

Series 9000

Satellite Modem / Router

Quick Start Guide

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1 Introduction

The Cybertec Series 9000 product range includes several models of Satellite Modem/Routers designed for use on the Thuraya satellite service. The Series 9000 models provide support for download data rates of up to 60Kbps and upload data rates of up to 15kbps.

This guide will provide an overview of the features and interfaces of the Series 9000. Installation of the unit and antenna will be described as well as the configuration of the unit for a standard satellite connection. Further information can be obtained from the Series 9000 User Manual.

Note: The guide assumes that the configuration of the Series 9000 Modem/Router is the factory default state. If the modem has been previously configured it may be necessary to perform a configuration reset to reset the configuration to the default state, prior to configuring the device. The procedure to perform a configuration reset is described in Section 4.8.

2 Safety



Please observe the general safety precautions outlined in this manual during all phases of operation and service of the Series 9000 Modem/Router. If you do not comply with these precautions or with specific safety warnings contained elsewhere in this manual or on the product itself, you will violate the standards of design, manufacture, and intended use of the product. Cybertec does not assume any liability for failure to comply with these precautions.



Read this manual completely and make sure it is understood fully before commencing installation. Check that the intended application does not exceed the safe operating specifications for this unit. This unit should only be installed by qualified personnel. The power supply wiring must be sufficiently fused, and if necessary it must be possible to manually disconnect the unit from the power supply.

3 Care Recommendations

To maintain correct operation of the unit and to fulfill the warranty obligations the following care recommendations should be followed. This unit must not be operated with the covers removed. Do not attempt to disassemble the unit, no user serviceable parts are contained within the unit. Do not drop, knock or shake the unit, rough handling may cause damage to internal circuit boards. Do not use harsh chemicals, cleaning solvents or strong detergents to clean the unit. Do not expose the unit to any kind of liquids (rain, beverages, etc), the unit is not waterproof. Keep the unit within the specified humidity levels. Do not use or store the unit in dusty, dirty areas, connectors as well as other mechanical parts may be damaged.

4 Indicators and Interfaces

This section describes the indicators and interfaces for each of the models in the Series 9000 range. The Series 9000, Model 9100 and Model 9220 differ in that the Model 9220 has 2 additional serial ports, digital inputs and digital outputs.

4.1 Model 9100

The Ethernet ports, serial port indicators are located on the front panel as show in figure 1. The rear panel contains the connectors for power, and antenna, in addition to the SIM drawer and factory reset switch, as shown in figure 2.

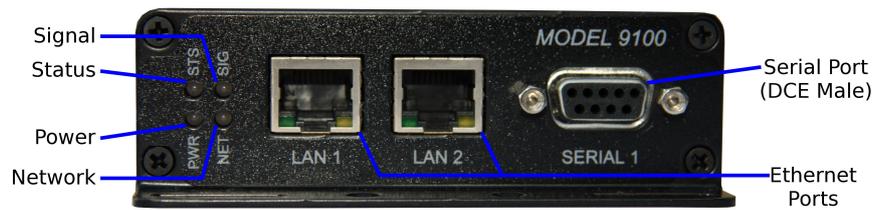


Figure 1: Model 9100 front panel.



Figure 2: Model 9100 rear panel.

4.2 Model 9220

The Ethernet ports, serial ports and indicators are located on the front panel as show in figure 3. The rear panel contains the connectors for power, digital inputs, digital outputs and antenna, in addition to the SIM drawer and factory reset switch, as shown in figure 4.

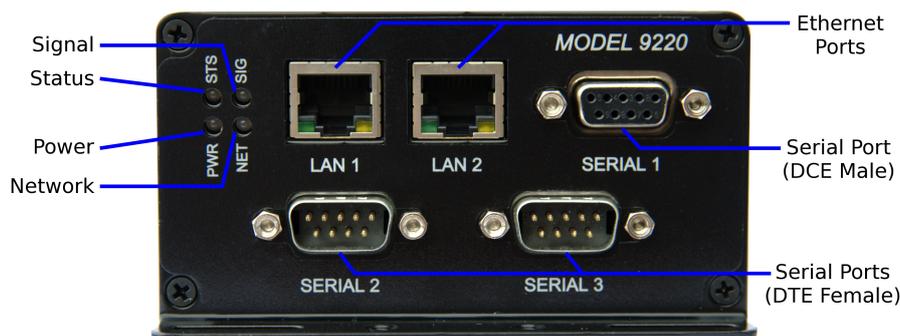


Figure 3: Model 9220 front panel.

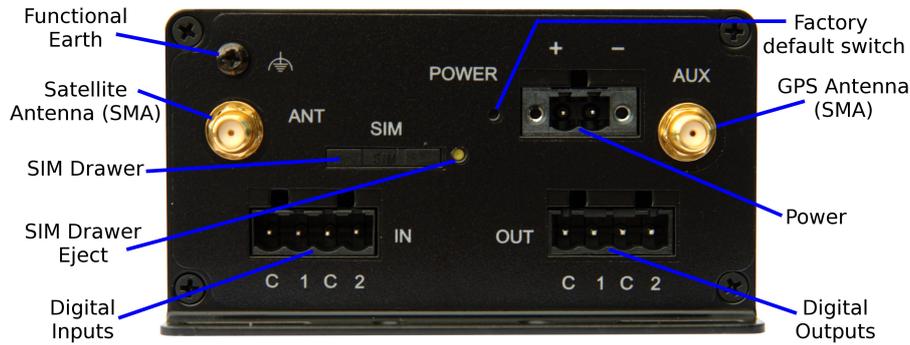


Figure 4: Model 9220 rear panel.

4.3 Indicators

The Series 9000 has 4 LED indicators on the front panel of the unit, refer to Figure 5 for the locations.

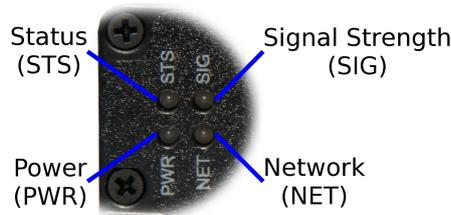


Figure 5: Front panel indicators

4.3.1 Power Indicator

The power indicator will light green when power is applied. If the indicator does not light when power is applied check the power supply voltage and connections, refer to Section 5.2.5 for details.

4.3.2 Network Indicator

The network indicator reports the status of the connection to the network. When powered up the indicator will be off, the indicator will then flash green whilst the unit searches for a network, once connected to the network the indicator will light green. The possible states are shown in Table 1.

Indicator	Description
Off	Not ready
green flashing	Searching for network
green (solid)	Locked to network

Table 1: Network Indicator.

4.3.3 Status Indicator

The status indicator reports the health of the unit. In normal operation the indicator will be green, if a fault is detected either at boot-up or during normal operation the indicator will light red. When the unit is first switched on or is reset the indicator will first light red, then flash red in sequence with the Signal Strength Indicator (refer to section 4.3.4), this is normal behaviour during boot-up and does not indicate a fault.

Indicator	Boot-up behaviour	Normal operation
Red	No Fault	Fault
Red Flashing	No Fault	Fault
Green	N/A	No Fault

Table 2: Status Indicator.

4.3.4 Signal Strength Indicator

The Signal Strength Indicator reports the level of the received RF signal as well as any network connection faults that occur. The signal strength is indicated by the number of green flashes of the indicator within an indicator period. Each indicator green flash will be followed by a short off time, an extended off time indicates the end of the indicator period. So an indicator period starts with a green flash followed by up to 5 additional flashes, then an extended off time, the cycle will then repeat. The maximum number of flashes in an indicator period is 6.

The indicator may be red during the extended off time following the green flashes, this indicates a network connection fault. The indicator will flash red if a SIM card is not present and will be solid red if the RF circuitry is restarting, network registration has failed or the RF signal level is too low for a connection.

When the unit is first switched on, or is reset the indicator will first light red, then flash red in sequence with the Status Indicator (refer to section 4.3.3), this is normal behaviour during boot-up and does not indicate a fault.

Indicator	Description
Green Flashing	Indication of received signal strength
Green flashing then Red	Network connection fault
Red flashing	SIM card not present or faulty
Red	RF circuitry initialising or network registration fault

Table 3: Signal Strength Indicator.

4.4 Ethernet

The Ethernet ports are on the front of the unit and are marked LAN 1 and LAN 2, each port has a LED indicating the connection speed and a LED indicating activity as shown in Figure 6. Both ports are capable of auto-negotiation, meaning cross-over cables are not required. The Ethernet ports are switched, allowing more than one Ethernet device to be connected to the unit at one time.

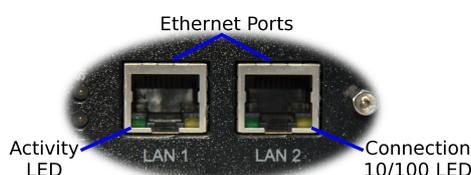


Figure 6: Ethernet ports.

4.5 Modem / DCE Serial Port

The Series 9000, has one Data Communications Equipment (DCE) serial port. The Modem / DCE Serial port is an RS232 level serial port, accessed via the front panel DB9 female connector. Refer to Figure 7 and Table 4 for the connections to this port.

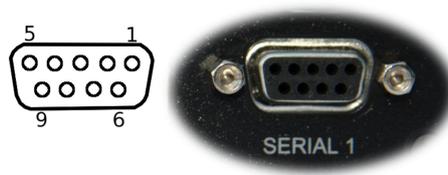


Figure 7: Modem / DCE Serial port.

Pin	Name	Direction	Description
1	DCD	Out	Data Carrier Detect
2	RxD	Out	Receive Data
3	TxD	In	Transmit Data
4	DTR	In	Data Terminal Ready
5	SG	-	Signal Ground
6	DSR	Out	Data Set Ready
7	RTS	IN	Request to Send
8	CTS	Out	Clear to Send
9	RI	Out	Ring Indicator

Table 4: Modem / DCE Serial port connections.

4.6 DTE Serial Ports (Model 9220 Only)

The Series 9000 Model 9220 has two Data Terminal Equipment serial ports. The two DTE serial ports are RS232 level ports, accessed via the two DB9 Male connectors on the front panel of the unit. Refer to Figure 8 and Table 5 for the connections to these ports.



Figure 8: DTE Serial ports.

Pin	Name	Direction	Description
1	DCD	In	Data Carrier Detect
2	RxD	In	Receive Data
3	TxD	Out	Transmit Data
4	DTR	Out	Data Terminal Ready
5	SG	-	Signal Ground
6	DSR	In	Data Set Ready
7	RTS	Out	Request to Send
8	CTS	In	Clear to Send
9	RI	In	Ring Indicator

Table 5: DTE Serial port connections.

4.7 Digital Inputs & Digital Outputs (Model 9220 Only)

The digital inputs and digital outputs are close contact type, the connectors are on the rear of the unit. The digital input connector is on the left hand side marked “IN”, the plug should be wired with reference to the circuit diagram shown in Figure 9 and the connections shown in Table 6. The digital output connector is on the right hand side marked “OUT”, the plug should be wired with reference to the circuit diagram shown in Figure figure 10 and the connections shown in Table 7.



The Common (C) connection terminals on the Digital Input connector and Digital Output connector are at the same potential as the power supply ground.

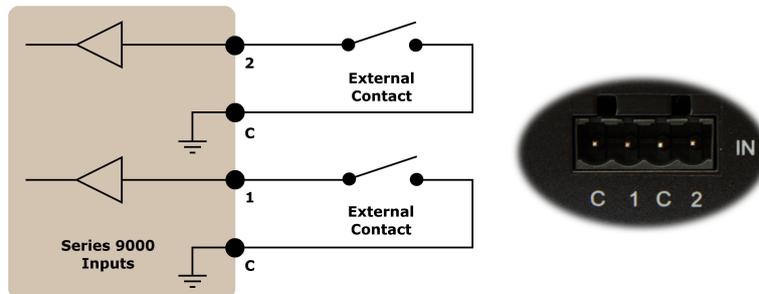


Figure 9: Digital Input circuit and connector.

Pin	Name	Direction	Description
1	C	-	Common
2	1	In	Input #1
3	C	-	Common
4	2	In	Input #2

Table 6: Digital Input connections.

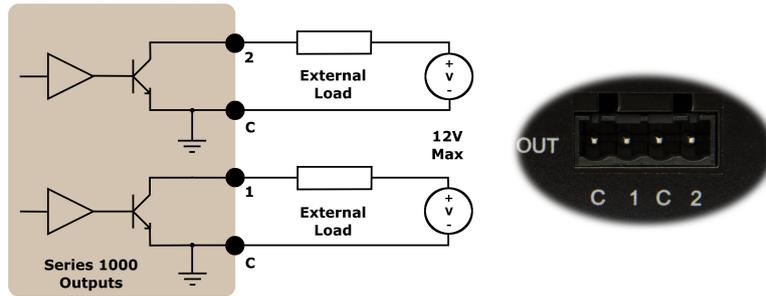


Figure 10: Digital Output circuit connector.

Pin	Name	Direction	Description
1	C	-	Common
2	1	Out	Output #1
3	C	-	Common
4	2	Out	Output #2

Table 7: Digital Output connections.

4.8 Factory Default Reset Switch

The factory default reset switch is used to restore the configuration of the Series 9000 to the factory defaults. The switch is accessed through a small hole on the rear of the unit adjacent to the power connector, refer to Figure 11. To reset the configuration first power down the unit then using a suitable tool depress the factory default reset switch, restore power to the unit ensuring the switch remains depressed for approximately 5 seconds after power is applied. The status and signal strength indicators will flash red then green to indicate the configuration has been reset. The modem will re-boot as normal with the factory default settings.



Figure 11: Factory Default Switch access.



Using the Factory Default Reset Switch will erase all existing configuration settings and restore the factory default settings. This includes the network connection profile settings APN, user name and password.

5 Installation

5.1 Antenna Installation

Correct antenna installation is required for optimal performance of the Series 9000. For correct alignment “line of site” is required between the antenna and the Thuraya satellite. This means the antenna needs to be pointed at the satellite with no obstruction in the path. Ensure that antenna is mounted so that it has a clear view of the sky and is not obstructed by any structure, object or vegetation.

5.1.1 Antenna Alignment

Before commencing installing of the antenna the correct elevation and azimuth for the location will need to be determined. The elevation is the angle at which the satellite signal will arrive at the antenna and the azimuth is the angle the antenna should be rotated from North. The best way to determine these values is to use the calculator at DishPointer www.dishpointer.com. At the Dish Pointer web page the details of the location are entered and depending on location either the Thuraya 2 (44.0E - Europe and the Middle East) or Thuraya 3 (98.5E - Australia and Asia) Satellite are selected. The elevation and azimuth values will then be calculated.

5.1.2 Mounting Bracket Attachment

The bracket is attached to the antenna with two screws. First align the bracket with the top two mounting holes on the antenna as shown in figure 12. Then referring to figure 13, insert the screws through the antenna mounting holes and place the flat washer and spring washer over the screw from the rear and secure with the nut.

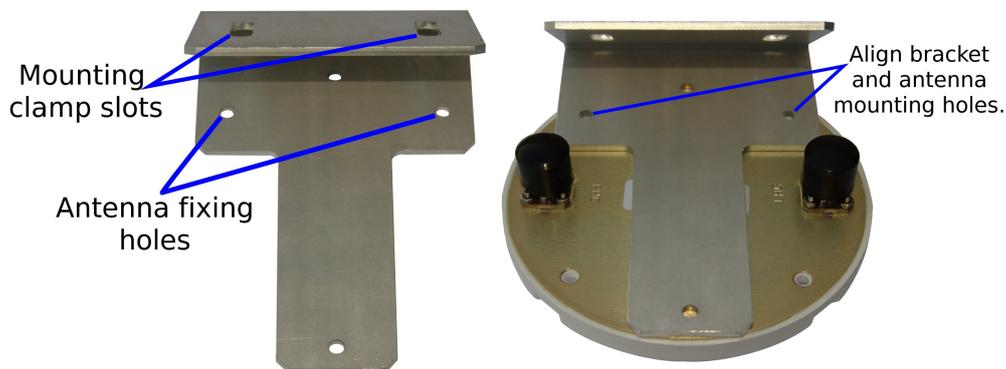


Figure 12: Antenna bracket showing fixing locations.

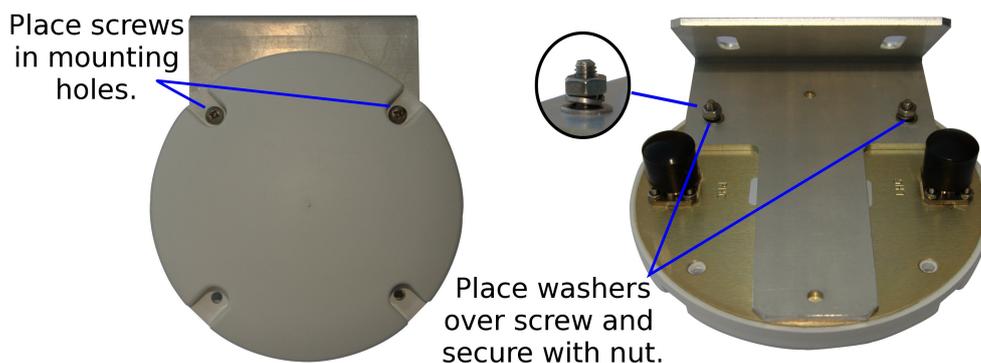


Figure 13: Fixing the antenna to the bracket.

5.1.3 Attaching the Antenna

The antenna is attached to the mounting pole using a hose clamp. Referring to Figure 14 thread the hose-clamp through the slots in the antenna mounting bracket. Then wrap the hose clamp around the mounting pole and slide the end of the hose-clamp through the screw mechanism. Using the alignment data determined in Section 5.1.1 point the antenna in the direction of the Satellite. Tighten the screw to secure the antenna to the pole.

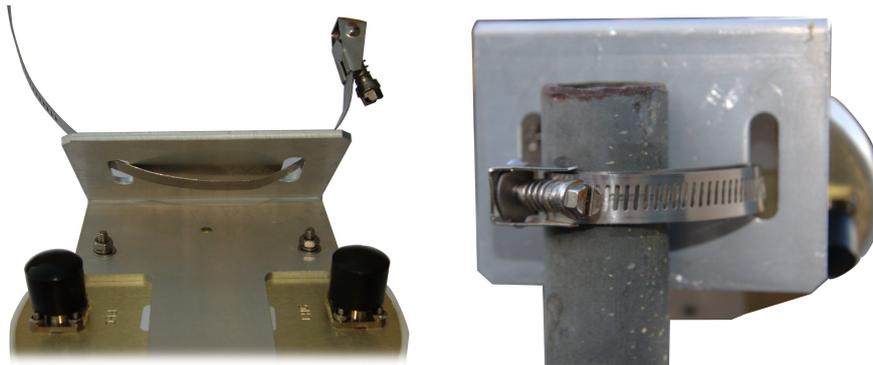


Figure 14: Fixing the antenna to the bracket.

5.1.4 Attaching the Antenna Cables

Remove the protective covers from the N-Type connectors and attach the cables as shown in Figure 15. Take note of markings adjacent to the connector, the markings indicate the polarisation of the signal on that connector and determine which of the connectors the cable will be connected to on the Series 9000.



Figure 15: Fixing the antenna to the bracket.

5.1.5 Fine Tuning

Fine tuning of the alignment may be required if the signal strength is not sufficient to establish a satellite connection. This should be completed once the Series 9000 has been installed and configured.

5.2 Series 9000 Installation

The steps required to install the Series 9000 Modem / Router are described. Although the images used show the Model 9100 the instructions apply to both the Model 9100 and the Model 9220.



The Series 9000 Modem/Router should be mounted in a clean and dry location, protected from water, excessive dust, corrosive fumes, extremes of temperature and direct sunlight. The unit uses convection cooling, allow sufficient ventilation to ensure adequate cooling of the modem.

5.2.1 Panel Mounting

The Series 9000 Modem/Router includes integrated mounting flanges and can be attached to a panel or tray by means of screws, using the slots shown in figure 16.



Do not drill or file the mounting flanges as this may damage the unit and will void the warranty.

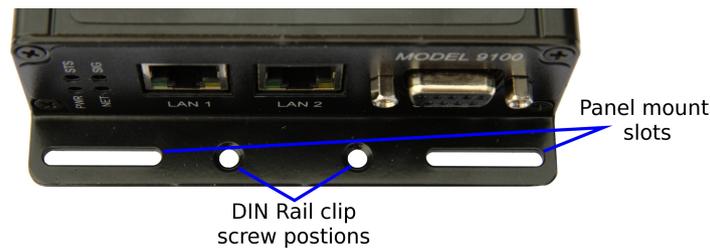


Figure 16: Mounting flange.

5.2.2 DIN Rail Mounting

The Series 9000 can be DIN rail mounted, using the DIN rail mounting kit supplied. The DIN rail clips should be screwed to the mounting flanges as shown in figure 17. The DIN rail clips can then be used to attach the Series 9000 to a DIN rail.

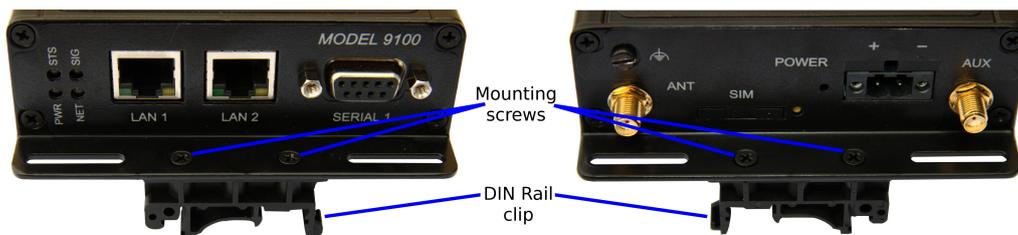


Figure 17: DIN Rail mounting.

5.2.3 Installing the SIM Card

Before removing or inserting the SIM card, ensure that the power has been turned off and the power connector has been removed from the unit.



Damage may result to the unit if excessive force is used to remove the SIM drawer.

- Do not use excessive force when pressing the SIM drawer eject button.
- Do not press or lever the SIM drawer, press only the SIM drawer eject button to remove the SIM drawer and SIM Card.

The SIM card drawer is located on the rear of the unit.

- The SIM card drawer eject button is a small yellow button located next to the SIM drawer on the rear panel of the Series 9000. Refer to the image on the left of Figure 18 for the location of the SIM card eject button. To eject the SIM card drawer press the SIM card drawer eject button using a suitable tool and remove the drawer.

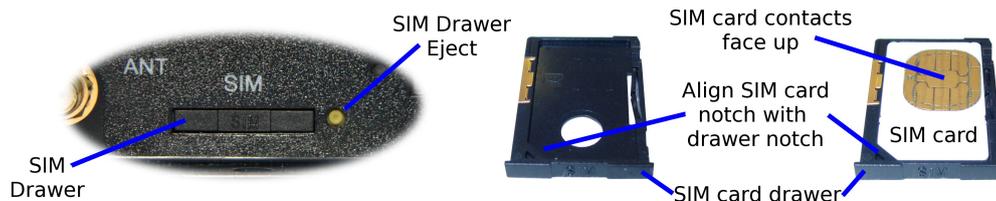


Figure 18: SIM card eject button.

- Insert the SIM card into the SIM card drawer with the contacts facing up, as shown on the right of Figure 18.
- Slid the drawer back into the unit ensuring that it locks into place.

5.2.4 Antenna Cables

The antenna connectors on the Series 9000 are SMA type. Attach the cables as shown in Figure 19. The orientation of the cables is as follows:

Antenna LHC Satellite connection. (Series 9000 Connector ANT)

Antenna RHC GPS connection. (Series 9000 Connector AUX)

Ensure that the connecting nut is done up tightly in order to make a good connection.



Figure 19: Antenna cables connected to SMA connectors.

5.2.5 Connecting the Power Supply

The Series 9000, requires a DC power source in the voltage range of +10VDC to +60VDC. The power connector accepts a screw terminal plug which should be wired as shown in figure 20 and plugged into the power connector on the rear of the Series 9000.



Figure 20: Power plug wiring and Power connector.



The Series 9000 is designed to self protect from permanent damage if the voltage exceeds 60VDC or if reverse polarity is applied. In the case of either event the modem may need to be returned for service.

The Series 9000 may be damaged if there is any potential difference between the chassis-ground, RS232 signal ground, power (-) input, or antenna shield. Before connecting any wiring, ensure all components are earthed to a common ground point. An external isolator will be required if a positive earth power supply is used.

5.2.6 Functional Ground

This equipment is intended to be grounded to comply with emission and immunity requirements. Ensure that the functional ground lug is connected to earth ground during normal use. Figure 21 shows the location of the Functional ground termination point.

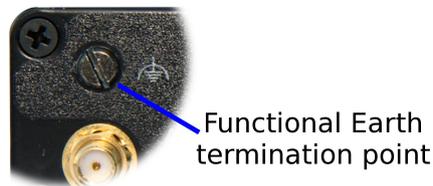


Figure 21: Functional ground lug.

6 Accessing and Using the Web Interface

All configuration of the Series 9000 modem is performed via the web interface. In order to view the web pages a computer with a fixed IP address, on the same sub-net as the Series 9000 Modem/Router, will need to be connected to one of the LAN ports.

- The default IP settings of the Series 9000 Modem / Router are:
 - IP Address: 10.10.10.10
 - Netmask: 255.255.255.0
- The recommended IP settings for the PC used to configure the Series 9000 Modem / Router:
 - IP Address: 10.10.10.20
 - Netmask: 255.255.255.0
 - Default Gateway: 10.10.10.10
 - Primary DNS: 10.10.10.10



Although it is possible to connect the Series 9000 Modem directly to a Local Area Network (LAN) it is recommend that the network configuration as described in this section be performed prior to doing so.

6.1 Windows PC Network Settings

The following describes how to configure the network settings of a Windows XP PC with the IP settings listed above, so that it can access the Series 9000 Modem/Router.



This procedure will change the network settings of the Windows PC, if the PC is connected to a network the connection should be removed before performing the changes. To restore the network settings of the PC record the current settings at Step 6 in the following procedure, then when the Series 9000 Modem has been configured following the procedure again and use the recorded values at Step 6.

1. Open the Control Panel by selecting *Start* ▸ *Control Panel*.



2. Double click the *Network Connections* icon.



3. Double click the Network icon.

4. The *Local Area Connection Status* dialog box will be displayed, as shown on the left of Figure 22, click the *Properties* button.

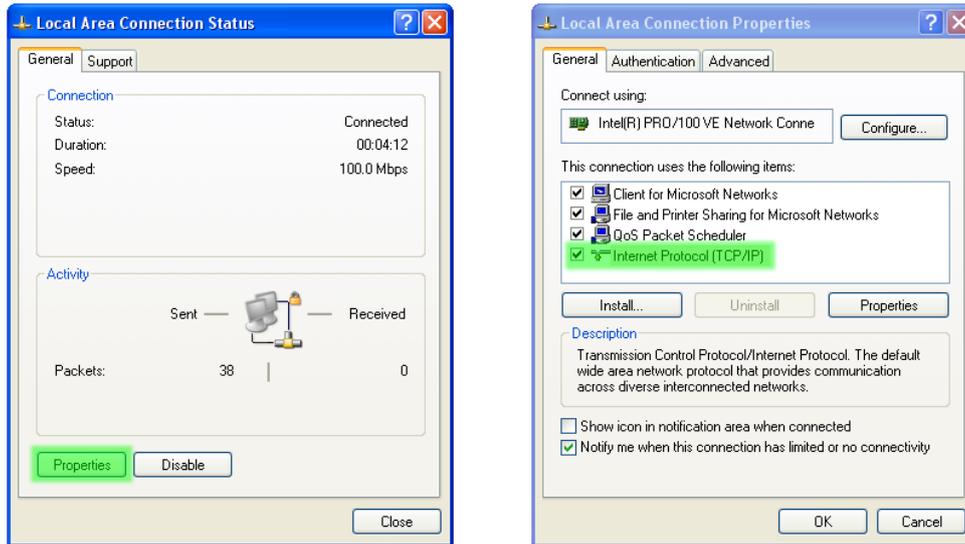


Figure 22: Local Area Connection Status and Properties dialog boxes.

5. The *Local Area Connection Properties* dialog box, as shown on the right of Figure 22, will be displayed. Click on *Internet Protocol (TCP/IP)* to highlight it and then click the *Properties* button.
6. The *Internet Protocol (TCP/IP) Properties* dialog box, change the settings to match those shown in Figure 23, and then click “OK”

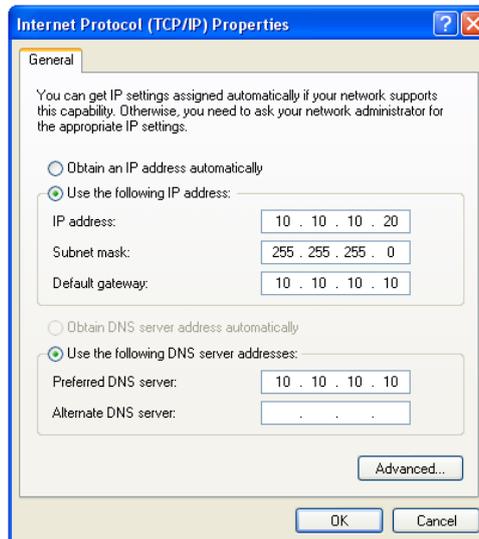


Figure 23: Internet Protocol (TCP/IP) Properties dialog box showing the recommended IP settings.

Note: If a web browser was open prior to making the network changes, then it will need to be closed and re-started before attempting to connect to the Series 9000 Modem/Router.

6.2 Accessing the Series 9000 Web Server

- Open a web browser on the PC and browse to 10.10.10.10 (the default Series 9000, IP address) .

- A login box similar to Figure 24 will pop up. If the box fails to display, re-check the cable connections to the unit and the IP address settings of the PC.

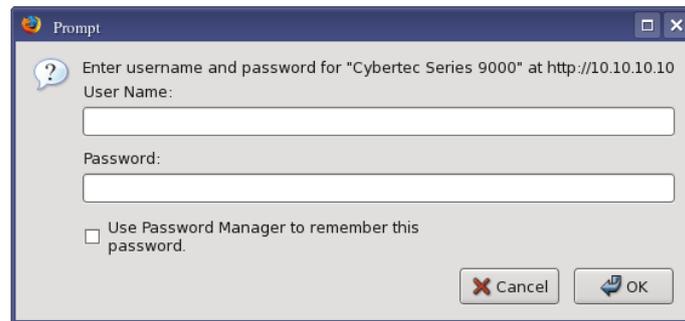


Figure 24: Web login box

- Enter the following login details:
 - User Name: admin
 - Password: admin
- The Status summary page will be displayed, it will be similar to Figure 25.

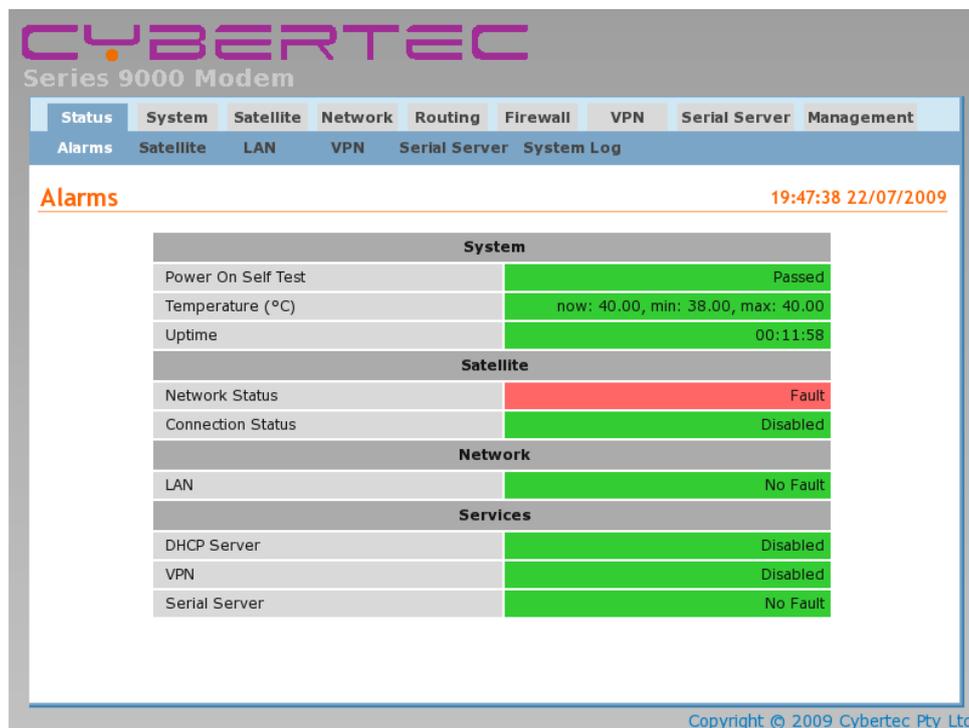


Figure 25: Status summary

Note: If the unit is not yet configured it is likely that the Network Status and Connection Status will indicate a fault condition.

7 Basic Configuration

The section explains the procedure to configure the Series 9000 for basic packet mode functionality. For details on configuring the modem for Circuit Switched mode and for more advanced configuration refer to the Series 9000 User Manual.

7.1 Configure the Satellite interface

To access the configuration page for the Satellite interface, click on *Satellite* the Satellite Network configuration page will be displayed as shown in Figure 26.

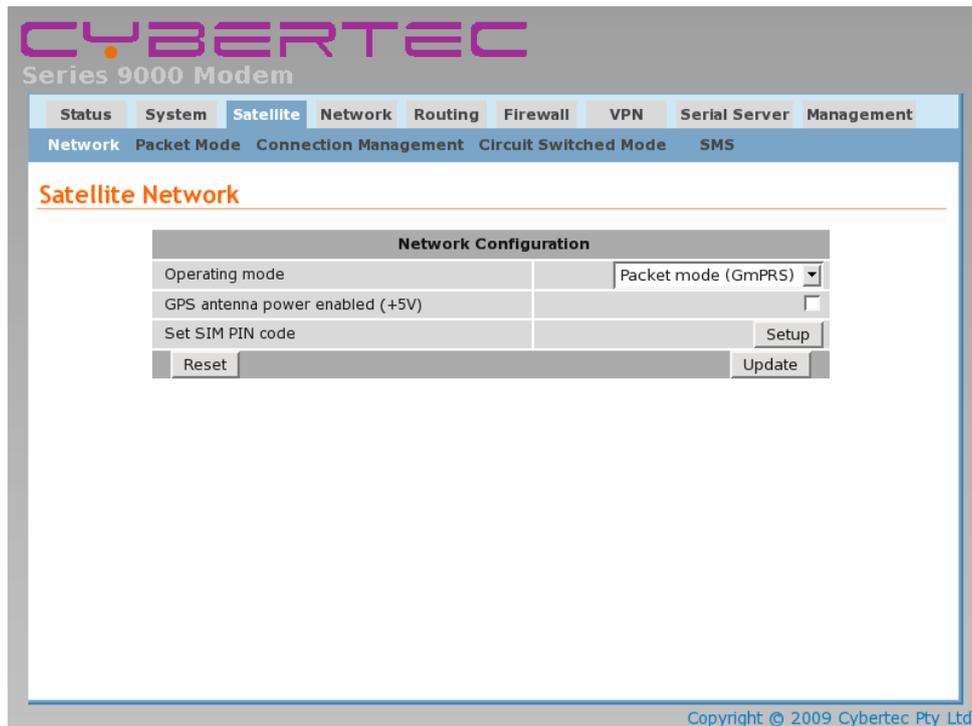


Figure 26: Satellite Network configuration.

7.1.1 Network Configuration

The “Network Configuration” section contains the settings for the operational mode of the modem. It also allows the antenna power supply to be enabled which by default is disabled. The default settings with Operating mode set to Packet mode (GmPRS) and GPS antenna power disabled will be adequate for connecting to the packet based network using the standard antenna.

7.1.2 Setting the SIM card PIN

The SIM card may have a PIN associated with it and may require the PIN to be entered before the modem can access the SIM. To set the SIM PIN click “Setup”. A dialog box will be displayed, similar to that shown in figure 27, set the field marked “Enter when requested” to “Yes” and enter the PIN in the “New PIN” and “Confirm PIN” entry boxes. Then click the “Set” button to save the PIN.

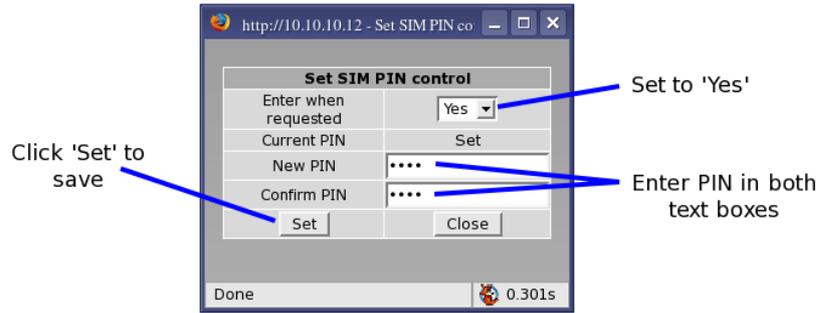


Figure 27: SIM PIN control dialog.

7.1.3 Adding a Network Connection Profile

To access the wireless packet mode settings click on the “Packet mode” tab. The screen shown in Figure 28 will be displayed. The page shows the connection configuration details and is divided into two sections. The first section shows the current connection state and the selected profile and the second section lists the available profiles. A connection profile groups together the settings required to connect to a provider’s network, the Series 9000 allows multiple profiles to be configured to allow quick changes to the network connection settings. For most applications only one profile is required.

Packet Mode

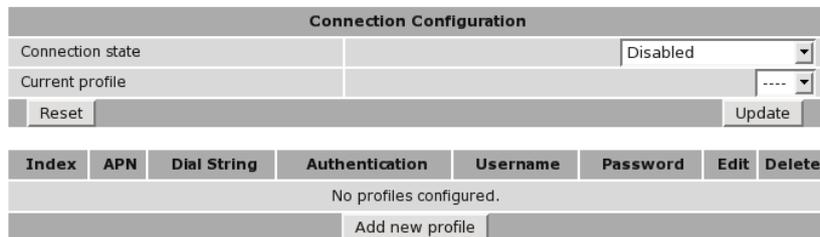


Figure 28: Wireless Interface Packet mode settings.

To configure a network profile click the “Add new profile” button, a page similar to Figure 29 will be displayed. The network provider will provide some or all of the configuration items listed below, depending on the type of connection provided. The values provided should be entered into the appropriate fields. A standard “Internet” type connection will usually only require the APN.

- *APN* (Access Point Name)
- *Dial string*
- *Authentication* (*None / PAP / CHAP*)
- *Username*
- *Password*



In order to set a password click the check-box marked New. The password can now be entered in the text field. The password is visible as it is being typed so that it can be checked for errors prior to being set. Once set the password will no longer be visible.



The satellite service provider may not supply a username and password if network authentication is not required. In this case set the Authentication to “None”, leave the username blank and do not set a password.

Packet Mode

Enter APN
 Enter dial string
 Set authentication
 Enter username
 check new and enter password
 Click to save profile

Figure 29: Adding a new profile.

Once the data has been entered click the “Update” bottom to add the profile. The screen will now change to show the newly added profile as this is the only profile entered it will be automatically selected as the current profile and the profile entry will be shaded green to indicate that it is the selected profile.

7.1.4 Enable the Satellite Connection

To complete the configuration of the satellite connection, set the Connection state to “Always connect” and click the “Update” button to save the changes. Once the changes have been set, the Series 9000 will attempt to establish a satellite connection. The connection time will vary and may take several minutes to complete. Figure 30 shows the completed satellite configuration.

Packet Mode

Index	APN	Dial String	Authentication	Username	Password	Edit	Delete
1	apn_string	*99#	CHAP	username	Set		

Buttons: Reset, Update, Add new profile

Figure 30: Completed wireless configuration.

7.1.5 Connection Status

To check the status of the connection select “Status” from the top level menu and then select “Satellite” from the second level menu. The Satellite status page will be displayed. Before a connection can be established the modem will need to obtain GPS lock, when first installed in a new location this may take some time to acquire. The modem may re-start the RF circuitry if a connection is not established within the timeout period. Figure 31 shows the Satellite status page with GPS lock not yet acquired.

Satellite

Network Status	
Network Registration	No
RF Level (RSSI)	31 / 42 (-51 dBm)
Provider	Thuraya
GPS Position Required	Yes

Connection Status	
Status	Error: No network registration
Current Session Time	
Total Session Time	00:00:00
IP Address	0.0.0.0
Packets Received	0
Bytes Received	0 B
Packets Transmitted	0
Bytes Transmitted	0 B

Annotations: "No network registration" points to the Network Registration value. "GPS lock required" points to the GPS Position Required value.

Figure 31: Satellite Status showing GPS lock required and no network registration.

Once GPS lock has been established the status of the connection will change as the modem connects to the network, first it will report “Checking” then “Connecting” and finally “Connected”. To see the value changing the page will need to be refreshed. Once connected the Satellite status page will look similar to that shown in Figure 32.

Satellite

Network Status	
Network Registration	Yes
RF Level (RSSI)	42 / 42 (-29 dBm)
Provider	Thuraya (Location: 0808 / Cell ID: F0,0F)
GPS Position Required	No

Connection Status	
Status	Connected
Current Session Time	00:02:12
Total Session Time	00:02:12
IP Address	58.111.27.128
Packets Received	16
Bytes Received	1.26 kB
Packets Transmitted	14
Bytes Transmitted	954 B

Annotations: "Registered to network" points to the Network Registration value. "GPS locked" points to the GPS Position Required value.

Figure 32: Satellite Status showing GPS lock and network registration.



During initialisation the status may be reported as “Error” while the connection is being established. If the error persists check the profile settings have been entered correctly. Refer to Section 7.1.3.

With the satellite network connection established the Status Alarms page should now indicate no faults as shown in Figure 33.

Alarms

System	
Power On Self Test	Passed
Temperature (°C)	now: 30.50, min: 30.50, max: 37.25
Uptime	00:20:56
Satellite	
Network Status	No Fault
Connection Status	No Fault
Network	
LAN	No Fault
Services	
DHCP Server	Disabled
VPN	Disabled
Serial Server	No Fault

Figure 33: Status Alarms page.

7.2 Configure the LAN interface and DHCP Server

To access the configuration page for the LAN interface and DHCP Server, select Interfaces from the top level menu the LAN interface screen similar to that shown in Figure 34 will be shown.

LAN

Interface Configuration	
Enabled	<input checked="" type="checkbox"/>
IP Address	10.10.10.10
Netmask	255.255.255.0
MTU	1500
DHCP Server Configuration	
Enabled	<input type="checkbox"/>
Start address	10.10.10.100
End address	10.10.10.200
Default lease time (mins)	1440
Maximum lease time (mins)	1440
Reset	Update

Figure 34: LAN Interface configuration

7.2.1 Setting the IP Address

If it is desired to change the IP address of the LAN port, follow the steps below:

- Enter the new IP address and netmask in the *Interface Configuration* table.
- Click *Update* to set the changes. Once the changes have been set, the IP address of the Series 1000 Modem will change. Enter the new address in the browser on the PC. It will be necessary to login again, following the procedure described in the previous section.

7.2.2 Enabling DHCP

The DHCP server allows clients on the local network to be automatically allocated IP addresses from the Series 9000. DHCP also provides the clients with network settings such as default route and location of DNS servers.

By default the DHCP server is disabled however it has been configured to serve IP addresses in the range 10.10.10.100 through 10.10.10.200, and the Default and Maximum lease times have been set to 1440 minutes. So if these values are consistent with the network to which the Series 9000 is connected, then the DHCP server can be enabled by setting the Enabled field to 'Yes' and clicking the Update button.

If the standard settings are not applicable for the connected network, then refer to Figure 35 and follow the steps below, to configure the DHCP server:

- Choose a group of available IP addresses on the local network. For example, if the IP address of the Series 9000 is 10.10.10.10 with a netmask of 255.255.255.0, a group chosen could be 10.10.10.100 to 10.10.10.200. This will provide 101 addresses for clients.
- Under the *DHCP Server Configuration* table,
 - Set the *Enabled* option to *Yes*.
 - Enter the first address of the group in the *Start Address* box.
 - Enter the last address of the group in the *End Address* box.
 - Enter a lease time for the Default Lease time.
 - Enter a lease time for the Maximum Lease time.
- Click *Update* to set the changes.

LAN

The screenshot shows a configuration interface with two main sections: 'Interface Configuration' and 'DHCP Server Configuration'. The 'Interface Configuration' section includes fields for 'Enabled' (checked), 'IP Address' (10.10.10.10), 'Netmask' (255.255.255.0), and 'MTU' (1500). The 'DHCP Server Configuration' section includes 'Enabled' (checked), 'Start address' (10.10.10.100), 'End address' (10.10.10.200), 'Default lease time (mins)' (1440), and 'Maximum lease time (mins)' (1440). At the bottom are 'Reset' and 'Update' buttons. Blue arrows point from text labels to these specific elements: 'Check to enable DHCP server' points to the 'Enabled' checkbox; 'Set the DHCP IP address range' points to the 'Start address' and 'End address' fields; 'Set the DHCP lease times' points to the 'Default lease time' and 'Maximum lease time' fields; and 'Click to save changes' points to the 'Update' button.

Interface Configuration	
Enabled	<input checked="" type="checkbox"/>
IP Address	10.10.10.10
Netmask	255.255.255.0
MTU	1500

DHCP Server Configuration	
Enabled	<input checked="" type="checkbox"/>
Start address	10.10.10.100
End address	10.10.10.200
Default lease time (mins)	1440
Maximum lease time (mins)	1440

Reset Update

Figure 35: DHCP configuration.

7.3 Configure clients to use the Series 9000

The Series 9000 will act as a gateway for connections destined over the wireless interface. The default configuration will provide Network Address Translation and firewalling to protect clients on the local network.

To configure clients to use the Series 9000 as their gateway:

- If the clients have a DHCP address allocated by the Series 9000, they will have learned the necessary settings. No further configuration is needed.
- If clients have static IP addresses, set their default route and DNS server to the IP address of the Series 9000.

8 Troubleshooting

The following is a list a potential problems and possible causes. If after the checking through the list a problem persists refer to the Series 9000 User Manual for further information.

8.1 Series 9000 Does not start.

- Check that the power indicator (Refer to Section 4.3.1) is green. If not then check the power supply is of the correct voltage and the connections to the Series 9000 are correct. Refer to section 5.2.5 for details.
- Check the front panel indicators for a fault condition, particularly the Status indicator. Refer to Section 4.3.

8.2 Cannot connect to web pages

- Check the Ethernet cabling between the PC and the Series 9000.
- Check that the connection LED on the Series 9000 Ethernet port is lit, if not then check the Ethernet cabling. Refer to Section 4.4.
- Check the IP address settings of the computer have been set correctly. Refer to section 6.
- The IP address of the Series 9000 Modem/Router may have been changed from the default value. If this is the case then:
 - Make sure the IP address settings of the computer are correct for the IP address chosen and the correct IP address has been entered in the web browser, or
 - If the IP Address of the Series 9000 Modem/Router is not know then a factory reset will reset the IP address to the default value. Refer to section 4.8 for details.
- The password may have been changed from the default, if the new password is not know then a factory reset will set the password to the default. Refer to section 4.8 for details.

8.3 Network Status Fault

Check the Wireless Status page for a list of possible faults.

8.3.1 SIM Card Absent or Faulty

- Check that the SIM card has been installed correctly. Refer to Section 5.2.3.
- Check with the Network provider to ensure that the SIM card has been activated.
- Check that the SIM PIN has been entered correctly. Refer to Section 27
- The SIM card may be faulty, if possible test using an alternative SIM card.

8.3.2 Network Registration Fault

- Check that the antenna has been installed and connected correctly. Refer to Section 5.1.
- If the signal strength is low check the antenna alignment. Refer to Section 5.1.1.
- Check that GPS lock as been acquired. Refer to Section 7.1.5
- Check that the connection profile details have been entered correctly. Refer to section 7.1.3.

8.4 Connection Status Fault

8.4.1 Status Disabled

- Check that the Connection State is set to enabled on the Wireless Packet Mode page. Refer to Section 7.1.4
- Check the profile, APN, Username and password have been set correctly. Refer to section 7.1.3.

Cybertec Pty Limited
ABN 72 062 978 474
Unit 11, 41-43 Higginbotham Road
Gladesville NSW 2111
Australia
Phone: +612 9807 5911
Fax: +612 9807 2258
www.cybertec.com.au

CYBERTEC