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CMS-6R4 Series

Console Management Switch + Power Control

Models Covered:
CMS-6R4
CMS-6R4-CE

User's Guide

Warnings and Cautions:
INSTALLATION INSTRUCTIONS

SECURE RACKING

If Secure Racked units are installed in a closed or multi-unit rack assembly, they may require further evaluation by Certification Agencies. The following items must be considered.

1. The ambient within the rack may be greater than room ambient. Installation should be such that the amount of air flow required for safe operation is not compromised. The maximum temperature for the equipment in this environment is 45°C. Consideration should be given to the maximum rated ambient.

2. Installation should be such that a hazardous stability condition is not achieved due to uneven loading.

Input Supply

Check nameplate ratings to assure there is no overloading of supply circuits that could have an effect on overcurrent protection and supply wiring.

GROUNDING

Reliable earthing of this equipment must be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than direct connections to the branch circuit.

No Serviceable Parts Inside; Authorized Service Personnel Only

Do not attempt to repair or service this device yourself. Internal components must be serviced by authorized personnel only.

- **Shock Hazard - Do Not Enter**

Disconnect Power

If any of the following events are noted, immediately disconnect the unit from the outlet and contact qualified service personnel:

1. If the power cord becomes frayed or damaged.

2. If liquid has been spilled into the device or if the device has been exposed to rain or water.

FCC Part 15 Regulation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Plug the equipment into an outlet on a circuit that is different from the one used by the receiver.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

> **WARNING:** **Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment**

EMC, Safety, and R&TTE Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

- Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

    and
- Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits;

    and
- Council Directive 1999/5/EC of 9 March on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This product meets the applicable Industry Canada technical specifications

The Ringer Equivalence Number is an indication of the maximum number of devices allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices does not exceed five

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1. Introduction

The CMS-6R4 Console Management + Power Control Switch, is designed for remote network management installations where rack space is precious and only a few network elements are in the rack. The CMS-6R4 combines six RS232 Console ports with four power reboot outlets and an internal 33.6Kbps Modem all in a 1U package. The CMS-6R4 provides remote access to RS232 console ports and maintenance ports on UNIX servers, routers and other network equipment, and also allows in-band or out-of-band control of power switching and reboot operations. System Administrators can access remote devices in order to change configuration parameters, connect users to restricted ports, collect buffered data, and perform Power On/Off/Reboot operations and a variety of other administrative functions.

Security Features and Co-Location Features

In order to protect access to sensitive configuration and operation features, the CMS-6R4 provides two different levels of password security; the Supervisor and the Non-Supervisor Level. The Supervisor Level allows access to all configuration and switching functions, and the Non-Supervisor Level only allows access to assigned plugs and ports, and cannot be used to change unit configuration.

Passwords transmitted via web browser use basic 64 bit encryption techniques to assure that your user-defined passwords remain secret and secure and that access to your equipment is protected.

In addition to password security features, the CMS-6R4 also includes an address specific IP security mask, which can be employed to prevent unauthorized network access to command mode, and an Invalid Access Lockout feature, which can automatically lock ports if the unit detects a series of invalid attempts to enter command mode.

Easy to Configure, Easy to Use

The CMS-6R4 can be configured and operated over a TCP/IP network using standard Telnet or a JavaScript enabled Web Browser, and can also be accessed via modem, or locally via serial port. Simple, user friendly-commands and web page menus allow you to assign unit parameters, view status, and initiate port connections and power switching operations. Outlets and serial ports can be addressed by number or by user-defined names.

CMS-6R4 and CMS-6R4 CE Models

This User's Guide discusses the both the CMS-6R4 and the CMS-6R4-CE models. Throughout this User's Guide, both models are referred to as the "CMS-6R4". The only difference between the two models is that the CMS-6R4 is designed for 100 to 120 VAC power operation, and the CMS-6R4-CE is designed for 208 to 240 VAC power operation. All other features function identically.

Typographic Conventions

Throughout this manual, typefaces and characters have been used to denote the following:

COURIER FONT Indicates characters typed on the keyboard. For example, **/ON 3** or **/OFF 4**.

[Bold Font] Text set in bold face and enclosed in square brackets indicates a specific key. For example, **[Enter]** or **[Esc]**.

2. Unit Description

2.1. Front Panel Components
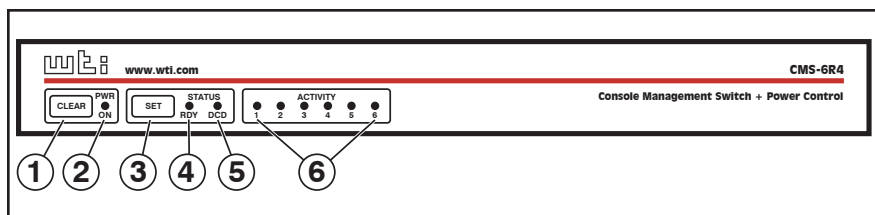
Figure 2.1: Front Panel Components

As shown in Figure 2.1, the CMS-6R4 front panel includes the following components:

① **Clear Button:** Restarts the CMS-6R4 operating program without changing user-selected parameters or breaking port connections.

② **Power Indicator:** Lights when power is applied to the unit.

③ **Set Button:** The Set Button has two functions; it can either be used as a manual On/Off switch for the CMS-6R4's four switched outlets, or it can also be used to initialize the unit to default parameters.

  • **Manual Switching:** To manually switch the outlets Off or On, press and hold the Set Button for approximately three seconds. Note that the Manual Switching function can also be disabled as described in Section 5.5.1.

  • **Initialization:** To initialize the unit to default parameters, press and hold both the Set and Clear buttons, then release only the Clear Button, wait for the Activity LEDs to flash, and then release the Set Button.

Notes:
  • During initialization, all activity LEDs will flash ON three times.

  • When the initialization procedure is performed, all command selected parameters will be cleared, and the CMS-6R4 will revert to default parameters.

④ **RDY Indicator:** (Ready) Flashes when the unit is ready to receive commands.

⑤ **DCD Indicator:** Lights when the Data Carrier Detect signal is present.

⑥ **Activity Indicators:** A series of six LEDs, which light to indicate data activity at the corresponding port.
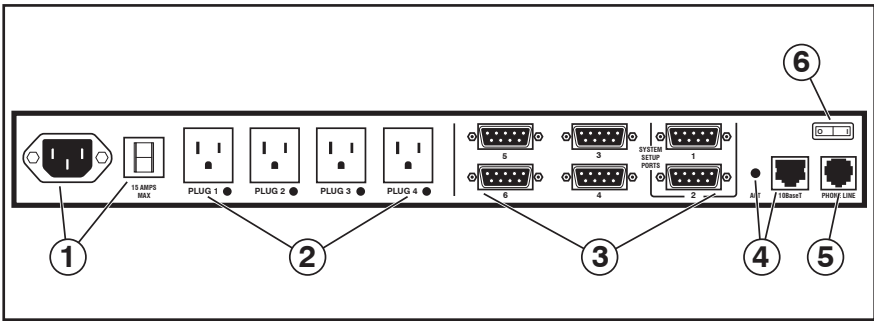
Figure 2.2: Back Panel Components (120 VAC Model Shown)

2.2. Back Panel Components

① **Power Inlet and Circuit Breaker:** An AC inlet and circuit breaker which supply power to the CMS-6R4. Includes cable keeper (not shown.)

- **Model CMS-6R4 (120 VAC):** IEC-320-C14, 100 - 120 VAC Power Inlet, 15 Amp Circuit Breaker.

- **Model CMS-6R4-CE (230 VAC):** IEC-320-C14, 208 - 240 VAC Power Inlet, 10 Amp Circuit Breaker.

② **Switched Plugs and Plug Indicators:** Four AC Outlets that can be switched On, Off, Rebooted or set to user-defined Default values in response to user commands.

- **Model CMS-6R4:** Four 100-120 VAC, NEMA 5-15 Outlets with indicator lights. 15 Amps Total Load.

- **Model CMS-6R4-CE:** Four 208-240 VAC, IEC-320-C13 Outlets with indicator lights. 10 Amps Total Load.

③ **Serial RS232 Ports:** For connection to console ports on target devices. Standard DB9 connectors configured as DTE ports, similar to a serial port on a PC. When connecting a modem, use a standard serial cable. When connecting a PC or other DTE device use a null modem cable.

Notes:

- Ports 1 is a System Setup Port. In order to ensure local access by system administrators, Supervisor Level command capability cannot be disabled at Port 1, and the Port Mode cannot be set to "Buffer" or "Passive".

- Port 2 can also be used as a Setup Port, providing that the Port Mode is set to Any-to-Any and the Supervisor Mode is enabled.

④ **10Base-T Port (Network Port):** An RJ45 Ethernet Port for connection to your TCP/IP network. The 10Base-T Port also features an Activity Indicator flashes to indicate activity at the Network Port. The default IP Address is 192.168.168.168. For more information on Network Port configuration, please refer to Section 5.5.2.

⑤ **Phone Line Port (Internal Modem Port):** For connection to your phone line. For information regarding modem configuration, please refer to Section 5.5.4.

⑥ **Main Power Switch:** Applies power to the CMS-6R4. This switch must be "On" in order for the CMS-6R4 to function. Note that this switch is not used to set the On/Off status of the switched outlets.

3. Quick Start

This Quick Start Guide describes a simplified installation procedure for the CMS-6R4 hardware, which will allow you to communicate with the unit in order to demonstrate basic features and check for proper operation.

Note that this Quick Start Guide does not provide a detailed description of unit configuration, or discuss advanced operating features in detail. For more information, please refer to the Installation, Configuration and Operation sections in this User's Guide.

3.1. Hardware Installation

3.1.1.   Apply Power to the CMS-6R4

Refer to the safety precautions listed at the beginning of this User's Guide, and then connect the unit to an appropriate power source. Connect the power supply cable to the unit's power inlet, snap the Cable Keeper into place, and then connect the cable to an appropriate power supply.

> **Note:** The CMS-6R4 is designed for 100 to 120 VAC operation and the CMS-6R4-CE is designed for 100 to 240 VAC operation.

When power is applied to the CMS-6R4, the ON LED should light, and the RDY LED should begin to flash. This indicates that the unit is ready to receive commands.

3.1.2.   Connect your PC to the CMS-6R4

The CMS-6R4 can either be controlled by a local PC Serial Port, controlled via modem, or controlled via TCP/IP network. In order to select parameters, connect ports or control outlets, commands are issued to the CMS-6R4 via either the Network Port, Modem Port or a Serial RS232 Port.

- **Network Port:** Connect the CMS-6R4 10Base-T, half duplex network interface to your network.
- **Serial Port:** Use the supplied null modem cable to connect your PC COM port to Serial Port 1 (The System Setup Port.)
- **Modem:** Connect your telephone line to the CMS-6R4 Phone Line Port.

3.2. Communicating with the CMS-6R4

The CMS-6R4 offers two separate user interfaces: the Web Browser Interface and the Text Interface. The Web Browser interface allows you to contact the unit via a TCP/IP network, using a standard, JavaScript enabled web browser. The Text Interface consists of a series of ASCII text menus, which may be accessed via TCP/IP network, Local PC or modem.

Notes:

- When the unit is shipped from the factory, communications parameters are set as follows: 9600 bps, RTS/CTS Handshaking, 8 Data Bits, One Stop Bit, No Parity. Although the CMS-6R4 allows these parameters to be easily redefined, for this Quick Start procedure, it is recommended to configure your communications program to accept the default parameters.

- The CMS-6R4 features a default IP Address (192.168.168.168) and a default Subnet Mask (255.255.255.0.) This allows initial network access to command mode without first setting up the unit's network parameters (providing that you are contacting the unit from a node on the same subnet.) When attempting to access the CMS-6R4 from a node that is not on the same subnet, please refer to Section 5 for further configuration instructions.

1. **Access Command Mode:** This procedure differs slightly, depending on whether you're contacting the CMS-6R4 via the Web Browser Interface or Text Interface.

    a) **Web Browser Interface:** Start your JavaScript enabled Web Browser. Enter the CMS-6R4's IP address in your browser address bar and press **[Enter]**.

    b) **Text Interface:**

        i. **Via Telnet:** Telnet to the CMS-6R4's default IP address.

        ii. **Via Local PC:** Start your communications program and press **[Enter]**.

        iii. **Via Modem:** Use your communications program to dial the number for the line that is connected to the CMS-6R4's Phone Line Port.
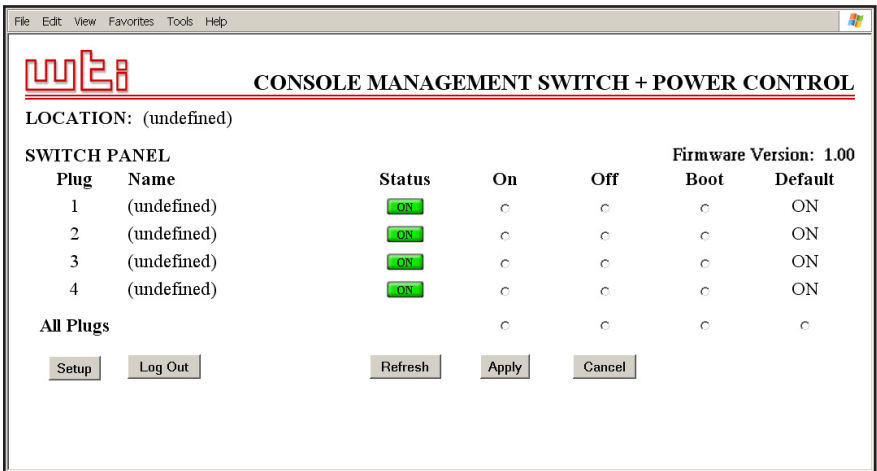
Figure 3.1: Main Status Screen - Web Browser Interface
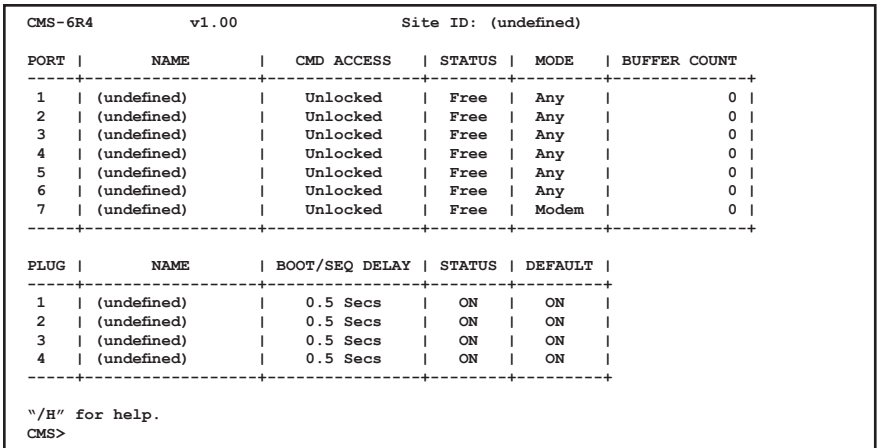
Figure 3.2: Main Status Screen - Text Interface

2. **Password Prompt:** Normally at this point, no user accounts have been defined yet, so if the password prompt is displayed, you can simply press **[Enter]** or click "OK" to bypass the prompt. However, if you have previously defined one or more passwords, enter the username (Web Interface only) and password and then press **[Enter]** or click "OK." The Status Screen should be displayed as shown in Figure 3.1 or 3.2.

3.3. Connecting Ports and Switching Outlets

Although both the Text Interface and Web Browser Interface allow you to select configuration parameters, the Text Interface is always used when invoking commands to create connections between ports. Although the Web Browser Interface does allow access to outlet switching functions, for this Quick Start procedure, it is recommended to perform the following steps via the Text Interface. If you have previously accessed command mode via the Web Browser Interface, exit command mode (log out), then re-enter command mode using the Text Interface as described in Step 1 in Section 3.2.

Proceed as follows to connect ports and switch outlets:

1. **Review the Help Menu:** At the Text Interface command prompt, type **/H** and press **[Enter]** to display the Help Menu, which provides a basic listing of all available CMS-6R4 commands.

2. **Creating Connections Between Ports:** The CMS-6R4 can perform two different types of port connections; Resident Connections and Third Party Connections:

   a) **Resident Connection:** Your resident port issues a /C command to connect to a second port.

      i. To connect your resident port to Port 3, type **/C 2 [Enter]**. While you are connected to Port 3, the unit will not recognize additional commands issued via your resident port. However, the unit will recognize a Resident Disconnect Sequence issued at either connected port.

      ii. Issue the Resident Disconnect Sequence (Logoff Sequence); type **^X** (press **[Ctrl]** and **[X]** at the same time).

   b) **Third Party Connection:** Your resident port issues a /C command to create a connection between two other ports.

      i. To connect Port 3 to Port 4, type **/C 3 4 [Enter]**.

      ii. While Ports 3 and 4 are connected, your resident port will still recognize commands. Type **/S [Enter]** to display the Status Screen. The "STATUS" column should now list Ports 3 and 4 as connected and the other ports as "Free".

      iii. Issue a Third Party Disconnect command; type **/D 3 [Enter]**. The unit will display the "Are you Sure (y/n)?" prompt. Type **y** and press **[Enter]** to disconnect.

      iv. Type **/S [Enter]** to display the Status Screen. The "STATUS" column should now list Ports 3 and 4 as "Free".

3. **Controlling Outlets:** You may wish to perform the following tests in order to make certain that the switched outlets are functioning properly.

    a) **Reboot Outlet:** At the command prompt, type **/BOOT 1** and press **[Enter]**. The status indicator for Plug 1 should go Off, pause for a moment and then go back On, indicating that the boot cycle has been successfully completed.

    b) **Switch Outlet Off:** At the command prompt, type **/OFF 1** and then press **[Enter]**. The status indicator for Plug 1 should go Off, indicating that the command has been successfully completed. Leave Plug 1 in the "Off" state, and then proceed to the next step.

    c) **Switch Outlet On:** At the command prompt, type **/ON 1** and press **[Enter]**. The status indicator for Plug 1 should then go back On, indicating that the command has been successfully completed.

4. **Exit Command Mode:** To exit command mode, type **/X** and press **[Enter]**. When the "Sure" prompt is displayed, type **Y** and press **[Enter]**.

This completes the Quick Start instructions for the CMS-6R4. Prior to placing the unit into operation, it is recommended to refer to the remainder of this user's guide for important information regarding advanced configuration capabilities and more detailed operation instructions.

4.   Installation

This Section provides further details regarding installation of the CMS-6R4.

4.1. Power Supply Connection

Use the supplied power cord to connect the CMS-6R4 to an appropriate power supply. Note that the CMS-6R4's Main Power switch must be "On" in order for the unit to operate.

⚠️ **CAUTIONS:** ⚡

- **Before attempting to install this unit, please review the warnings and cautions listed at the front of the user's guide.**

- **This device should only be operated with the type of power source indicated on the instrument nameplate. If you are not sure of the type of power service available, please contact your local power company.**

- **Reliable earthing (grounding) of this unit must be maintained. Particular attention should be given to supply connections when connecting to power strips, rather than directly to the branch circuit.**

4.1.1.   Installing the Cable Keeper

The CMS-6R4 includes a cable keeper, which is designed to prevent the power supply cable from being accidentally disconnected from the unit.

When attaching the power supply cable to the unit, first swing the cable keeper out of the way, then plug the power cable securely into the power input. When the cable is in place, snap the cable keeper over the plug to secure the cable to the unit.

4.2. Connecting Devices to the Switched Outlets

Connect the power cord from your switched device to a switched AC Outlet on the CMS-6R4 back panel. Note that when power is applied to the CMS-6R4, the Switched AC Outlets will be switched "ON". Note that the CMS-6R4 (120 VAC Model) is designed for 100 to 120 VAC operation and will support up to 15 Amps maximum, and the CMS-6R4-CE (230 VAC Model) is designed for 100 to 240 VAC operation and will support up to 10 Amps maximum.

4.3. Connecting Devices to the RS232 Serial Ports

The six, serial RS232 Ports on the CMS-6R4 back panel are standard DB9 connectors, configured as DTE Ports, and are similar to a standard serial port on a PC. Note that Port 1 is designated as a System Set Up Port, and that in order to ensure that this port is always accessible by system administrators, the Supervisor Mode cannot be disabled at Port 1. For a description of the RS232 Port interface, please refer to Appendix A.

Use a DB9 cable to connect the RS232 serial port on your device to the RS232 serial port on the CMS-6R4 back panel. When connecting external modems and other DCE devices, use a standard serial modem cable. When connecting PCs and other DTE devices, use a standard null modem cable.

4.4. Connecting Control Devices to the CMS-6R4

The CMS-6R4 can be controlled and configured via local serial connection, or controlled remotely via modem or TCP/IP network connection.

4.4.1. Control via Local PC

Use the supplied null modem cable to connect your PC COM port to one of the CMS-6R4's two RS232 System Setup Ports. The System Setup Ports are male, RS232C DB9 connectors, wired in a DTE configuration. In the default state, the Setup Ports are configured for 9600 bps, no parity, 8 data bits, 1 stop bit.

4.4.2. Control via Modem

Connect your telephone line to the Phone Line port on the CMS-6R4 back panel. If necessary, configure the Modem Port as described in Section 5.5.4.

4.4.3. Connecting the Network Cable

The Network Port is an RJ45 Ethernet jack, for connection to a TCP/IP network. Connect your 10Base-T cable to the Network Port. Note that the CMS-6R4 includes a default IP address (192.168.168.168) and a default subnet mask (255.255.255.0.) When installing the CMS-6R4 in a working network environment, it is recommended to define network parameters as described in Section 5.5.2.

> **Note:** The CMS-6R4 features a 10Base-T network interface. When connecting to a 100Base-T interface, most router switches will autosense to determine if the device is 100Base-T or 10Base-T, and then configure the network interface accordingly. If your router switch does not autosense, the network interface port must be manually set to 10Base-T.

This completes the CMS-6R4 installation instructions. Please proceed to the next Section for instructions regarding unit configuration.

5. Configuration

5.1. Supervisor Mode and Non-Supervisor Mode

In order to restrict access to sensitive command functions, the CMS-6R4 features two operating modes; Supervisor Mode and Non-Supervisor Mode.

- **Supervisor Mode:** Allows access to all configuration menus, switching functions and status screens. The Supervisor Mode status screens show On/Off conditions for all serial ports and switched outlets, and list all currently defined system parameters.

- **Non-Supervisor Mode:** Allows access to port connection, switching and reboot commands, but does not allow access to configuration functions. Non-Supervisors may only issue commands to, or view status of the ports and plugs that are specifically allowed by their password/account.

The CMS-6R4 will display a password prompt when the unit is contacted via the COM Port or Network Port. The password entered at this prompt determines whether the unit will start-up in Supervisor Mode or Non-Supervisor Mode. If the password allows access to Supervisor Mode, then the Supervisor Mode will be active. If the password does not permit access to Supervisor Mode, then the Non-Supervisor Mode will be active. The process of defining passwords and granting Supervisor rights is discussed in Section 5.4 and Section 5.5.1.1.

Notes:

- If you wish to restrict access to configuration menus, you must create at least one password that permits access to Supervisor Mode.

- If you do not create at least one password that permits access to Supervisor Level commands, then the CMS-6R4 will always start-up in Supervisor Mode, allowing unprotected access to configuration and switching functions.

- If you do not create at least one password that permits Supervisor Level commands, then the Password Prompt will not be displayed when you access the CMS-6R4 command mode.

- When the CMS-6R4 is contacted via the Web Interface, the password prompt will also include a field for the user name. The user name prompt is not displayed when the unit is contacted via the Text Interface.

5.2. Communicating with the CMS-6R4

In order to configure the unit or invoke command functions, you must first connect to the CMS-6R4 and access command mode. As discussed in Section 3, the CMS-6R4 offers two separate command interfaces: the Web Browser Interface, and the Text Interface.

The CMS-6R4 also offers three different methods for accessing command mode; via network, via external modem, or via local PC. The Web Browser Interface is only available when the CMS-6R4 is contacted via network, and the Text Interface is available via network, modem or local PC. The sections that follow describe the procedure for accessing the Web Browser Interface or Text Interface.

> **Note:** Configuration functions are only available when you have logged into the CMS-6R4 command mode using a password that permits access to the Supervisor Mode.
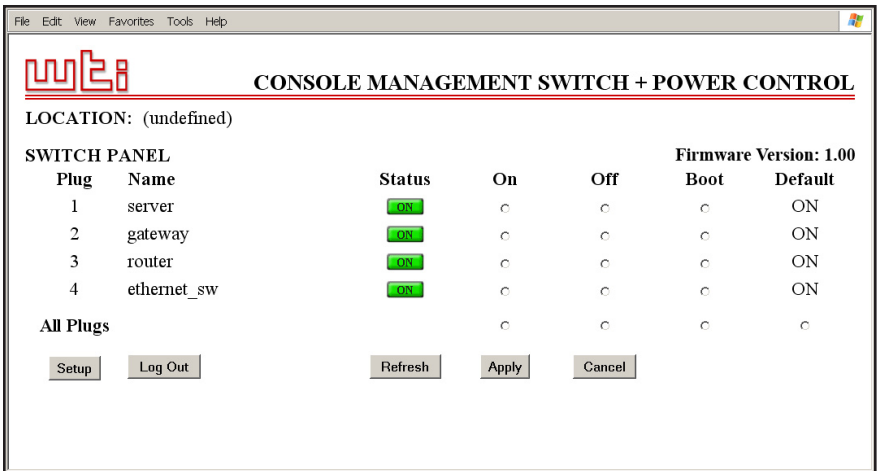
Figure 5.1: Main Status Screen - Web Browser Interface (Sample Values Shown)

5.2.1.   Accessing the Web Browser Interface

In order to use the Web Browser Interface, the CMS-6R4 must be connected to a TCP/IP network, and your PC must be equipped with a JavaScript enabled web browser (such as Internet Explorer or Netscape® Navigator.)

1.   Start your JavaScript enabled Web Browser.

2.   Key the CMS-6R4's IP address (default = http://192.168.168.168) into the web browser's address bar, and then press **[Enter]**.

3.   **Password Prompt:** The CMS-6R4 will display a prompt, which asks for your name and password. Key in a password that permits access to Supervisor Level commands, and then press **[Enter]** (Text Interface) or click on "OK" (Web Browser Interface.) Note that the password prompt will only be displayed if you have previously defined a password/account that permits access to Supervisor Level Commands.

If a valid password is entered, the Main Status Screen will appear as shown in Figure 5.1.

```
CMS-6R4          v1.00                Site ID: (undefined)

PORT |      NAME       |   CMD ACCESS   | STATUS |  MODE   | BUFFER COUNT
-----+-----------------+----------------+--------+---------+--------------+
  1  | (undefined)     |    Unlocked    |  Free  |  Any    |            0 |
  2  | (undefined)     |    Unlocked    |  Free  |  Any    |            0 |
  3  | (undefined)     |    Unlocked    |  Free  |  Any    |            0 |
  4  | (undefined)     |    Unlocked    |  Free  |  Any    |            0 |
  5  | (undefined)     |    Unlocked    |  Free  |  Any    |            0 |
  6  | (undefined)     |    Unlocked    |  Free  |  Any    |            0 |
  7  | Internal_Modem  |    Unlocked    |  Free  |  Modem  |            0 |
-----+-----------------+----------------+--------+---------+--------------+

PLUG |      NAME       | BOOT/SEQ DELAY | STATUS | DEFAULT |
-----+-----------------+----------------+--------+---------+
  1  | (undefined)     |    0.5 Secs    |   ON   |   ON    |
  2  | (undefined)     |    0.5 Secs    |   ON   |   ON    |
  3  | (undefined)     |    0.5 Secs    |   ON   |   ON    |
  4  | (undefined)     |    0.5 Secs    |   ON   |   ON    |
-----+-----------------+----------------+--------+---------+

"/H" for help.
CMS>
```

Figure 5.2: Main Status Screen - Text Interface

5.2.2.   Accessing the Text Interface

The Text Interface can be accessed via Network, modem or local PC. In order to access the Text Interface, your installation must include the following:

- **Access Via Network:** The CMS-6R4 must be connected to your TCP/IP Network, and your PC must include a communications program (such as Hyperterminal™.)

- **Access Via Modem:** A phone line must be connected to the CMS-6R4's Modem Port. Your PC Must include a communications program (such as Hyperterminal™.)

- **Access Via Local PC:** Your local PC must be connected to a CMS-6R4 RS232 COM Port. The local PC must include a communications program (such as Hyperterminal™.)

To access command mode via the Text Interface, proceed as follows:

1.   The CMS-6R4 is transparent to parity and will accept 7 or 8 bit characters, but will always answer back at 8 bits, no parity. Make certain your communication program is set for the appropriate baud rate, bits, parity and Communications Port.

   a)   **Via Modem:** Start your communications program. Dial the number for the line connected to the CMS-6R4's Phone Line port. Wait for the Connect message, then proceed to Step 2.

   b)   **Via Local PC:** Start your communications program and press **[Enter]**. Wait for the connect message, then proceed to Step 2.

    c) **Via Network:** The CMS-6R4 includes a default IP address (192.168.168.168), which allows you to contact the unit from any network node on the same subnet. When the CMS-6R4 is installed in a working network environment, it is recommended to redefine the IP Address, Subnet Mask, and Gateway Address as described in Section 5.5.2.

        i. Telnet to the CMS-6R4's IP address. For example, if the IP address is "192.168.168.168", then on a UNIX system, the Telnet command would be:

        `$ telnet 192.168.168.168 [Enter]`

        ii. If the Telnet connection is refused, this may mean that either the IP Security feature has denied the connection (See Section 5.5.2.1), or that the unit is operating on a 100Base-T network that does not autosense for 10Base-T devices (see Section 4.4.3.)

2. **Password:** If you have not yet created a password that permits access to Supervisor Mode, the password prompt will not be displayed when the unit is accessed via the Text Interface.

    a) If a password that permits access to Supervisor Mode has been defined, the unit will display the Password Prompt. Key in a password that permits access to Supervisor Mode, and press **[Enter]**.

    b) Note that the Password feature is case sensitive.

3. If a valid password is entered, the CMS-6R4 will display the Status Screen shown in Figure 5.2, followed by the "CMS>" Command Prompt.

5.3. System SetUp Port

Port 1 is designated as a System SetUp Port, and will therefore, always permit access to Supervisor Mode. In order to ensure that access to command functions is always available, the Supervisor Mode cannot be disabled at Port 1, and the Port Mode for Port 1 cannot be set to "Buffer" or "Passive" mode.

    Note: Port 2 can also function as a Setup Port, providing that the Port Mode is set to "Any-to-Any" or "Modem", and the Supervisor Mode is enabled.

5.4. Password Functions

The CMS-6R4's password directory allows you to define up to 32 passwords. These passwords are not only used to protect access to the CMS-6R4 unit, but are also used to determine the type of commands that each user will be allowed to invoke, and the ports and switched outlets that each user will be allowed to control.

Passwords that have access to Supervisor Mode are allowed to change configuration parameters and may connect to any CMS-6R4 port and switch any CMS-6R4 outlet. On the other hand, passwords which are denied access to Supervisor Mode are not allowed to change configuration parameters, and are restricted to the ports and outlets specifically allowed by that password. The password directory feature is described in greater detail in Section 5.5.1.1.

Note that once you have defined at least one password that permits access to Supervisor Mode, the CMS-6R4 will display a password prompt whenever you attempt to access command mode. Supervisor Level commands are summarized in Section 10.2 of this User's Guide.

Notes:

- If you do not define at least one password that permits access to Supervisor Mode, then Supervisor Level commands will be available to all ports, and port access and configuration functions will not be password protected.

- If you wish to restrict users from changing CMS-6R4 configuration parameters or connecting to restricted ports, you must define at least one password that permits access to Supervisor Mode as described in Section 5.5.1.1.

- If the unit is reset to default parameters, all passwords will be erased, and Supervisor Level commands will be available at all ports, without password protection.

Note that if you wish to completely deny a given port's access to Supervisor Mode (even *with* a Supervisor password), the Port Parameters menus (/P) can be used to disable the Supervisor Mode at the Network Port and at any RS232 Port except for Port 1 (the System SetUp Port.)

5.5. Configuration Menus

As described in the sections that follow, configuration parameters can be selected via the Web Browser Interface or Text Interface. Although the Web Browser and Text Interface provide two separate means for selecting parameters, both interfaces allow access to essentially the same set of parameters, and parameters selected via one interface will also be applied to the other.

Web Browser Interface: Click the "Setup" button to gain access to the configuration menus; a row of buttons will be displayed along the left hand edge of the screen. Note the following:

- Newly selected parameters will not be activated until you click the "Apply" button.

- Click "Switch Panel" to return to the main status screen.

Text Interface: Refer to the Help Screen (/H), then enter the appropriate command to access the desired menu. Note the following:

- To exit from a parameters menu, press the **[Esc]** key.

The following sections describe options and parameters that can be accessed via each of the configuration menus.

> **Note:** Configuration menus are only available when the Supervisor Mode is active. Configuration menus are not available if you have logged in using a password that does not permit access to Supervisor Level commands.

5.5.1. The System Parameters Menu

The System Parameters Menus allow you to select parameters such as the Site I.D. Message, Command Confirmation and other options and, in the Text Interface it is also used to create passwords/accounts (In the Web Browser Interface, passwords are created via the "Users" button in the Setup Menu.

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "System Parameters" button. The System Parameters Menu will be displayed as shown in Figure 5.3.

- **Text Interface:** Type **/F** and press **[Enter]**. The System Parameters Menu will be displayed as shown in Figure 5.4.
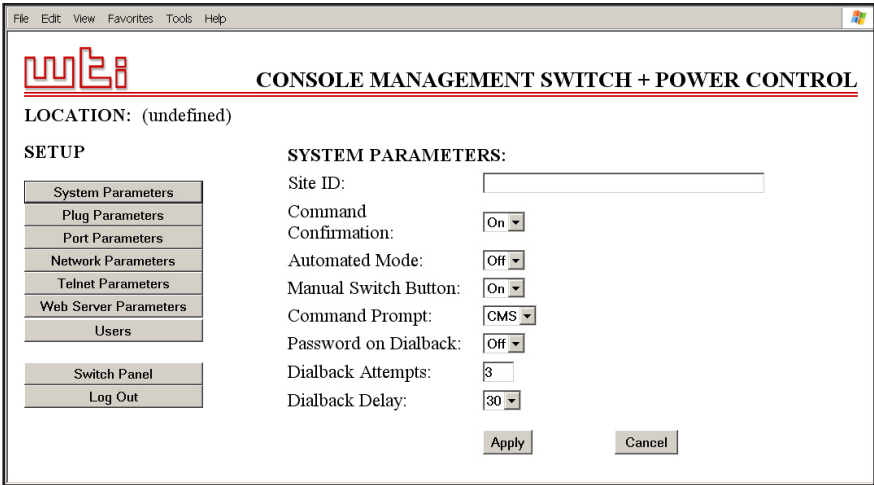
Figure 5.3: System Parameters Menu - Web Browser Interface

```
SYSTEM PARAMETERS:

1.  Site ID:               (undefined)
2.  Command Confirmation:  On
3.  Automated Mode:        Off
4.  Manual Switch Button:  On
5.  Command Prompt:        CMS
6.  Password on Dial Back: Off
7.  Dial Back Attempts:    3
8.  Dial Back Delay:       30 Secs
9.  Create/Edit user password




Enter Selection,
Press <ESC> to Exit ...
```
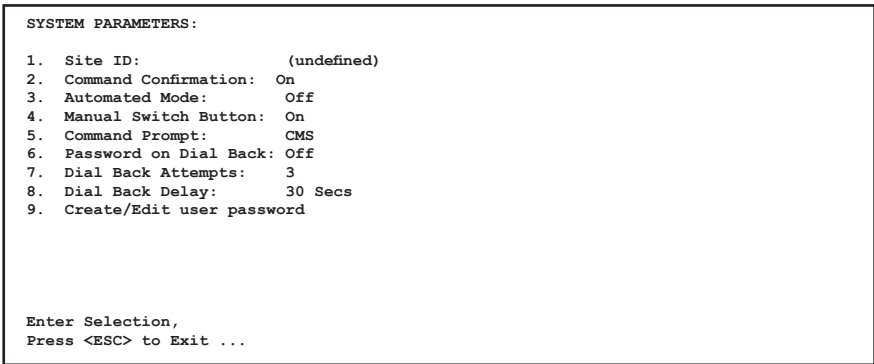
Figure 5.4: System Parameters Menu - Text Interface

The System Parameters Menus allow you to define the following parameters:

- **Site ID:** Defines a brief text message, which can describe the location or function of the CMS-6R4 unit. (Up to 32 characters, Default = undefined.)

Notes:

- The Site ID Message cannot begin with a forward slash (**/**) or backslash (****) character.

- The Site ID Message cannot include non printable characters or quotation marks.

- **Command Confirmation:** When enabled, the CMS-6R4 will display a confirmation prompt before executing certain commands. When disabled, the prompt will be suppressed and commands will be executed immediately. (Default = On/Enabled.)

- **Automated Mode:** When enabled, the CMS-6R4 will execute port connection/disconnection, switching, reboot and exit commands without displaying a confirmation prompt, status screen or confirmation messages. For more information, please refer to Section 6.5. (Default = Off.)

  Note: When this option is enabled, security functions are suppressed, and users are able to access configuration menus and control plugs without entering a password. If security is a concern and the Automated Mode is required, it is recommended to use the IP Security feature (Section 5.5.2.1) to restrict access.

- **Manual Switch Button:** Enables/disables the Set Button's manual plug control function, but does not effect the Set Button's ability to reset parameters to default values. (Default = "On".)

  - **Off:** Disables the manual plug control function.

  - **On:** Enables manual plug control. When pressed and held for three seconds, all outlets will be toggled On or Off.

- **Command Prompt:** Allows the Text Interface command prompt to be set to either "CMS", "NPS", "IPS" or "NBB." (Default = CMS.)

- **Password on Dial Back:** Enables/Disables the "Password on Dial Back" feature as described in Section 5.5.1.6. (Default = Off.)

- **Dial Back Attempts:** Sets the number of times that the CMS-6R4 will attempt to call the dial back number when the Dial Back feature is properly configured and enabled, and you attempt to access command mode via Modem. For more information on the Dial Back feature, please refer to Section 5.5.1.6. (Default = 3.)

- **Dial Back Delay:** Sets the amount of time that will elapse between Dial Back Attempts. For more information on the Dial Back Feature, please refer to Section 5.5.1.6. (Default = 30 Seconds.)

- **Edit Password Directory:** Provides access to a series of menus that are used to create, edit, and delete passwords/accounts as described in Section 5.5.1.1.

5.5.1.1. The Password Directory

In addition to defining passwords and assigning command privileges to each password, the Edit Password Directory function allows you to determine which ports and switched outlets each password will be allowed to control, and also configures Dial Back parameters. The Password Directory allows for the definition of up to 32 separate passwords.

Note:

- The Password Directory menu is only available when you have logged into command mode using a password that permits access to Supervisor Mode.

- In the Text Interface, the /V command can be invoked to view the Password Directory.

To activate the Edit Password Directory menu, proceed as follows:

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Users" button. The Password Directory Menu will be displayed as shown in Figure 5.5.

- **Text Interface:** First, type **/F** and press **[Enter]** to access the System Parameters Menu (Figure 5.4.) At the System Parameters Menu, type **9** and press **[Enter]** to display the Password Directory Menu (Figure 5.6.)

The Password Directory Menu offers the following options:

- **View Password Directory:** Displays a summary of currently defined user accounts. Note that actual passwords will not be displayed, and when configuring the system via the Text Interface, the Password Directory is displayed by invoking the /V command and is not present on the Password Directory menu.

- **Add Name/Password (Create Users):** Creates new passwords and assigns Supervisor Mode access and port access rights as described in Section 5.5.1.2.
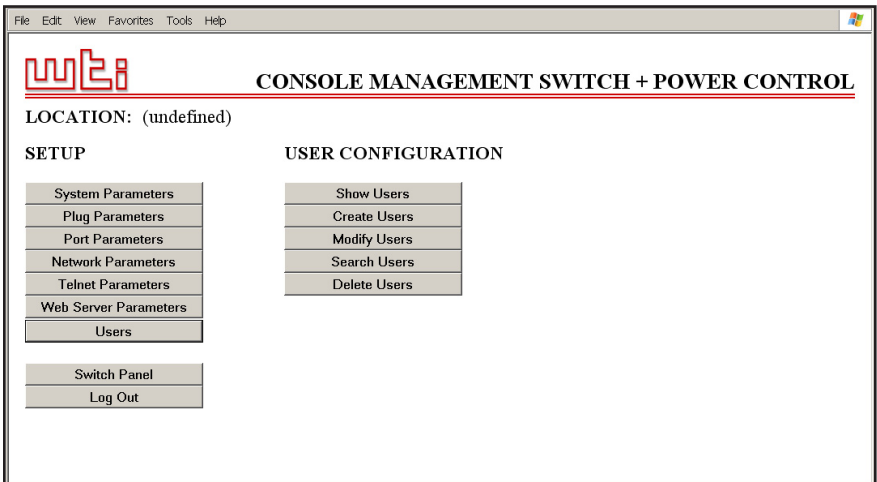
Figure 5.5: The Password Directory Menu (Web Browser Interface)

```
EDIT PASSWORD DIRECTORY:

1. Add Name/Password
2. Edit/Delete from List
3. Edit/Delete from Search
4. Delete Entire Directory

Enter: #<CR> to select,
       <ESC> for previous menu ...
```
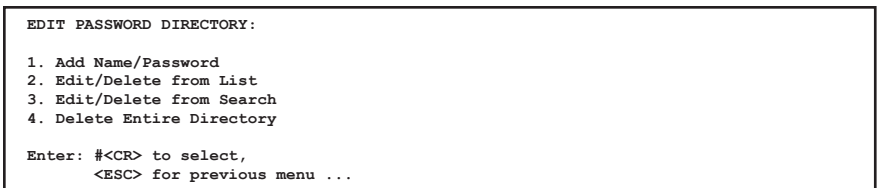
Figure 5.6: The Password Directory Menu (Text Interface)

- **Edit Users (Modify Users):** Allows you to change assigned passwords and port and plug rights for each account. When configuring the unit via the Text Interface, users accounts are edited via the "Edit from List" or "Edit from Search" functions; when configuring the unit via the Web Browser Interface, accounts are edited via either the "Search Users" or "Modify Users" functions as described in Section 5.5.1.3.

- **Deleting Users:** Allows you to delete existing user accounts. When configuring the unit via the Text Interface, user accounts are deleted using the "Delete from List" or "Delete from Search" functions; when configuring the unit via the Web Browser Interface, accounts are deleted using the "Delete Users" functions as described in Section 5.5.1.4.

- **Delete Entire Directory:** Clears the password directory, and deletes all existing passwords as described in Section 5.5.1.5. When configuring the unit via the Text Interface, this function is accessed via item 4 "Delete Entire Directory" in the Password Directory Menu; when configuring the unit via the Web Interface, this function is accessed via the "Delete Users" menu, using the "Delete All" button.

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5.5.1.2. Adding Passwords

The "Add Name/Password" menu (Text Interface) and "Create User" menu (Web Browser Interface) are used to create new user accounts and add passwords to the password directory. To create new passwords/accounts, proceed as follows:

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Users" button. From the Password Directory Menu, click the "Create Users" button to define new user accounts. The Create User Menu will be displayed as shown in Figure 5.7.

- **Text Interface:** First, type **/F** and press **[Enter]** to access the System Parameters Menu (Figure 5.4.) At the System Parameters Menu, type **9** and press **[Enter]** to display the Password Directory Menu (Figure 5.6), then type **1** and press **[Enter]** to access the Add Name/Password menu as shown in Figure 5.8.

The Add Name/Password Menu allows you to assign the following parameters:

- **Name:** Assigns a username to the password. Note that usernames are only required when logging into command mode via the Web Browser Interface. (Default = undefined.)

- **Password:** After initially keying in the password, you will need to enter the password a second time in order to verify that it is correct. (Default = undefined.)

- **Dial Back #:** Defines the number that the CMS-6R4 will dial when the Dial Back feature is enabled and the unit is contacted via modem. For more information on the Dial Back Mode, please refer to Section 5.5.1.6. (Default = undefined.)

- **Dial Back Mode:** Enables/Disables the Dial Back Mode for this password. For more information on the Dial Back Mode, please refer to Section 5.5.1.6. (Default = Off.)

- **Supervisor Mode:** Enables/Disables Supervisor Mode for this password. When Supervisor Mode is enabled, the password will provide access to all configuration menus, and allow connections to all ports. When Supervisor Mode is disabled, the password will not permit access to configuration menus, and will only allow access to ports specifically permitted by the password. (Default = Off.)

  Note: In order to access Supervisor Mode from any given port, the port at which the password is issued must also permit Supervisor Commands.
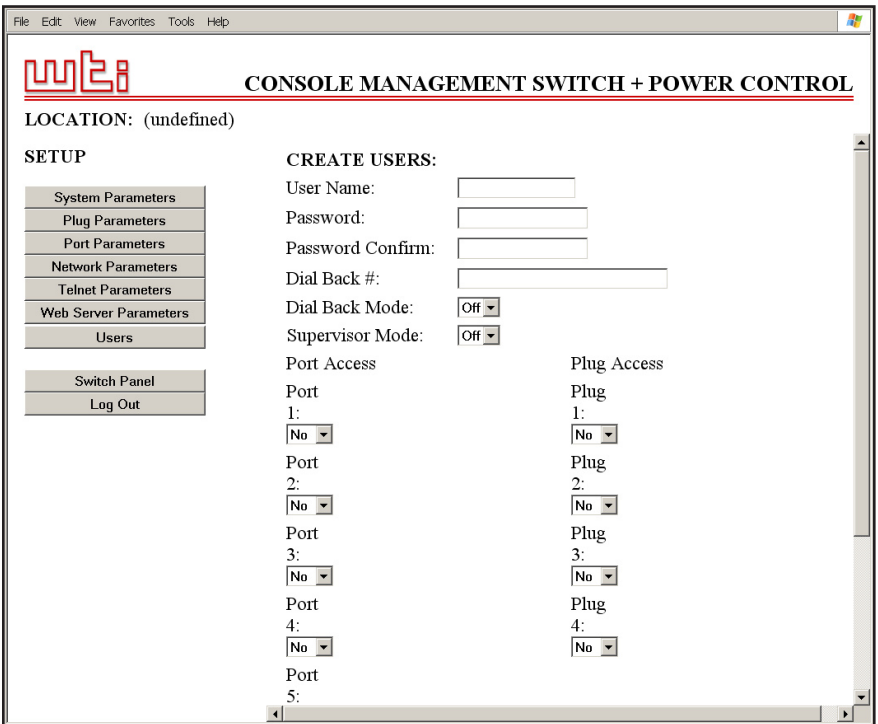
Figure 5.7: The Create Name/Password Menu (Web Browser Interface)

```
ADD NAME/PASSWORD:

1. Name:            (undefined)
2. Password:        (undefined)
3. Dial Back #:     (undefined)
4. Dial Back Mode:  Off
5. Supervisor Mode: Off
6. Port Access:     None
7. Plug Access:     None
8. Save Entry

Enter: #<CR> to select,
       <ESC> for previous menu ...
```
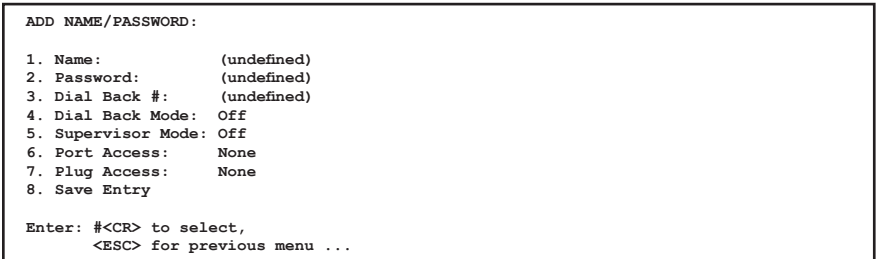
Figure 5.8: The Add Name/Password Menu (Text Interface)

- **Port Access:** Determines which ports this password will be allowed to create connections with. (Default = none.)

Notes:

- Several different passwords/accounts can be allowed to create connections to the same port.

- When selecting ports via the text interface, key in the number for the desired port and then press **[Enter]**. To select additional ports, enter the number for each corresponding port. Note that each port number selected must be followed by the **[Enter]** key.

- **Plug Access:** Determines which Plugs (Outlets) this password will be allowed to control. (Default = none.)

Notes:

- Several different passwords/accounts can be allowed access to the same outlets.

- When selecting outlets via the text interface, key in the number for the desired outlet and then press **[Enter]**. When selecting additional outlets, each outlet number selected must be followed by the **[Enter]** key.

- **Save Entry:** (Text Interface Only) Note that if you exit from the menu without first saving, the password and account information will not be saved. In the Web Browser Interface, passwords are saved when you press the "Apply" button

5.5.1.3. Editing Passwords

This function is used to edit existing user accounts, and allows you to change passwords, dialback parameters, plug access and port access for each user account. To edit existing passwords, proceed as follows:

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Users" button. From the Password Directory Menu, click either the "Modify Users" button or the "Search Users" button and then select the desired user(s) from the resulting submenu.

- **Text Interface:** First, type **/F** and press **[Enter]** to access the System Parameters Menu (Figure 5.4.) At the System Parameters Menu, type **9** and press **[Enter]** to display the Password Directory Menu (Figure 5.6.) At the Password Directory Menu, either type **2** and press **[Enter]** to select the password from a list, or type **3** and press **[Enter]** to select the password using the search function.

Once you have selected the desired account, the Edit Users Menu will be displayed. The Edit Users Menu provides access to the same options that are present in the "Add Users" menu, discussed in Section 5.5.1.2.

> **Note:** After you have edited a user account, is important to always save the account before exiting the Edit Users menu; if the account is not saved, then the edited account information will be discarded when you exit from the menu.

5.5.1.4 Deleting Passwords

This function is used to delete existing user accounts. To delete existing passwords/accounts, proceed as follows:

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Users" button. From the Password Directory Menu, click the "Delete Users" button, then select the desired user(s) from the resulting menu and click the "Delete" button.

- **Text Interface:** First, type **/F** and press **[Enter]** to access the System Parameters Menu (Figure 5.4.) At the System Parameters Menu, type **9** and press **[Enter]** to display the Password Directory Menu (Figure 5.6.) At the Password Directory Menu, either type **2** and press **[Enter]** to select the password from a list, or type **3** and press **[Enter]** to select the password via the search function. When the account information is displayed, type **9** and press **[Enter]** to delete the selected account.

  Note: Deleted accounts cannot be automatically restored.

5.5.1.5. Deleting the Entire Password Directory

The Edit Password Directory menu can also be used to delete the entire password directory, rather than accessing each individual password and deleting them one at a time. To delete the Password Directory and clear all passwords, proceed as follows:

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Users" button. From the Password Directory Menu, click the "Delete Users" button. When the Delete User's menu appears, click the "Delete All" button.

- **Text Interface:** First, type **/F** and press **[Enter]** to access the System Parameters Menu (Figure 5.4.) At the System Parameters Menu, type **9** and press **[Enter]** to display the Password Directory Menu (Figure 5.6.) At the Password Directory Menu, type **4** and press **[Enter]** to delete all currently defined user accounts.

Notes:

- Deleted passwords cannot be recovered.

- If the Password Directory is deleted, the password prompt will no longer be displayed, and users will be able to access Supervisor Mode without a password. In order to restrict access to Supervisor commands, you must define at least one password that specifically permits access to Supervisor Mode.

5.5.1.6. The Dial Back Function

The Dial Back Function provides an additional layer of security when callers attempt to access command mode via modem. When this function is properly configured, callers will *not* be granted immediate access to command mode upon entering a valid password; instead, the unit will disconnect, and dial a user-defined number before allowing access via that number. If desired, users may also be required to re-enter the password after the CMS-6R4 dials back.

Note that a separate Dial Back Number can be defined for each password, and the feature may also be independently enabled for each password. To enable this function, proceed as follows:

1. Access command mode using a port and password that permit access to Supervisor Mode, and then access the System Parameters Menu as described in Section 5.5.1.

2. **System Parameters Menu:** Note that dial back parameters selected via this menu are global, and will apply to all passwords. Define the following parameters:

    *   **Password on Dial Back:** (Optional) Determines whether or not the Dial Back Mode will require the answering party to re-enter their password after a Dial Back is performed.

    *   **Dial Back Attempts:** The number of times the CMS-6R4 will attempt to call the dial back number.

    *   **Dial Back Delay:** The amount of time the CMS-6R4 will wait between Dial Back attempts.

3. **Edit Password Directory:** Access the Password Directory menu as described in Section 5.5.1.1. From this menu, you may either define new passwords that use the Dial Back Function, or alter existing passwords to include the Dial Back Function. The following parameters should be defined for each password that will use the Dial Back function:

    *   **Dial Back #:** The number that will be called when a Dial Back is performed. This is the number for the password owner's modem.

    *   **Dial Back Mode:** Enables/Disables the Dial Back function for this password. When enabled, this password will require a dial back to be performed before allowing access, whenever this password user attempts to access the unit via modem.

    Note: In order for new parameters to be saved, you must either Save the Password (Text Interface) or apply the password (Web Browser Interface) before leaving the menu.

Dial Back Example:

Assume that the unit is configured as follows:

System Parameters Menu:
- Password on Dial Back: **On**
- Dial Back Attempts: **3**
- Dial Back Delay: **30 Seconds**

User Account Parameters:
- Name: **Test1**
- Password: **test1**
- Dial Back #: **5551234**
- Dial Back Mode: **On**

Given this configuration, the unit would behave as follows :

1. **Password "test1" Entered at Modem Port:** Unit confirms that password is valid, then disconnects.

2. **Dial Back:** Unit dials "555-1234" (the Dial Back Number for "test1") and waits for the user's remote modem to answer.

3. **Password on Dialback:** When the modem at the Dial Back Number answers, the CMS-6R4 will prompt the user to re-enter the password before allowing access to command mode.

4. **Dial Back Attempts and Delays:** If the modem does not answer, the unit will then attempt to redial the number three times (Dial Back Attempts), and will pause for approximately 30 seconds (Dial Back Delay) between each redial.

5.5.2. Network Parameters Menu

The Network Parameters Menu is used to select the IP Address and other network parameters.

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Network Parameters" button. The Network Parameters Menu will be displayed as shown in Figure 5.9.

- **Text Interface:** Type **/N** and press **[Enter]**. The Network Parameters Menu will be displayed as shown in Figure 5.10.

Notes:

- Although the Web Browser Interface and Text Interface both allow configuration of the same network parameters, note that for the Text Interface, the IP Security feature is configured via a separate submenu. For more information on IP Security, please refer to Section 5.5.2.1.

- In the Web Browser Interface, both Telnet Parameters and Web Server Parameters are defined via separate menus, which are accessed using the buttons on the left hand edge of the Setup menu. In the Text Interface, these parameters are defined via the Network Parameters Menu.

- Settings for network parameters depend on the configuration of your individual network. Contact your network administrator for appropriate settings.

The Network Parameters Menus allow the following parameters to be defined. Except where noted, all parameters listed here are available via both the Web Browser Interface and Text Interface.

Network Parameters:

- **IP Address:** Defines the IP address for the CMS-6R4 unit. (Default = 192.168.168.168.)

- **Subnet Mask:** Defines the Subnet Mask for the CMS-6R4 unit. (Default = 255.255.255.0.)

- **Gateway Address:** Defines the Gateway Address for the CMS-6R4 unit. (Default = undefined.)

- **Send MSS:** Defines the Maximum Segment Size that will be sent by the CMS-6R4. (Default = 536.)

- **IP Security:** Sets up the IP Security feature. Please refer to Section 5.5.2.1 for a detailed description of the IP Security feature.
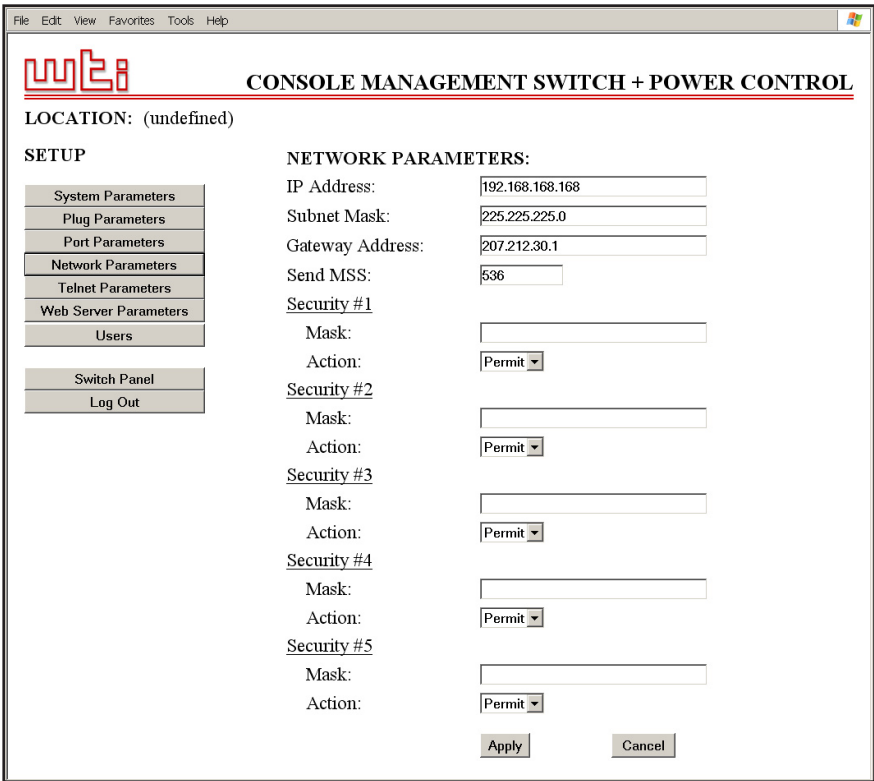
Figure 5.9: Network Parameters Menu - Web Browser Interface

```
NETWORK PARAMETERS:
1. IP Address:          192.168.168.168
2. Subnet Mask:         255.255.255.0
3. Gateway Address:     207.212.30.1
4. Send MSS:            536
5. IP Security

TELNET PARAMETERS:
10. Service:            On
11. Telnet Port #:      23
12. Telnet Port Parameters

WEB SERVER:
20. Service:            On
21. Server Port #:      80
22. Inactivity Timeout: 5 Min

MAC Address:            01-23-45-67-89-ab

Enter Selection,
Press <ESC> to Exit ...
```
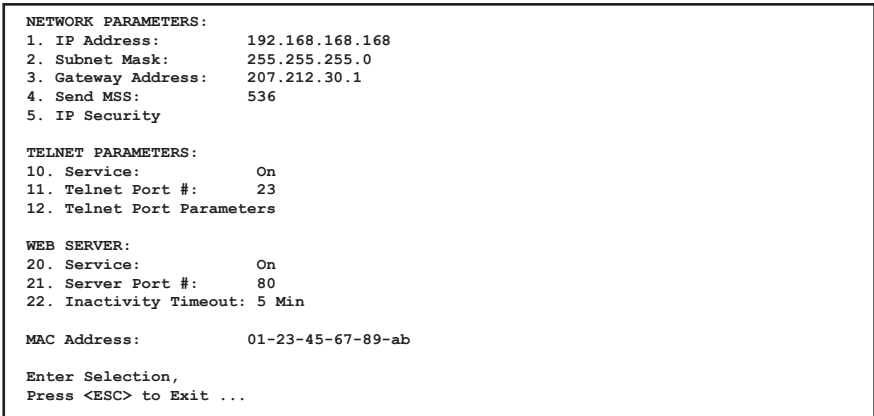
Figure 5.10: Network Parameters Menu - Text Interface

Telnet Parameters:

- **Service:** Enables/Disables Telnet communication with the CMS-6R4 unit. When this item is "Off," users will not be able to contact the unit via Telnet. (Default = On.)

- **Port Number:** Selects the TCP/IP port number that will be used for Telnet connections. The Port Number can be set to any valid number except 80; this is because 80 is the default port number for the CMS-6R4's Web Server feature. (Default = 23.)

- **Telnet Port Parameters:** Provides access to the Telnet Port Parameters menu, which is discussed in Section 5.5.2.2.

    Note: In the Text Interface, Telnet Port Parameters are defined via item 12 in the Network Parameters menu. In the Web Browser Interface, Telnet Port Parameters are defined using the Telnet Parameters button in the SetUp Menu.

Web Server:

    Note: In the Text Interface, Web Server Parameters are defined via the Network Parameters menu. In the Web Browser Interface, Web Server Parameters are defined using the Web Server Parameters button in the Setup Menu.

- **Service:** Enables/Disables the CMS-6R4's Web Server. Note that when the Web Server is disabled, you will not be able to communicate via the Web Browser Interface. (Default = On.)

- **Port Number:** Sets the TCP/IP Port Number. The Port Number can be set to any valid number except 23; this is because 23 is the default port number that is used for communication with the unit via Telnet. (Default = 80.)

- **Inactivity Timeout:** Enables and selects the Timeout Period for the Web Browser Interface. If enabled, and the Web Browser Interface does not receive or transmit commands for the specified Timeout Period, the port will disconnect. (Default = 5 Min.)

MAC Address:

- **MAC Address:** Displays the unit's MAC Address. Please note that this item only displays the assigned MAC Address, and cannot be used to redefine the address. Note also that the MAC Address is not displayed via the Web Browser Interface.

```
 IP SECURITY:

 1.  Security Mask #1:    (undefined)
 2.  Mask #1 Action:      Permit
 3.  Security Mask #2:    (undefined)
 4.  Mask #2 Action:      Permit
 5.  Security Mask #3:    (undefined)
 6.  Mask #3 Action:      Permit
 7.  Security Mask #4:    (undefined)
 8.  Mask #4 Action:      Permit
 9.  Security Mask #5:    (undefined)
10.  Mask #5 Action:      Permit


 Enter selection,
 Press <ESC> to return to previous menu ...
```

Figure 5.11: IP Security Menu - Text Interface

5.5.2.1. IP Security Feature

The IP Security feature can be used to restrict unauthorized IP addresses from establishing a connection with the CMS-6R4. In the default state, the unit accepts incoming IP connections from all hosts.   To configure the IP Security feature, proceed as follows:

1.   Access the IP Security Menu:

   a)   **Web Browser Interface:** The IP Security feature is configured using the fields at the bottom of the Network Parameters Menu as shown in Figure 5.9. To access the Network Parameters Menu, click the "SetUp" button at the bottom of the Status Screen, and then click the "Network Parameters" button on the left hand side of the Setup Menu.

   b)   **Text Interface:** Go to the Network Parameters menu (**/N**), type **5** and press **[Enter]**. The IP Security menu will be displayed as shown in Figure 5.11.

2.   The IP Security menu lists five IP Security "masks" along with the selected permit/deny action for each mask.

   a)   Each Security Mask prompt defines a specific IP address or range of addresses. Each Mask Action prompt defines the permit/deny action for the corresponding mask.

   b)   Masks are listed in order of ascending priority; Mask 1 has the lowest priority, Mask 5 has the highest priority.

   c)   Masks have a cumulative effect; high priority masks supersede the effect of lower priority masks.

   d)   Each IP Address consists of a series of four eight bit numbers. The number 255 is used as a wild card.

Example 1: Deny access to all hosts except 192.1.1.5:

Security Mask #1: 255.255.255.255   Mask #1 Action: Deny
Security Mask #2: 192.1.1.5   Mask #2 Action: Permit

Since 255 is a wild card, Mask #1 blocks all IP Addresses. Mask #2 then specifically grants access to 192.1.1.5 only.

Example 2: Allow access only by addresses that begin with 192.

Security Mask #1: 255.255.255.255   Mask #1 Action: Deny
Security Mask #2: 192.255.255.255   Mask #2 Action: Permit

Since 255 is a wild card, Mask 1 blocks all IP addresses. Mask 2 then grants access to all addresses that begin with 192.

Example 3: Allow access only by addresses that begin with 192, deny access to 192.1.1.5.

Security Mask #1: 255.255.255.255   Mask #1 Action: Deny
Security Mask #2: 192.255.255.255   Mask #2 Action: Permit
Security Mask #3: 192.1.1.5   Mask #3 Action: Deny

Since 255 is a wild card, Mask 1 blocks all IP addresses. Mask 2 then grants access to all addresses that begin with 192. Finally, Mask 3 specifically blocks access by 192.1.1.5.

Note:

- Mask #5 has priority over the other four masks. If Mask #5 is set to deny access by "255.255.255.255" (all wild cards), you will not be able to access CMS-6R4 Command Mode via network. Access will only be allowed via a Local PC or external modem connected to the CMS-6R4 COM Port.

- When using the wild card address "255.255.255.255", make certain that at least one higher priority mask permits access by your IP address.

```
TELNET PORT PARAMETERS

1. Supervisor Mode:         Permit
2. Logoff Character:        ^X
3. Sequence Disconnect:     One Character Only
4. Inactivity Timeout:      5 Min
5. Response Type:           Verbose
6. Command Echo:            On
7. Accept Break:            Yes
8. Discard LF:              Off
9. Invalid Access Lockout: Off


"/H" for help.
```
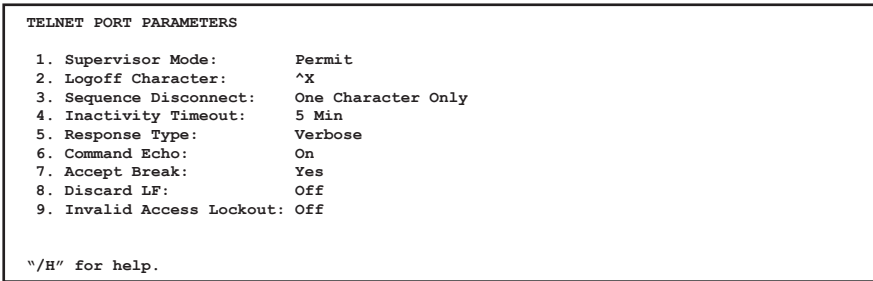
Figure 5.12: The Telnet Port Parameters Menu - Text Interface
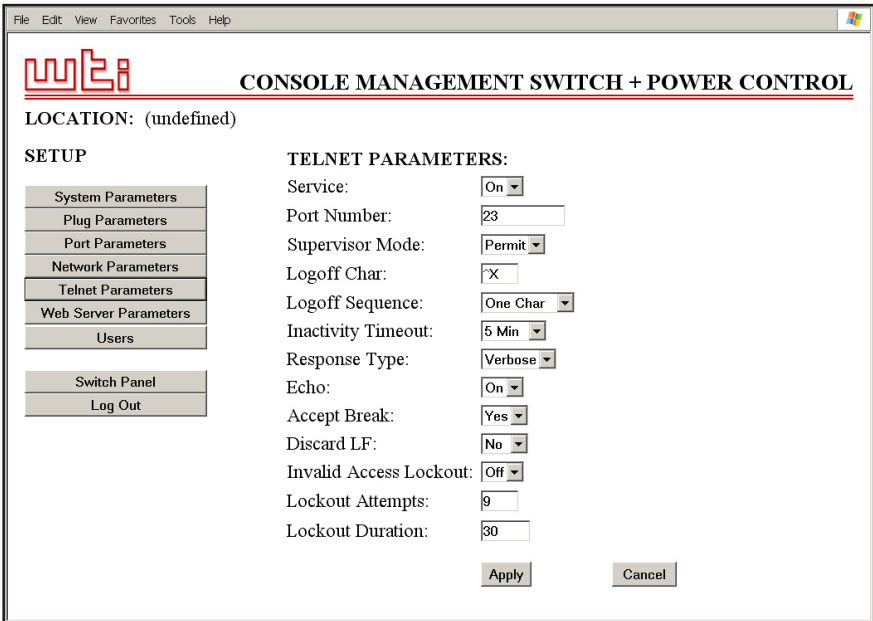

Figure 5.13: The Telnet Port Parameters Menu - Web Browser Interface

5.5.2.2. Telnet Port Parameters

The Telnet Port Parameters Menus are used to configure the Telnet Port, and select parameters such as the Response Type and Command Echo. To access the Telnet Port Parameters Menus, proceed as follows:

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Telnet Parameters" button; the Telnet Parameters menu will be displayed as shown in Figure 5.13.

- **Text Interface:** Type **/N** and press **[Enter]** to access the Network Port Parameters Menu (Figure 5.10.) From the Network Port Parameters menu, type **12** and press **[Enter]**. The Telnet Port Parameters Menu will be displayed as shown in Figure 5.12.

    Note: Settings for network parameters depend on the configuration of your individual network. Contact your network administrator for appropriate settings.

The Telnet Port Parameters Menu allows the following parameters to be defined. Except where noted, all parameters listed here are available via both the Web Browser Interface and Text Interface.

- **Service:** Enables/Disables the Telnet port. When the Telnet Port is disabled, you will not be able to communicate with the unit via Telnet. (Default = On.)

    Note: In the Web Browser Interface, the Service parameter is accessed via the Telnet Parameters button on the left hand side of the SetUp menu. In the Text Interface, the Service Parameter is located in the Network Parameters Menu, which can be access by typing **/N** and pressing **[Enter]**.

- **Port Number:** Selects the TCP/IP port number that will be used for Telnet connections. The Port Number can be set to any valid number except 80; this is because 80 is the default port number for the CMS-6R4's Web Server feature. (Default = 23.)

    Note: In the Web Browser Interface, the Port Number setting is accessed via the Telnet Parameters button on the left hand side of the SetUp menu. In the Text Interface, the Port Number setting is located in the Network Parameters Menu, which can be access by typing **/N** and pressing **[Enter]**.

- **Supervisor Mode:** Permits or denies access to Supervisor Mode via Telnet. When disabled (Deny), the port will *not* enter Supervisor Mode, even when a password that normally permits access to Supervisor Mode is entered. (Default = Permit.)

- **Logoff Character:** Defines the Logoff Character for the Telnet port. The Logoff Character determines the command(s) or character(s) that must be issued in order to disconnect the Telnet Port from a CMS-6R4 RS232 Serial Port (Resident Disconnect). (Default = **^X** (**[Ctrl]** plus **[X]**).)

Notes:

- When redefining the Logoff Character, make certain to select a character that does not normally occur in your data.

- The Logoff Character is only used when disconnecting a Resident Connection via the Text Interface.

- **Sequence Disconnect:** Enables/Disables and configures the Resident Disconnect command. This prompt offers the option to either disable the Sequence Disconnect, or select a one character format or a three character format. (Default = One Character). Note the following:

  - When a Resident Connection is initiated, the CMS-6R4 will send a message which lists the connected ports, and displays the one character or three character command that will be required in order to disconnect.

  - The One Character Disconnect sequence is intended for situations where the destination port will *not* receive the disconnect command. When the Three Character format is selected, the disconnect sequence *will* pass through to the destination port prior to breaking the connection.

  - When the One Character format is selected, resident connections are terminated by entering the selected Logoff Character only. There is no need to press **[Enter]** before and after the Logoff Character when the One Character format is selected.

  - When the Three Character format is selected, the Resident Disconnect Sequence will use the format "**[Enter]LLL[Enter]**", where **L** is the selected Logoff Character.

- **Inactivity Timeout:** Enables and selects the Timeout Period for the Telnet port. If enabled, and the port does not receive or transmit data for the specified Timeout Period, the port will disconnect. (Default = 5 Minutes.)

   Note: When connected ports time out and are disconnected, both ports will also exit from command mode.

- **Response Type:** Selects the type of messages that the Telnet port will send in Text Interface mode when responding to commands. The user can select Verbose (English Text), Terse (Numeric / Abbreviation), or Quiet Mode (No Response.) (Default = Verbose.)

- **Command Echo:** Enables or Disables the command echo for the Telnet port. (Default = Off.)

- **Accept Break:** Determines whether the Telnet port will accept breaks received from the attached device, and pass them along to a connected port. When enabled, breaks received at this port will be passed to any port that this port is connected to, and sent along to the device connected to the other port. When disabled, breaks will be refused at this port and not sent to the other port. (Default = Yes)

- **Discard LF:** If desired, this option can be used to discard the Line Feed character that is often produced by Telnet software. When this parameter is enabled, the <LF> character sent after the <CR> will not be forwarded to the serial port that the Telnet connection is in session with. This parameter applies to all CMS-6R4 Telnet connections. (Default = Off.)

   Notes:
   - The "Discard LF" setting is only applied to inbound connections, and will not be applied to outbound connections that have been established using the /TELNET command.

   - When the status of the "Discard LF" parameter is changed, the new setting will take effect immediately, thus changing all current, active connections.

   - The "Discard LF" setting does not apply to Raw Socket Mode connections. Raw connections will not discard the <LF> character.

- **Invalid Access Lockout:** Enables/Disables the Invalid Access Lockout feature for the Network Port as described in Section 5.5.2.3. The Invalid Access Lockout feature can be used to automatically disable a port when a user-defined number of invalid access attempts are detected (e.g., bad password/username.) (Default = Off.)

5.5.2.3. The Invalid Access Lockout Feature

When properly configured and enabled, the Invalid Access Lockout feature will watch all login attempts made at all CMS-6R4 ports. If a given port exceeds the selected number of invalid attempts specified for that port, then that port will be automatically disabled for a user-defined length of time.

When an Invalid Access Lockout occurs, you can either wait for the Lockout Duration period to elapse (after which, the CMS-6R4 will automatically reactivate the port), or you can issue the /UL command (type **/UL** and press **[Enter]**) via the Text Interface to instantly unlock all CMS-6R4 serial ports.

Notes:

- The Invalid Access Lockout Feature is available to the Serial RS232 Ports, the Internal Modem Port, and the Network Port.

- When a Port is locked, an external modem connected to that port will not answer.

- When a given CMS-6R4 serial port is locked, the other serial ports will remain unlocked, unless the Invalid Access Lockout feature has been triggered at those other ports.

- If any one of the CMS-6R4's logical network ports is locked, all other network connections to the unit will also be locked.

- All invalid access attempts at the CMS-6R4 Network Port are cumulative (the count for invalid access attempts is determined by the total number of all invalid attempts at all available logical network ports.) If a valid login name/password is entered at any of the logical network ports, then the count for all CMS-6R4 logical network ports will be restarted.

- In the Text Interface, Invalid Access Lockout parameters are defined via a submenu of the Telnet Port Parameters menu. In the Web Browser Interface, Invalid Access Lockout parameters are defined using the Telnet Parameters Menu as described in Section 5.5.2.2.

The Telnet Parameters Menu (Web Browser Interface) and Invalid Access Lockout Menu (Text Interface) allow the following parameters to be defined:

- **Lockout Enable:** Enables/Disables the Invalid Access Lockout feature. (Default = Off.)

- **Lockout Attempts:** The number of invalid attempts required to activate the Invalid Access Lockout feature. (Default = 9.)

- **Lockout Duration:** The length of time ports will remain locked when an Invalid Access Lockout occurs. If the duration is set at "Infinite", then ports will remained locked until the /UL command is issued. (Default = 30 Minutes.)

5.5.3.   RS232 Port Parameters

The Port Parameters Menus are used to configure the CMS-6R4's serial RS232 Ports, and allow you to assign a name to each port and select parameters such as the baud rate, parity and handshake mode. To access the Serial Parameters Menu, proceed as follows:

- **Web Browser Interface:** Click the "Setup" button to access the Setup Menus, and then click the "Port Parameters" button. The Port Parameters Menu will be displayed as shown in Figure 5.14.

- **Text Interface:** Type **/P n** and press **[Enter]** (where **n** is the number or name of the port that you wish to configure.) The Port Parameters Menu will be displayed as shown in Figure 5.15.

  Note: Port 7 is the Internal Modem port; the Port Mode for this port is set to "Modem" and cannot be changed. To configure the Modem port, either select port 7 via the Web Browser Interface, or access the Text Interface and type **/P 7 [Enter]**.

As shown in Figure 5.14 and Figure 5.15, the Port Parameters Menus allow you to define the following parameters:

- **Port Name:** Assigns a name to this port. (Default = undefined.)

  Note: The Port name can be up to sixteen characters long, and cannot include control characters, forward slashes (/), asterisks (*), or space characters. The first character of the Port Name must be a letter of the alphabet.

- **Baud Rate:** Baud Rate for this RS232 Port. (Defaults: Port 1 through Port 6 = 9,600 bps; Port 7 (Internal Modem Port) = 57.6 Kbps.)

  Note: When this setting is changed, the new baud rate will not be applied until the user exits and then re-enters command mode.

- **Bits/Parity:** The data bits and parity setting for this port. (Default = 8 Bits, No Parity.)

- **Stop Bits:** The Stop Bits setting for this port. (Default = 1 Bit.)

- **Handshake Mode:** Selects the handshake format for this port; XON/XOFF, RTS/CTS (hardware), Both, or None. (Default = RTS/CTS).
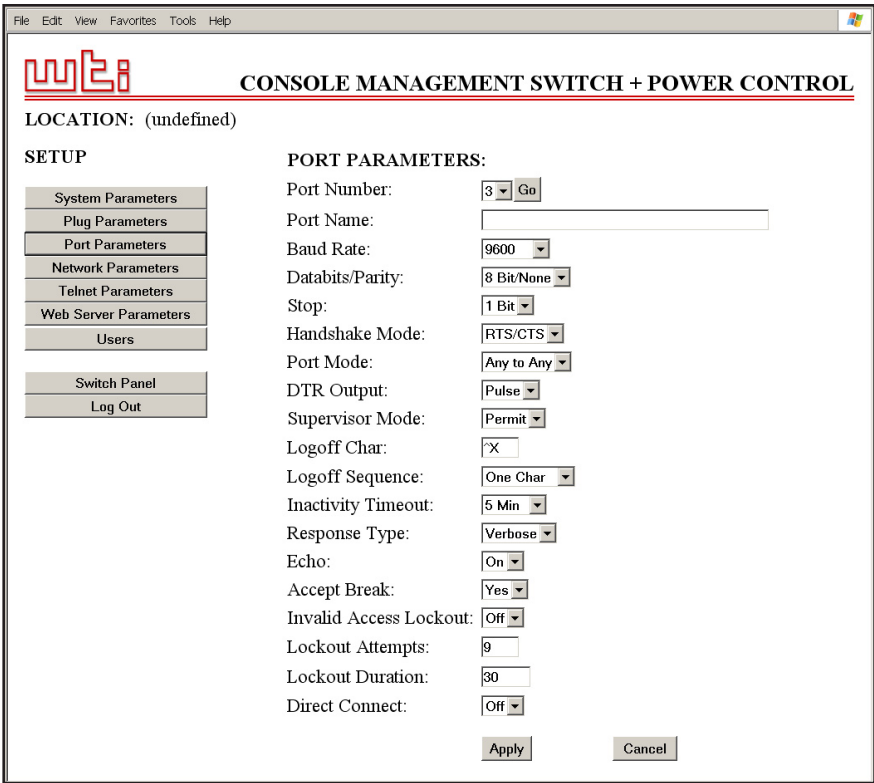
Figure 5.14: Port Parameters Menu - Web Browser Interface

```
PORT PARAMETERS #3:

 1. Port Name:           (undefined)    15. Direct Connect:  Off
 2. Baud Rate:           9600               Telnet Port:     2103
 3. Bits/Parity:         8-None             Raw Port:        3103
 4. Stop Bits:           1
 5. Handshake Mode:      RTS/CTS
 6. Port Mode:           Any-to-Any
    64. DTR Output:      Pulse
 7. Supervisor Mode:     Permit
 8. Logoff Character:    ^X
 9. Sequence Disconnect: One Character Only
10. Inactivity Timeout:  5 Min
11. Response Type:       Verbose
12. Command Echo:        On
13. Accept Break:        Yes
14. Invalid Access Lockout: Off


Enter: "<" previous port,
       ">" next port,
       <ESC> exit ...
```
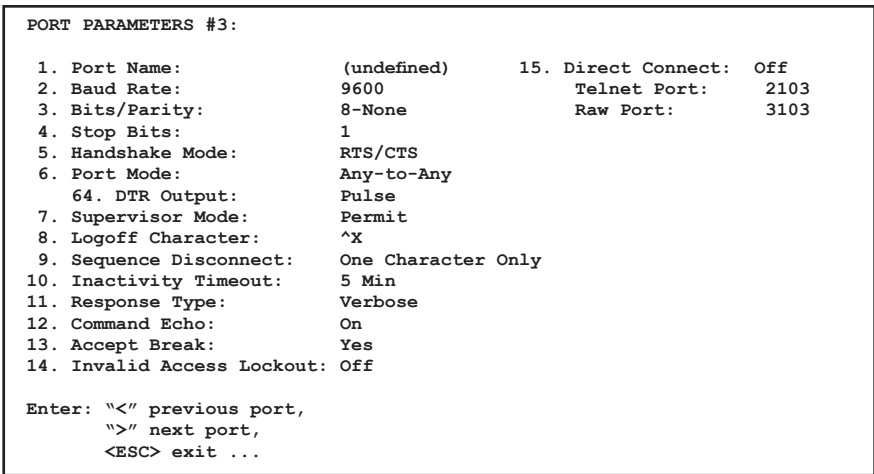
Figure 5.15: Port Parameters Menu - Text Interface (Port 3 Shown)

• **Port Mode:** Selects the Port Mode for this port. Note that when the Port Mode is set to "Modem" the modem initialization string will be sent every 15 minutes. For more information on Port Modes, please refer to Section 5.5.3.1. (Default: Ports 1 to 6 = Any-to-Any; Port 7 = Modem.)

Notes:

• In order to ensure local access to command mode functions, Port 1 (the System Setup Port) cannot be set to Buffer Mode or Passive Mode.

• The Port Mode for Port 7 (Internal Modem Port) will always be set to Modem Mode and cannot be changed.

When Any-to-Any Mode, Passive Mode, or Buffer Mode is selected, the CMS-6R4 will display the DTR Output Prompt as shown in Figure 5.15. The DTR Output prompt is not displayed when Modem Mode is selected.

• **DTR Output:** Determines how DTR will react when this port disconnects. DTR can be held low, held high, or pulsed for 0.5 seconds and then held high. In the default state, DTR will pulse for 0.5 seconds and then remain high. For more information on hardware lines, please refer to Appendix A. (Default = Pulse.)

When Port Mode is set to Modem Mode, the Port Parameters Menu will include additional prompts which are used to define the following:

• **Reset String:** If necessary, this prompt can re-define the modem reset string, which is sent prior to the Initialization string. (Up to 48 Characters, Default = **ATZ.**)

• **Initialization String:** Defines a command string that can be sent to initialize a modem to settings required by your application. (Up to 48 Characters, Defaults: Ports 1 through 6 = **AT&C1$D2S0=1**; Port 7 (Internal Modem Port) = **ATE0M0&C1&D2S0=1**.)

• **Hang-Up String:** Although the CMS-6R4 will pulse the DTR line to hang-up an attached modem, the Hang-Up string parameter is often useful for controlling modems that do not use the DTR line. (Up to 48 Characters, Default = undefined.)

Notes:

• When communicating with the CMS-6R4 via modem, communications parameters will not be changed until you exit from command mode and discontinue the modem connection to the unit.

• For a complete listing of all available AT commands and S-Register functions, please refer to the MT5634 Modem Command Set document that can be found on the User's Guide CDROM, or on the WTI web site at http://www.wti.com/guides/guidarch.htm.

- **Supervisor Mode:** Permits or denies access to Supervisor Mode at this port. When Supervisor Mode is enabled, and a password that permits Supervisor level commands is entered at this port, the port will allow access to Supervisor Mode. When this feature is disabled, the port will not allow access to Supervisor Mode, even when a password that normally permits Supervisor Mode is entered at this port. (Default = Permit.)

  Note: Supervisor Mode cannot be disabled at Port 1 (the System Setup Port.)

- **Logoff Character:** Defines the Logoff Character for this port. The Logoff Character determines the command(s) or character(s) that must be issued at this port in order to disconnect from a second port. (Resident Disconnect.) (Default = **^X** (**[Ctrl]** plus **[X]**).)

- **Sequence Disconnect:** Enables/Disables and configures the Resident Disconnect command. This prompt offers the option to either disable the Sequence Disconnect, or select a one character format or a three character format. (Default = One Character).

  ### Notes:

  - When a Resident Connection is initiated, the CMS-6R4 will send a message which lists the connected ports, and displays the one character or three character command that will be required in order to disconnect.

  - The One Character Disconnect sequence is intended for situations where the destination port will *not* receive the disconnect command. When the Three Character format is selected, the disconnect sequence *will* pass through to the destination port prior to breaking the connection.

  - When the One Character format is selected, resident connections are terminated by entering the selected Logoff Character only. There is no need to press **[Enter]** before and after the Logoff Character when the One Character format is selected.

  - When the Three Character format is selected, the Resident Disconnect Sequence will use the format "**[Enter]LLL[Enter]**", where **L** is the selected Logoff Character.

- **Inactivity Timeout:** Enables and selects the Timeout Period for this port. If enabled, and the port does not receive or transmit data for the specified Timeout Period, the port will disconnect and exit command mode. (Default = 5 Minutes.)

  Note: When connected ports time out and are disconnected, both ports will also exit from command mode.

- **Response Type:** Selects the type of messages that this port will send in Text Interface mode when responding to commands. The user can select Verbose (English Text), Terse (Numeric / Abbreviation), or Quiet Mode (No Response). (Default = Verbose.)

- **Command Echo:** Enables or Disables the command echo for this port. (Default = On).

- **Accept Break:** Determines whether this port will accept breaks received from the attached device, and pass them along to a connected port. When enabled, breaks received at this port will be passed to any port that this port is connected to, and sent along to the device connected to the other port. When disabled, breaks will be refused at this port, and hence, not sent to the other port. (Default = Yes.)

- **Invalid Access Lockout:** Enables/Disables the Invalid Access Lockout feature at this port as described in Section 5.5.2.3. Briefly, the Invalid Access Lockout feature can be used to automatically disable a port when a user-defined number of invalid access attempts are detected. (Default = Off.)

- **Direct Connect:** Direct Connect allows you to access the CMS-6R4 and automatically create a connection between the Network Port and a specific RS232 port by including the appropriate Telnet port number in the connect command (e.g. Port 5 = 2105). For more information, please refer to Section 6.6. As described below, the Direct Connect feature offers three options. (Default = Off.)

  ▸ **Off:** Telnet users will not be able to employ the Direct Connect feature to connect to this port.

  ▸ **On - No Password:** Telnet users will be able to employ the Direct Connect feature to connect to this port without entering a password.

  ▸ **On - Password:** Telnet users will be able to use Direct Connect to connect to this port, but will be required to enter a password before the connection is established.

  Note: If "On - Password" is selected, and Supervisor commands are disabled at the Network Port, then only accounts that do not permit Supervisor commands will be allowed to establish a direct connection via the Network Port. If Supervisor commands are disabled at a given port, then that port will not allow access by accounts that permit Supervisor commands.

  When the Port Parameters menu is accessed via the Text Interface, the menu also lists both Direct Connect port numbers for this port (port numbers are not listed in the Web Browser Interface.)

  ▸ **Telnet Port:** The Telnet port number that is used to create a Direct Connection to this port using standard Telnet protocol.

  ▸ **Raw Port:** The Telnet port number that is used to create a Raw Socket connection to this port. When Raw Socket Mode is used, data is always sent "as is", and command echo is always enabled.

5.5.3.1. RS232 Port Modes

The CMS-6R4 offers four different port operation modes; Any-to-Any Mode, Passive Mode, Buffer Mode, and Modem Mode. The Port Modes function as follows:

- **Any-to-Any Mode:** Allows communication between connected ports. Any-to-Any Mode Ports can be connected to other Any-to-Any, Passive, Buffer, or Modem Mode Ports by accessing command mode and invoking the /C command (see Section 6.2.3). The Any-to-Any Mode is available to all CMS-6R4 ports, except the Internal Modem Port.

- **Passive Mode:** Allows communication between connected ports, but does not allow access to command mode. Passive Mode Ports can be connected by accessing command mode from a free Any-to-Any or Modem Mode port and invoking the /C command (see Section 6.2.3). The Passive Mode is not available to Ports 1 and 2, or the Internal Modem Port.

- **Buffer Mode:** Allows collection and storage of data received from connected devices. Collected data can be retrieved by accessing command mode from a free Any-to-Any or Modem Mode Port, and issuing the Connect Command (/C.) Note that the Buffer Mode also allows pass-through communication with the connected device. The Buffer Mode is not available to Ports 1 and 2, or the Internal Modem Port.

- **Modem Mode:** A Modem Mode port can perform all functions normally available in Any-to-Any Mode, but the Modem Mode also allows definition of a Hang-Up String, Reset String, and Initialization String. Any CMS-6R4 RS232 port can be configured for Modem Mode, and the Internal Modem port is always configured for Modem Mode.

For more information on Port Modes, please refer to Section 6.

```
COPY SERIAL PORT PARAMETERS:

 1. Port Name:                          15. Direct Connect:
 2. Baud Rate:
 3. Bits/Parity:
 4. Stop Bits:
 5. Handshake Mode:
 6. Port Mode:
    64. DTR Output:
 7. Supervisor Mode:
 8. Logoff Character:
 9. Sequence Disconnect:
10. Inactivity Timeout:
11. Response Type:
12. Command Echo:
13. Accept Break:
14. Invalid Access Lockout:


(Note: Port 1 will NOT have restricted values changed.)
Enter: Parameter # <CR> to define parameter value(s) to copy to other ports,
       -<CR> to remove all values set,
       X<CR> to exit WITHOUT copy,
       <ESC> to copy to ports and exit ...
```

Figure 5.16: The Copy Parameters Menu - Text Interface

5.5.3.2. Copying Parameters to Several Ports

The /CP command (Copy Port Parameters) provides a convenient means for selecting similar parameters for all or several CMS-6R4 Serial Ports.

When the /CP command is invoked, the unit will display a menu which allows you to select parameters, and then copy them to all or several Serial Ports. The Copy Port Parameters menu can be used to set all parameters for the specified port(s), or define only a select group of parameters for the desired ports.

Notes:

- The /CP command will not copy parameters to the Network Port.

- The /CP command can only be invoked via the Text Interface.

- The /CP command is only available to passwords and ports that permit access to Supervisor Level commands.

- The /CP command cannot be used to set Port 1 (the System Setup Port) to Passive Mode or Buffer Mode.

- The /CP command cannot be used to disable the Supervisor Mode at Port 1 (the System Setup Port.)

To select common parameters for all or several CMS-6R4 Serial Ports, proceed as follows:

1. Access the Command Mode via the Text Interface, using a password and port that permit access to Supervisor Level commands.

2.   When the command prompt appears, invoke the /CP command as described below. The menu shown in Figure 5.16 will be displayed.

   a)   **All Ports:** To copy parameters to all CMS ports, type **/CP** and then press **[Enter]**.

   b)   **Range of Ports:** To copy parameters to a range of Serial Ports, type **/CP m-n** and then press **[Enter]**. Where **m** and **n** are CMS port numbers that specify the beginning and end of the desired range. For example, to copy parameters to ports 3 through 5, type **/CP 3-5** and then press **[Enter]**.

   c)   **Several Ports:** To copy parameters to several Serial Ports, type **/CP m,n,x [Enter]**. Where **m**, **n** and **x** are the numbers for the desired ports. For example to copy parameters to ports 3, 5, and 7, type **/CP 3,5,7 [Enter]**.

   d)   **Combination:** To invoke the /CP command in a manner where a range of Serial Ports is specified, along with other port(s) outside the range, type **/CP m-n,x [Enter]**. Where **m**, **n** and **x** are Serial Port numbers. For example to copy parameters to Ports 2 through 4, plus Port 6, type **/CP 2-4,6** and then press **[Enter]**.

3.   **Selecting Parameters:** To select parameters to be copied, key in the number for the desired parameter, press **[Enter]**, and then follow the instructions in the submenu. Note that it is not necessary to define all port parameters; for example, the /CP command could be used to select only the Baud Rate for all specified ports.

4.   **Clear Menu:** After defining several parameters, if you wish to clear the /CP menu and start again, type **–** (dash) and press **[Enter]**. The Copy Parameters menu will be reset.

5.   **Exit Without Copy:** To exit from the Copy Parameters menu without copying selected parameters to the selected Serial Ports, type **x** and then press **[Enter]**. The CMS-6R4 will exit from the Copy Parameters menu.

6.   **Copy Parameters:** When you have finished selecting parameters, press **[Esc]** to copy the selected parameters to the Serial Ports. If the "Sure" confirmation prompt is displayed, type **Y** to proceed or **N** to abort the command.

5.5.4.　Configuring the Internal Modem

The CMS-6R4 includes an internal modem, which can also be configured via the Text Interface or Web Browser Interface.

The configuration menu for the internal modem is identical to the configuration menus for the RS232 Serial Ports, except that the Port Mode for the Modem Port is always set at "Modem Mode" and the Any-to-Any Mode, Buffer Mode and Passive Mode are not available. To access the Modem Port configuration menu, proceed as follows:

- **Text Interface:** Type **/P 7** and press **[Enter]**.

- **Web Browser Interface:** Click on the SetUp button at the bottom of the Status Screen to display the setup menus. Next Click the Serial Button to display the Serial Port configuration menus. In the Port Number field, press the down arrow to display the dropdown port selector menu, then highlight port 7 (the internal modem port) and click on the "Go" button.

For a description of the various parameters that can be configured via the Modem Port Configuration Menu, please refer to Section 5.5.3.

5.5.5. Plug Parameters Menus

The Plug Parameters Menus are used to define Plug Names, Plug Passwords, boot/sequence delay times and Power Up Default values for each of the CMS-6R4's Switched AC Outlets.

* **Web Browser Interface:** Click the "Setup" button to access the configuration menus, then click the "Plug Parameters" button. The Plug Parameters Menu will be displayed as shown in Figure 5.17.

* **Text Interface:** Type **/PL** ***n*** and then press **[Enter]** (Where ***n*** is the number or name of the plug you wish to configure.) The Plug Parameters Menu will be displayed as shown in Figure 5.18.

Note that in this case, the major difference between the Web Browser Interface and Text Interface is that the Web Browser Interface allows you to select parameters for all plugs from a single menu, whereas the Text Interface includes a separate menu for each plug.

The Plug Parameters Menu allows you to define the following parameters:

* **Plug Name:** (Up to 16 Characters, Default = undefined.)

  Note: Plug Names cannot begin with a number, dash (**-**), underscore character (**_**), forward slash character (**/**) or backslash (****) character, and cannot include non printable characters, spaces, asterisks (*****), colons (**:**), the plus symbol (**+**) or quotation marks.

* **Boot/Seq. Delay:** When more than one plug is switched On/Off or a reboot cycle is initiated, the Boot/Sequence delay determines how much time will elapse between switching operations, as described in Section 5.5.5.1. (Default = 0.5 Second.)

* **Power Up Default:** Determines how this plug will react when the Default command (/DPL) is invoked, or after power to the unit has been interrupted and then restored. After the default command is invoked, or power is restored, the CMS-6R4 will automatically switch each plug On or Off as specified by the Power-Up Default. (Default = On).

  Note: The Default Plugs command (/DPL) is only available to passwords and ports that permit access to Supervisor Level commands.
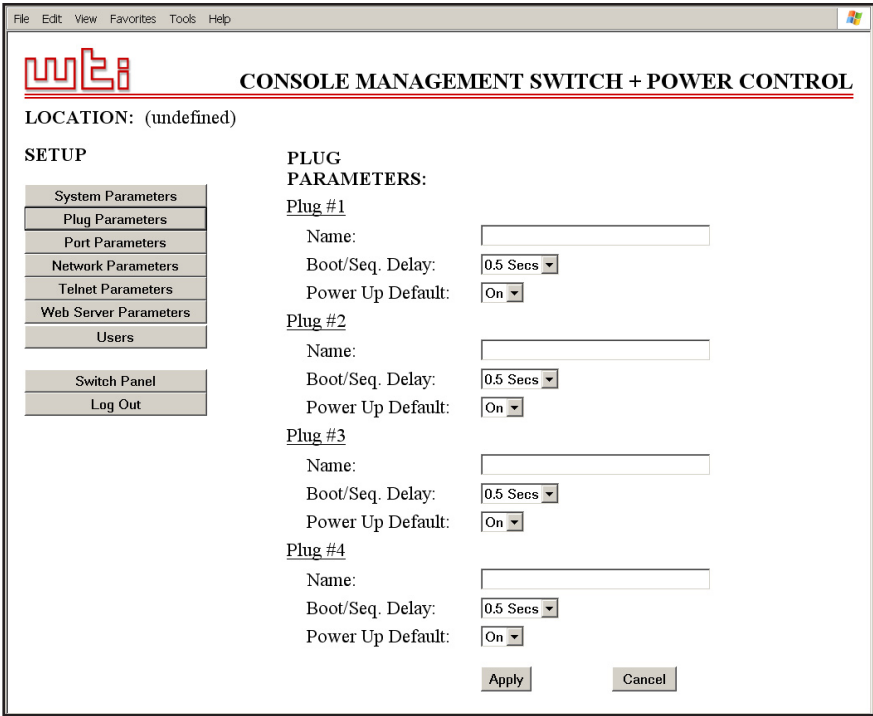
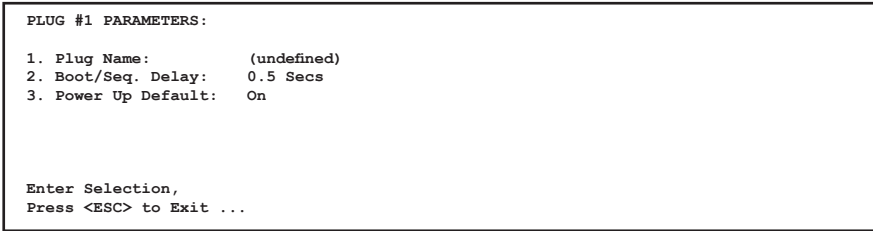*Figure 5.17: Plug Parameters Menu - Web Browser Interface*

```
PLUG #1 PARAMETERS:

1. Plug Name:         (undefined)
2. Boot/Seq. Delay:   0.5 Secs
3. Power Up Default:  On




Enter Selection,
Press <ESC> to Exit ...
```

Figure 5.18: Plug Parameters Menu - Text Interface (Plug 1 Shown)

5.5.5.1. The Boot / Sequence Delay Period.

The Boot / Sequence Delay value will be applied differently for Reboot operations as opposed to simple On/Off operations as described below:

1. **Reboot Cycles:**

    a) **Single Plug:** The Boot/Seq. Delay determines how long the plug will remain Off before it is switched back On again.

    b) **Several Plugs:** The Boot/Seq. Delay determines how long the plug will remain "Off", and also how long the CMS-6R4 will pause before proceeding to the next plug.

2. **On/Off Switching:** The Boot/Seq. Delay determines how long the CMS-6R4 will pause before proceeding to the next plug.

Examples: Assume that a user is allowed access to plugs one through four, and that the Boot / Sequence Delays for each plug have been set as follows:
Plug 1 = 1 Second, Plug 2 = 2 Seconds, Plug 3 = 5 Seconds,
Plug 4 = 1 Minute.

If the user applies an "On" command to all four plugs, the CMS-6R4 will respond as follows:

1. Turn On Plug 1, Wait 1 Second.
2. Turn On Plug 2, Wait 2 Seconds.
3. Turn On Plug 3, Wait 5 Seconds.
4. Turn On Plug 4.

If a "Reboot" Command is applied to Plug 3, the CMS-6R4 will respond as follows:

1. Turn Off Plug 3, Wait 5 Seconds, Turn On Plug 3.

If a Reboot Command is applied to all four plugs, the CMS-6R4 will respond as follows:

1. Turn Off all four plugs (short delay between plugs.)
2. Wait 1 Second, Turn On Plug 1, Wait 1 Second.
3. Wait 2 Seconds, Turn On Plug 2, Wait 2 Seconds.
4. Wait 5 Seconds, Turn On Plug 3, Wait 5 Seconds.
5. Wait 1 Minute, Turn on Plug 4.

5.6. Save Configuration Parameters

After you have finished configuring the CMS-6R4 to fit your application, it is recommended to save all parameters to an ASCII file.

Saving Parameters to an ASCII file allows you to create a "backup" of your currently defined configuration. As described in Section 8, this provides quick recovery in the event that the unit is accidentally reset to default parameters, and also allows you to copy parameters to other CMS-6R4 units when several units need to be configured with the same parameters.

6. Operation

As discussed in Section 5, the CMS-6R4 offers two separate command interfaces; the Web Browser Interface and the Text Interface. Note that Both interfaces offer essentially the same command options and features, and that parameters defined via the Web Interface will also apply when communicating via the Text Interface (and vice versa.)

6.1. Operation via the Web Browser Interface

When using the Web Browser Interface, all switching commands are invoked via the Plug Status Screen, which also displays the status of the CMS-6R4's switched outlets.

> **Note:** Although the Web Browser Interface allows you to select parameters for the RS232 ports and control power switching operations, port connections cannot be initiated via the Web Browser Interface. The Text Interface is used to create connections between the CMS-6R4's Serial RS232 ports.

6.1.1. The Status Screen - Web Browser Interface

When you login to the CMS-6R4 command mode using the Web Browser Interface, the first screen that is displayed is the Status Screen. The Status Screen (Figure 6.1) lists the current On/Off status of the CMS-6R4's Switched Outlets. The Status Screen also provides a series of "radio buttons" which are used to control switching of the outlets.

To invoke On/Off/Boot commands or view plug status via the Web Browser Interface, proceed as follows:

1. Access the CMS-6R4 Command Mode as described in Section 5.2.1.

2. When the Status Screen (Figure 6.1) appears, note that the screen includes a status field and switching and reboot controls for each of the CMS-6R4's Switched AC Outlets.

Notes:
*   When switching and reboot operations are initiated, Boot/Sequence Delay times will be applied as described in Section 5.5.5.1.
*   You will only be allowed to issue switching and reboot commands to the outlets that are allowed by the password entered during login.
*   The Status Screen will only show the outlets that are allowed by the user's password; the status of other outlets will not be displayed.
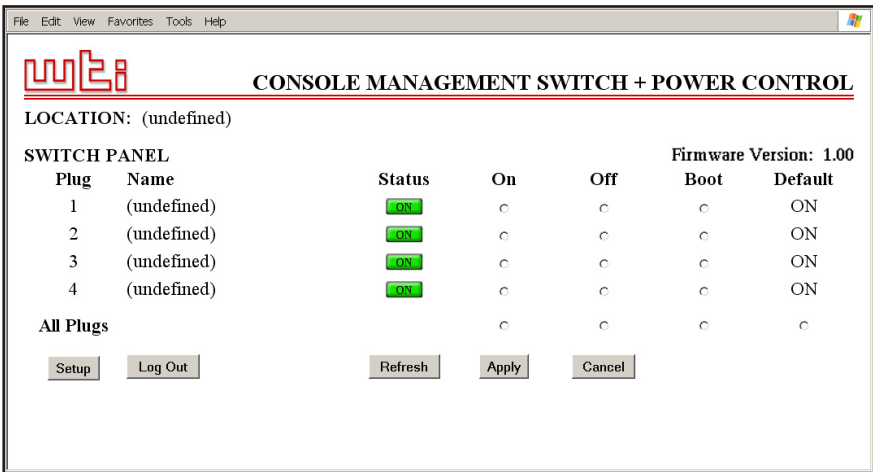
Figure 6.1: The Status Menu - Web Browser Interface

3. **Switching Plugs On:** Click the "On" radio button next to the desired plug(s), then click "Apply". To switch all Plugs On, click the "On" radio button in the "All Plugs" row, then Click "Apply."

4. **Switching Plugs Off:** Click the "Off" radio button next to the desired plug(s), and then click "Apply". To switch all Plugs Off, click the "Off" radio button in the "All Plugs" row, and then Click "Apply."

5. **Reboot Cycle:** Click the "Boot" radio button next to the desired plug(s), and then click "Apply". To reboot all Plugs, click the "Boot" button in the "All Plugs" row, and then Click "Apply."

6. **Set All Plugs to Power Up Defaults:** To set all outlets to their user-defined Power-Up Default On/Off status, click the "Default" button in the "All Circuits" row and then click "Apply." Note that in order for this command to function, Power Up Default values for each plug must first be defined as described in Section 5.5.5.

When each switching, default or reboot command is invoked, the CMS-6R4 will display a screen which indicates that a switching operation is in progress, then return to the Plug Status screen when the command is complete. At that time, the Status Screen will list the updated On/Off status of each plug.

```
CMS-6R4          v1.00            Site ID: (undefined)
Display                          Configuration
/H          Display Help Screen   /F         System Parameters
/S          Display Status        /PL [n]    Plug Parameters
/SN         Display Network Status /P [n]    Port Parameters
/SD         Port Diagnostics      /N         Network Parameters
/W [n]      Port Parameters (Who) /CP <z>    Copy Serial Port Parameters
/V          View Password Directory /U       Send Parameters to File
/J          Display Site ID       /UF        Upgrade Firmware
                                  /FD        Factory default the unit
Control
/DPL        Set Plugs to Default State  +----------------------------------+
/BOOT <n>   Boot Plug n           | [n] = optional name or number    |
/ON <n>     Turn On Plug n        | <m> = required name or number    |
/OFF <n>    Turn Off Plug n       | <n> = required name(s) or        |
/C <m> [n] Connect - Local [remote] |   = required number(s) or      |
/D <n>      Disconnect            |     = * for "all"                |
/E <n>      Erase Buffer          | n:n = plug n through plug n      |
/UL         Unlock Invalid Access | n+n or n n = plug n and plug n   |
/I          Reset Network Interface | ,y  = bypass "Sure? (y/n)"     |
/X          Exit/Disconnect       | z   n,n-n,... | *                |
/TELNET <ip> [port] [RAW]  Telnet Out  +----------------------------------+

CMS>
```

Figure 6.2: The Text Interface Help Screen (Supervisor Mode Shown)

6.2. Operation via the Text Interface

When using the Text Interface, all switching and port connection functions are initiated by invoking simple, ASCII commands. ASCII commands are also used to display status screens and to log out of command mode. The Text Interface includes a Help Menu, which summarizes all available CMS-6R4 commands. To display the Text Interface Help Menu (Figure 6.2), type **/H** and press **[Enter]**.

Notes:

- Wait for the "CMS>" prompt to appear before entering commands. The prompt will not reappear until the previous command is complete.

- Commands are *not* case sensitive. All commands are invoked by pressing **[Enter]**.

- You are only allowed to issue commands to the outlets and ports that are allowed by the password entered during login.

- If command confirmation is enabled, the CMS-6R4 will display the Status Screen after commands are successfully completed.

- When switching and reboot operations are initiated, Boot/Sequence Delay times will be applied as described in Section 5.5.5.1.

- If the password entered at login does not permit Supervisor Level commands, then the Help Screen will only list Non-Supervisor commands.

```
CMS-6R4          v1.00              Site ID: (undefined)

PORT |        NAME        |   CMD ACCESS   | STATUS |   MODE   | BUFFER COUNT
-----+------------------+----------------+--------+---------+--------------+
  1  | (undefined)      |    Unlocked    |  Free  |  Any    |           0 |
  2  | (undefined)      |    Unlocked    |  Free  |  Any    |           0 |
  3  | (undefined)      |    Unlocked    |  Free  |  Any    |           0 |
  4  | (undefined)      |    Unlocked    |  Free  |  Any    |           0 |
  5  | (undefined)      |    Unlocked    |  Free  |  Any    |           0 |
  6  | (undefined)      |    Unlocked    |  Free  |  Any    |           0 |
  7  | Internal_Modem   |    Unlocked    |  Free  |  Modem  |           0 |
-----+------------------+----------------+--------+---------+--------------+

PLUG |        NAME        | BOOT/SEQ DELAY | STATUS | DEFAULT |
-----+------------------+----------------+--------+---------+
  1  | (undefined)      |   0.5 Secs     |   ON   |   ON    |
  2  | (undefined)      |   0.5 Secs     |   ON   |   ON    |
  3  | (undefined)      |   0.5 Secs     |   ON   |   ON    |
  4  | (undefined)      |   0.5 Secs     |   ON   |   ON    |
-----+------------------+----------------+--------+---------+

"/H" for help.
CMS>
```

Figure 6.3: The Status Screen - Text Interface

6.2.1.   The Status Screen - Text Interface

When you login to the CMS-6R4 command mode using the Text Interface, the first screen displayed after login is the Status Screen. The Status Screen (Figure 6.3) lists the current status of the CMS-6R4's Switched AC Outlets and RS-232 Serial Ports and displays the firmware version and currently defined Site I.D. Message.

6.2.2.   Switching Outlets - Text Interface

To switch or default outlets, or initiate a Boot Cycle, proceed as follows:

1. **Switch Outlet(s) On:** To power-on an outlet, type **/ON n** and press [Enter]. Where "**n**" is the number or name of the desired outlet. For example:

    /ON 1 or **/ON ROUTER**

2. **Switch Outlet(s) Off:** To power-off an outlet, type **/OFF n** and press **[Enter]**. Where "**n**" is the number or name of the desired outlet. Note that the "**/OFF**" command can also be entered as "**/OF**". For example:

    /OFF 2 or **/OF ROUTER**

3. **Boot Outlets(s):** To initiate a Boot cycle, type **/BOOT n** and press **[Enter]**. Where "**n**" is a the number or name of the desired outlet. Note that the "**/BOOT**" command can also be entered as "**/BO**". For example:

    /BOOT 1 or **/BO ATMSWTCH**

4. **Set Outlets to Power Up Defaults:** Type **/DPL** and press **[Enter]**. All outlets will be set to their default On/Off status, which is defined using the Plug Parameters Menu as described in Section 5.5.5.

5. **Suppress Command Confirmation Prompt:** To execute a Boot/On/Off command without displaying the "Sure?" prompt, include the "**,Y**" option at the end of the command line. For example:

    /ON,Y ROUTER or **/BOOT,Y 2**

6.2.2.1. Applying Commands to Several Outlets - Text Interface

As described below, switching and reboot commands can be applied to only one Switched AC Outlet, or to several outlets.

> **Note:** When switching and reboot operations are initiated, Boot/ Sequence Delay times will be applied as described in Section 5.5.5.1.

1. **Several Outlets:** To apply a command to several plugs, enter the numbers or names for the outlets, separated by a "plus sign" (**+**). For example to switch outlets 1, 3, and 4 Off, enter the following:

   /OFF 1+3+4 [Enter]

2. **Series of Outlets:** To apply a command to a series of outlets, enter the number for the outlets that mark the beginning and end of the series, separated by a colon. For example, to switch outlets 1 through 3 On, enter the following:

   /ON 1:3 [Enter]

4. **All Outlets:** To apply a command to all outlets, enter an asterisk in place of the name or number. For example, to Boot all outlets, enter the following:

   /BO * [Enter]

6.2.3. Connections Between RS232 Ports - Text Interface

Two different types of connections can be made between CMS-6R4 ports; Resident Connections and Third Party Connections.

- **Resident Connections:** Your resident port issues a /C command to connect to a second port. For example, Port 4 issues the /C command to connect to Port 5.

- **Third Party Connections:** (Supervisor Mode Only) Your resident port issues a /C command to create a connection between two other ports. For example, Port 1 is your resident port, and Port 1 issues a command to connect Port 2 to Port 3.

Notes:
- Third Party Connections can only be initiated when the Supervisor Mode is active.

- The Serial RS232 Ports cannot employ the /C command to initiate a connection to the Network Port.

- You can only create connections to the ports that are allowed by the password entered at login.

- The Web Browser Interface cannot be used to initiate port connections. The Text Interface is always used to create connections between ports.

6.2.3.1. Connecting Ports

To Connect ports, proceed as follows:

1.   Access the Command Mode.

2.   Invoke the /C command to connect the desired ports.

   a)   **Resident Connection:** To connect your resident port to another port, type **/C *x* [Enter]**. Where *x* is the number or name of the port you want to connect. The CMS will display the numbers of the connected ports, along with the command sequence that will be required in order to disconnect the two ports.

   Example: To connect your resident port to Port 5, type **/C 5 [Enter]**.

   b)   **Third Party Connection:** (Supervisor Mode Only) To connect any two ports (other than your resident port), type **/C *x* *X* [Enter]**. Where *x* and *X* are two port names or numbers. The CMS will display the numbers of the two connected ports.

   Example: To connect Port 5 to Port 6, type **/C 5 6 [Enter]**.

Notes:

*   **Resident Connections:** RS232 Ports are not allowed to initiate a Resident Connection to the Network Port.

*   **Third Party Connections:** RS232 Ports are not allowed to connect another port to the network port. For example, Port 1 is not allowed to connect Port 3 to the Network Port.

When the /C command specifies the port name, it is only necessary to enter enough letters to differentiate the desired port from other ports. Type an asterisk (*) to represent the remaining characters in the port name. For example, to connect your resident port to a port named "SALES," the connect command can be invoked as **/C S***, providing no other port names begin with the letter "S."

6.2.3.2. Disconnecting Ports

There are three different methods for disconnecting ports, the Resident Disconnection, the Third Party Disconnection, and the No Activity Timeout. Providing the Timeout feature is enabled, a No Activity Timeout will disconnect resident ports or third party ports.

> **Note:** The "DTR Output" parameter in the Port Parameters Menu determines how the DTR signal will react when the port disconnects. The DTR signal can either be held low, held high, or pulsed and then held high.

1. **Resident Disconnection:** Disconnects your resident port from another port. For example, if you are communicating via Port 3, and Port 3 is connected to Port 4, a Resident Disconnection would be used to disassociate the two ports. The CMS-6R4 offers two different Resident Disconnection command formats; the One Character Format and the Three Character Format (for more information, please refer to Sections 5.5.2 and 5.5.3.):

    > **Note:** The Resident Disconnection methods discussed here cannot be used to terminate a Telnet "Direct Connection" or an outbound Telnet connection. Direct Connections are terminated using the Telnet program's disconnect command, and outbound connections are terminated by invoking the **^]** (Control plus Right Bracket) command. For more information, please refer to Section 6.6..

    a) **One Character (Default):** When the One Character Disconnection Sequence is selected, simply enter the selected Logoff Character once (Default = **^X** (**[Ctrl]** plus **[X]**)). Note that it is *not* necessary to enter a carriage return before or after the Logoff Character.

    b) **Three Characters:** Uses the format "**[Enter]LLL[Enter]**", where **L** is the selected Logoff Character. For example, if the Logoff Character is defined as "**+**", then the three character disconnect sequence would be **[Enter]+++[Enter]**.

    c) If the default Resident Disconnect Sequence is not compatible with your application, both the command format and Logoff Character can be redefined via the Port Configuration menus, as described in Sections 5.5.2 and 5.5.3.

2. **Third Party Disconnection:** (Supervisor Mode Only) The /D command is issued from your resident port to disconnect two third party ports. For example, if your Resident Port is Port 1, a Third Party Disconnection could be used to disconnect Port 3 from Port 4.

   Note: The Third Party Disconnect method can be used to terminate a Telnet "Direct Connection" or an outbound Telnet connection. For more information, please refer to Section 6.6.

   a) The /D command uses the format: **/D *x* *X* [Enter]**, where *x* and *X* are the numbers of the ports that you wish to disconnect.

   b) The /D (Disconnect) command can only be invoked by passwords and ports that permit access to Supervisor Level commands.

   c) The /D command can specify both connected ports, or either of the two ports. For example, if Port 1 is your resident port, any of the following commands can be used to disconnect Port 3 from Port 4:

$$\textbf{/D 3 4 [Enter]}$$
<div align="center">or</div>

$$\textbf{/D 3 [Enter]}$$
<div align="center">or</div>

$$\textbf{/D 4 [Enter]}$$

3.   **No Activity Timeout:** Providing the Timeout feature is enabled at either connected port, the No Activity Timeout can disconnect Resident Ports, *or* Third Party Ports.

   Note: The No Activity Timeout also applies to Telnet "Direct Connections" and outbound Telnet connections. For more information, please refer to Section 6.6.

   a)   **Serial RS232 Ports:** To configure the Timeout Feature for the Serial RS232 Ports, proceed as described in Section 5.5.3.

   b)   **Network Port:** To configure the Timeout Feature for the Network Port, proceed as described in Section 5.5.2.

   c)   When the Timeout Feature is enabled, the port will automatically disconnect if no data is received for the defined Timeout Period.

<div align="center">

Notes:

</div>

- When two connected ports time out, both ports will exit command mode after disconnecting.

- The Timeout value also applies to unconnected ports that are left in Command Mode. When an unconnected port is left in Command Mode, and no additional data activity is detected, the port will automatically exit Command Mode when its defined timeout value elapses.

6.2.3.3. Defining Hunt Groups

A Hunt Group creates a situation where the CMS will scan a group of ports and connect to the first available port in the group. Hunt Groups are created by assigning identical or similar names to two or more ports. Hunt Groups can be defined using Any-to-Any, Passive, Buffer, or Modem Mode Ports. Note that the Network Port *cannot* be included in Hunt Groups.

1. Access the Command Mode as described in Section 5.2. Make certain to use a password and port that permit access to Supervisor Level commands.

2. Access the Port Configuration Menu for the desired Port as described in Section 5.5.3.

3. Use the Port Configuration Menu to define a Port Name for the first port in the group.

4. Repeat steps 2 and 3 above to assign identical names to the other ports in the Hunt Group. For example, a series of ports in a group could all be named "SERVER".

5. To connect to the next available port in the hunt group, invoke the /C command using the port name to specify the desired group. For example, **/C SERVER [Enter]**.

6. Your port will be connected to the first available port in the group. If all ports are presently connected, the CMS-6R4 will respond with the "BUSY" message.

7. It is only necessary to enter enough letters of the port name to differentiate the Hunt Group ports from other ports. Type an asterisk (*) to represent the remaining characters in the port name. For example, to connect your resident port to the first available port in a group of ports named "SALES1", "SALES2", and "SALES3", the connect command can be invoked as **/C S* [Enter]**, providing no other port names begin with the letter "S".

Hunt Group port names must be unique. Otherwise, ports with similar names will also be included in the Hunt Group.

Hunt Group Example 1:

1. Ports 3 and 4 are Modem Mode ports, and external modems are installed at both ports. Port 3 is named "MODEM1" and Port 4 is named "MODEM2".

2. Your resident port is Port 1. To connect to the first available external Modem, access the Command Mode and type **`/C MODEM*` [Enter]**.

Hunt Group Example 2:

1. Ports 3, 4, and 5 are Any-to-Any Mode ports. All three ports are named "SERVER".

2. Your resident port is Port 1. If you want to connect Port 2 to the first available server, access the Command Mode and type **`/C 2 SERVER` [Enter]**.

6.3 Port Modes

6.3.1. Any-to-Any Mode

Any-to-Any Mode Ports can be connected to other Any-to-Any, Passive, Buffer, or Modem Mode ports by accessing command mode via the Text Interface and issuing the /C Command. The Any-to-Any Mode is the default port mode at Ports 1 through 6.

6.3.2. Passive Mode

Passive Mode Ports function the same as Any-to-Any Mode Ports, but do not allow access to command mode. A Passive Mode Port can communicate with other ports, but cannot enter command mode, and therefore cannot redefine parameters, display status, connect ports or control power outlets.

Passive Mode Ports can be connected by accessing command mode from a free Any-to-Any or Modem Mode Port, and invoking the Third Party Connect or Resident Connect Command as described in Section 6.2.3.2. Passive Mode ports will not buffer data, except during baud rate conversion.

> **Note:** In order to ensure access to command mode functions, the Passive Mode is not available at Ports 1 or 2 (the SetUp Ports) or at Port 7 (the Internal Modem Port.)

6.3.3.   **Buffer Mode**

The Buffer Mode allows collection of data from various devices without the requirement that all devices use the same communication parameters (e.g., baud rate, parity, etc.).

Notes:

- Buffer Mode Ports cannot access command mode.
- Buffer Mode is not available at Ports 1 or 2 (the SetUp Ports) or the Internal Modem Port (Port 7.)

6.3.3.1. Reading Data from Buffer Mode Ports

To check port buffers for stored data, access command mode via the Text Interface, using a password and port that permit Supervisor commands, and type **/S [Enter]** to display the Status Screen. The "Buffer Count" column indicates the amount of data currently being stored for each port.

To retrieve data from buffer memory, go to a free Any-to-Any or Modem Mode Port, then issue the /C command using the following format:

$$\text{/C } \textbf{\textit{n}} \text{ [Enter]}.$$

Where $\textbf{\textit{n}}$ is the number of the port buffer to be read.

> **Note:** In order to read data from a given port, your password must allow access to that port.

If the buffer contains data, the CMS-6R4 will display a prompt that offers the following options:

- **Next Screen:** To send data one screen at a time, press the Space Bar. Each time the space bar is pressed, the next screen is sent.
- **Scroll All:** To send all data currently stored in the buffer, type **1** and press **[Enter]**.
- **Skip/Connect:** To skip sending the buffered data, yet remain connected to the port, type **2** and press **[Enter]**.
- **Erase/Connect:** To erase all data currently stored in the buffer, yet remain connected to the port, type **3** and press **[Enter]**.
- **Exit:** To exit from Read Buffer mode, press **[Esc]**.

> **Note:** Only one user can read from a port buffer at a time. If a second user attempts to read from a port that is already being read, an error message will be sent.

To clear data from any port buffer (with or without reading it first), access command mode via the text interface, using an account and port that permit Supervisor commands, then issue the /E (Erase Buffer) command using the following format:

/E *n* [Enter]

Where *n* is the number of the port buffer to be cleared.

> **Note:** The /E command cannot erase data from a port buffer that is currently being read by another port.

6.3.3.2. Port Buffers

The Status Screen lists the amount of Buffer Memory currently used by each port. The CMS-6R4 uses buffer memory in two different ways, depending on the user-selected port mode.

- **Any-to-Any, Passive, and Modem Mode Ports:** When two ports are communicating at dissimilar baud rates, the buffer memory prevents data overflow at the slower port.

- **Buffer Mode Ports:** Stores data received from connected devices. The user issues a Read Buffer command (/R) from an Any-to-Any or Modem Mode port to retrieve data.

If the Status Screen indicates an accumulation of data, the /E (Erase Buffer) command can be invoked to clear the buffer.

> **Note:** When a Buffer Mode port is reconfigured as an Any-to-Any, Passive, or Modem Mode port, any data stored in the buffer prior to changing the port mode will be lost.

6.3.4. Modem Mode

The Modem Mode provides features specifically related to modem communication. A Modem Mode Port can perform all functions normally available in Any-to-Any Mode. The Modem Mode is available to all Serial RS232 Ports, and is the default port mode at the Internal Modem Port (Port 7.)

When the Modem Mode is selected, the Port Configuration menu will display three additional prompts, which allow you to re-define the modem reset string, initialization string, and hang-up string.

When a call is received at a Modem Mode port, the unit will prompt the caller to enter a password. The CMS-6R4 allows three attempts to enter a valid password. If a valid password is not entered within three attempts, or if the user does not respond to the login prompt within 30 seconds, the modem will disconnect.

Notes:

- When a Modem Mode port exits command mode, or the DCD line is lost while command mode is active, the CMS-6R4 will pulse DTR to the modem. The unit will then send the user-defined modem command strings to make certain the modem is properly disconnected and reinitialized.

- The Serial RS232 Ports can use the CMS-6R4's Internal Modem for placing outbound calls. If an external modem is installed at a CMS-6R4 Serial Port, other ports can use the modem for calling out. To call out, invoke the /C command to connect to the port, then access the modem as you normally would.

- If desired, the Invalid Access Lockout feature can provide additional security for Modem Mode ports. When properly configured, the Invalid Access Lockout will automatically shut down a port whenever that port exceeds the user defined number of invalid access attempts. For more information, please refer to Section 5.5.2.3.

6.4. Logging Out of Command Mode

When you have finished communicating with the CMS-6R4, it is important to always disconnect using either the "Log Out" button (Web Browser Interface) or /X command (Text Interface), rather than simply closing your browser window or communications program.

When you disconnect using the Log Out button or /X command, this ensures that the CMS-6R4 has completely exited from command mode, and is not waiting for the inactivity timeout period to elapse before allowing additional connections.

6.5. The Automated Mode

The Automated Mode allows the CMS-6R4 to execute switching and reboot commands, without displaying menus or generating response messages. Automated Mode is designed to allow the CMS-6R4 to be controlled by a device which can generate commands to control power switching functions without human intervention.

When Automated Mode is enabled, the /ON, /OFF, /BOOT, /D and /X commands are executed without a "Sure?" confirmation prompt and without command response messages; the only reply to these commands is the "CMS>" prompt, which is displayed when the command is complete.

Note that although Automated Mode can be enabled using either the Web Browser Interface or Text Interface, Automated Mode is designed primarily for users who wish to send ASCII commands to the CMS-6R4 without operator intervention, and therefore does not specifically apply to the Web Browser Interface. When Automated Mode is enabled, the Web Browser Interface can still be used to invoke On / Off / Boot commands.

Notes:

- When the Automated Mode is enabled, the password prompts will not be displayed at login, and you will be able to access Supervisor Level command functions (including the configuration menus) and control plugs and ports without entering a password.

- If you need to enable the Automated Mode, but want to restrict network access to configuration menus, it is strongly recommended to enable and configure the IP Security Function as described in Section 5.5.2.1.

To enable/disable Automated Mode, access the System Parameters menu (see Section 5.5.1,) then set the "Automated Mode" option to "On". When Automated Mode is enabled, CMS-6R4 functions will change as follows:

1. **All Password Security Suppressed:** When a user attempts to access command mode, the password prompt will not be displayed at either the COM / RS232 Port or the Network Port. Unless specifically restricted by the IP Security Function, all users will be allowed to access both switching and configuration functions, and all commands will be immediately accepted without the requirement to enter a password.

2. **Status Screen Suppressed:** The status screens will not be automatically displayed after commands are successfully executed. Note however, that the /S command can still be invoked to display the status screen as needed.

3. **"Sure?" Prompt Suppressed:** All commands are executed without prompting for user confirmation.

4. **Error Messages Suppressed:** If the **[Enter]** key is pressed without entering a command, the CMS-6R4 will not respond with the "Invalid Command" message. Note however, that an error message will still be generated if commands are invoked using invalid formats or arguments.

All other status display and configuration commands will still function as normal.

6.6. The Direct Connect Feature

The Direct Connect feature allows you to initiate a Telnet session with the CMS-6R4 and make an immediate connection to a specific RS232 Serial Port of your choice, without first being presented with the command interface. This allows you to connect to a discrete TCP port mapped directly to one of the CMS-6R4 RS232 Ports.

Direct Connect employs unique, pre-assigned TCP port numbers for each RS232 Port. The user connects to the RS232 Port of choice by including the associated TCP port number in the Telnet connect command line.

The Direct Connect feature can be individually configured at each CMS-6R4 Serial RS232 Port. In addition, Direct Connect allows you to communicate with the CMS-6R4 using either Standard Telnet protocol, or Raw Socket Mode. Direct Connect can be used with any of the available RS232 Port modes (Any to Any, Buffer, Modem, and Passive).

6.6.1. Standard Telnet Protocol and Raw Socket Mode

The Direct Connect feature offers the option to communicate with the CMS-6R4 unit using either Standard Telnet Protocol or Raw Socket Mode. The TCP Port number included in the Telnet connect command line determines which protocol is used.

When Standard Telnet Protocol is used, the CMS-6R4 will respond to all IACs. When Raw Socket Mode is used, data is always sent "As Is", and command echo is always enabled.

Notes:

- Telnet ports 23, 2001, and 3001 allow normal access to the CMS-6R4 command mode. However, port 3001 will transfer data using raw socket mode.

- The "Discard LF" setting (Telnet Parameters Menu) does not apply to Raw connections.

6.6.2.   Direct Connect Configuration

The Direct Connect Function is configured on a per port basis using the Port Configuration Menus as described in Section 5.5.3. The following options are available via both the Text Interface and Web Browser Interface:

1.   **Direct Connect OFF:** Direct Connect disabled at this Port. (Default)

2.   **Direct Connect ON - NO PASSWORD:** The Direct Connect feature is enabled at this port, but password is *not* required in order to connect to the port.

   a)   When the Telnet connection is established, the user is immediately connected directly to the specified port, and the client is notified at the TCP level.

   b)   This option is intended for situations where security is provided by the attached device.

3.   **Direct Connect ON - PASSWORD:** The Direct Connect feature is enabled at this port, but the user must enter a password before a Direct Connection is established.

   a)   When the Telnet connection command is executed, the CMS-6R4 will send a message which lists the Site ID Message, the number and name of this port, and the TCP Port number that was entered in order to initiate the connection.

   b)   The CMS-6R4 will prompt the user to enter a password. If a valid password is entered, the CMS-6R4 will then return a message that confirms the connection and lists the name and number of the port.

   c)   If a valid password is not entered within 30 seconds or three attempts, the port will then timeout and disconnect.

Notes:

- Password protection for the Direct Connect feature will only function if at least one password that permits access to Supervisor Level commands has been defined (see Section 5.1.)

- If Supervisor commands are disabled at the Network Port, then accounts that permit Supervisor commands will not be able to initiate a Direct Connection.

- If Supervisor commands are enabled at the Network Port, then accounts with Supervisor access and accounts *without* Supervisor access will both be allowed to establish Direct Connections.

- If your user account does not permit access to the target port, the connection will be refused.

6.6.3. Connecting to a Serial Port using Direct Connect

The Direct Connect TCP port numbers are as follows:

1. **Standard Telnet Connections:** When standard Telnet Protocol is used, the CMS-6R4 will respond to all IACs. TCP port numbers 2101 through 2106 correspond to Serial RS232 Ports 1 through 6 respectively.

2. **Raw Socket Mode Connections:** When Raw Socket Mode is used, data is always sent "As Is", and command echo is always enabled. TCP port numbers 3101 through 3106 correspond to Serial RS232 Ports 1 through 6 respectively.

When establishing a Direct Connection to RS232 Port "x", the corresponding TCP port number must be used. If conditions are acceptable (e.g. Target RS232 Port must be free and properly configured), an immediate connection will be made, with one possible exception; password entry may first be required depending on current password configuration settings.

   Note: When a Direct Connect attempt fails because the RS232 Port is busy, the call is immediately rejected at the TCP level.

Connection Example

1. Assume that the Direct Connect feature has been enabled at Port 6, and the "On - No Password" option has been selected. If the CMS-6R4's IP address is "1.2.3.4", and you wish to establish a standard Telnet protocol connection with port 6 (TCP Port Number 2106), then on a UNIX system, the connect command would be invoked as follows:

```
$ telnet 1.2.3.4 2106 [Enter]
```

2. The CMS-6R4 will first send the site ID, Port Number, Port Name, and Telnet Port number, and then once a connection is established, the "Connected" message will be sent.

6.6.4.   **Terminating a Direct Connect Session**

To terminate a Direct Connect session, use the client Telnet program's "disconnect" feature. The following will occur immediately upon a client initiated disconnect:

1.   The Network port is disconnected from the RS232 Port.

2.   The Network session is terminated.

3.   The RS232 Port is put to sleep.

Notes:

- The Sequence Disconnect Command, which is defined via the Port Configuration menus (Section 5.5.3) cannot be used to terminate a Direct Connection.

- Any CMS-6R4 port that has accessed Command Mode using a password that permits access to Supervisor Level commands can terminate a direct connection at another port by issuing the /D command as described in Section 6.2.3.2.

- Acknowledgment of data received by the CMS-6R4 network port does not indicate that the data has been completely sent out the serial port. Data may still be queued in the CMS-6R4 buffers. Any data queued in the CMS-6R4 at the time of a client initiated disconnect is discarded, and is not passed through to the attached device.

6.7. Manual Operation

In addition to the command driven functions available via the Web Browser Interface and Text Interface, the CMS-6R4's switched plugs can also be toggled On and Off manually. To manually toggle all plugs On or Off, press the Default Button, and hold it down for approximately three seconds.

If desired, the Default Button's manual plug control ability can also be disabled via the System Parameters menu as described in Section 5.5.1.

7. The Status Screens

The Text Interface includes a series of status screens can be used to display connection status, outlet status and communication parameters for the RS232 ports, Internal Modem Port and Network Port and also summarize currently defined user passwords and accounts. There are four different status screens; The Main Status Screen (/S), the Network Status Screen (/SN), the Port Diagnostics Screen (/SD), the Port Parameters Screens (/W) and the User Directory (/V).

> **Note:** With the exception of the User Directory, most of the status screens discussed in this section are only available via the Text Interface.

7.1. The Main Status Screen (/S)

The Main Status Screen lists the general status of the CMS-6R4's six RS-232 ports, Internal Modem Port and also the On/Off status of the four switched outlets. To display the Main Status Screen, access the Text Interface command mode and type **/S [Enter]**, the Main Status Screen will appear as shown in Figure 7.1.

Note that the screen format will vary, depending upon whether your password permits or denies access to Supervisor commands. If the password entered at login does not allow Supervisor commands, then the Main Status Screen will only display the status of the ports and outlets that are allowed by that account.

The Main Status Screen lists the following items:

Port Section:
- **Port:** The Port Number.
- **Name:** The user-defined name for each port.
- **Command Access:** The Status of the Invalid Access Lockout feature at each port.
- **Status:** The connect status of each port.
  - If the port is connected to an RS232 port, this column will list the number of the other port in "c-nn" format, where "nn" is the number of the port connected to this port (for example, "**C-03**".)
  - If the connected port is listed as "**N-xx**" (where "**xx**" is a number), this indicates that the RS232 port is connected to the Network port. The numbers indicate which of the available Telnet sessions is being used (e.g., "**N-03**").

```
CMS-6R4          v1.00                  Site ID: (undefined)

PORT |       NAME        |   CMD ACCESS   | STATUS |   MODE   | BUFFER COUNT
-----+-------------------+----------------+--------+----------+--------------+
 1   | (undefined)       |    Unlocked    |  Free  |  Any     |           0  |
 2   | (undefined)       |    Unlocked    |  Free  |  Any     |           0  |
 3   | (undefined)       |    Unlocked    |  Free  |  Any     |           0  |
 4   | (undefined)       |    Unlocked    |  Free  |  Any     |           0  |
 5   | (undefined)       |    Unlocked    |  Free  |  Any     |           0  |
 6   | (undefined)       |    Unlocked    |  Free  |  Any     |           0  |
 7   | (undefined)       |    Unlocked    |  Free  |  Modem   |           0  |
-----+-------------------+----------------+--------+----------+--------------+

PLUG |       NAME        | BOOT/SEQ DELAY | STATUS | DEFAULT |
-----+-------------------+----------------+--------+---------+
 1   | (undefined)       |    0.5 Secs    |   ON   |   ON    |
 2   | (undefined)       |    0.5 Secs    |   ON   |   ON    |
 3   | (undefined)       |    0.5 Secs    |   ON   |   ON    |
 4   | (undefined)       |    0.5 Secs    |   ON   |   ON    |
-----+-------------------+----------------+--------+---------+

"/H" for help.
CMS>
```

Figure 7.1: The Main Status Screen

Port Section (Continued)

- **Mode:** The user-selected Port Mode.
- **Buffer Count:** The amount of data (in bytes) stored in the buffer for this port.

Plug Section:

- **Plug:** The Plug Number.
- **Name:** The user-defined name for each plug.
- **Boot/Sequence Delay:** The currently defined Boot/Sequence Delay value for this plug (for more information, please refer to Section 5.5.5.1.)
- **Status:** The current On/Off status of each plug.
- **Default:** The user-defined default On/Off status for each plug.

```
CMS-6R4          v1.00              Site ID: (undefined)

NETWORK STATUS:       01-23-45-67-89-ab

TCB  SRC PORT  STATE          SOURCE IP ADDR  |  PORT      TCB  STATE
  1     None  Listen                   None  |  Telnet     11  Connected
  2     None  Listen                   None  |  Telnet     12  Not Conn
  3     None  Listen                   None  |  Telnet     13  Not Conn
  4     None  Listen                   None  |  Telnet     14  Not Conn
  5     None  Listen                   None  |  Telnet   None  Not Conn
  6     None  Listen                   None  |  Telnet   None  Not Conn
  7     None  Listen                   None  |  HTTP #1     1  Not Conn
  8     None  Listen                   None  |  HTTP #2     2  Not Conn
  9     None  Listen                   None  |  HTTP #3     3  Not Conn
 10     None  Listen                   None  |  HTTP #4     4  Not Conn
 11     2487  Established  192.168.168.168  |  HTTP #5     5  Not Conn
 12     None  Listen                   None  |  HTTP #6     6  Not Conn
 13     None  Listen                   None  |  HTTP #7     7  Not Conn
 14     None  Listen                   None  |  HTTP #8     8  Not Conn
 15     None  Free                     None  |  HTTP #9     9  Not Conn
 16     None  Free                     None  |  HTTP #10   10  Not Conn

"/H" for help.
CMS>
```

Figure 7.2: The Network Status Screen

7.2. The Network Status Screen (/SN)

This screen lists current conditions for the Network Port. To display the Network Status Screen, type **/SN** and press **[Enter]**. The Network Status Screen is only available to passwords and ports that permit access to Supervisor Level commands.

```
CMS-6R4          v1.00                Site ID: (undefined)


PORT DIAGNOSTICS:

PORT |      NAME      | STATUS |  BAUD  | COM |  HS  |  MODE  |  BUF  | CTS
-----+----------------+--------+--------+-----+------+--------+-------+----
  1  | (undefined)    | *Free  |  9600  | 8N1 | RTS  |  Any   |    0  |  L
  2  | (undefined)    |  Free  |  9600  | 8N1 | RTS  |  Any   |    0  |  L
  3  | (undefined)    |  Free  |  9600  | 8N1 | RTS  |  Any   |    0  |  L
  4  | (undefined)    |  Free  |  9600  | 8N1 | RTS  |  Any   |    0  |  L
  5  | (undefined)    |  Free  |  9600  | 8N1 | RTS  |  Any   |    0  |  L
  6  | (undefined)    |  Free  |  9600  | 8N1 | RTS  |  Any   |    0  |  L
  7  | (undefined)    |  Free  | 57.6K  | 8N1 | RTS  | Modem  |    0  |  H
-----+----------------+--------+--------+-----+------+--------+-------+----


"/H" for help.
CMS>
```

Figure 7.3: The Port Diagnostics Screen

7.3. The Port Diagnostics Screen (/SD)

The Port Diagnostics Screen provides more detailed information about each port. To display the Port Diagnostics Screen (Figure 7.3), access the Text Interface command mode and type **/SD [Enter]**.

Note that the screen format will vary, depending upon whether your password permits or denies access to Supervisor commands. If the password entered at login does not allow Supervisor commands, then the Port Diagnostics Screen will only display the status of the ports allowed by that password. The Port Diagnostics Screen lists the following items:

- **Port:** The Port Number.
- **Name:** The user-defined name for each port.
- **Status:** The connect status for each port.
  - When the port is connected, this column will list the number of the other port connected to this port. If the column contains an asterisk, this indicates the port has accessed command mode.
  - If the connected port is listed as "**N-xx**" (where "**xx**" is a number), this indicates that the RS232 port is connected to the Network port. The numbers indicate which of the available Telnet sessions is being used.
- **Baud:** The baud rate selected for each port.
- **COM:** The Data Bits, Parity, and Stop Bits selected for each port. For example, "8N1" indicates Eight data bits, No parity, and One stop bit.
- **HS:** The handshaking (flow control) mode for each port.
- **Mode:** The user-selected Port Mode.
- **BUF:** The amount of data (in bytes) stored in the buffer for this port.
- **CTS:** The High/Low status of the CTS line at the RS232 interface.

```
PORT PARAMETERS #3:

 1. Port Name:              (undefined)      15. Direct Connect:  Off
 2. Baud Rate:              9600                 Telnet Port:     2103
 3. Bits/Parity:            8-None               Raw Port:        3103
 4. Stop Bits:              1
 5. Handshake Mode:         RTS/CTS
 6. Port Mode:              Any-to-Any
    64. DTR Output:         Pulse
 7. Supervisor Mode:        Permit
 8. Logoff Character:       ^X
 9. Sequence Disconnect:    One Character Only
10. Inactivity Timeout:     5 Min
11. Response Type:          Verbose
12. Command Echo:           On
13. Accept Break:           Yes
14. Invalid Access Lockout: Off

CMS>
```

Figure 7.4: The Port Parameters Screen (Serial Port 3 Shown)

7.4. The Port Parameters Screen (/W)

7.4.1.   Port Parameters Screen - Serial Ports

The /W (Who) command can be used to display the Port Parameters Screen, which lists more detailed information about an individual port. The Port Parameters Screen can display information for Serial Ports (Figure 7.4) or the Network Port, and is only available when you have logged into command mode using a password that permits access to Supervisor Level commands.

For more information on the various items displayed on the Port Parameters Screen, please refer to the port configuration description in Section 5.5.3.

When the /W command is applied to a Serial RS232 Port, the following format is used:

/W x [Enter]

Where **x** is the number for the Serial Port that you wish to display.

```
NETWORK PARAMETERS:
1. IP Address:         207.212.30.80
2. Subnet Mask:        255.255.255.0
3. Gateway Address:    207.212.30.1
4. Send MSS:           536
5. IP Security         Off

TELNET PORT PARAMETERS
 1. Supervisor Mode:        Permit
 2. Logoff Character:       ^X
 3. Sequence Disconnect:    One Character Only
 4. Inactivity Timeout:     5 Min
 5. Response Type:          Verbose
 6. Command Echo:           On
 7. Accept Break:           Yes
 8. Discard LF:             Off
 9. Invalid Access Lockout: Off

CMS>
```

Figure 7.5: The Port Parameters Screen (Network Port Shown)

7.4.2.   Port Parameters Screen - Network Port

The /W (Who) command can also be used to display configuration parameters for the Network Port (Figure 7.5.) To display Network Port Parameters, access the Text Interface command mode via the Network Port, using a password that permits access to Supervisor Level commands, and then invoke the /W without including the port number argument, as shown in the example below:

/W [Enter]

For more information on the various items displayed on the Port Parameters Screen, please refer to the port configuration description in Section 5.5.2.

```
Name              Password         Dial Back #                          DB  SA
-------------------------------------------------------------------------------
SUPER             (defined)        5551212                              Off On
admin             (defined)        5556621                              On  On
david             (defined)        (undefined)                          Off On
guest1            (defined)        (undefined)                          Off Off
guest2            (defined)        5554412                              On  Off
joseph            (defined)        (undefined)                          Off Off
kelly             (defined)        5556789                              On  Off
scott             (defined)        (undefined)                          Off Off
sean1             (defined)        (undefined)                          Off Off
service           (defined)        (undefined)                          Off Off

Reached End of Directory.
CMS>
```

Figure 7.6: The User Directory Screen (Text Interface)

Figure 7.7: The User Directory Screen (Web Browser Interface)

7.5. The User Directory

Both the Text Interface and Web Browser Interface will allow you to view a listing of all currently defined user accounts. To display the User Directory, proceed as follows:

- **Text Interface:** Access command mode using a port and password that permit access to Supervisor Level commands. When the command prompt appears, type /V and press [Enter]. The screen shown in Figure 7.6 will be displayed.

- **Web Browser Interface:** Access command mode using a port and password that permit access to Supervisor Level commands. Click the "Setup" button at the bottom of the screen. From the Setup Menu, click the "Users" button on the left hand side of the screen, and then click the "Show User" button to display the screen shown in Figure 7.7.

7-7

The following User Directory parameters are listed in both the Text Interface and Web Browser Interface:

- **Name:** The assigned username for each password account.

- **Password:** This column indicates whether or not a password has been defined for each account. Note that actual passwords are not displayed, and instead this column will read either "(defined)" or "(undefined)".

- **Dialback Number:** The user-defined Dialback Number for each password account. For more information on the Dialback feature, please refer to Section 5.5.1.6.

- **DB (Dialback):** This column lists the status of the Dialback feature for each password account. If Dialback is enabled, the column will read "ON".

- **SA (Supervisor Access):** This column indicates whether or not each password account will permit access to Supervisor Level commands. If the password account will permit Supervisor Level commands, this item will read "ON."

For more information on the User Directory, and a description of the process used to define password accounts, please refer to Section 5.5.1.1.

8. Saving and Restoring Configuration Parameters

After the CMS-6R4 has been properly configured, parameters can be downloaded and saved as an ASCII text file on your local or remote PC. Later, if the configuration is accidentally altered, the file with the saved parameters can be uploaded to automatically reconfigure the unit without the need to manually assign each parameter.

Saved parameters can also be uploaded to other CMS-6R4 units. This allows rapid set-up when several units will be configured with the same parameters.

The "Save Parameters" procedure can be performed from any terminal emulation program (e.g. ProComm, Crosstalk, Hyperminal, etc.), which allows downloading of ASCII files.

Notes:
- Although this function is only available via the Text Interface, parameters that are defined via the Web Browser Interface will also be sent to the ASCII file.

- Note that the "Save Parameters" feature is only available when the Supervisor Mode is active.

8.1. Sending Parameters to a File

1. Start your communications program and access the CMS-6R4 command mode using a Password and port that permit access to Supervisor Level commands.

2. When the CMS-6R4 command prompt appears, type **/ʊ** and press **[Enter]**. The CMS-6R4 will prompt you to prepare your communications program. Set up your communications program to receive an ASCII download, and specify a name for the file that will receive the saved parameters (e.g. CMS6R4.PAR).

3. When the communications program is ready to receive the file, return to the CMS-6R4 command mode, and press **[Enter]** to proceed.

4. The CMS-6R4 will send a series of ASCII command lines which specify the currently selected parameters.

8.2. Restoring Saved Parameters

This Section describes the procedure for using your communications program to send saved parameters to the CMS-6R4.

Notes:

• Parameters saved to an ASCII file can only be restored via the Text Interface. This procedure cannot be performed via the Web Browser Interface.

• Note that the "Restore Parameters" feature is only available when the Supervisor Mode is active.

1. Start your communications program and access the CMS-6R4 command mode via the Text Interface as described in Section 5.2.2.

2. If the Password Prompt is displayed, key in a password that permits access to Supervisor Level commands, and then press **[Enter]**.

3. Configure your communications program to upload an ASCII text file.

4. Upload the file with the saved parameters. If necessary, key in the file name and directory path.

5. When the upload is complete, make certain to terminate the communications program's upload mode.

Note:

• The current On/Off status of each CMS-6R4 plug will not be saved or restored.

• When the configuration file is sent to the CMS-6R4 via telnet, the unit's IP Address, Subnet Mask, and Gateway Address will not be changed until after you exit from command mode.

At this point, saved parameters should have been restored to the CMS-6R4 unit. Check the configuration menus and status screens to make certain that saved parameters have been correctly restored.

9. Upgrading the CMS-6R4 Firmware

When new, improved versions of the CMS-6R4 firmware become available, the "Upgrade Firmware" function can be used to update the unit. Updates can be installed via the Network Port, Internal Modem Port or Serial Port 1.

Notes:

- The upgrade procedure can only be performed via the Text Interface.
- The upgrade command (/UF) will only function when invoked at the Network Port, Serial Port 1 or the Internal Modem Port (Port 7.)
- All other network ports will be disabled during the firmware upgrade procedure.
- When the upgrade procedure is complete, parameters may be set to their default states. Therefore, it is recommended to save previously selected configuration parameters to an ASCII file (as described in Section 8) before beginning this upgrade procedure.
- If the upgrade includes new parameters or features which were not included in the previous firmware version, these new parameters will be set to their default values.
- When the upgrade is performed via the Network Port, the CMS-6R4 will *not* default the IP Address, Subnet Mask, or Gateway Address. This allows the Telnet connection to be easily reestablished after the upgrade is complete.

1. Obtain the update file. Firmware modifications can either be mailed to the customer on a CDROM, sent via email, or downloaded from WTI. Copy the upgrade file to your hard drive and then proceed as follows.

2. Access the CMS-6R4 command mode using the Text Interface via either the Network Port, Internal Modem Port (Port 7) or Port 1. If the password prompt is displayed, key in a password that permits access to Supervisor Level commands.

3. When the command prompt appears, type **/UF** and press **[Enter]**. The CMS-6R4 will display a screen which offers the following options:

    1. **Continue Upload and Keep Current Parameters:** All exisiting parameter settings will be restored when the upgrade is complete

    2. **Continue Upload and Default the System:** When the upgrade is complete, all parameters will be set to default values.

    3. **Abort Upload:** Cancels upgrade and returns to command prompt.

    Key in number for the desired upload option and then press **[Enter]**.

4. Use your communication program's (e.g., HyperTerminal) upload/send function to transfer the upgrade to the CMS-6R4 unit. Select ASCII format, then specify the filename and directory location where the firmware upgrade file resides on your hard drive.

    Note: The Upload function will timeout after one minute of inactivity. If the function times out, reselect the desired upload option as described in Step 3 and press **[Enter]** to continue or **[Esc]** to abort.

5. If the upload is successful, the CMS-6R4 will prompt the user to continue the upgrade or abort.

    1. **Upgrade:** To continue with the upgrade, type **1** and press **[Enter]**. The CMS-6R4 will erase the previous firmware, move new firmware from SRAM to program flash memory, calculate and store the new checksum, and reboot. Do not attempt to reconnect to the unit until the RDY indicator blinks to indicate the process is complete.

    2. **Abort:** To abort the procedure, type **2** and press **[Enter]**.

6. **Incomplete Upload:** If the upload is interrupted, times-out, or if the update file becomes corrupted during transfer, the CMS-6R4 will display a screen which asks for confirmation before proceeding. To proceed, type **1** and press **[Enter]**, then return to Step 4 above to retry the upload, or press **[Esc]** to reboot the CMS-6R4 unit.

7. **Recovery Mode:** In the rare event that the CMS-6R4 operating system becomes corrupted during installation, front panel indicators will blink, and the unit will automatically switch to Recovery Mode. For further instructions, please contact WTI Customer Service as described in Appendix C.

When firmware upgrades are offered, an updated Users Guide or addendum will also be available.

10. Command Reference Guide

10.1. Command Conventions

Most commands described in this section conform to the following conventions:

- **Text Interface:** Commands discussed in this section, can only be invoked via the Text Interface. These commands *cannot* be invoked via the Web Browser Interface.

- **Slash Character:** Most CMS-6R4 commands begin with the Slash Character (**/**).

- **Port Name Wild Card:** It is not always necessary to enter the entire port name. Port names can be abbreviated in command lines by entering the first character(s) of the name followed by an asterisk (*****). For example, a port named "SERVER" can be specified as "**S***". Note however, that this command would also be applied to any other port name that begins with an "S".

- **Suppress "Sure?" Prompt:** The **,Y** option can be included in the command line to override the "Sure?" prompt. For example, to disconnect Port 8 without displaying the Sure prompt, type **/D,Y 8** and then press **[Enter]**.

- **Enter Key:** Most commands are invoked by pressing **[Enter]**.

- **Connected Ports:** When two ports are connected, most CMS-6R4 commands will not be recognized by either of the connected ports. The only exceptions are the Resident Disconnect Sequence (Default = **^X** (**[Ctrl]** plus **[X]**)) and the Send Break command (**^** (**[Ctrl]** plus **[\]**)

- **Configuration Menus:** To exit from a configuration menu, press **[Esc]**. The only exception to this rule is the Copy Parameters Menu (/CP), and in that case the **[Esc]** key is used to confirm the copy operation.

10.2. Command Summary

Function	Command Syntax	Command Availability	
		Supervisor	Non-Super.
Initiate Boot Cycle	`/BOOT[,Y] <n> [Enter]`❶ `/BO[,Y] <n> [Enter]`❶	X	X❷
Connect	`/C <n> [n] [Enter]`	X	X❸
Copy RS232 Port Parameters	`/CP <n> [Enter]`	X	
Third Party Disconnect❹	`/D[,Y] <n> [n] [Enter]`❶ `/D[,Y] * [Enter]`❶	X	
Set Plugs to Default State	`/DPL[,Y] [Enter]`	X	
Erase Buffer	`/E[,Y] <n> [n] [Enter]`❶ `/E[,Y] * [Enter]`❶	X	
Set System Parameters	`/F [Enter]`	X	
Set to Factory Defaults	`/FD[,Y] [Enter]`❶	X	
Help Menu	`/H [Enter]`	X	X❺
Reset Network Interface	`/I [Enter]`	X	
Display Site ID	`/J [Enter]`	X	X
Set Network Port Parameters	`/N [Enter]`	X	
Turn Off Plug **n**	`/OFF[,Y] <n> [Enter]`❶ `/OF[,Y] <n> [Enter]`❶	X	X❷
Turn On Plug **n**	`/ON[,Y] <n> [Enter]`❶	X	X❷
Set RS232 Port Parameters	`/P <n> [Enter]`	X	
Set Plug Parameters	`/PL <n> [Enter]`	X	
Display Main Status Screen	`/S [Enter]`	X	X❷
Display Port Diagnostics	`/SD [Enter]`	X	X❷
Display Network Status	`/SN [Enter]`	X	
Telnet Connection Out	`/TELNET <ip>[port][raw] [Enter]`	X	
Send Parameters to a File	`/U [Enter]`	X	X
Upgrade Firmware	`/UF [Enter]`	X	
Unlock Invalid Access Lockout	`/UL [Enter]`	X	
View Password Directory	`/V [Enter]`	X	
Display Port Parameters (Who)	`/W [n] [Enter]`	X	X❺
Exit Command Mode	`/X[,Y] [Enter]`❶	X	X
Resident Disconnect❼	`^X`	X	X

❶   The "**,Y**" argument can be included to suppress the command confirmation prompt.

❷   Command only applies to the ports and plugs that are allowed by the password/account.

❸   Non-Supervisors are not allowed to create third party connections, or connect to ports that are not allowed by their password/account.

❹   Third Party Disconnect: Disconnects two or more nonresident ports. Must be issued from a third port with Supervisor command capability.

❺   The Non-Supervisor Mode Help Menu will not include commands that are only available to Supervisors.

❻   Non-Supervisors can only apply this command to their resident port.

❼   Resident Disconnect: Disconnects your resident port from another port. The disconnect sequence can be redefined via the Port Configuration Menus.

10.3 Command Response Messages

When commands are sent to the CMS, the unit can respond with either verbose (English Text) or terse messages (numeric / abbreviated). The port configuration commands (/P and /N) can specify an individual response format for each port. In addition to the Terse and Verbose response modes, the port configuration commands can also select the Quiet Mode. When the Quiet Mode is selected, the port will not send messages in response to commands.

The table below summarizes the various response messages for both the Terse and Verbose modes.

Terse	Verbose
0	OK
0	RAM Test Passed
1	Connected *
2	Busy
3	Disconnected
4	Invalid Command
5	Are You Sure (Y/N) ?
6	Invalid Parameter
7	Invalid Syntax
8	Invalid Access
9	Enter Site ID:
A	Aborted
B	Enter Password:
C	Invalid Password
D	RAM Test Failed at *
E	Inactivity Timeout, Disconnected
F	Data in Buffer from Previous Connection ... Re-Enter Logoff Sequence to Purge Buffer.
G	Asleep
H	Plug Defaulted
I	Plug Booted
J	Plug Turned On
K	Plug Turned Off

 * These verbose Response Messages include additional information not provided by terse Response Messages.

10.4. Command Set

This Section provides information on all Text Interface commands, sorted alphabetically by command.

/BOOT   Initiate Boot Cycle

Initiates a boot cycle at the selected plug(s). When a Boot cycle is performed, the CMS-6R4 will first switch the selected plug(s) Off, then pause for the user defined Boot/Sequence Delay Period, then switch the plug(s) back on. For more information on the Boot/Sequence Delay Period, please refer to Section 5.5.5.1. The **/BOOT** command can also be entered as **/BO**.

> **Note:** When this command is executed by a Non-Supervisor, it will only be applied to the plugs that are allowed by the password entered at login.

Availability: Supervisor / Non-Supervisor

Format: /BOOT[,Y] <n> [Enter] or **/BO[,Y] <n> [Enter]**
  Where:

,Y	(Optional) Suppresses the Command Confirmation Prompt.
n	The number or name of the plugs that you intend to boot. To apply the command to several plugs, enter a space character or a plus sign (+) between each plug number. To apply the command to a range of plugs, enter the numbers for the first and last plugs in the range, separated by a colon character (:). To apply the command to all plugs allowed by your password, enter an asterisk character (*).

Response:

  Verbose: "Sure? (y/n)", if Y, the unit will indicate that the command is in process, and then display the main status screen when complete.

  Terse: 5, if Y, the unit will respond with I.

Example: Assuming that your password allows access to Plug 2 and Plug 3, to initiate a boot cycle at Plugs 2 and 3, invoke either one of the following command lines:

/BOOT,Y 2+3 [Enter] or **/BO,Y 2+3 [Enter]**

/C   Connect

Establishes a bidirectional connection between two ports. For more information, see Section 6.2.3. There are two types of connections:

- **Resident Connect:** If the /C command specifies only one port, your resident port will be connected to the specified port.
- **Third Party Connect:** If the /C command specifies two ports, the unit will connect the two ports indicated. Third Party Connections can only be initiated by ports and accounts that permit Supervisor commands.

Notes:

- If your user account does not permit Supervisor commands, you will only be allowed to connect to ports specifically allowed by that account.
- Non-Supervisors cannot create Third Party connections; Non-Supervisors are only allowed to create connections between their resident port and the ports allowed by their password/account.
- If the user account permits Supervisor commands, you are allowed to connect to any port.
- RS232 Ports are not allowed to create a Third Party connection to the Network Port. For example, Port 1 cannot connect Port 3 to the Network Port.

Availability: Supervisor / Non-Supervisor

Format: /C <x> [x] [Enter]
   Where **x** is the number or name of the port(s) to be connected.

Response:
   Verbose: "Connected x x." When a Resident Connection is initiated, the CMS-6R4 will also display the Resident Disconnect Sequence.
   Terse: 1

/CP   Copy RS232 Port Parameters

Allows quick set-up when several RS232 ports will be configured with similar parameters. When the /CP command is invoked, the CMS-6R4 will display a menu that can be used to copy parameters to all or several RS232 ports. For more information, please refer to Section 5.5.3.2.

Availability: Supervisor Only

Format: /CP <x> [Enter]
   Where:

   x   Is the number of the port(s) where the copied parameters will be applied. To apply the command to several ports, enter a comma between each port number. To apply the command to a range of ports, enter the numbers for the first and last ports in the range, separated by a dash character (-). To apply the command to all plugs allowed by your password, omit the port number argument.

Response: Displays Copy Parameters Menu.

/D   Third Party Disconnect

Invoke the /D command at your resident port to disconnect two other ports. Note that the /D command cannot disconnect your resident port.

Availability: Supervisor Only

Format: /D[,Y] <x> [x] [Enter]
   Where:

   ,Y   (Optional) suppresses the "Sure?" prompt.
   x   Is the number or name of the port(s) to be disconnected. To apply the command to several plugs, enter a space character or a plus sign (+) between each plug number. To apply the command to a range of plugs, enter the numbers for the first and last plugs in the range, separated by a colon character (:). To apply the command to all plugs allowed by your password, enter an asterisk character (*).

Response:
   Verbose: "Sure (y/n)?", if Y, unit will respond with "Disconnected".
   Terse: 5, if Y, unit will respond with 3.

Example: To disconnect Port 2 from Port 3 without the "Sure?" prompt, access the Command Mode from a third port with Supervisor Level command capability and type:

                /D,Y 2 [Enter] or **/D,Y 3 [Enter]**

/DPL   Set Plugs to Default State

Sets all four switched outlets to their user-defined default state. For information on setting outlet defaults, please refer to Section 5.5.5.

Availability: Supervisor Only

Format: /DPL[,Y] [Enter]
   Where ,Y is an optional command argument, which can be included to suppress the command confirmation prompt.

Response:
   Verbose: Lists plugs to be defaulted, and then displays the command confirmation prompt. If "Y" is entered in response to the prompt, the CMS-6R4 will display the "Processing - Please Wait" message and then display the status screen when the default operation is complete.
   Terse: 5, if Y, unit will respond with H.

/E   Erase Buffer

Erases data from the buffer for a specified port(s). Note that erased data cannot be recovered.

Availability: Supervisor Only
Format: /E[,Y] <x> [x] [Enter]
   Where:
   ,Y   (Optional) Suppresses the "SURE? (Y/N)" (command confirmation) prompt.
   x   Is the number or name of the port buffer(s) to be cleared. To apply the command to several ports, enter a space character or a plus sign (+) between each port number. To apply the command to a range of ports, enter the numbers for the first and last ports in the range, separated by a colon character (:). To apply the command to all ports allowed by your password, enter an asterisk character (*).

Response:
   Verbose: The unit will display the command confirmation prompt. If Y is entered in response to the prompt, the unit will erase the specified buffer and then respond with "OK".
   Terse: 5, if Y, the unit will respond with 0.

Example: To clear the buffer for Port 3, access the Command Mode from a port and account that permit Supervisor commands, and type **/E 3 [Enter]**.

/F   Set System Parameters

Displays a menu which is used to define the Site ID message, create user accounts, set the system clock, and configure and enable the Invalid Access Lockout feature. Note that all functions provided by the /F command are also available via the Web Browser Interface in the "System Properties" menu. For more information, refer to Section 5.5.1.

Availability: Supervisor Only
Format: /F [Enter]
Response: Displays System Parameters Menu.

/FD   Set to Factory Defaults

Clears all user-defined parameters, and resets the unit to factory default values.

Availability: Supervisor Only
Format: /FD[,Y] [Enter]
    Where **,Y** is an optional argument that can be used to suppress the command confirmation prompt.

/H   Help

Displays a Help Screen, which lists all available Text Interface commands along with a brief description of each command. Note that when the /H command is invoked by a Non-Supervisor, the Help screen will not include commands that are only available in Supervisor Mode.

Availability: Supervisor / Non-Supervisor
Format: /H [Enter]
Response: Displays Help Screen.

/I   Reset Network Interface

Resets and reinitializes the CMS-6R4's Network Port.

Note: This command cannot be issued from the Network Port. The Network Port cannot reset itself.

Availability: Supervisor Only

Format: /I [Enter]

Response:
   Verbose: "Are You Sure (y/n)?", if Y, initialization begins.
   Terse: 5, if Y, initialization begins.

/J   Display Site ID

Displays the Site I.D. message.

Availability: Supervisor / Non-Supervisor

Format: /J [Enter]

Response: Displays Site I.D. Message.

/N   Set Network Port Parameters

Displays a menu which is used to select parameters for the Network Port. Also allows access to the IP Security function, which can restrict network access by unauthorized IP addresses. Note that all of the functions provided by the /N command are also available via the Web Browser Interface in the "Network Parameters" menu. For more information, please refer to Section 5.5.2.

Availability: Supervisor Only

Format: /N [Enter]

Response: Displays Network Parameters Menu.

/OFF   Switch Plug(s) Off

Switches selected outlet(s) Off, as described in Section 6.2.2. When a several plugs are switched Off by this command, Boot/Sequence Delay Period will be applied as described in Section 5.5.5.1. The **/OFF** command can also be entered as **/OF**.

> **Note:** When this command is executed by a Non-Supervisor, it will only be applied to the plugs that are allowed by the password entered at login.

Availability: Supervisor / Non-Supervisor

Format: /OFF[,Y] <n> [Enter] or **/OF[,Y] [Enter]**
  Where:

,Y	(Optional) Suppresses the Command Confirmation Prompt.
n	The number or name of the plugs that you intend to switch Off. To apply the command to several plugs, enter a space character or plus sign (+) between each plug number. To apply the command to a range of plugs, enter the numbers for the first and last plugs in the range, separated by a colon character (:). To apply the command to all plugs allowed by your password, enter an asterisk character (*).

Response:
  Verbose: The CMS-6R4 will list the plugs that will be switched Off, and then display the "Sure? (y/n)" prompt, if Y is entered in response to the prompt, the unit will indicate that the command is in process, and then display the main status screen when complete.
  Terse: 5 if Y, unit will respond with K.

Example: Assuming that your password allows access to Plug 2 and Plug 3, to switch Plugs 2 and 3 Off, invoke either one of the following command lines:

/OFF,Y 2+3 [Enter] or **/OF,Y 2 3 [Enter]**

/ON   Switch Plug(s) ON

Switches selected outlet(s) On, as described in Section 6.2.2. When a several plugs are switched On by this command, Boot/Sequence Delay Period will be applied as described in Section 5.5.5.1.

> **Note:** When this command is executed by a Non-Supervisor, it will only be applied to the plugs that are allowed by the password entered at login.

Availability: Supervisor / Non-Supervisor

Format: /ON[,Y] <n> [Enter]
   Where:

   ,Y   (Optional) Suppresses the Command Confirmation Prompt.
   n   The number or name of the plugs that you intend to switch On. To apply the command to several plugs, enter a space character or plus sign (+) between each plug number. To apply the command to a range of plugs, enter the numbers for the first and last plugs in the range, separated by a colon character (:). To apply the command to all plugs allowed by your password, enter an asterisk character (*).

Response: T
   Verbose: The CMS-6R4 will list the plugs that will be switched On, and then display the "Sure? (y/n)" prompt, if Y is entered in response to the prompt, the unit will indicate that the command is in process, and then display the main status screen when complete.
   Terse: 5, if Y, the unit will respond with J.

Example: Assuming that your password allows access to Plug 2 and Plug 3, to switch Plugs 2 and 3 On, invoke following command:

/ON,Y 2+3 [Enter]

/P   Set RS232 Port Parameters

Displays a menu that is used to select options and parameters for the RS232 Serial Ports. Note that all functions provided by the /P command are also available via the Web Browser Interface in the "Serial Parameters" menu. Section 5.5.3 describes the procedure for defining port parameters.

Availability: Supervisor Only

Format: /P [x] [Enter]
   Where **x** is the number or name of the port to be configured.

Response: The Port Parameters Menu is displayed.

/PL Set Plug Parameters

Displays a menu that is used to select options and parameters for Switched Outlets. Note that all functions provided by the /PL command are also available via the Web Browser Interface in the "Plug Parameters" menu. Section 5.5.5 describes the procedure for defining plug parameters.

Availability: Supervisor Only

Format: /PL [x] [Enter]

Where **x** is the number or name of the plug to be configured.

Response: The Plug Parameters Menu is displayed.

/S Display Main Status Screen

Displays the Main Status Screen, which summarizes general parameters for the plugs and ports, lists the connection status for each RS232 Serial Port, and current On/Off status of each plug. For more information, please refer to Section 7.1.

Notes:

• When this command is executed by a Non-Supervisor, the Main Status Screen will only list plugs and ports that are allowed by the password entered at login.

• When the Main Status Screen is displayed via the Web Browser Interface, status and parameters for the RS232 Serial Ports will not be included.

Availability: Supervisor / Non-Supervisor

Format: /S [Enter]

Response: Displays Main Status Screen.

/SD Display Port Diagnostics

Displays the Port Diagnostics Screen, which provides detailed information regarding the status of each port. For more information, please refer to Section 7.3.

Notes: When this command is executed by a Non-Supervisor, the Port Diagnonstics Screen will only list ports that are allowed by the password entered at login.

Availability: Supervisor / Non-Supervisor

Format: /SD [Enter]

Response: Displays Port Diagnostics Screen.

/SN Display Network Status

Displays the Network Status Screen, which lists current conditions and parameters for the Network Port. For more information, please refer to Section 7.2.

Availability: Supervisor Only

Format: /SN [Enter]

Response: Displays Network Status Screen

/TELNET Telnet Connection Out

Establishes an outward bound Telnet Connection, using the parameters specified in the command line.

Availability: Supervisor Only

Format: /TELNET<ip>[port][raw] [Enter]
 Where:
 ip   The target IP address.
 port The
 raw The
Response: Displays Telnet connect message.

/U Send Parameters to a File

Saves all user-defined CMS-6R4 configuration parameters to an ASCII text file as described in Section 8.1. Please see Section 8.2 for instructions regarding restoring saved parameters.

Availability: Supervisor Only

Format: /U [Enter]

Response: The CMS-6R4 will send a series of command lines.

/UF Upgrade Firmware

When new versions of the CMS-6R4 firmware become available, this command is used to update existing firmware as described in Section 9. This command will only function at the Network Port, Internal Modem Port (Port 7) and at Serial Port One.

Availability: Supervisor Only

Format: /UF [Enter]

Response: The CMS-6R4 will display a menu which offers the options to retain existing parameters, default parameters, or abort.

/UL   Unlock Port (Invalid Access Lockout)

Manually overrides the CMS-6R4's Invalid Access Lockout feature. Normally, when a user-defined number of unsuccessful password attempts are detected at a given port, the Invalid Access Lockout feature will shut down that port for a user specified time period in order to prevent further access attempts. When the /UL command is invoked, the CMS-6R4 will immediately unlock all ports that are currently in the locked state. For more information on the Invalid Access Lockout feature, please refer to Section 5.5.2.3.

Availability: Supervisor Only.

Format: /UL [Enter]

Response: The CMS-6R4 will unlock all CMS-6R4 RS232 Ports.

/V   View Password Directory

Displays a menu which lists all currently defined User Password accounts. The Password Directory Screen will list the User Name, whether or not a password has been defined, the Dialback Number, the Status of the Dialback feature, and whether or not Supervisor Access is enabled for each password/account. For more information on defining, editing and deleting passwords, please refer to Sections 5.4 and 5.5.1.1.

Availability: Supervisor Only.

Format: /V [Enter]

Response: The CMS-6R4 will Display the Password Directory screen.

/W   Display Port Parameters (Who)

Displays configuration information for an individual port, but does not allow the user to change parameters. For more information, please refer to Section 7.4. Note that when you have logged into command mode using a password/account that does not permit access to Supervisor Level commands, the /W command can only be used to display parameters for your resident port.

Availability: Supervisor / Non-Supervisor

Format: /W [x] [Enter]
   Where **x** is the port number or name. If the "**x**" argument is omitted, parameters for your resident port will be displayed.

Response: Displays port parameters.

Example: To display parameters for a port named "SERVER", access the Command Mode from a port and account that permits Supervisor commands, and type **/W SERVER [Enter]**.

/X   Exit Command Mode

Exits command mode. When issued at the Net Port, also ends the Telnet session. Note that exiting from command mode will not terminate port connections.

- **Any-to-Any Mode:** Exits command mode.

- **Modem Mode:** Disconnects and resets modem, hang-up message is sent, hardware line to modem drops for 500 ms, and reset message is sent.

Availability: Supervisor / Non-Supervisor

Format: /X[,Y] [Enter]
   Where **,Y** is a command argument that can be used to suppress the command confirmation prompt.

Response:
   Verbose: Disconnected.
   Terse: 3.

^X   Resident Disconnect Sequence

The Resident Disconnect Sequence is used to disconnect your resident port from another port as described in Section 6.2.3.2. Although the default Resident Disconnect Sequence is **^X** (**[Ctrl]** plus **[X]**), the command can be redefined via the Port Configuration Menus as described in Section 5.5.

   Note: The Resident Disconnect Sequence cannot be used to terminate a Direct Connection.

Availability: Supervisor / Non-Supervisor

Format (Default): ^X

Response:
   Verbose: The CMS-6R4 will send the "Disconnected" message, followed by the Port Status Screen.
   Terse: 3

A. Interface Description

A.1. Serial RS232 Port Interface
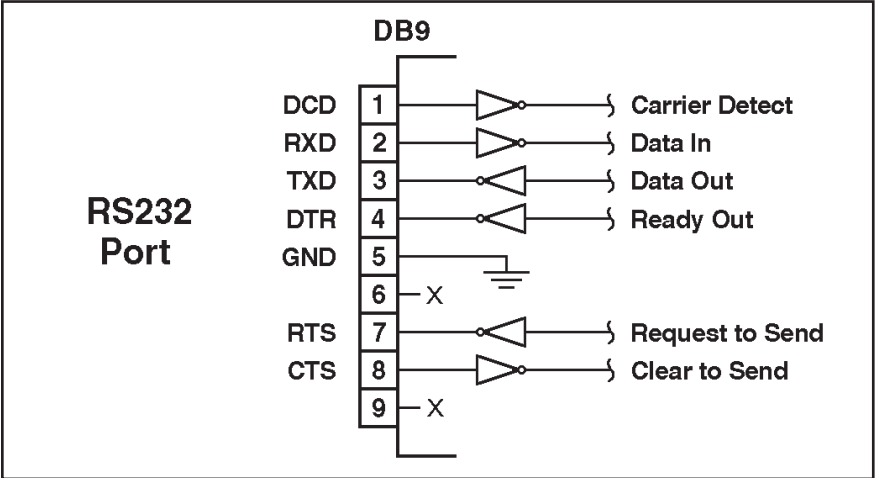
Figure A.1: Serial Port Interface

B. Specifications

Power Input / Output:
Model CMS-6R4 (120 VAC)
- **AC Input:** 15 Amps Maximum
    - **Voltage:** 100 - 120 VAC, 50/60 Hz
    - **Connector:** IEC320-C14 Inlet.
- **AC Outputs:**
    - **Connectors:** Four (4) NEMA 5-15
    - **Load:** 15 Total Amps Maximum.

Model CMS-6R4-CE (240 VAC)
- **AC Input:** 10 Amps Maximum
    - **Voltage:** 208 - 240 VAC 50/60 Hz
    - **Connector:** IEC-320-C14 Inlet.
- **AC Outputs:**
    - **Connectors:** Four (4) IEC-320-C13 Outlets.
    - **Load:** 10 Total Amps Maximum

Network Interface:
- **Network Port:** Ethernet, 10Base-T, RJ-45.

RS-232 Interface:
- **Connectors:** Six (6) DB-9M (DTE Pinout.)
- **Coding:** 7 or 8 Bits, Even/Odd/None Parity, 1 or 2 Stop Bits.
- **Flow Control:** Xon/Xoff, RTS/CTS, or None.
- **Data Rate:** 300 bps to 115,200 bps.

Physical / Environmental:
- **Size:**
    - **Width:** 17" (43.2 cm) - 19" Rack Brackets Included
    - **Depth:** 6.5" (16.5 cm)
    - **Height:** 1.75" (4.5 cm) One Rack U.
- **Shipping Weight:** 8 Lbs.
- **Operating Temperature:** 32°F to 122°F (0°C to 50°C)
- **Humidity:** 10 - 90% RH

C.   Customer Service

Customer Service hours are from 8:00 AM to 5:00 PM, PST/PDT, Monday through Friday. When calling, please be prepared to give the name and model of the unit, its serial number and a description of its symptoms. If the unit should need to be returned for factory repair it must be accompanied by a Return Authorization number from Customer Service.

WTI Customer Service
5 Sterling
Irvine, California 92618

Toll Free Service Line: 1-888-280-7227
Local Phone: (949) 586-9950
Service Fax: (949) 457-8138

Email: service@wti.com

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