DMM Series
3G / GSM Modem Router

Quick Start Guide

CYBERTEC

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DMM Series Quick Start Guide

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1   Introduction

The Cybertec DMM Series product range includes several models of 3G and GSM Modems.

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

2   Safety

Please observe the general safety precautions outlined in this manual during all phases of operation and service of the device. 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 unit and to fulfil 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 part may be damaged.

4 Indicators and Interfaces

This section describes the indicators and interfaces for the DMM Series.

4.1 Front Panel

The Ethernet ports, antenna connector, power connector and indicators are located on the front panel as show in figure 1.
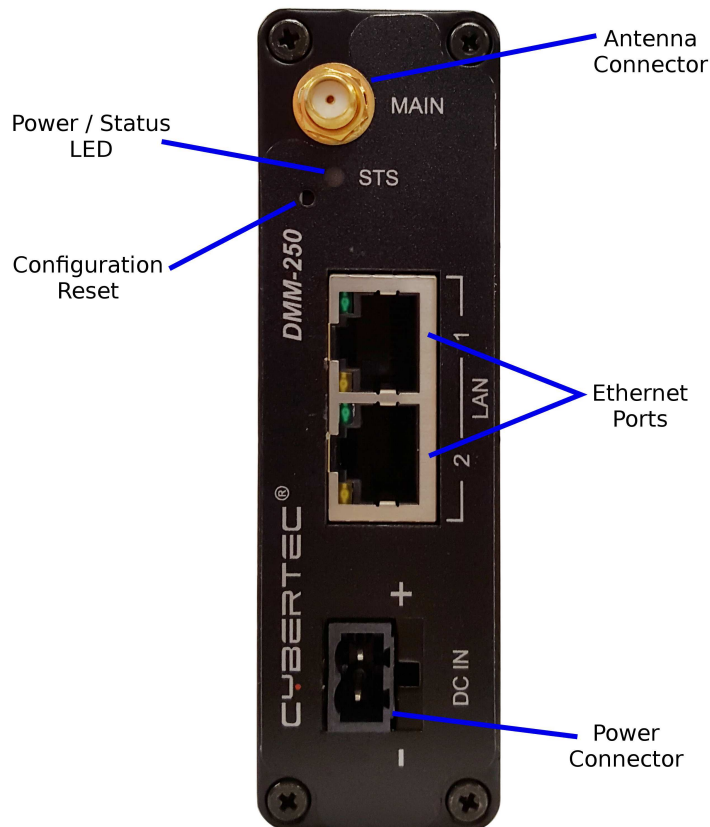

Figure 1: DMM Series front panel.

4.2   Rear Panel

The rear panel contains the SIM slot, functional earth and DIN Clip as shown in figure 2.
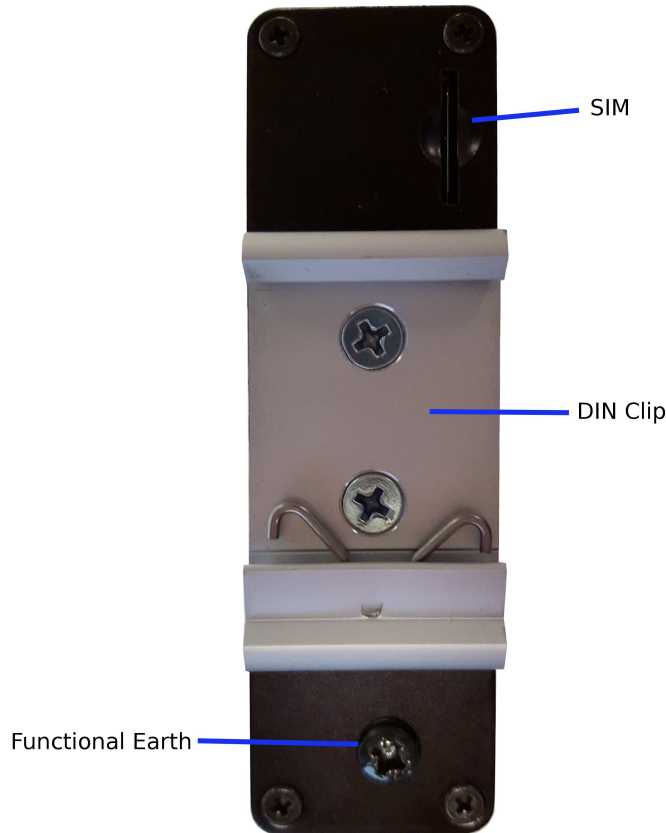
Figure 2: DMM Series rear panel.

4.3   Indicators

The DMM Series modem has single power / status LED on the front panel of the unit. The indicator will light green when power is applied and will light red when an error or fault condition is detected.

4.4   Ethernet

The Ethernet ports are on the front of the unit, the port has a LED indicating the connection speed and a LED indicating activity as shown in Figure 3. The Ethernet port is capable of auto-negotiation, meaning cross-over cables are not required.

Figure 3: Ethernet ports.

5 Installation

The steps required to install the DMM Series Modem are described.

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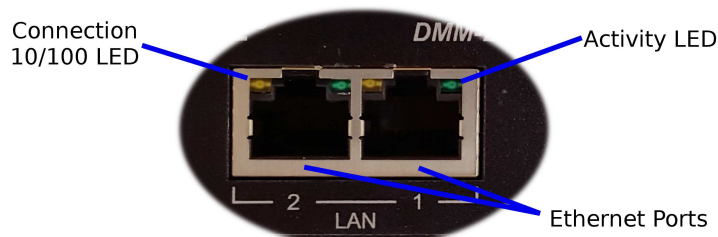 extremes of temperature and direct sunlight. The unit uses convection cooling, allow sufficient ventilation to ensure adequate cooling of the modem.

5.1 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 or insert the SIM.

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

Figure 4: Inserting the SIM card.

- Insert the SIM card into the SIM card drawer with the contacts facing away from the closest edge, as shown on the right of Figure 4.

- Push the SIM until in clicks, indicating it is in place.

- If inserted correctly it should be just behind the panel.

- To remove the SIM press until it clicks then release and it will spring out.

5.2 Antenna

The antenna connector on the DMM Series Modem is an SMA type and found on the rear of the unit. The supplied antenna is intended for direct mounting to the SMA connector. Attach the antenna as shown in Figure 5. Ensure that the connecting nut is done up tightly in order to ensure a good connection.

Figure 5: Antenna connected to SMA connector.

5.3 Power Supply

The DMM Series Modem requires a DC power source in the voltage range of +10VDC to +30VDC. The power connector accepts a screw terminal plug which should be wired as shown in figure 6 and plugged into the power connector on the rear of the unit.
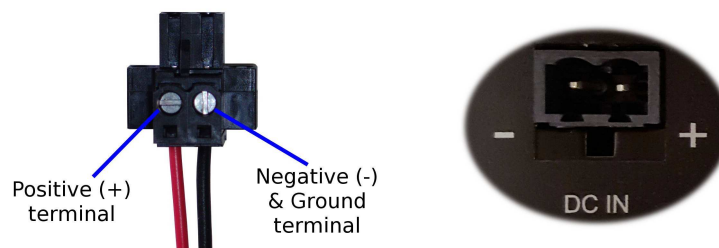

Figure 6: Power plug wiring and Power connector.

⚠ The unit is designed to self protect from permanent damage if the voltage exceeds +36VDC or if reverse polarity is applied. In the case of either event the modem may need to be returned for service.

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5.4 Functional Earth

In order to comply with emission and immunity requirements the unit should be grounded. Ensure that the functional earth lug is connected to earth ground during normal use. The Functional earth termination screw is on the rear of the unit.
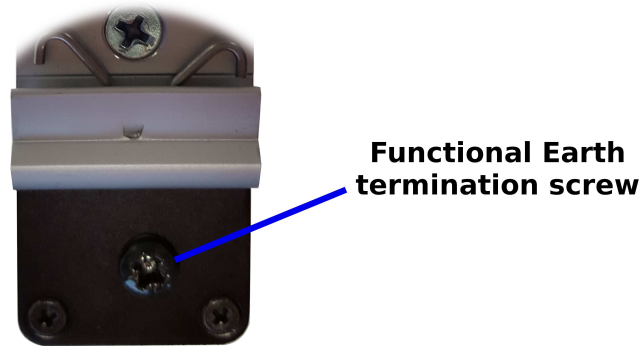

Figure 7: Functional earth termination screw.

5.5 Mounting

The DMM Series Modem is designed to be DIN rail mounted. Using the DIN rail clip on the rear of the unit ensure the unit is securely mounted to a suitable DIN rail.

6 Accessing the Web Interface

All configuration of the DMM Series 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 DMM Series Modem, will need to be connected to one of the LAN ports.

- The default IP settings of the DMM Series Modem are:

  ○ IP Address: 10.10.10.10
  ○ Netmask: 255.255.255.0

- The recommended IP settings for the PC used to configure the DMM Series Modem are:

  ○ 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 DMM Series 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 DMM Series Modem.

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 DMM Series 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* dialogue box will be displayed, as shown on the left of Figure 8, click the *Properties* button.
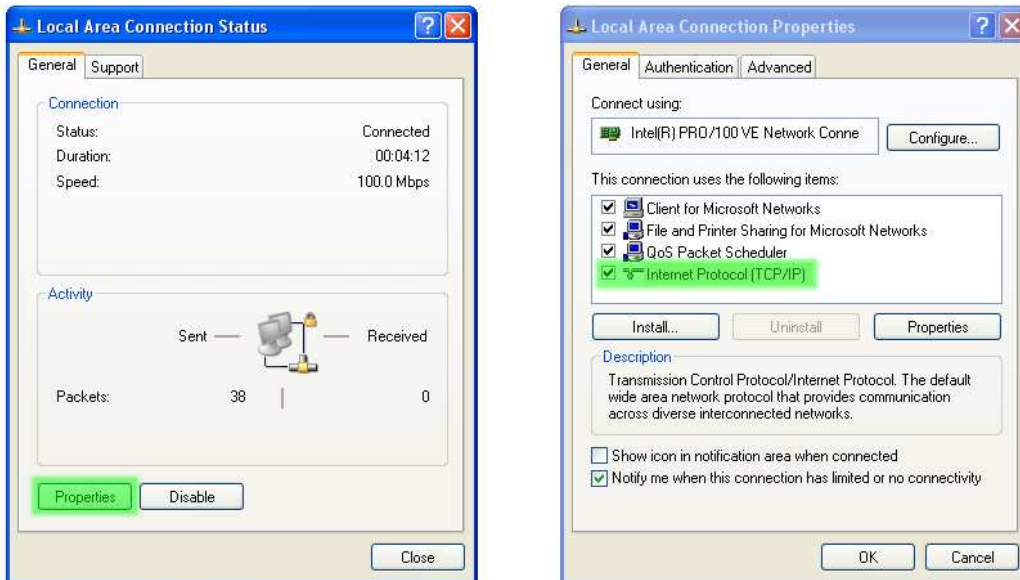
Figure 8: Local Area Connection Status and Properties dialogue boxes.

5. The Local Area Connection Properties dialogue box, as shown on the right of Figure 8, 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 dialogue box, change the settings to match those shown in Figure 9, and then click "OK"
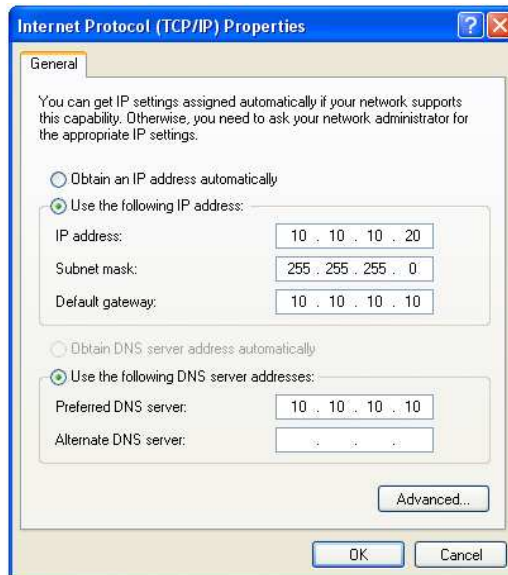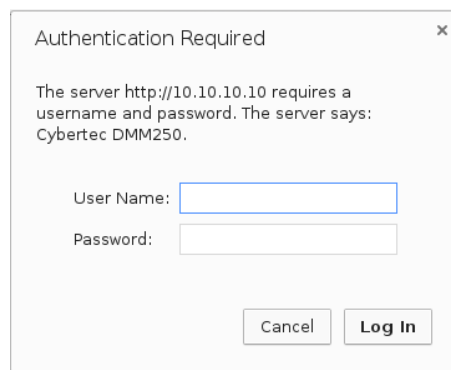

Figure 9: Internet Protocol (TCP/IP) Properties dialogue box showing the recommended IP settings.

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

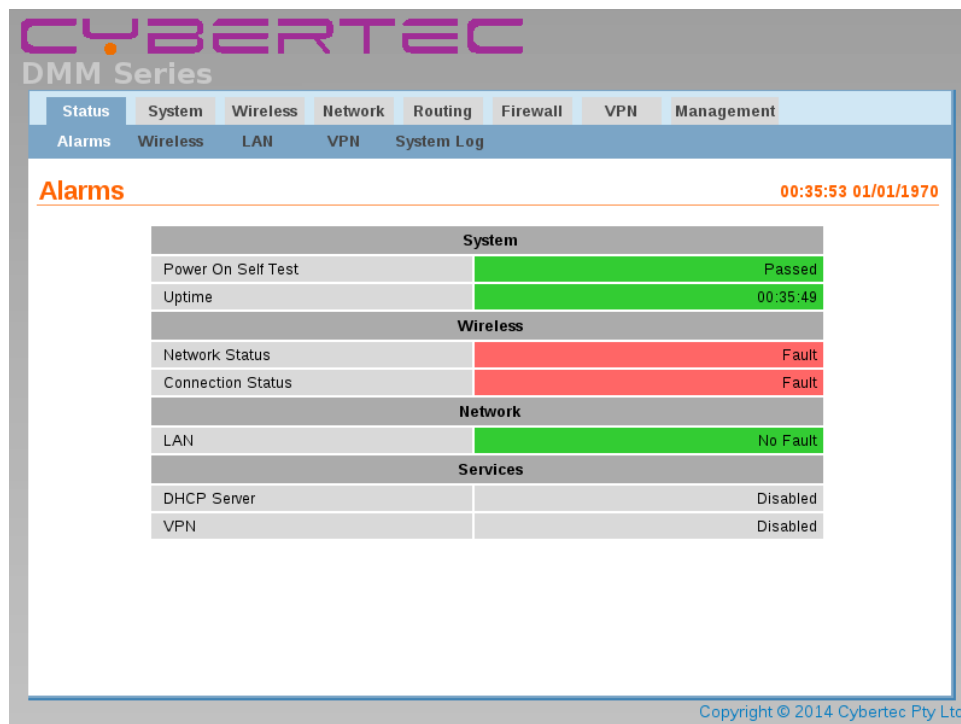## 6.2   Connecting to the DMM Series Web Server

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

- A login box similar to Figure 10 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.

- Enter the following login details:

  - User Name: admin
  - Password: admin

- The Status summary page will be displayed, it will be similar to Figure 11.

Note: As the unit has not yet been configured it is likely that some faults will be indicated.

Figure 10: DMM Series Web login box

Figure 11: DMM Series Status summary

7   Basic Configuration

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

7.1   Configure the Wireless interface

To access the configuration page for the Wireless interface, click on *Wireless,* the Wireless Network configuration page will be displayed similar to that shown in Figure 12. Note: the Frequency Band Selection table will not be shown on the GSM Models.
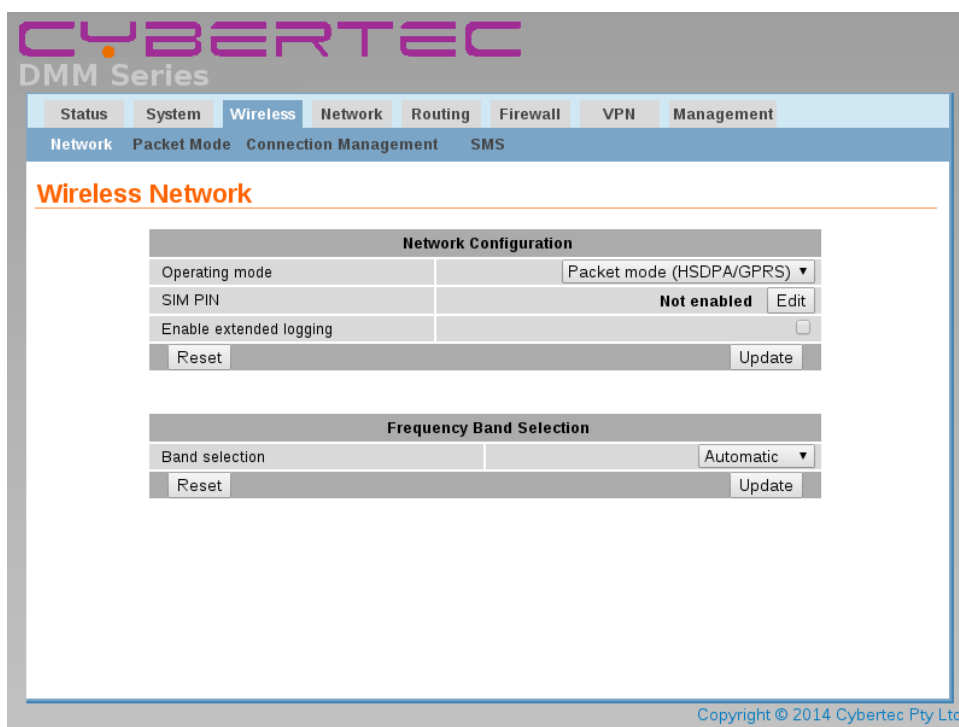

Figure 12: Wireless Network configuration.

7.1.1   Network Configuration

The "Network Configuration" section contains the settings for the operational mode of the modem. The default settings with Operating mode set to Packet mode (HSPA/GPRS) and the Frequency Band Selection set to Automatic will be adequate for a standard Internet type connection.

7.1.2   Setting the SIM card PIN

The SIM card may have a PIN associated with it and my require the PIN to be entered before the modem can access the SIM. To set the SIM PIN click the ⟨Edit⟩ button. A dialogue box will be displayed, similar to that shown in Figure 13. To enable the PIN click the Enable check box. The dialogue box will change to allow the PIN to be entered as shown in Figure 14. Enter the PIN in both boxes and click update. The PIN has now been saved.
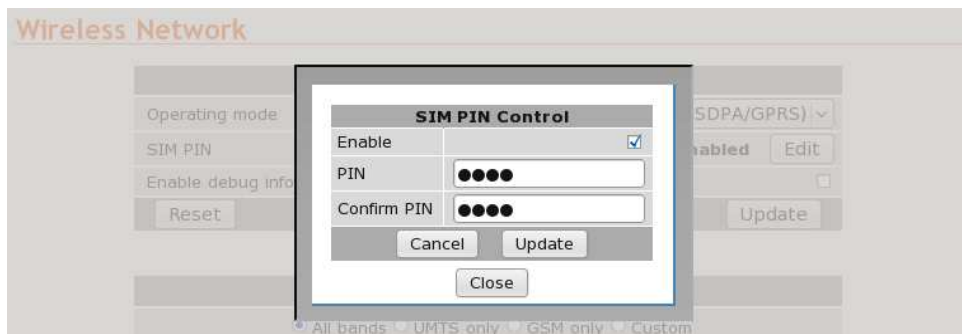
Figure 13: SIM PIN control dialogue.

Figure 14: SIM PIN control dialogue.

7.1.3 Adding a Network Connection Profile

To access the packet mode configuration, select Wireless ▷ Packet Mode from the menu. The screen shown in Figure 15 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. Multiple profiles may be configured to allow quick changes to the network connection settings. For most applications only one profile is required.
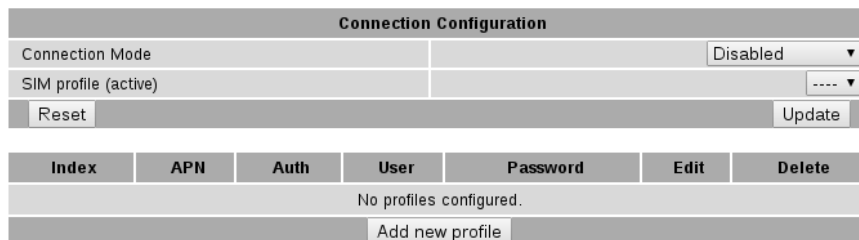

Figure 15: Wireless Interface Packet mode settings.

To add a new profile, click the Add new profile button, the add entry page will display as shown in Figure 16.

Packet Mode

Figure 16: Adding a new profile.

The settings required are listed below:

APN This is the name of the network provider's Access Point Name (APN).

Authentication For connections requiring a user-name and password to connect, this field sets the authentication protocol used:

>**None** No authentication is performed.
>
>**PAP** The Password Authentication Protocol is used.
>
>**CHAP** The Challenge-Handshake Authentication Protocol is used.

Username For connections with **PAP** or **CHAP** selected for authentication, this is the user-name the modem will use to authenticate.

Password For connections with **PAP** or **CHAP** selected for authentication, this is the password the modem will use to authenticate. In order to set a password click the check box marked **New** then enter the password in the adjacent 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 network provider will specify the required settings for completing a connection profile. The provider may not supply a user-name and password if network authentication is not required. In this case set the **Authentication** to **None**. The only required field is the APN.

Once the profile has been entered click the Update button to save and commit changes. 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 Wireless Connection

To complete the configuration of the wireless connection, set the Connection state to "Always connect" and click the "Update" button to save the changes. Once the changes have been set, the DMM Series Modem will attempt to establish a connection to a wireless network. The connection time will vary and may take several minutes to complete. Figure 17 shows the completed wireless configuration.

Packet Mode

Figure 17: 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 "Wireless" from the second level menu. The Wireless status page will be displayed. 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 Wireless status page will look similar to that shown in Figure 18.
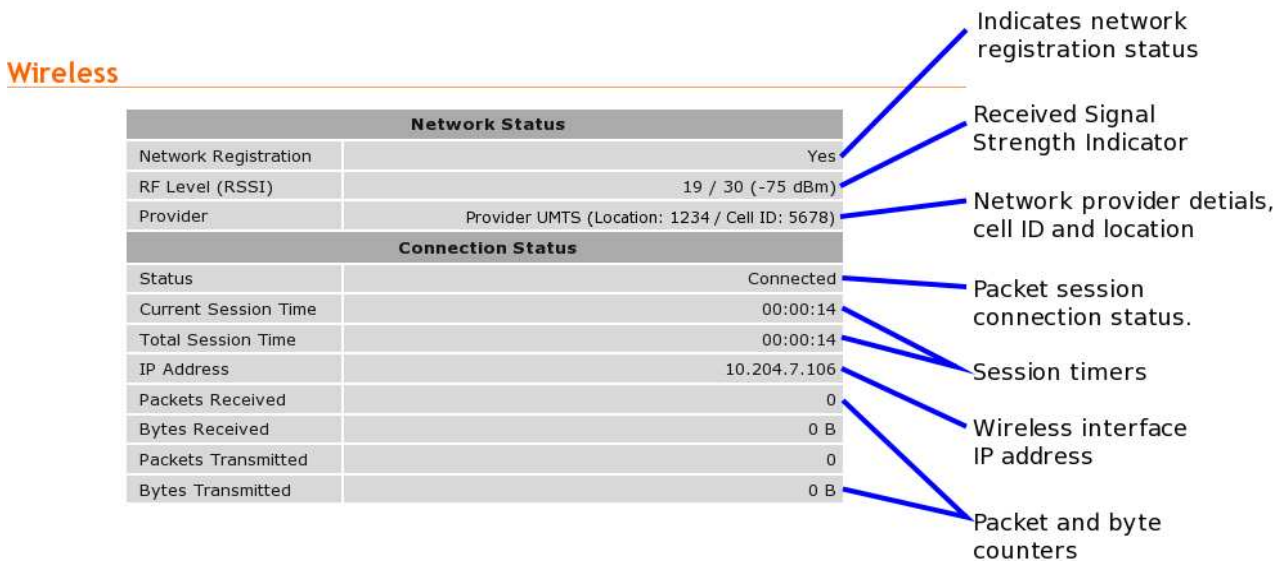

Figure 18: Wireless Status showing a modem in the connected state.

⚠ 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 Wireless network connection established the Status Alarms page should now indicate no faults as shown in Figure 19.

Figure 19: 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 20 will be shown.

Figure 20: 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 DMM Series 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 DMM Series Modem. 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 DMM Series Modem 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 21 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 DMM Series Modem 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.

Figure 21: DHCP configuration.

7.3 Configure clients to use the DMM Series Modem

The DMM Series Modem 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 DMM Series Modem as the default gateway:

- If the clients have a DHCP address allocated by the DMM Series Modem, 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 DMM Series Modem .

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 DMM Series Modem User Manual for further information.

8.1 DMM Series Modem does not start.

- Check the power / status indicator (Refer to Section 4.3) is lit green. If not check the power supply is the correct voltage and the connector is wired correctly. Refer to section 5.3.

- 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 DMM Series Modem .

- Check that the connection LED on the DMM Series Modem Ethernet port is lit. 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 DMM Series Modem 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 for the DMM Series Modem and;
  - the correct IP address has been entered in the web browser.

- The password may have been changed from the default.

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 5.1.

- 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 7.1.2

- 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 5.2.

- If the signal strength is low check the antenna alignment. Refer to Section 5.2.

- 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, User-name and password have been set correctly. Refer to section 7.1.3.

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