GROUND |

# 4 SETUP

Setup of the SS-10 3G can be done by using one of the following methods:

- **SMS Setup Method:** Sending SMS commands to the unit;
- **Telephone Setup Method:** Using a telephone connected to the SS-10 3G;
- **PC Serial Port Setup Method:** Sending commands to the unit by connecting it to a PC and use a Comms package like HyperTerminal, or
- **PC Serial Port Setup Method:** Connect the unit to a PC using the **SS-10 Tool** package;



## 5 SETTABLE PARAMETERS

### 5.1 BASIC SETUP

<table>
<tr><th>Parameter</th><th>Description</th><th>Notes</th></tr>
<tr><td>01</td><td>Total Digit Count<br>Sets the total number of digits required before dialing.<br>It is recommended that this parameter is set to 10.</td><td></td></tr>
<tr><td>02</td><td>Dial Timeout<br>Set dial timeout in 10$^{ths}$ of a second. Normally 4 seconds<br>This is the time taken before the call proceeds when numbers shorter than the total digit count are dialed.</td><td></td></tr>
<tr><td>03</td><td>Call Progress Tones<br>Enable (1), disable (0)</td><td></td></tr>
<tr><td>04</td><td>Polarity Reversal Signalling<br>Set reversal time in 10$^{ths}$ of a second. To enable reversal on answer add 100 to the number input. E.g. 04*20 sets the time to 2.0 seconds without reversal on answer and setting 04*120 sets it to 2.0 seconds WITH reversal on answer.</td><td></td></tr>
<tr><td>05</td><td>Break Pulse Signaling<br>Set the break time in 10$^{ths}$ of a second. Some PABX systems require a current break to indicate that the call has terminated. The SS-10 3G can provide such a break. If it is not required then set this parameter to 0.</td><td></td></tr>
<tr><td>06</td><td>Call Line Identification<br>Restrict CLI (1) or allow CLI (0).</td><td></td></tr>
<tr><td>07</td><td>Transmit Levels Set transmit levels 0-255 (64 normal)<br><table><tr><th>Relative Level</th><th>Value</th><th>Description</th></tr><tr><td>-12 dB</td><td>32</td><td>Softer</td></tr><tr><td>-6 dB</td><td>64</td><td>Factory Setting</td></tr><tr><td>0 dB</td><td>128</td><td>Louder</td></tr><tr><td>+6 dB</td><td>255</td><td>Loudest</td></tr></table></td><td></td></tr>
<tr><td>08</td><td>Receive Levels Set receive levels 0-255 (64 normal)<br><table><tr><th>Relative Level</th><th>Value</th><th>Description</th></tr><tr><td>-12 dB</td><td>32</td><td>Softer</td></tr><tr><td>-6 dB</td><td>64</td><td>Factory Setting</td></tr><tr><td>0 dB</td><td>128</td><td>Louder</td></tr><tr><td>+6 dB</td><td>255</td><td>Loudest</td></tr></table></td><td></td></tr>
</table>

| 5.2 | REPORTING SETUP | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 10 | **No Call SMS Report**<br>Set the interval, in minutes, after which a report may be sent by SMS if no calls have taken place.<br>Set to 0 to disable 'no call reporting'. | |
| 11 | **Routine Reports**<br>Set the interval, in minutes, between routine reports that will be sent by SMS to the pre-programmed destination.<br>Set to 0 to disable routine reporting. | |
| 12 | **SMS Report Destination**<br>Sets the destination number for SMS report. Please include country code. Eg. **+27**828221381 | |
| 13 | **SS-10 3G Identity**<br>This command is only available from the serial port. It is used to set a 16 character ID so that the SS-10 3G can identify itself in SMS messages that are sent. | |

## 5.3 SIM & NETWORK

<table>
<tr><th>Parameter</th><th>Description</th><th>Notes</th></tr>
<tr><td>30</td><td>Sets the PIN<br>Sets the PIN (SimPin1). It is only needed if the SIM card has its PIN set.<br><br>Using a PIN locked SIM<br>The SIM can be loaded into the SS-10 3G using the command:<br>**30*nnnn<enter><br>where nnnn is the PIN number. It is important to make sure that the PIN is entered correctly. If the PIN is not correct then the SS-10 3G will output a message on the serial port indicating this. It will also flash the IN USE and NETWORK LED's in an alternating pattern until it is powered down. Note that after 3 attempts the SIM will be blocked and the PUK will have to be used to unblock the SIM. This will need to be done using a normal GSM handset or the SS-10 Tool.<br><br>Using a BLANK SIM<br>If the SIM card is setup without a PIN, no further action needs to be taken, as the SS-10 3G will recognize that no PIN is required and it will automatically log onto the network.</td><td></td></tr>
<tr><td>31</td><td>Set Network Operator<br>5 digit network code - use space for automatic network selection.<br><br><table><tr><th>Vodacom</th><th>MTN</th><th>Cell C</th></tr><tr><td>65501</td><td>65510</td><td>65507</td></tr></table></td><td></td></tr>
<tr><td>34</td><td>Select Network Band (GSM/3G)<br>The unit can be made to only log onto the 2G GSM network (0) or only the 3G UMTS network (2). Alternatively the unit can be set to automatically select the network type with the best signal (1).</td><td></td></tr>
<tr><td>35</td><td>Enable International Callback<br>This feature is for use with the eMobile International Callback SIM. (1) enables the feature, (0) disables the feature. NB. Please remember to set the Dialled Digit Count (see above) to a higher value (16 recommended) to support the length of international numbers. Line current will be disconnected for +-10 sec if a call is terminated during setup. This allows time for proper call clearing on the network.</td><td></td></tr>
</table>

| 5.4 | AUTHORIZED USER | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 32 | **Authorised User 1**<br>Gives authorisation to user 1 for controlling access to the SS-10 3G unit via SMS by entering the user's numbers. Country code to be included, e.g. **+27**828221381 | |
| 33 | **Authorised User 2**<br>Gives authorisation to user 2 for controlling access to the SS-10 3G unit via SMS by entering the user's numbers. Country code to be included, e.g. **+27**828221381 | |

| 5.5 | HARDWARE SETTINGS | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 40 | **On-Hook Voltage**<br>The On-Hook voltage can be set with this command. The allowed range is from 20 volts to 45 volts. Nominal value is 35 volts. | |
| 41 | **Off Hook Voltage**<br>The Off-Hook voltage is set using this command. It can be set from 18 to 40 volts. The nominal value is 25 volts. This allows power usage to be reduced during conversations, which reduces heating in confined spaces. | |
| 42 | **Peak Ring Voltage**<br>Sets the peak ring voltage. The range is 40 to 60 volts. The factory setting is 65 volts, normally this setting will not require adjustment. | |

| 5.6 | POWER DOWN TIME | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 55 | **Power Down Time**<br>Time in minutes between forced network logoffs. | |
| 56 | **Automatic call termination**<br>Time in minutes before call termination. Enter 0 to disable feature. | |

| 5.7 | CALL BARRING | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 60 | **Incoming Calls**<br>Prohibits incoming calls (1), allows incoming calls (0). | |
| 61 | **Display Number Table**<br>Used to display the number list.<br>An extra digit will precede the number.<br>(2) Indicates an allowed number, (1) indicates a barred number.<br><br>***Note: Command will only work in serial setup mode*** | |
| 62 | **Add Number**<br>Add a '2' before the number to allow the number.<br>Add a '1' before the number to bar the number. | |
| 65 | **Set 'Need Allowed'**<br>When this is set to '1', all numbers will be barred by default and allowed numbers have to be explicitly enabled. | |

| 5.8 | MISCELLANEOUS | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 80 | **Clear Totals**<br>Resets the report values | |
| 81 | **Set Report Timer**<br>Sets the time interval for the report timer. | |

| 5.9 | CALL BACK | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 43 | **Set National Dial Code**<br>Sets the national dial code that will be recognised eg.+27 | |
| 70 | **Erase Call Back Entries.**<br>Erase all the call back entries by using **70*112233 | |
| 71 | **Add Entry**<br>Add a number to the call back list. E.g. **71*0821111111<br>Please note that the number must begin with a "0" | |
| 72 | **Delete Entry**<br>Delete a number from the call back list. E.g. **72*0821111111 | |
| 73 | **Allow Any Number**<br>Set to 1 allows any number to be called back<br>Set to 0 enforces the listed numbers | |

| 5.10 SETUP INFORMATION | | |
|---|---|---|
| **Parameter** | **Description** | **Notes** |
| 96 | **Reboot the GSM Module**<br>Should be used after level changes. | |
| 97 | Sends a report back to originator. | |
| 98 | Sends an SMS containing settings. | |
| 99 | Displays the settings. | |

# 6 SERIAL PORT COMMANDS

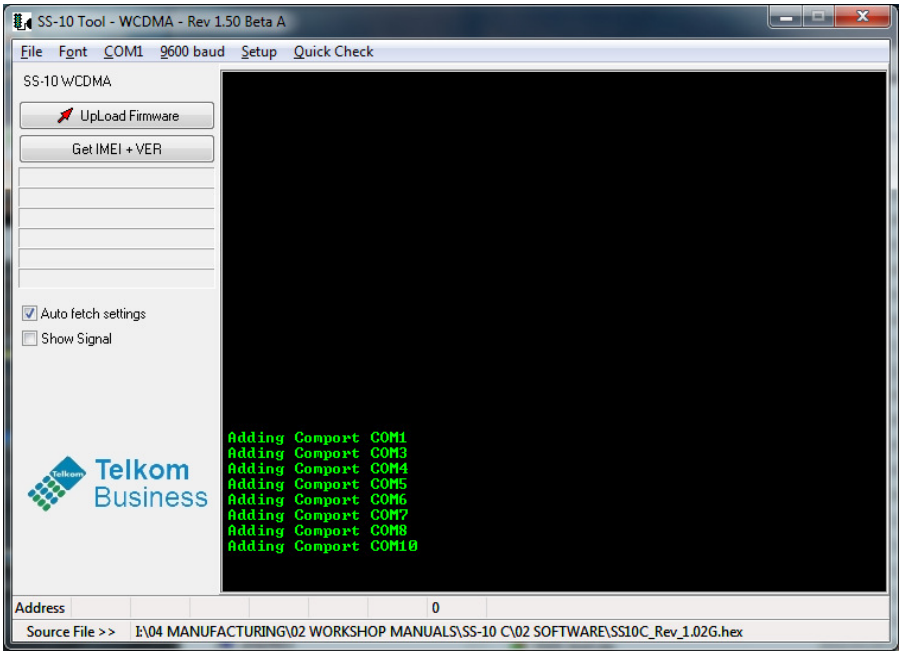
## 6.1 SIMPLIFIED SERIAL PORT COMMANDS

Simplified basic commands for entering via the serial port generally used for diagnostic or basic setup purposes.

| Instruction | Description | Notes |
|---|---|---|
| **DR<enter>** | Gives a short report on state. | |
| **AT<ddddddd><enter>** | Sends the data dddd to the cell module. | |
| **RESET<enter>** | Resets the SS-10 3G. | |
| **DIAG<enter>** | Toggles the diagnostic state of the SS-10 3G. | |
| **SMS<enter>** | Sends a test SMS to the pre-programmed destination. | |
| ****<nn>*<ddd><enter>** | Sets parameter nn to value ddd. | |
| **SETID<sssss><enter>** | Sets the ID of the SS-10 3G to sssss.<br>This is used to identify the particular SS-10 3G (site name) when automatic SMS messages are sent. | |
| **SHOWCB<space><nn>** | Shows 20 entries starting at entry 'nn' | |

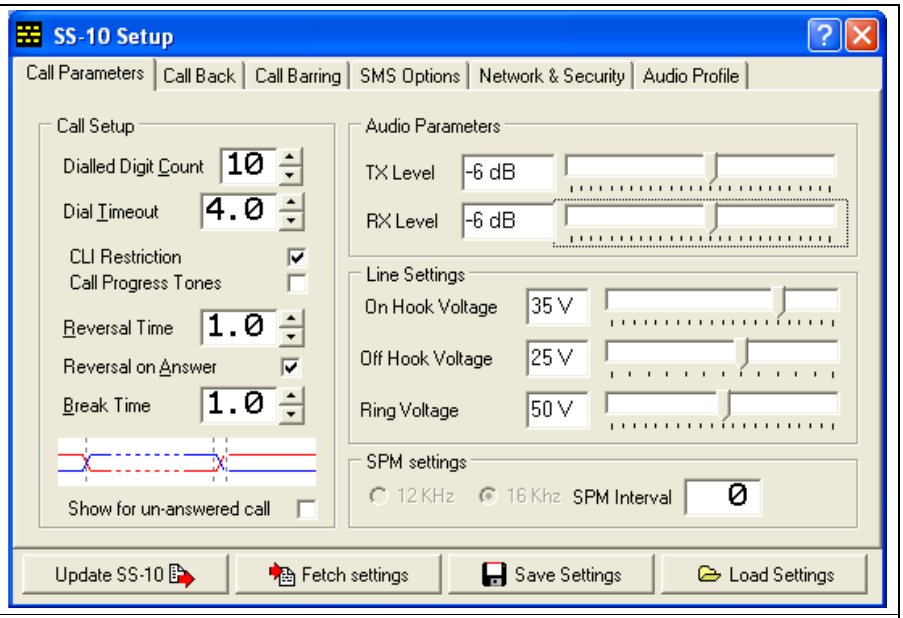
# 7 SETUP OF THE UNIT BY USING THE SS-10 TOOL

## 7.1 MAIN WINDOW

| | |
|---|---|
| **SS-10 Tool**<br>**Main Window**<br>Load the SS-10 Tool<br>Click on the **COM** tab to select the required COM port if it differs from the default port.<br>Set the speed to 9600 baud if it is not detected automatically. |  |
| **IMEI +VER** | **Display the following:**<br>IMEI, Software Revision and Hardware type of the GSM/3G engine.<br>Displays SS-10 3G firmware revision number. |
| **UpLoad Firmware** | To update the firmware, load the Firmware file from the **File** Menu.<br>Use **UpLoad Firmware** button to load the Firmware into the unit.<br>Refer to the **Upgrade Firmware** section for the complete procedure. |
| **Show Signal** | Tick the Show Signal box for a visual and measured indication of the signal strength. |
| **Auto Fetch Settings** | The SS-10 Tool will automatically fetch the settings from the SS-10 when the Setup window is opened. |

## 7.2 CALL PARAMETERS

Click on SETUP to start with the setup of the SS-10 3G.

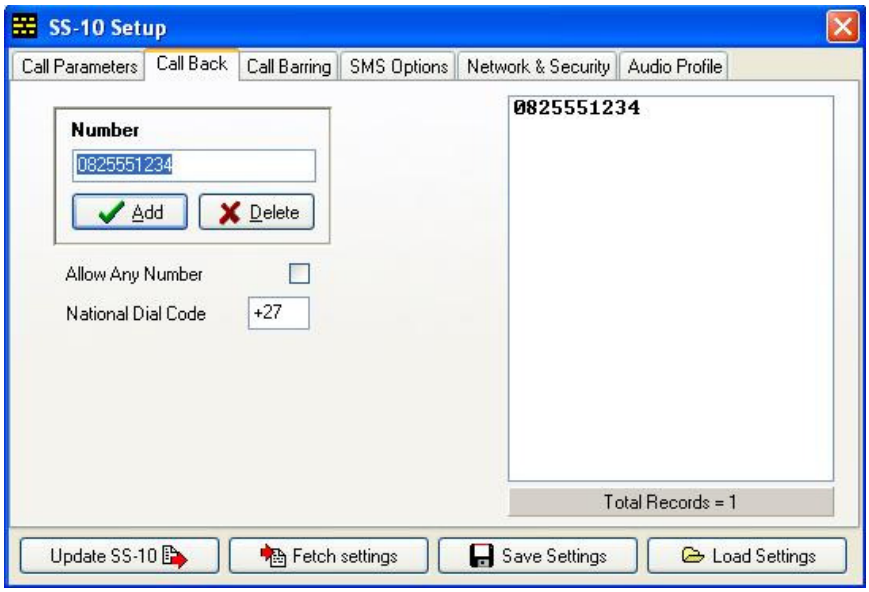
| **Call Parameters:**<br><br>Call setup, Audio and Line levels can be changed in this window. |  |
|---|---|
| **Call Setup** | |
| Dialled Digit Count | Sets the total number of digits required before dialing.<br>It is recommended that this parameter is set to 10. |
| Dial Timeout | Sets dial timeout in $10^{ths}$ of a second<br>This is the time taken before the call proceeds when numbers shorter than the total digit count are dialed. Nominal value is 4 seconds |
| CLI Restriction | Restricts or allows Call Line Identification. |
| Call Progress Tones | Enables or disables Call Progress Tones. |
| Reversal Time | Sets reversal time in $10^{ths}$ of a second. |
| Reversal on Answer | Enables or disables Reversal on Answer. |
| Break Time | Sets the break time in $10^{ths}$ of a second. Some PABX systems require a current break to indicate that the call has terminated. If it is not required then set this to 0. |
| Show for un-answered call | When ticked the graph will display the reversal sequence for an unanswered call. |
| **Audio Parameters** | |
| TX Level | Sets Audio Transmit level. Nominal value is -6 dB |
| RX Level | Sets Audio Receive level. Nominal value is -6 dB |
| **Line Settings** | |
| On-Hook Voltage | The allowed range is from 20 to 45 volts. Nominal value is 35 volts. |
| Off-Hook Voltage | It can be set from 18 to 40 volts. The nominal value is 25 volts. This allows power usage to be reduced during conversations, which reduces heating in confined spaces. |
| Ring Voltage | The range is 40 to 65 volts. The factory setting is 50 volts, normally this setting will not require adjustment |

## 7.3 CALL BACK

### Call Back:

Call back numbers can be added in this window.

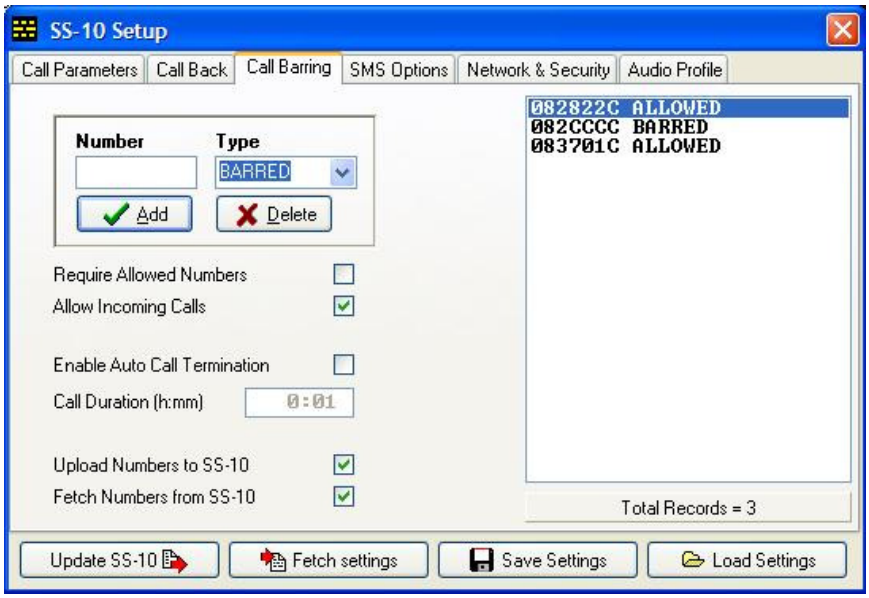
**NB:** In some cases, the network does not issue a command to disconnect a busy call. If this is the case, the call should be manually terminated when the 'busy' tone is heard to allow for call back.




Click on Add or Delete to enter or remove the number from the list.

| | |
|---|---|
| **Number** | The call back number to be added to the list. **NB.** This number must begin with the "0" digit. |
| **Allow Any Number** | When ticked, the call back list will be ignored and any incoming call number will be called back. |
| **National Dial Code** | This is the only national dialling code that will be recognised as valid for call back. Default is +27. |

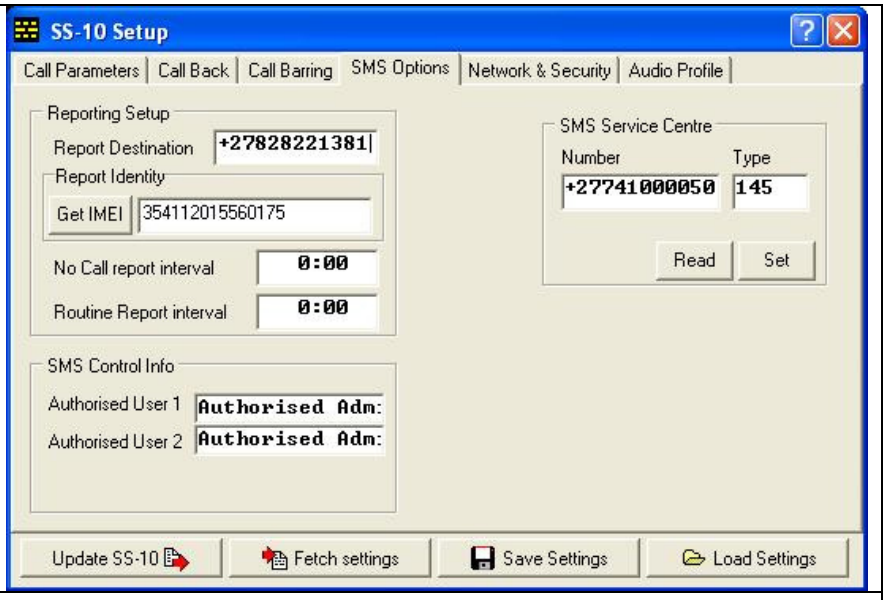
## 7.4 CALL BARRING

| | |
|---|---|
| **Call Barring:**<br><br>Calls can be barred or allowed |  |

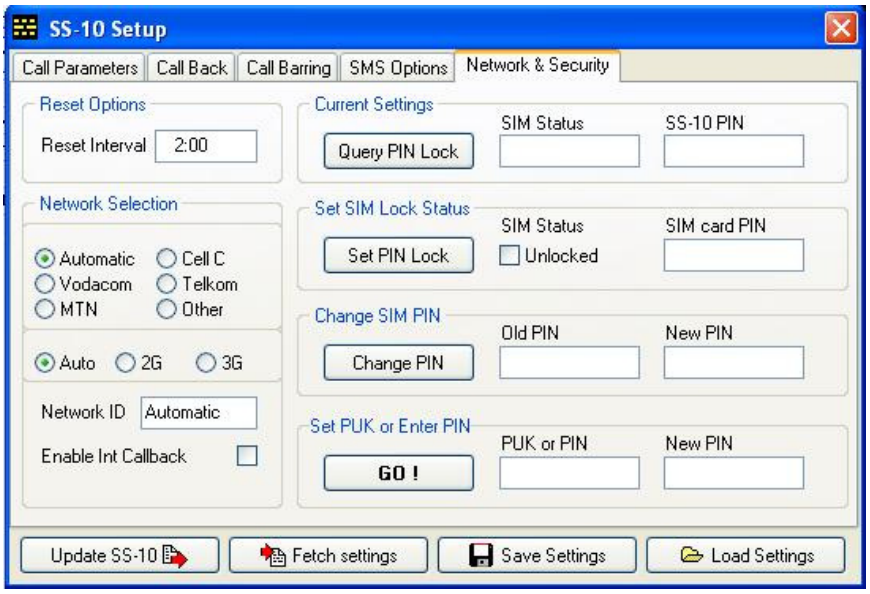
Enter the first digits of the number needed to recognise the number type.
Select the Type as BARRED or ALLOWED.
Click on Add or Delete to enter or remove the number from the list.

| | |
|---|---|
| **Require Allowed Numbers** | If the block is not ticked it will allow all the numbers that are not barred. |
| **Allow Incoming Calls** | The SS-10 3G can be set to allow or ignore incoming calls. |
| **Auto Call Termination** | The SS-10 3G can be set to terminate an outgoing call after a set duration. |
| **Upload Numbers to SS-10** | To enable or disable the upload of the Call Barring List to the SS-10 when using the “Update SS-10” button. |
| **Fetch Numbers From SS-10** | To enable or disable the download of the Call Barring List from the SS-10 when using the ‘Fetch Settings’ button. |

## 7.5 SMS OPTIONS

| | |
|---|---|
| **SMS Options:**<br><br>The SS-10 3G can be set to send fault reporting via SMS to a required destination number.<br><br>It can authorise two users to control the unit via SMS. |  |
| **Reporting Setup** | ▪ Feed bridge voltages<br>▪ Module voltage<br>▪ Number of unanswered calls<br>▪ Number of answered calls<br>▪ Total duration of answered calls<br>▪ Number of forced call terminations |
| Report Destination | Destination number for reports to be sent. Country code to be included, e.g. **+27**828221381 |
| Report Identity | Identity to be sent with report for identifying the unit. Click on **Get IMEI** to retrieve the number from the unit or use any custom text as the identity. |
| No Call Report Interval | A report will be sent if no answered calls have been made for this period of time. |
| Routine Report Interval | Fixed intervals between sending of reports. |
| **SMS Control Info** | |
| Authorised User | Give authorisation to two users for controlling the access to the SS-10 3G unit via SMS by entering the user's numbers. Country code to be included, e.g. **+27**828221381 |
| **SMS Service Centre** | |
| Number | Enter the SMS service number for the network. |
| Type | After entering the service number, click on **Read** to automatically get 'type' from the network. |

## 7.6 NETWORK

| | |
|---|---|
| **Network:**<br><br>Select the required Network and Reset Interval if needed.<br><br>Manage SIM security. |  |
| Network Selection | When using 'Other', the 5-digit network operator ID should be obtained from the local Network Operator. The SS-10 3G can be forced onto the 2G (GSM) or 3G (WCDMA) band. Alternatively, the unit can be set to use the band with the best signal (Auto). |
| Enable Int. Callback | This feature is only for use with the eMobile International Callback SIM. Tick the box to enable the feature. **NB.** Please remember to set the Dialled Digit Count (see above) to a higher value (16 recommended) to support the length of international numbers. |
| Reset Interval | Set the interval in hours and minutes between forced network log-offs. |
| Current Settings | To query the current status of the SIM. LOCKED or UN LOCK |
| Set SIM Lock Status | Tick to lock SIM. Enter the pin in the 'SIM card PIN' text box. |
| Change SIM PIN | To change the SIM PIN Number |
| Set PUK | In the event that the PUK number is required. Sets new PIN. |

## 8 UPGRADE OF THE SS-10 3G FIRMWARE

**Download Firmware**

The latest firmware for the SS-10 3G is available from:
http://www.sstelecoms.com/

**Connect unit to PC**

Connect the SS-10 3G unit to the PC by using a serial cable and make sure it is switched on.

**Upgrade the Firmware by using the SS-10 Tool**

**Load the** SS-10 3G Tool Program:

- Click on **ComPort** to select the required COM.
- Set the **BaudRate** to 9600.
- From the **File** Menu choose **Open** and select the required Firmware file.
- Click the **UpLoad Firmware** button to upload the new firmware to the unit.
- Remove the serial cable from the unit after setup.

## 9 TECHNICAL SPECIFICATIONS

| | |
|---|---|
| **Housing** | Black powder coated Aluminum 147 x 90 x 26 mm |
| **LED indicators** | POWER<br>IN USE<br>NETWORK<br>SIGNAL STRENGTH |
| **Connectors** | PC connection: 9 way D-Type female<br>LINE connectors: RJ11<br>POWER connection: 2.1 mm DC socket |
| **Set-up** | Set-up data is stored in non-volatile memory.<br>Setup can be done by using a telephone or PC. |
| **Compatibility** | Compatible with most PABX's |
| **Required voltage** | 10 VDC to 16 VDC |
| **Current consumption** | 300 mA |