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SS-81SA



User Manual

SS-81SA USER MANUAL

REVISION HISTORY

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1. PURPOSE

The purpose of the SS-81SA is to provide a versatile interface that gives users access to the GPRS network. It can also be used to do remote maintenance on serially connected equipment.

Common uses:

Serial port internet access using the PPP protocol

- Email
- Internet
- VPNs

Direct access to the serial port remotely via GPRS. This will provide

- Maintenance access to an FCT Mux
- Maintenance access to an SS-87
- Logging

2. FEATURES

FEATURES	
<ul style="list-style-type: none">• Direct access so that PCs can use PPP sessions	<ul style="list-style-type: none">• Direct TARGET setup
<ul style="list-style-type: none">• Single 5 volt power supply	<ul style="list-style-type: none">• Remote TARGET setup
<ul style="list-style-type: none">• Remote SS-81 setup	<ul style="list-style-type: none">• Simple Network Time Protocol (SNTP) support
<ul style="list-style-type: none">• LED indicators for<ul style="list-style-type: none">○ GPRS logon○ Server contact○ Transmit Data○ Receive Data	<ul style="list-style-type: none">• Diagnostics<ul style="list-style-type: none">○ PING○ DNS look up
<ul style="list-style-type: none">• Push operation allows use of INTERNET APN	

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3. DESCRIPTION OF FRONT PANEL



Front Panel

LED INDICATORS

LED INDICATORS		
PWR		Indicates that the unit is supplied with a mains voltage
F1		Auxiliary function Indicator (not implemented)
PORT 1 & PORT 0	HS	Indicates Handshaking on the specific Port
	TX	Indicates transmission to device connected at Port0 or Port1
	RX	Indicates Data reception from Port0 or Port1
GPRS	RX	Indicates that data is being received from the GSM module
	TX	Indicates that data is being sent to the GSM module
	SVR	Indicates that contact has been established with the server
	NET	Indicates that the unit is logged on to the GPRS network.

4. DESCRIPTION OF REAR PANEL



Rear panel

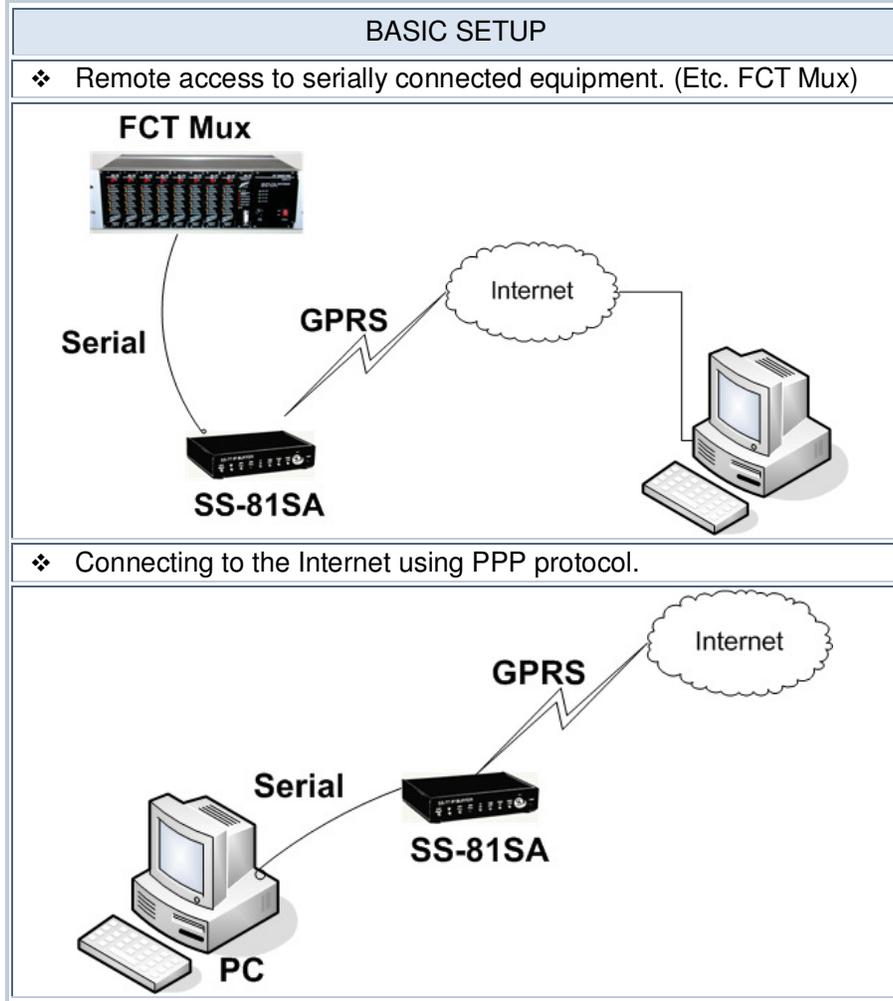
- SMA ANTENNA CONNECTOR
- SERIAL PORTS

PORT 0		PORT 1	
9 way 'D' type MALE		9 way 'D' type FEMALE	
Pin	Description	Pin	Description
2	Receive from device.	2	Transmit to device
3	Transmit to device	3	Receive from device.
4	Handshake to Port 0 device.	4	Handshake from PC
5	Common ground signal.	5	Common ground signal.
6	Handshake from Port 0 device.	6	Handshake to device.

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- POWER SUPPLY - External
 - External 12 volt power supply (centre pin positive)

5. APPLICATIONS



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6. GETTING STARTED

Preparing the SIM card

Some SIM cards require initialising for proper operation.

- To initialise the SIM card follow the following steps:
- Place SIM card in cellular phone
- Enter PIN (if required)
- Request and accept MMS and Data settings
- Reply to SMS messages from Network if Network requests a reply.
- Accept more settings if required
- Make a 'missed' call to a regular cellular phone.
- Remove PIN request if no security on SIM is required.

Note: If the pin code is required use SIMPIN command.

- Put SIM card in the slot provided on the SS-81SA

GPRS SETUP

- Connect a serial cable between PC and Port1 of the SS-81SA.
- Use a coms package like HyperTerminal to connect to the SS-81SA.
 - Baud Rate : 19200
 - Parity : None
 - Stop Bits : One
 - Flow Control: None
- Set the buffer name – Make sure it is unique and 8 characters long.
- Set the Host – either to an IP address or an internet name.
- Ensure the Port and CmdPort are both 1122
- If a private APN is used, set the username and password
- Check that the Time Server is set
- Set the interval to 90
- SAVE the settings
- RESET the GPRS module (using 'RESET' command)

EXAMPLE OF COMMANDS

```
bufid SS81GPRS
host sstelecoms.pointclark.net
port 1122
cmdport 1122
timesvr time-a.nist.gov
interval 90
save
reset
```

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7. COMMANDS

COMMAND TABLE		
Command	Description	
ALTDNS <a.b.c.d>	Sets an alternate IP address for the DNS server. When this is set (i.e. not equal to 0.0.0.0) then it will override all other DNS settings. This address would normally be obtained from the service provider or network operator.	
APN <apn>	This is the Access Point Name used by the particular network or it can be a private APN. Normally Vodacom & MTN use 'internet' and Virgin uses 'vdata'.	
AT <cmd>	Will send <cmd> to the GPRS modem.	
BUFID <BuffName>	An 8 character field (it will be padded if less than 8 characters are entered)	
CMDPORT <pppp>	The port from which remote commands are accepted. Default value is 1122	
DIAG <n>	Turns on (1) or off (0) diagnostic output. The following values can also be used.	
	Value	Diagnostic function of code
	01	Outputs the PPP messages for debugging of the PPP state machine.
	02	Outputs the GSM engine control messaging for debug of the GSM engine state machine.
	04	Outputs target message for diagnostic purposes.
	08	Outputs DNS diagnostic messages.
	The command parameters should be the sum of the options desired expressed in Hex Decimal. I.e. DIAG 0F will turn on all the current options.	
DISP	Displays the current settings on the unit	
DNSOPT <n>	This setting will provide DNS options as listed below:	
	Value	Option
	0	Automatic selection
	1	Always use DNS 1
	2	Always use DNS 2
	Note: The Automatic option will select the other DNS address if the currently selected address fails. This toggles between DNS 1 and DNS 2 as provided by the network operator or service provider. Changeover will take place when an Answer type message was not received in time.	
HANGUP	Stops GPRS operation	
HOST <address>	This is the IP address or the FQDN of the logging server. If it is an FQDN, the SS-81 will perform a DNS search to determine the IP address	
IMEI	Outputs the IMEI number of the GPRS module	
INTERVAL <nnn>	The time in seconds between polling the server when no data transfer is taking place. Recommended setting is between 60 & 120. This allows the 'NATTED' address to remain in place.	
LBAUD <baudrate>	This is the 'buffer' or logging input baud rate. Can be set from 2400 to	

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	115200. For TARGET mode operation it should be set to the baud rate of the TARGET device.
LOAD	Restore the settings from non-volatile memory.
PASW	If a private APN is used a password may be required

COMMAND TABLE	
Command	Description
PORT <pppp>	This is the IP port number that the SS-81 will address at the host. The default port number is 1122.
PPP <n>	Enables (1) direct access after Network Logon. Used when the SS-81 is to be operated as a GPRS module on external equipment.
RESET	Closes the GPRS session and restarts the SS-81 firmware.
SAVE	Saves the settings to non-volatile memory.
SCID	Outputs the SIM card ID.
SIMPIN <Sim Pin>	Sets the PIN that will be supplied to the SIM (if requested). This field is numeric and should be between 4 and 8 digits.
TARGET <command>	This sends the text <command> to the device on the Local Port. This may be an SS-83 or an SS-76.
TARGET MODE <n>	Enables (1) or Disables (0) semi transparent target based operation.
TARGET SETUP	Sets the SS-81 into a 'through connection mode' where the setup serial port is transparently connected to the 'data' port (That would be connected to some form of Target Device such as an SS-83 or SS-76) and allows the Target device to be set up from this port. This mode will timeout after 120 seconds of inactivity.
TARGET TIME	Enables (1) or Disables (0) the setting of the Target time upon successful Time Server queries.
TIMESVR <address>	A suitable time server. Either IP address or FQDN. The default is 'time-a.nist.gov'
USER <username>	If a private APN is used a username may be required.
VER	Displays the firmware Version Number.

8. TESTING COMMANDS

TESTING COMMAND TABLE		
Command	Description	
TEST GPRS 1	This command is used when direct access to the module is needed. In this mode one can check the airtime balance and do other general diagnostics. Related commands:	
	Command	Description
	ATD*101#;	This will retrieve the airtime balance on Virgin Mobile
	AT^SMSO	This causes the GSM engine to power down, allowing the exiting on the TEST GPRS 1 mode.

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	AT+CSQ	Displays the signal strength. In fact any of the MC-55 commands can be given as there is a completely transparent link to the module.
VOLT		Displays the voltages relating to the GSM engine e.g.: Voltages: GSM VDD = 2871mV, GSM Supply = 4101mV
TESTMEM		Tests the 512K RAM that is fitted to the SS-81. Executing TestMem Memtest part 1: addr 80000 data 55 Memtest part 2: addr 80000 data 00 e: 00
		If different results are obtained it suggests a memory fault. Note: This test will erase everything in memory.

TESTING COMMAND TABLE	
Command	Description
RTS	This will display the state of the 'input' handshaking line on the serial ports in a small table.
	The format is PORT.PIN = STATE RTS Lines: 0.6 = 0 1.7 = 1 1.4 = 1
DNS	This command is used to find out the IPV4 address from an FQDN DNS >www.google.com< Options:- 8180, ID 305 Name: www.google.com Returned IP = 216.239.59.103, TTL = 121 seconds accepted by #0
PING	Ping will test the path and response time to a host. It requires an IPV4 address. Subsequent 'pings' can be without an IP address. Pinging 216.239.59.103 Ping reply from 216.239.59.103 time = 910 msec

9. REMOTE ACCESS TO SERIAL CONNECTED EQUIPMENT

OPERATION MODES

9.1 NORMAL SS-81 OPERATION

Target mode 0

The SS-81 modules will respond to the following two commands while in normal SS-81 mode.

- 'DIRECT' Command

This command will enable a 'pass through' mode of operation where any packets that are received by GPRS are sent directly to the serial port without any modification. Any data received on the serial port is coalesced using the Nagle algorithm and send as packets on the GPRS link. This mode is time limited. It will timeout after 90 seconds if no packets are received.

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- 'SS81SETUP' Command
This command allows packets received by GPRS to be interpreted as if they were entered at the serial port, so that the SS-81 settings can be changed.
Note: Be very careful using this as it is possible to change the settings so that all communication is lost and cannot be re-established without visiting the site.

9.2 TARGET OPERATION

Target Mode 1

In this mode the SS-81 will only respond to one command and that is 'SS81SETUP'. The behaviour is the same as in normal SS-81 mode. Any packets received on the GPRS link will be sent to the TARGET transparently and any responses that are returned will be sent as coalesced packets. However, while waiting for a Greeting response from the Host server, the SS-81 will respond as for Normal SS-81 Operation.

10. USING SS-81SA AS A GPRS MODEM - DIRECT PPP

Settings on SS-81-SA

- Enable PPP operation by setting 'PPP 1'
- Set Local Baud rate to 115200 baud. (LBAUD 115200)
- Set the APN as appropriate (MTN = internet, Virgin = vdata or private APN)
- Save settings

Connect serial cable between PC and Port0 of the SS-81SA

Connections between PC Serial port & SS-81-SA Port 0			
SS-81-SA (DB9 Female)		PC Serial Port (DB9 Female)	
PIN	DESCRIPTIONS	DESCRIPTIONS	PIN
1	No Connection (DCD)	No Connection (DCD)	1
2	Transmit (Input)	Transmit (Output)	3
3	Receive (Output)	Receive (Input)	2
4	Handshake (Output)	Handshake (Input)	8
5	Ground - Common		5
6	Handshake (Input)	Handshake (Output)	7
7	Handshake (Output)**	Handshake (Input)	6
8	Handshake (Input)**	Handshake (Output)	4
9	No Connection	No Connection	9

**These connections are not used, but are needed to make a symmetrical cable

Setup a Modem Connection on the PC

- From the Control Panel select Phone and Modem Options
- Press the 'Modems' TAB
- Press the 'ADD' button
- Tick 'Don't detect my modem; I will select it from a list.' then click Next

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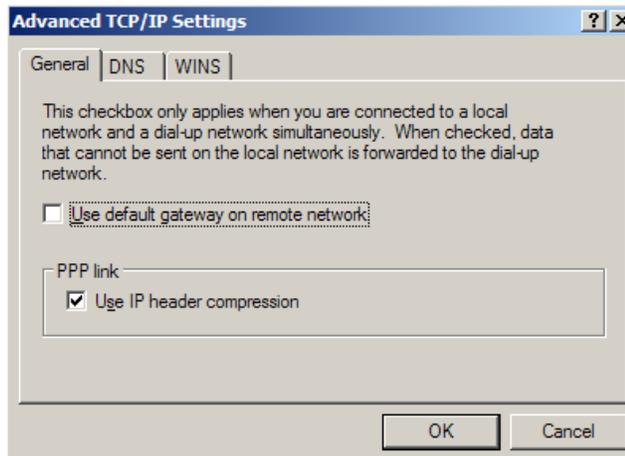
- Under Manufacturer select (Standard Modem Types)
 - Under Models select 'Standard 33600 bps Modem' then click Next
 - Choose the com port that you want to use it on and click Next
 - Click Finish
- The chosen modem should now be displayed. Close Phone and modem options by clicking the 'OK' button.

Set up a Network connection on the PC

- Open Network Connections.
- Click on 'Create New Connection' to open Wizard.
- Select 'Connect to the Internet' and click Next.
- Select 'Set up my connection manually' and click Next.
- Select 'Connect using a dial-up modem' and click Next.
- Choose the modem shown that was set up earlier and click Next (Make sure all the others are 'Un-Checked').
- Type in a name such as 'SS-81 GPRS' then click Next.
- Type in *99***1# for the phone number then click Next.
- Leave the Username and Password blank unless using a private APN then click Next.

To prevent all internet traffic from routing out via this link:

- Open the 'Properties' of the dial up connection.
- Select 'Networking' tab.
- Select Internet Protocol -> Properties
- Select 'Advanced'
- Make sure that the 'Use default gateway on remote network' is UN-ticked.



11. GETTING IMEI NUMBER AND OTHER INFO

S/W version '2.01' and above

- Type in the command IMEI
- Type in the command SCID for SIM card ID.



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12. CONTACT DETAILS

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