User Guide

Digi CM

www.digi.com

Making DEVICE NETWORKING easy™

90000301_D

Contents

Chapter 1

Introduction

Digi CM Model Support

This manual offers information on Digi CM 8-port, 16-port, 32-port, and 48-port models.

Feature Overview

With Digi CM, administrators can securely monitor and control servers, routers, switches, and other network devices from anywhere on the corporate TCP/IP network, over the Internet, or through dial-up modem connections, even when the server is unavailable through the network.

Digi CM employs SSHv2 encryption, to keep server access passwords safe from hackers, and supports all popular SSH clients, as well as secure access from any Java-enabled browser. It is the first console server to provide a secure graphical user interface for easy out-of-band management of Microsoft Windows Server 2003 systems. It connects to serial console ports using standard CAT5 cables, eliminating the hassles of custom cabling. In addition, the Digi CM offers a PCMCIA card slot, for adding dialup modems or wireless network cards. Flash memory cards can be used to save port logs and backup configuration files.

Digi CM is available in 8-, 16-, 32- and 48-port models, in a 1U rack-mount form factor.

Feature Summary

Category	Feature
Security	• SSH v2 server and client • SSL • IP Filtering
Authentication	• TACACS+ • RADIUS w/SSH • LDAP • Kerberos • User access per port • Local user database

Category	Feature
Management	• Command line • WEB --HTTP/HTTPS • SNMP • Custom applications • Port Triggers and Alerts • Multi level menus • Auto-discovery • Integrated power management and control
Data Capture	• Local port logging • External logging (syslog, NFS, PC card)
Port Access	• Telnet/SSH with custom menu • Reverse Telnet/SSH • HTTP/HTTPS • Port escape menu
PC Card Support	• CompactFlash memory card • Wireless LAN adapter (802.11b) • Ethernet LAN adapter • PSTN/CDMA modem card See http://cm.digi.com for more information.
Other Features	• Solaris Ready • Multiple users per port • Flash upgrade able • LEDs--3 per serial port*, 5 Ethernet,1 CPU • SSH sessions simultaneously on all ports • Secure Clustering - Single IP for multiple Digi CM devices • IP addresses per port

Note: *The serial port LEDs are only available on the Digi CM 8/16/32 port devices.

User Groups

The Digi CM comes with built-in user groups, defined by access levels. The following table lists user groups, their access rights, and default user names.

Group	Access Privileges		Configuration Privileges		Defaults	
----------	**Ports**	**Command Line**	**Ports**	**System**	**Login**	**Password**
Root	yes	yes	yes	yes	root	dbps
System Admin	yes	yes (read only)	yes	yes	admin	admin
Port Admin	yes	no	yes	no	-	-

Group	Access Privileges		Configuration Privileges		Defaults	
User	yes	no	no	no	-	-

Root and Admin Usernames and Passwords

The Digi CM comes with two default users, root and system admin.

Root's password can be modified through the command line interface using the command `passwd`.

User Name	Default Password
root	dbps
admin	admin

Adding Port Administrators and Users

The system administrator and root user can add port administrators and users easily with the web interface by choosing System administration > User administration > Add user. Root's password must be modified from the command line using the command `passwd`.

Ways to Configure the Digi CM

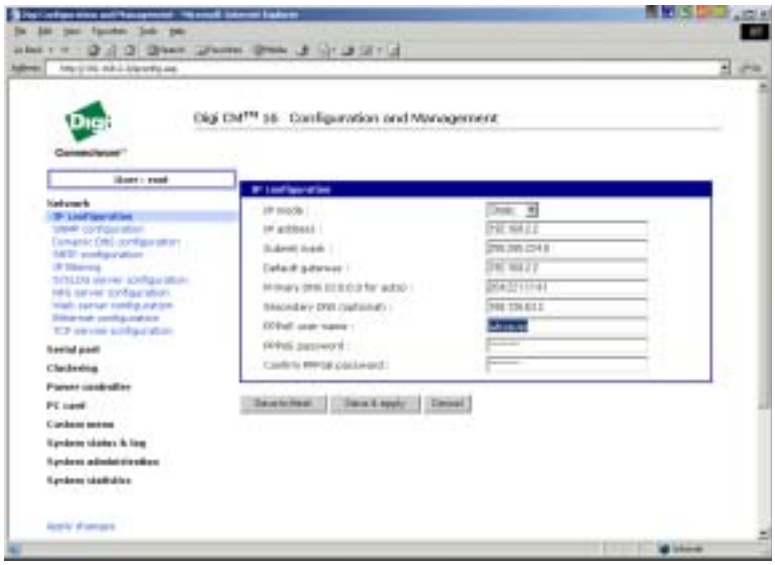
This section discusses the three ways to configure the Digi CM using the web interface, configuration menu, or command line interface.

Web Interface

The Digi web interface features HTTPS for secure access.

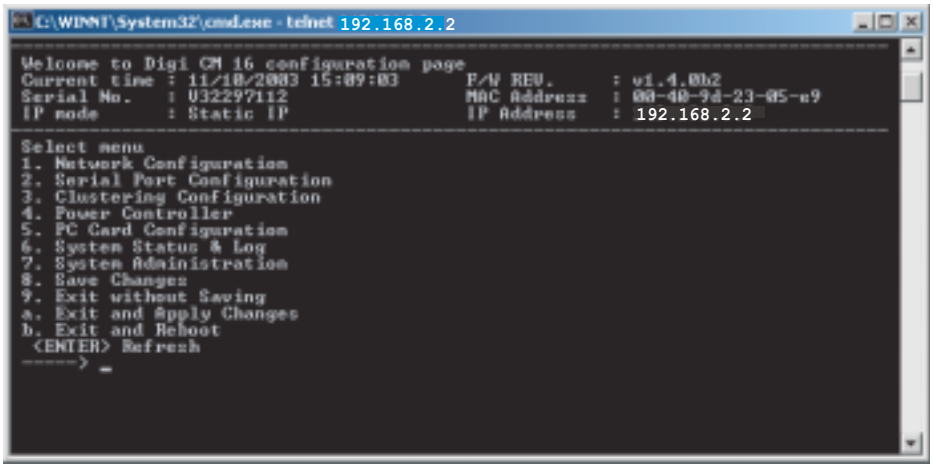
The web interface provides an easy way to configure the Digi CM. The root user and system administrator can configure all features through the web. Port administrators can configure ports, including port clustering, but cannot modify system settings. Users cannot use the web interface for configuration.

To access the web interface, enter the Digi CM IP address or host name in a browser's URL window. The following page is displayed after login.



Configuration Menu

The root user and system administrator have full access to the configuration menu from a Telnet session or a serial connection through the console port. Functionality is similar to the web interface, with the exception of custom menus, which can be created only from the web interface. The configuration menu is presented to system administrators automatically. Root users accesses it by entering the command `configmenu`. Port administrators can access this menu but can modify serial port configuration only. Users cannot access this menu.



Command Line Interface

The command line interface can be accessed from a Telnet session or from the console port. The root user always has access to this interface. The system administrator can be granted read-only permission as well. No other users can access the command line interface.

Ways of Accessing the Digi CM: Overview

There are four ways to access the ports on the Digi CM:

- Web Interface
- Port Access Menu
- Direct Port Access
- Custom Menus

Web Interface Access Menu

The web interface menu provides easy and convenient access to ports. All users can access the menu by entering Digi CM IP address or host name in a web browser's URL window.

To access a port from the web interface, do the following:

1. Access the web interface.
2. Click **Serial port** > **Connection**.
3. Select a port by clicking in the appropriate icon.

   A Java applet or Telnet window opens with a login prompt.

Port Access Menu

The Port Access Menu provides access to ports. It is accessible to all users through the web interface, Telnet and SSH sessions, and remote modem access. The information that follows shows you how to access this menu.

Access Type	Permissions	Procedure
Web interface	Any user can use this method.	1. Access the web interface 2. Choose Serial port > Connection > Port access menu connection 3. Log in
Telnet	Any user can use this method.	1. Telnet to the Digi CM specifying its IP address and port 7000. (7000 is the default socket port for both Telnet and SSH) Example: `telnet 192.168.15.7 7000` 2. Log in
Command line	Root	From the command line, issue the portaccessmenu command. Example: `portaccessmenu`

Direct Port Access

Users can connect directly to a properly configured port through a Telnet or SSH session. Configuration requirements include setting the Host Mode to Console Server Mode and the Protocol to either Telnet or SSH. Ports, by default are set to Console Server Mode and Telnet. Use the following information to make a Telnet or SSH connection to a port:

Type	Command Syntax	Example:Connection to Port 3
Telnet	telnet *ip-address tcp-port* where *ip-address* is the Digi CM's IP address and *tcp-port* is the Listening TCP port for a port	telnet 192.168.15.7 7003 (7000 is the default socket port for both Telnet and SSH)
SSH	ssh *user-name@ ip-address tcp-port* where *user-name* is a user's name, *ip-address* is the Digi CM's IP address and *tcp-port* is the Listening TCP port for a port	ssh admin@ 192.168.15.7 -p 7003 (7000 is the default socket port for both Telnet and SSH)

Note: The example assumes that the Listening TCP port is 7003, the default for port 3.

Custom Menus

Custom menus are created by either root or the system administrator to limit a user's access to specific ports. For more information, see "Making Custom Menus" on page 59.

Port Escape Menu

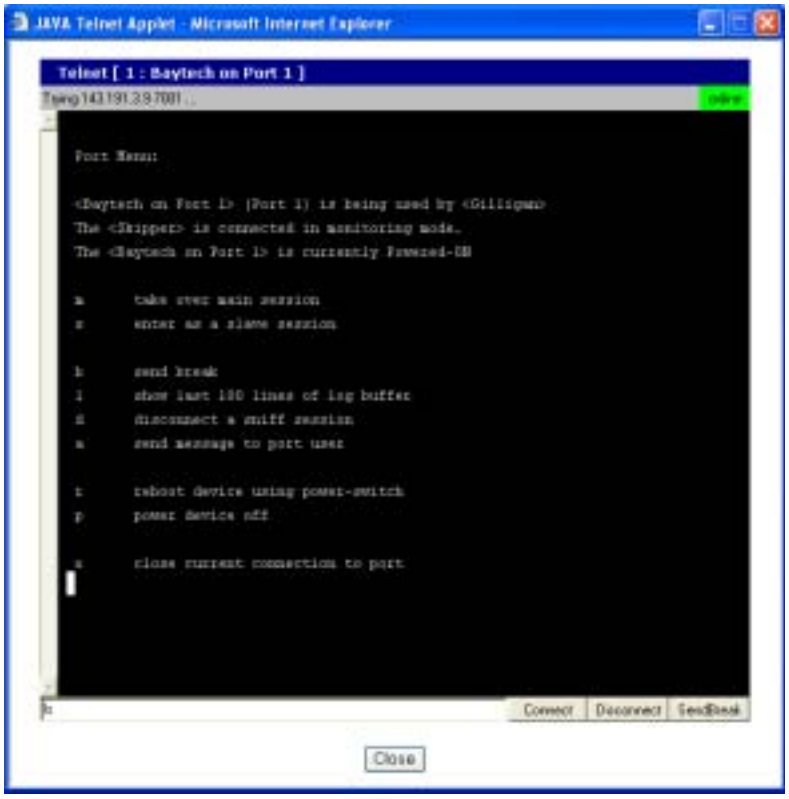
Port escape is the ability to escape from a port without disconnecting. Port escape is available to main session users as well as sniff users. Every connection method accommodates port escape. Users configure the escape sequence per port. Follow the procedure to configure the port escape sequence.

1. **Serial Port** > **Configuration** > Select the port number or All.
2. **Host mode configuration** > Port escape sequence - enter a letter for the Port escape sequence.
3. Click Save to flash and continue with other configurations or click Save & apply for the changes to take effect.

4. Click Save & Apply.

To open a sniff session:

1. Click **Serial port** > **Connection.**
2. Select the port you want to access.
3. Log in with your user name and password.
4. Enter the letter of the port escape sequence.



The following table describes the fields and the operations for the port escape feature. You will only see the fields allowed for your permissions.

Description of Fields

Escape Sequence Ctrl+	Description of Action	Occurrence
m	take over main session (read/write)	only presented to users with read/write access upon entering a session
s	enter as a slave session (read only)	only presented to users with read/write access upon entering a session
b	send break	not functional for sniff users
l	show last 100 lines of log buffer	must enable logging for this option
d	disconnect a sniff session	only functional to admin
a	send message to port user(s)	not available to sniff users
r	reboot device using power-switch	only if power management is available on this port
p	power device on/off	(show only on or off) only if power management is available on this port
x	close current connection to port	closes the sniff session connection

Saving and Applying Changes

In the web interface, you can save and apply configuration changes in two ways. With the one-step method, you choose "Save & apply" and changes are saved and applied (take effect) immediately. With the two-step method, you choose "Save to flash," which immediately saves changes but the changes do not take effect until you choose **Apply changes**. The following topics describe how to do each of these operations.

One Step: Save and Apply Changes

To save and apply changes immediately, choose the Save & apply button.

Two-Step: Save to Flash and then Apply Changes

To save multiple changes but apply changes once, do the following:

Choose the Save to flash button.

When you finish changing the configuration, choose the **Apply changes** link which is located on the left navigation menu (or the Save & apply button at the bottom of the page.)

Chapter 2 Getting Started

Introduction

This chapter covers basic configuration topics. Included is information on assigning IP settings, enabling secure access with the web interface, accessing the unit through SSH, and adding and removing users.

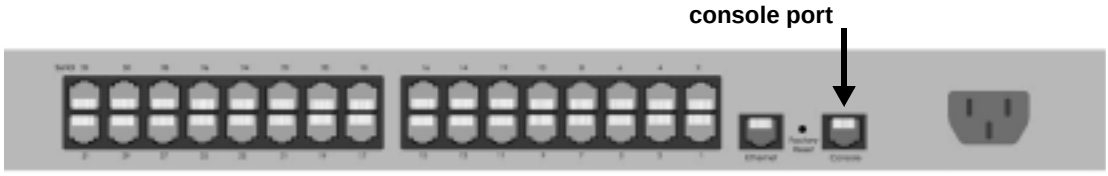
Note: Initial setup is described in the Quick Start Guide included with the product packaging. A copy of this document is also available online at http://cm.digi.com.

Assigning IP Settings from the Console Port

To use the console port to assign IP settings, do the following:

The default IP address is 192.168.161.5.

1. Connect the console port on the rear panel of the Digi CM to a serial port on a workstation using the Ethernet console cable and the appropriate Digi console adapter packaged with the Digi CM. The arrow in the following graphic points to the console port.

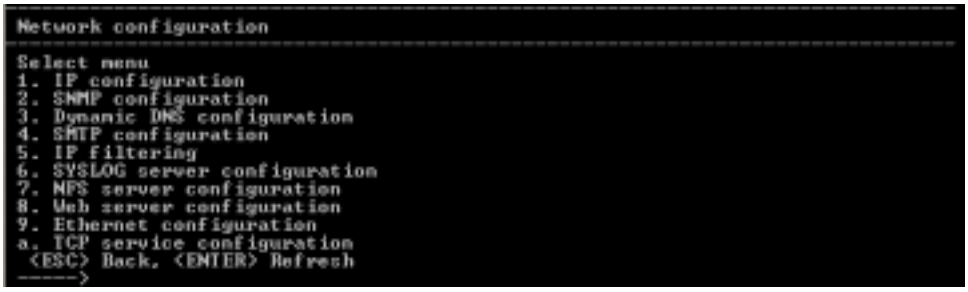


CM 32 back panel shown

2. Configure a terminal emulation program, such as HyperTerminal, using the following settings:
   - bps=9600
   - data bits=8
   - parity=none
   - stop bits=1
   - flow control=none.
3. Establish a connection to the console port and press Enter to get a command prompt.
4. At the login prompt, log in as `admin`. The default password for admin is `admin`.

   The Configuration menu appears.

5. Enter the number for Network configuration



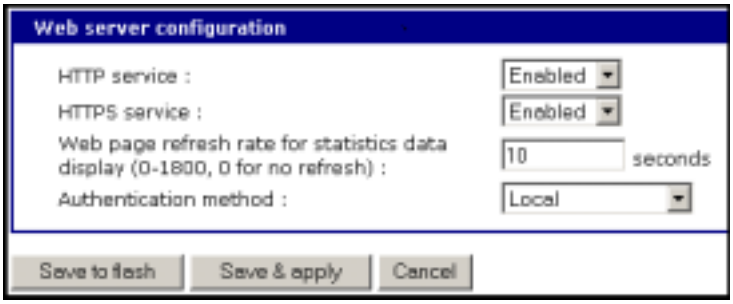
6. Enter the number for IP configuration
7. Enter the appropriate parameters for the IP settings
8. Press ESC when done to return to the main configuration menu.
9. Enter the number to exit and apply changes.

   Changes are saved and applied immediately. There is no need to reboot.

Configuring HTTP and HTTPS

By default HTTP and HTTPS are enabled on the Digi CM device. To modify these settings, do the following:

1. Enter the IP address for the Digi CM in a web browser's URL.
2. Under the left navigation bar, **Network** > **Web server configuration**
3. Select Enabled or Disabled.
4. Set the desired refresh rate for statistics, connection, and power control data. The default value is 10 seconds.
5. Select an authentication method for accessing the web interface. The default is local.
6. To save and apply changes, click Save & apply.



Configuring for SSH

Options

The Port Access Menu and individual ports can be configured for SSH.

The Digi CM supports Blowfish and 3DES encryption methods for SSH.

Configuring the Port Access Menu for SSH

1. Access the web interface.
2. Log in as root, admin, or a member of the port administration group. The default password for root is `dbps`, and the default password for admin is `admin`.
3. Under **Serial port** > **Configuration** > **Port access menu configuration**.

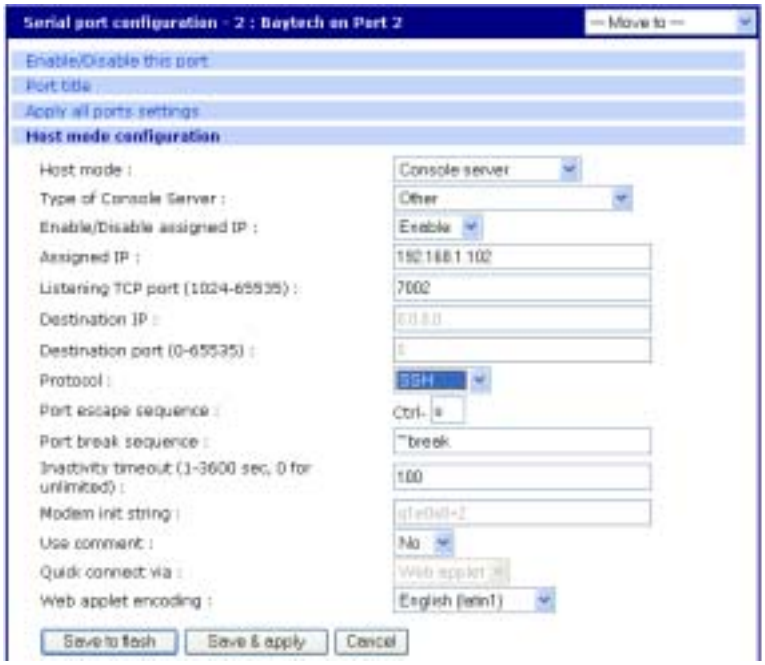
   The Port access configuration menu appears.
4. Select SSH as the Port access menu protocol.

5. Click Save & apply.

Configuring a Port for SSH

1. Access the web interface.

2. Log in as root, admin, or a member of the port administration group. The default password for root is `dbps`, and the default password for admin is `admin`.
3. Under **Serial port** > **Configuration**.
4. Select the port or ports you want to configure for SSH.
5. Click **Host mode configuration**.
6. Specify SSH as the Protocol as shown in the following screenshot.



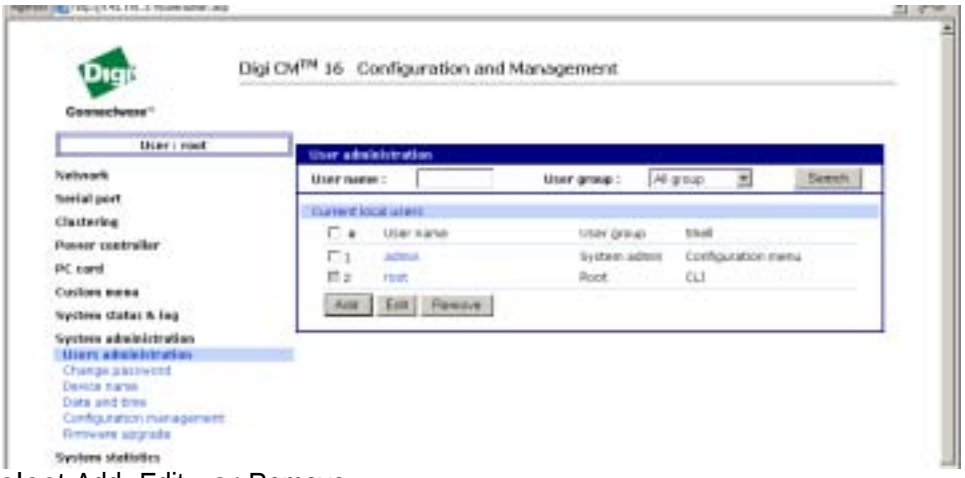
7. Click Save & apply.

Adding, Editing, and Removing Users

The root user and system administrator can add, remove, or edit users from the web interface.

Procedure

1. Access the web interface.
2. Log in as root or admin. The default password for root is `dbps`, and the default password for admin is `admin`.
3. Under the **System administration** heading click **Users administration.**



4. Select Add, Edit , or Remove.
   - Add: Assign a user name, user group, password, and shell.
   - Edit: Change user group, password, or their shell
   - Remove: Remove a user from the system

5. Click Save & apply.

   Note: The root and admin users cannot be removed from the system. The password for root can be changed from the command line only using the command `passwd`.

About Shell Options

The shell program selection determines the interface the user sees when establishing a Telnet or SSH session with the Digi CM.

User Group	Shell Program Options
root	command line
system admin	command line, configuration menu, port access menu, custom menus

User Group	Shell Program Options
port admin	configuration menu, port access menu, custom menus
user	port access menu, custom menus

Chapter 3 Installing and Configuring PC Cards

Introduction

This chapter includes information on adding and configuring PC cards for the Digi CM. PC card devices that can be added to the Digi CM include a serial modem, compact-flash card, wireless LAN card, and a network LAN card.

Compatible PC Cards

All compact-flash cards work with the Digi CM, but not all serial modem, wireless LAN, or regular LAN cards do. To see a list of compatible cards that have been tested with the Digi CM, visit the Digi support site at http://cm.digi.com

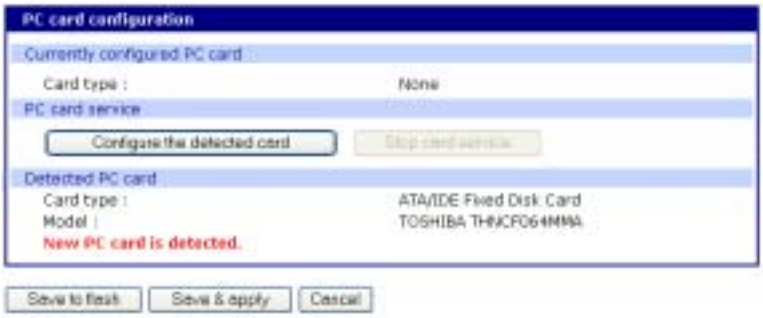
Adding a Compact-flash Card

A PC card slot is located on the front panel of the Digi CM. The arrow in the following graphic indicates the PC card slot.

Digi CM 32 shown

To install and configure the compact-flash card on the Digi CM, do the following.

1. Insert the card into the PC card slot.
2. Access the web interface.
3. Under the **PC card** heading click **Configuration**.



4. Click Configure the detected card.

Always select the Stop card service button and Save & apply before removing the PC card.

The following fields appear on the configuration page.

— **ATA/IDE Fixed Disk Card configuration**

Total data size to be used - Enter the amount of memory you want to assign to the compact-flash card for configuration files.

Delete all files in ATA/IDE Fixed Disk Card - Select the Delete button to clear the compact-flash card of all files.

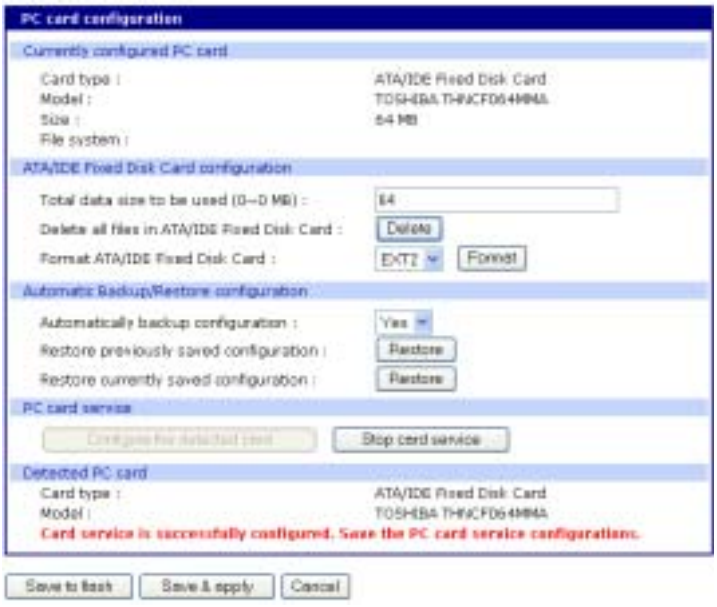
Format ATA/IDE Fixed Disk Card. - The options are EXT2 or FAT formats. Select the format option and then select the Format button.

— **Automatic Backup/Restore Configuration**

Automatically backup configuration - Choose Yes to enable and No to disable automatic backup.

Restore previously saved configuration - Click Restore to import the previously saved configuration.

Restore currently saved configuration - Click Restore to import the most recently saved configuration.



5. Enter the appropriate parameters on the configuration page.

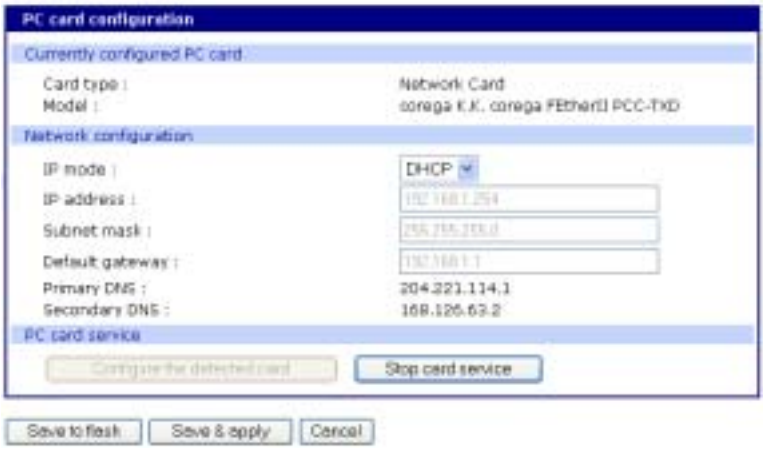
Adding a Network Card

To install and configure a network card on the Digi CM, do the following.

1. Insert the card into the PC slot.
2. Access the web interface.
3. Under the **PC card** heading, click **Configuration**.

   Note: The card is automatically discovered and a configuration menu is displayed.

4. Enter the appropriate parameters in the configuration menu.



5. Click Save & apply.

   Note: If DHCP is active the IP address will appear after the configuration is saved and applied.

Adding a Wireless LAN Card

To install and configure a wireless LAN card on the Digi CM, do the following.

1. Insert the card into the PC slot.
2. Access the web interface.
3. Under the **PC card** heading, click **Configuration**.

   Note: The card is automatically discovered and a configuration menu is displayed.

4. Click Configure the detected card.
5. Enter the appropriate parameters in the configuration menu.
   WEP is the acronym for Wired Equivalent Privacy and is a security protocol for wireless LANs using encryption to protect data transfers. If you are unsure of the settings for the wireless card, see your network administrator.

   SSID - Set Service Identifier and is the name of the wireless LAN network

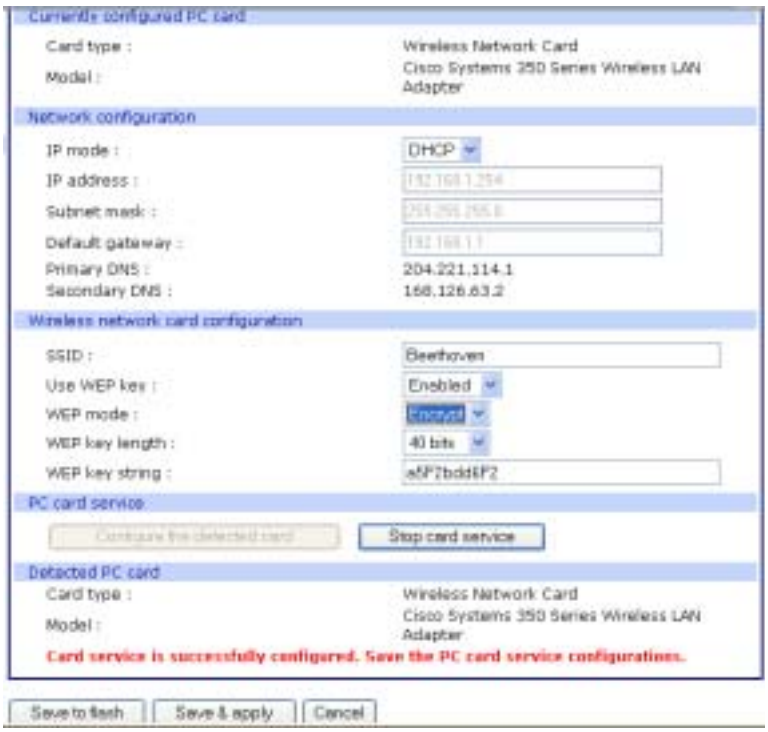
   Use WEP key - Enable or disable the WEP key

   WEP mode - Encrypted or unencrypted

   WEP key length - The options are 40 or 128 bits if the WEP key is enabled

   WEP key string - Refer to the wireless network administrator for the wireless encryption key string

6. Click Save to flash.



7. Enter the appropriate parameters.
8. Click Save & apply.

Adding A Serial Modem

The modem must first be inserted and installed on your system before it can be used. To configure the modem do the following:

1. Access the web interface.
2. From the menu click **Configuration** under the **PC card** heading.

   Note: The card is automatically discovered and a configuration menu is displayed.

3. Click Configure the detected card.

4. Edit any appropriate parameters and Click Save & apply.

Chapter 4

Configuring Ports

Introduction

This chapter provides information on configuring serial ports. Key port configuration attributes include whether or not the port is enabled or disabled, the host mode, which defines a type of communication between the port and a remote host, the protocol, authentication, user access restrictions, and serial communication attributes.

Enabling and Disabling the Ports

All serial ports may be enabled or disabled individually or as a group from the web interface.

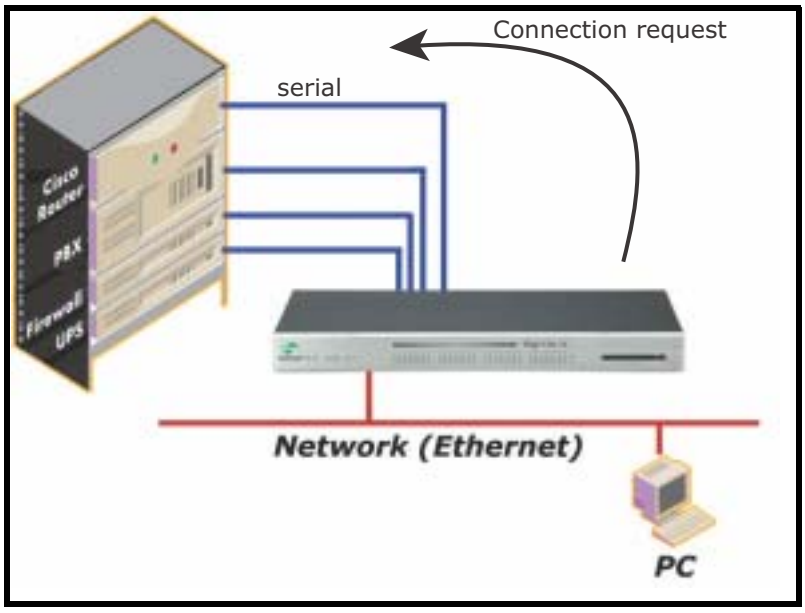
1. Click **Serial port** > **Configuration** > Port number or all
2. Select Enable or Disable from the drop down menu.
3. Click Save to flash and continue with other configurations or click Save & apply.

Host Mode Configuration

The Digi CM provides four modes of communication between serial devices and remote hosts. Console server, terminal server, dial-in modem, and dial-in terminal server. These are described in the following sections.

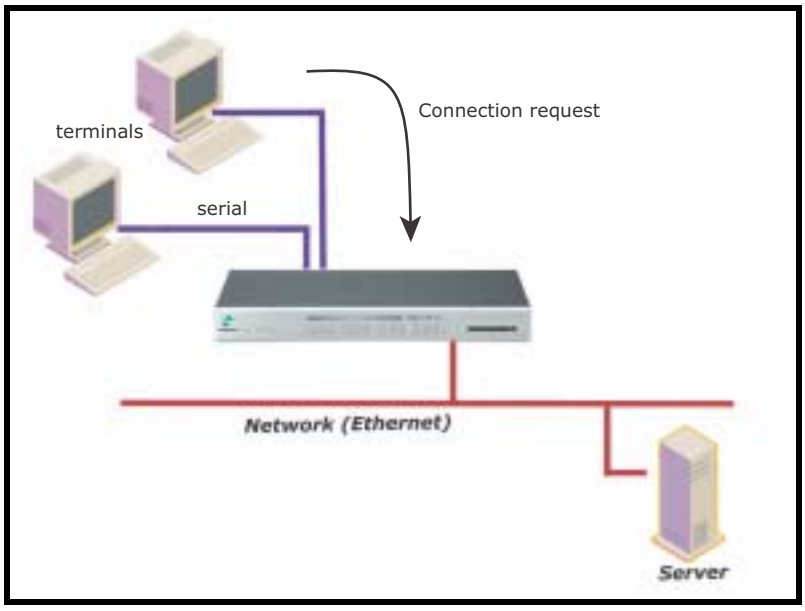
Console Server Mode

Configuring a serial port as a console server creates a TCP socket on the Digi CM that listens for a Telnet or SSH client connection. Users who connect to the TCP socket have access to the device attached to the serial port as though the device were connected directly to the network. RawTCP is also supported with the Console Server Mode.



Terminal Server Mode

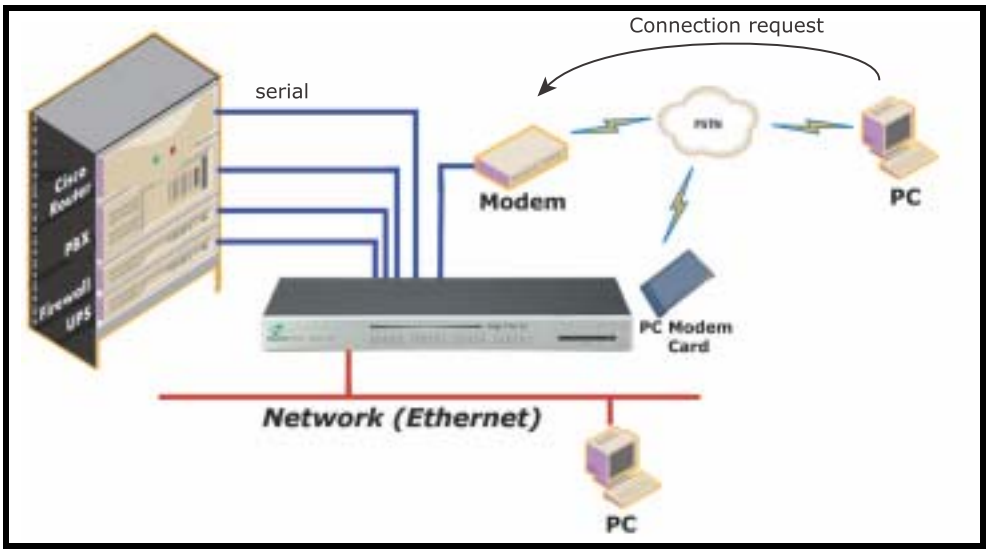
In terminal server mode, the Digi CM serial port is configured to wait for data from the device connected to the port. If data is detected, the Digi CM starts a TCP session as a Telnet or SSH client to a pre-defined server. The server must be defined by the user before the port can be configured for a Telnet or SSH client. This mode is used when the user wants to access servers on the network from a serial terminal. RawTCP is also supported with the Terminal Server Mode.



Dial-In Modem Mode

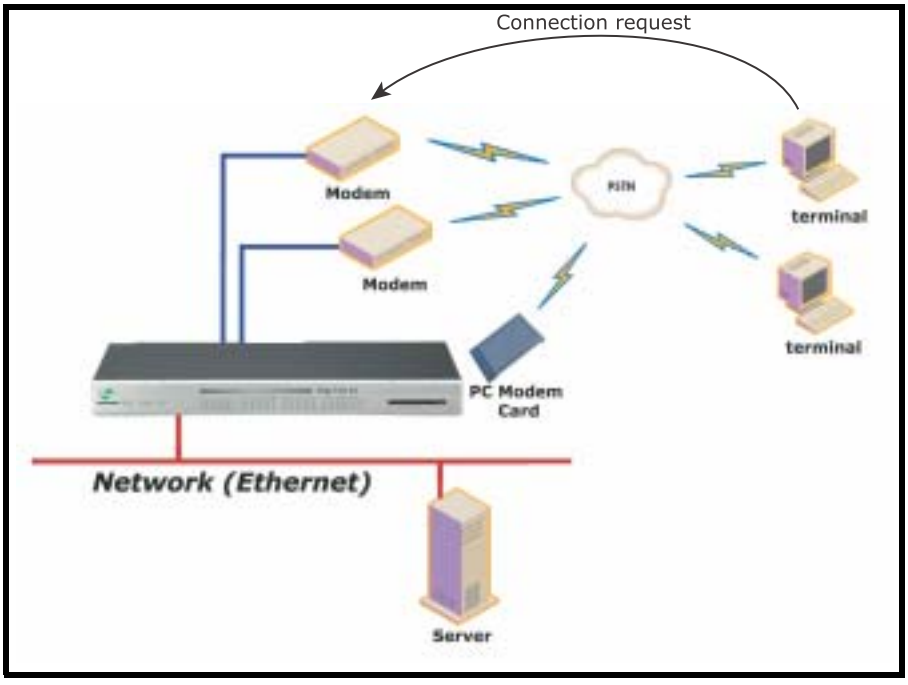
In this mode, the Digi CM assumes an external modem is attached to the serial port and is waiting for a dial-in connection from a remote site. When a user dials-in using a terminal application, the Digi CM accepts the connection and displays a menu listing available serial ports. Users can then select a serial

port and access the devices attached to the Digi CM by selecting the serial port number from the menu.



Dial-In Terminal Server

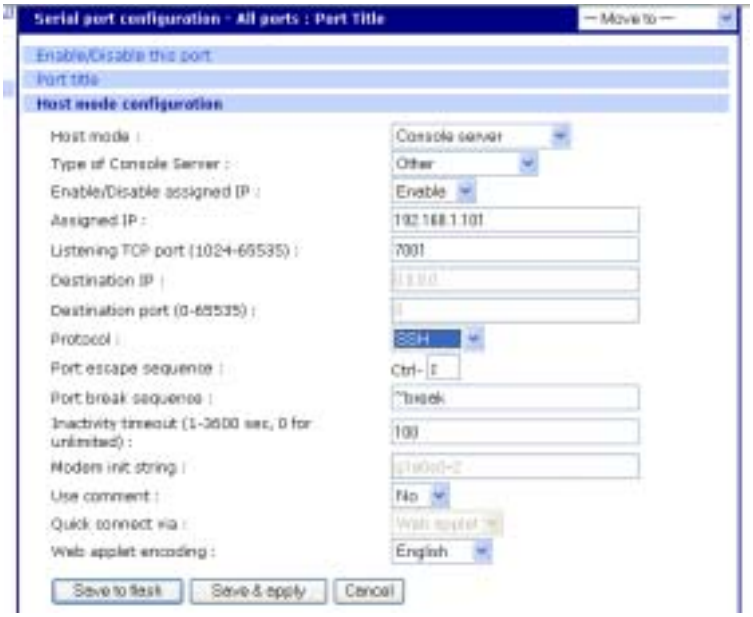
Dial-in terminal server mode is a combination of the terminal server mode and the dial-in modem mode. In the dial-in terminal server mode, the Digi CM assumes the serial port is connected to an external modem and is waiting for a dial-in connection from a remote site. When users dial-in using terminal applications, the Digi CM accepts the connection as a Telnet or SSH client to a pre-defined server. This mode is most frequently used when users want to use modems to access servers on a network.



Configuring Host Mode

To configure a serial port for host mode, enter the values in the applicable fields. To access the Host mode configuration screen, do the following:

1. Access the web interface.
2. Under the **Serial Port** heading, click **Configuration**.
3. Choose All or an Individual port > **Host mode configuration**.



4. Fill in the highlighted fields as they apply to your configuration.

   Host mode - The options are console server mode, terminal server mode, dial-in modem mode, and dial-in terminal server mode.

   Type of console server - The options are MS SAC console -English or Japanese which you use to provide a graphic user interface to the Windows Server 2003 Special Administration Console (see "Microsoft SAC Support" on page 63) and Other, which you use in all other cases.

   Enable/Disable Assigned IP address - Determines whether an IP address will be assigned to the port. The default is Enable.

   Assigned IP - Also known as alternate IP, this field assigns an IP address to the port, enabling a user to Telnet directly to the serial port using an IP address (without having to specify a TCP port).

   Listening TCP port. - This is the TCP port users will specify to access the port when connecting directly to the port using Telnet or SSH.

   Destination IP. - Used in terminal server mode, this is the IP address of the system that users will be automatically connected to when they access the port.

   Destination port. - Used in terminal server mode, this is the TCP port that will be used when the user who accesses the port is automatically connected to a system on the network.

   Protocol - The options are SSH, RawTCP, and Telnet.

   Port escape sequence - The letter to initiate port escape.

Port break sequence - The sequence of characters that sends a break character to a device.

Inactivity timeout - The timeout length ranges from 1 to 3600 seconds. 0 means that there is no timeout.

Modem init string - Use the default string or enter your own string.

Dial-in modem escape sequence -The key sequence used to return to the menu in dial-in mode.

Use comment - Determines whether a port user is prompted to add a comment each time the port is accessed.

Quick connect via - Determines method for connecting to a port when in console server mode (available only with the Telnet protocol).

Web applet encoding - Supported languages for Java terminal.

5. Click Save & apply.

Supported Protocols

The Digi CM supports three protocol options: SSH, Raw TCP, and Telnet.

In configuring a serial port, the user has three protocol options. The three protocols available are: RawTCP, SSH, and Telnet. Choose SSH as the protocol for users logging in from an SSH client program to access a port. Choose RawTCP for users connecting directly to a TCP socket. Choose Telnet for users logging in from a Telnet client program and accessing the ports. Use the Host mode configuration page in the web interface to select the correct protocol.

Port Parameters

In attaching a serial device to a Digi CM serial port, the port parameters must match. The serial ports by default are enabled, meaning users have full access to the port. To configure the port parameters for the Digi CM, do the following:

1. Access the web interface.
2. Under the **Serial Port** heading, Click **Configuration**.
3. Choose All or an Individual port > **Serial port parameters**.
4. Fill in the serial port parameters. The following are the defaults: bps=9600, data bits=8, parity=none, stop bits=1, flow control=none, and DTR behavior=High when open. .

5. Click Save & apply

DTR Behavior

DTR can be set on the serial port to one of three settings: always high, always low, or High when open. Setting the DTR to High when open keeps the DTR high if a TCP connection is established. The DTR setting cannot be set by the user when the host mode is configured for dial-in modem or dial-in terminal server mode.

Inter-character Timeout

This setting is only available when the host mode protocol is set for RawTCP. The parameter sets the time value for the Digi CM to transfer data stored in the buffer. The Digi CM transfers data when the buffer is full using the TCP/IP protocol. However, if it is not full, the Digi CM will also transfer data dependent on the timeout value selected.

Chapter 5 System and Port Logging

Introduction

The Digi CM provides four options for saving system and port logs. The options are: a syslog server, NFS server, compact-flash card, and the Digi CM memory. When memory is selected as the storage location, log files are saved to volatile memory, meaning files are lost when the power is turned off. To use a syslog server, an NFS server, or a compact-flash card, you must first enable the devices and enter the required information. Compact-flash cards must be installed before they can be enabled and configured for logging purposes.

System logs track events such as logins, authentication failures, system configuration changes, and more. Port logs on the other hand document the data flow through the serial ports. Locations for viewing the system and port logs is outlined in this chapter.

Enabling Log Storage Location

Enable NFS Server

Log data can also be saved to an NFS server, but the NFS server must be configured with read and write privileges. To use an NFS server, the user must specify the NFS server's IP address and its mounting path. To enable the NFS server for port or system logging, do the following:

1. Access the web interface.
2. Under the Network heading, Click **NFS server configuration**.

NFS service - Enabled or disabled.

Primary NFS server name -IP address of NFS server

Mounting path on primary NFS server - directory to primary NFS server

Primary NFS timeout - Interval in seconds before timeout (5-3600)

Primary NFS mount retrying interval - Interval in second between attempts to connect (5-3600)

Enable/Disable encrypted primary NFS server - IF server supports encrypted NFS server

Encrypted primary NFS server user - User name of server

Encryped primary NFS server password - password

Secondary NFS service - Enabled or Disabled

Secondary NFS server name - Name of server

Mounting path on secondary NFS server - Directory to server

Secondary NFS timeout (sec, 5-3600) - Timeout in seconds

Secondary NFS mount retrying interval (sec, 5-3600) - Retry interval in seconds

Enable/Disable encrypted secondary NFS server - If secondary server supports

incrypted NFS server

Encrypted secondary NFS server user - User name

Encrypted secondary NFS server password - Password

Confirm secondary NFS server password - Repeat password

3. Choose Enabled.
4. Enter the IP address of the primary and secondary (if applicable) NFS server and the mounting path of each.
5. Click Save & apply.

Enable Syslog Server

To enable the Digi CM for system or port logging on a syslog server, do the following:

1. Access the web interface.
2. Under the Network heading, Click **Syslog server configuration**.
3. Choose Enabled.
4. Enter the IP address of the primary and secondary (if applicable) syslog server and select the syslog facility from the drop down menu.
5. Click Save & apply.

Enable A Compact-flash Card

The compact-flash card must be installed and configured on the Digi CM before it can be used for system logging or storing Digi CM configuration information. When storing log files to an external flash card, the size of the available storage is dependent on both the size of the card and the port counts of the Digi CM used. The maximum settings for log file sizes are listed in the following table. See also Adding a Compact-flash Card on page 25.

Total Flash Card Size	Digi CM	System Log	Port Log (per port)	Total Memory Used
32	8	4.6	3.1M	29M
	16	4.6	1.53M	
	32	4.6	762K	
	48	4.6	500K	
64	8	9.2	6.2M	58M
	16	9.2	3.1M	
	32	9.2	1.53M	
	48	9.2	1.02M	
128	8	18.4	12.3M	118M
	16	18.4	6.2M	
	32	18.4	3.1M	
	48	18.4	2.0M	
256	8	36.8	24.6M	236M
	16	36.8	12.3M	
	32	36.8	6.2M	
	48	36.8	4.1M	

Enable Digi CM Memory

The Digi CM memory is already enabled for port logging and only needs to be configured for system or port logging. When storing log files to the Digi CM local memory, a total of 3.5M is available. The amount of memory per serial port is dependent on the port count of the Digi CM used. The log file sizes are shown in the following table are maximum settings. See also Configuring System Logging on page 40.

Digi CM	System Log	Port Log (per port)	Total Memory Used
8	300K	400K	3.5M
16		200K	
32		100K	
48		66K	

Configuring System Logging

To configure the Digi CM for system logging, do the following:

1. Access the web interface.
2. Under **System status & log**, Click **System logging**.
3. Choose Enabled for System logging and the log buffer size.
4. From the System log storage location, choose the location you want from the drop down menu. The choices available are dependent on what you have enabled and/or installed. The Digi CM memory choice is always available.

   System logging - Enabled or Disabled

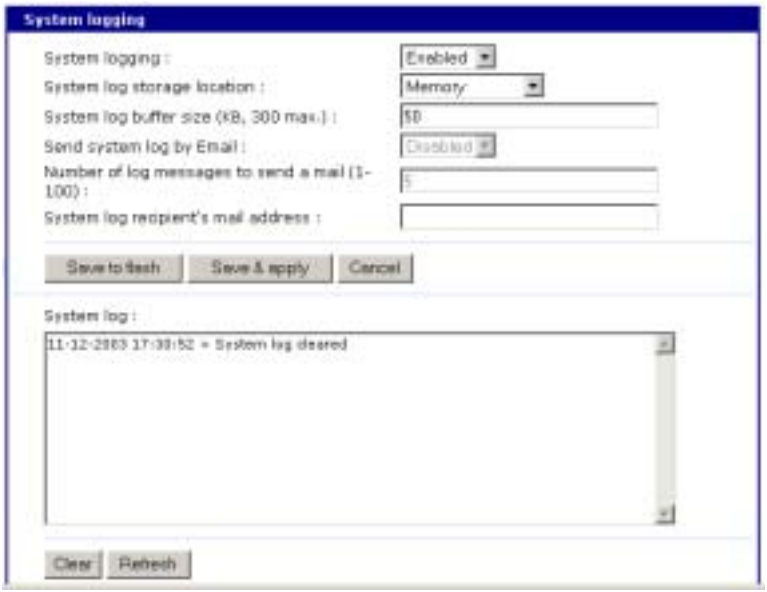
   System log storage location - Memory or NFS server

   System log buffer size (KB, 300 max) - log buffer size in KB

   Send system log by Email - Enable or Disabled

   Number of log messages to send a mail (1-100) - Number of messages

   System log recipient's mail address - Email address for log recipient



5. Choose to enable or disable email alerts and the number of log messages to send. The default value is 5 seconds for the delay in log email messages.
6. Enter the contact email address.
7. Click Save & apply.

Viewing System Logs

The system logs can be viewed from the web interface on the System logging page or from the location where they have been saved. The following table lists the file locations of the system logs.

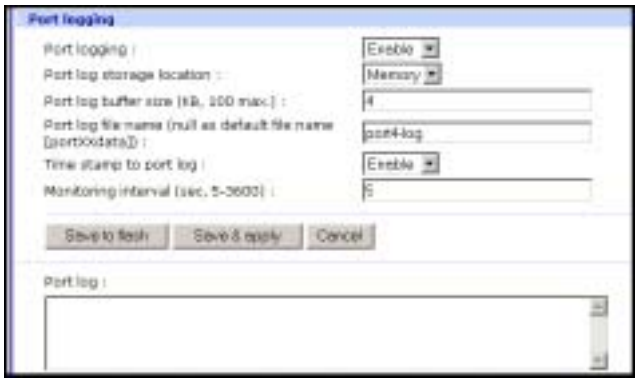
System Logfile	
Log Storage	File Location
Digi memory	/tmp/logs
Compact-flash card	/mnt/flash/logs
Syslog server	must be viewed on the syslog server
NFS server	/mnt/nfs/logs

Configure Port Logging

If a serial port is configured for console server mode, the port logging feature can be enabled. Port logging allows the user to save serial data to the memory of the Digi CM, a compact-flash card, a syslog server, or to an NFS server. If the memory is used for port logging, all data will be cleared when the system's power is turned off.

Users can also define alarm keywords for each serial port and send email alerts or SNMP traps to enable unattended serial data monitoring. To configure a serial port for port logging in console server mode, do the following:

1. Access the web interface.
2. Under the **Serial port** heading, Click **Configuration**.
3. Choose All or the Individual port and then **Port logging**.
4. Configure the settings.
5. Click Save & apply.



Note: When port logging is enabled, a Port Event Handling page is available to create alarm keywords and send alerts. See Chapter 6 Alerts and Notifications on page 43 for more information.

Viewing Port Logs

The port logs can be viewed from the web interface on the Port logging page or from the location where they have been saved. The following table lists the file locations of the system logs.

Port Logfile	
Log Storage	File Location
Digi memory	/tmp/port#data
Compact-flash card	/mnt/flash/port#data
Syslog server	must be viewed from the syslog server
NFS server	/mnt/nfs/port#data

To view the port logs on the NFS server for port number 5, enter the following command:

```
more /mnt/nfs/port5data
```

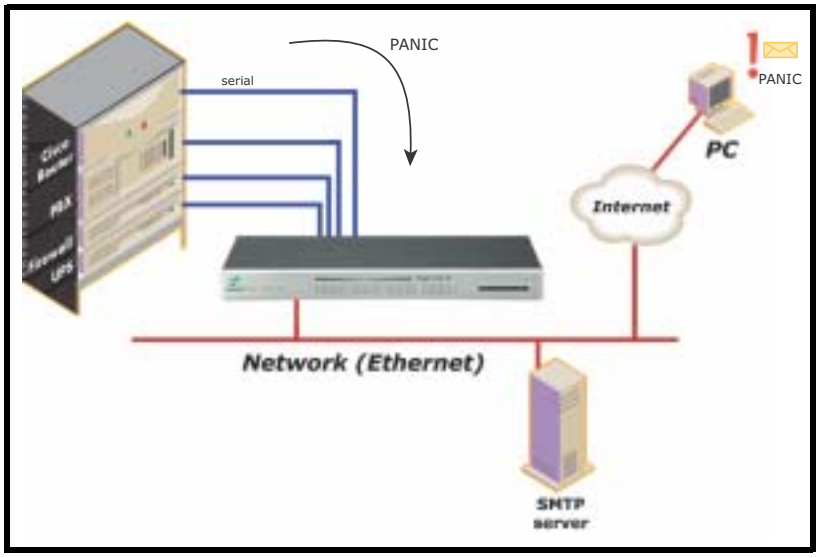
Partial logfiles can also be viewed on the web interface by going to **Serial port** > **Configuration** > select a port you want to view > **Port logging**.

Chapter 6 Alerts and Notifications

Introduction

The Digi CM can be configured for system alerts and notifications. It sends email messages when the number of system log messages reaches a certain value or when an alarm message is detected in the serial port data. The Digi CM uses SMTP (Simple Mail Transfer Protocol) for sending the notifications. To use SMTP, the system administrator must configure a valid SMTP server for sending the emails. The Digi CM supports three types of SMTP servers: SMTP server without authentication, SMTP server with authentication, and POP before SMTP.

The Digi CM also supports SNMP (Simple Network Management Protocol), a protocol used to manage a network and monitor devices on a network. System and port alerts can also be sent using SNMP traps. The Digi CM supports both versions 1 and 2 of the SNMP protocol. The main function of SNMP on the Digi CM is to allow a system administrator to query remote devices for information.



Configuring SMTP Alerts

Most SMTP servers check the sender's email address with the host domain name to verify the address as authentic. Consequently, when assigning an email address for the device email address, any arbitrary username with the registered hostname may be used. An example is username@company.com.

To configure the Digi CM for SMTP alerts, the following parameters are required:

SMTP server - Use either the hostname or the IP address.

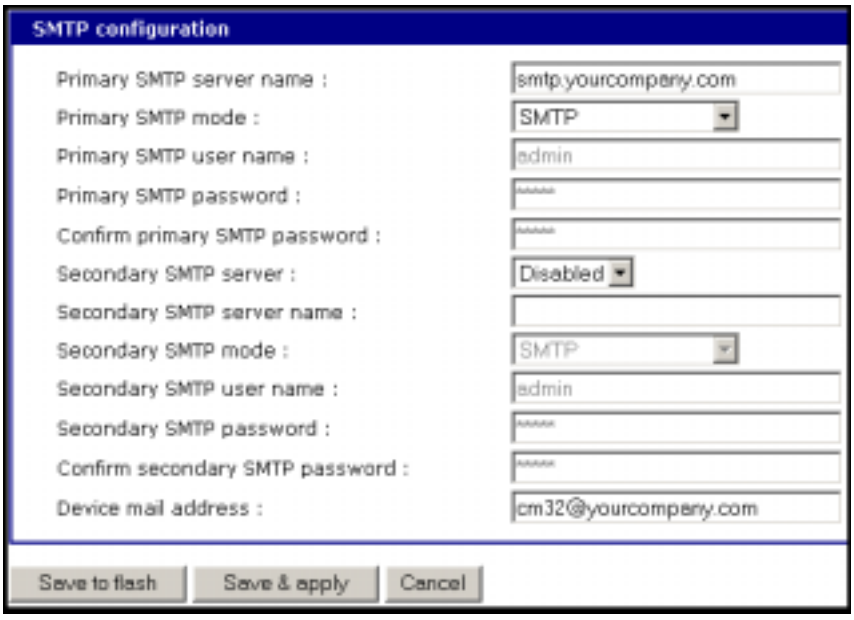
Device mail address - Specify the sender's email address for the log and alarm delivery.

SMTP mode - Specify the type of SMTP server to use.

Username and password - These fields are required for POP before SMTP and SMTP with authentication servers.

To configure SMTP alerts on the Digi CM, do the following:

1. Access the web interface.
2. Under the **Network** heading, choose **SMTP configuration**.
3. Fill in the required fields. SMTP with authentication and POP before SMTP require usernames and passwords.
4. Click Save & apply.



SNMP Information

The Digi CM supports SNMP authentication, power on, and link up traps.

Applications such as NMS (Network Management System) or an SNMP browser can exchange information with the Digi CM and control actions to the unit. The protocol functions defined for SNMP includes GET, SET, GET-Next, GET-Bulk, and TRAP. Below are the definitions of the protocol functions found in SNMP. Authentication, power on, and link up traps are supported.

Protocol	Function
GET	Queries a device for more information
SET	Makes changes to a device's state
GET-Next	After an initial GET query, goes to the next value
GET-Bulk	Retrieves tables of information and security functions
TRAP	Notifies a system administrator of a significant event

Traps

There are additional traps that can be set at the port level. The following table shows where the trap is under **Serial port** > **Configuration** on the web interface, trap name, configure options, and the trap functions. The MIBs for login traps can be found at http://ftp.digi.com/support/utilities/digicm/

Trap Location	Trap Name	Options	Function
Port access menu	Port login	Enable Disable	Sets the login trap for the Port access menu
SMNP trap configuration	• Port login • Device connection trap	Enable Disable	• Sets the login trap for SMNP • Sets the disconnect trap for the device cable
Port event handling	SNMP trap	Enable Disable	Sets the alert to notify the administrator

Configuring SNMP

To configure the Digi CM for SNMP do the following:

1. Access the Digi CM web interface.
2. Under the **Network** heading, choose **SNMP configuration**.
3. Fill in information for the MIB-II system objects section and choose Yes under EnableAuthenTrap. The fields are described in the following section:

   sysContact - Identity of the contact person managing the MIB-II system.

   sysName - The name identifying the system. By convention, this is the fully qualified domain name of the Digi CM unit. An example is: DigiCM@companyname.com.

   sysLocation. - The physical location of the unit such as Room 264 or Engineering Lab.

   sysService (Read only). - A series of values, separated by commas, indicating the set of services the system provides. By default the Digi CM only supports Application (7) service level.

   EnablePowerOnTrap. - Determines whether the SNMP agent generates a

trap each time the Digi CM is started.

EnableAuthenTrap. - Indicates whether the SNMP agent process is permitted to generate authentication failure traps.

EnableLinkUpTrap. - Determines whether the SNMP agent generates a trap each time the network connection comes up.

EnableLoginTrap - Determines whether the SNMP agent generates a trap for each login.

Note: Trap values override all other configuration information, meaning all other authentication failure traps can be disabled with this setting.

4. Enter Access control settings based on the following field descriptions:

   IP Address - Defines what applications can access the Digi CM SNMP agent to exchange information and control actions. If no IP addresses are listed, any application can access the SNMP agent.

   Community - The options are public or private.

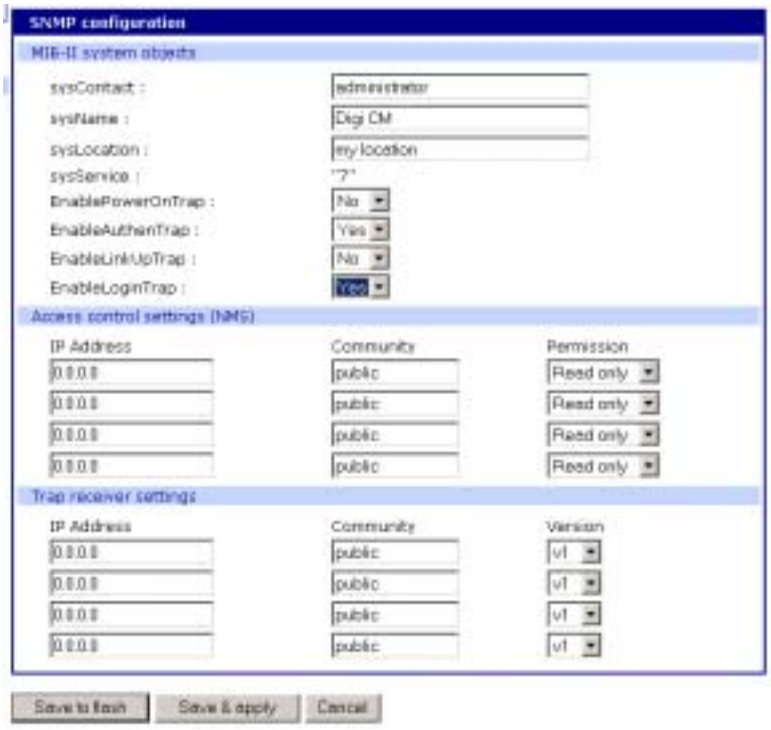
   Permissions - The options are Read only or Read/Write.

5. Enter Trap receiver settings based on the following field descriptions:

   IP Address - Enter the IP address of the device receiving the trap alerts.

   Community - The options are public or private.

   Version - Choose the SNMP version, either version 1 or version 2c.



6. Click Save & apply.

Managing the SNMP Protocol

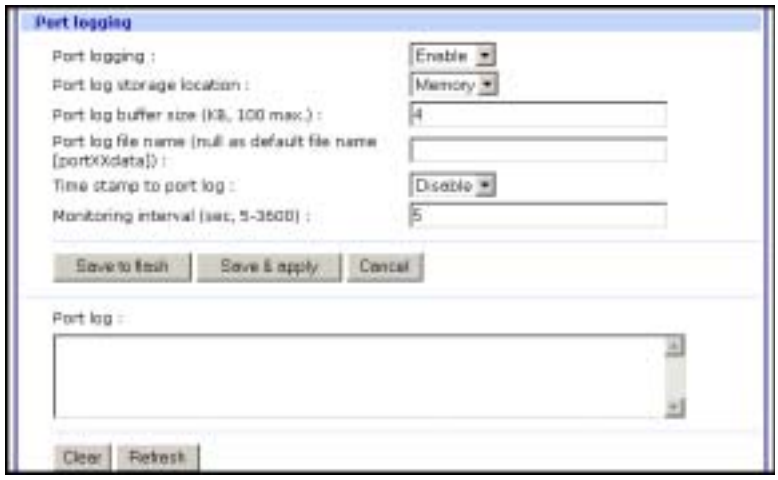
The Digi CM SNMP protocol can be managed using an NMS or SNMP browser. However, before the NMS or SNMP browser can access the data, the Access control settings must list the IP address of the host from which the

browser is executed. See the preceding graphic for details.

Configuring Port Event Handling

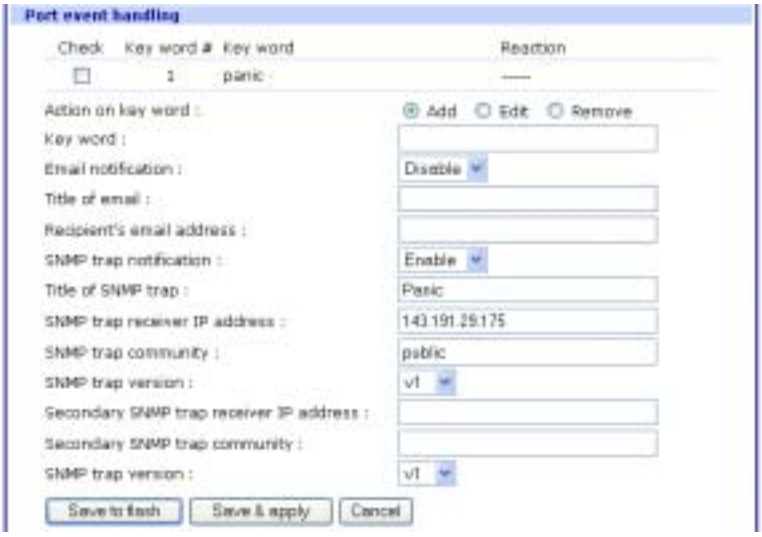
Once an SMTP or SNMP server has been configured, it can be used to send port-related alerts and notifications. The following describes how to configure a port for port event handling.

1. Access the web interface.
2. Choose **Serial port** > **Configuration**.
3. Choose a port to configure and then **Port logging**.
4. Select Enable.



5. Choose Save & apply.
6. Choose **Port event handling**.

   The following page appears.



7. Select an action and enter the keyword for the port handling event.
8. Enable Email notification.

   Note: It is assumed that SMTP is configured first. If not, see "Configuring SMTP Alerts" on page 44.

9. Enter the title of the Email (subject line).
10. Enter the Email receipient's address.
11. Enable SNMP trap notification.
12. Enter the title of the trap.
13. Enter the IP address of the trap receiver.
14. Enter the SNMP community
15. Select the version.
16. Complete configuration and then choose Save & apply.

    Note: Key word is any text string that will trigger an alert when it traverses the serial port.

Chapter 7 Configuring Security and Authentication

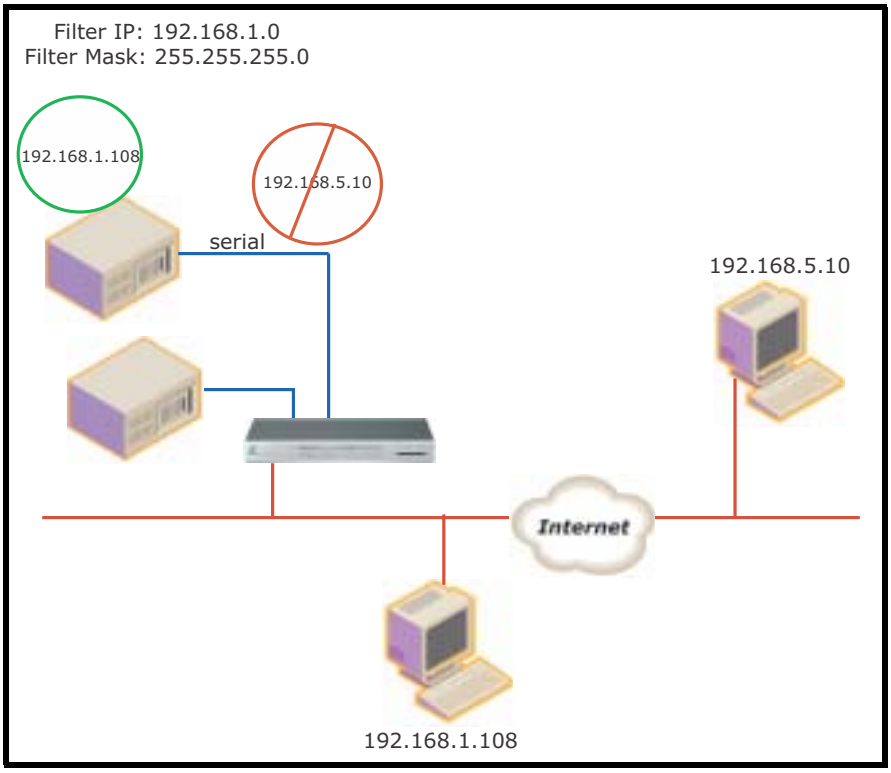
Introduction

The Digi CM provides several ways to control access to the network and the devices on the network. One method is through IP filtering, which allows or prevents users with specific IP addresses from accessing devices or serial ports on the network. IP filtering can be permitted or restricted for all ports globally or on a per port basis. Another access control method involves restricting or permitting specific users. Users can be easily added or removed from either a restricted or permitted users list. Sniff session access, which allows multiple users to access a single port, is also discussed.

The Digi CM provides for various authentication methods. They are: Local, RADIUS, TACACS+, LDAP, and Kerberos. Authentication may be configured where a secondary method is attempted if the primary method fails.

Configuring Network IP Filtering

Access to the Digi CM can be controlled through IP filtering. IP filtering controls access to the Digi CM from remote hosts either trying to access from a remote console or a web browser. IP filtering can also be used to control access to individual ports.



Console and Web IP Filtering

IP filtering is a way of controlling access to the Digi CM from remote hosts. If the administrator wants to allow specific remote hosts access to the Digi CM, the administrator must provide the host's IP address and subnet mask. There are three ways to configure the Digi CM from remote hosts: Telnet console IP filtering, SSH console IP filtering, and Web IP filtering. Under each method are three fields to complete:

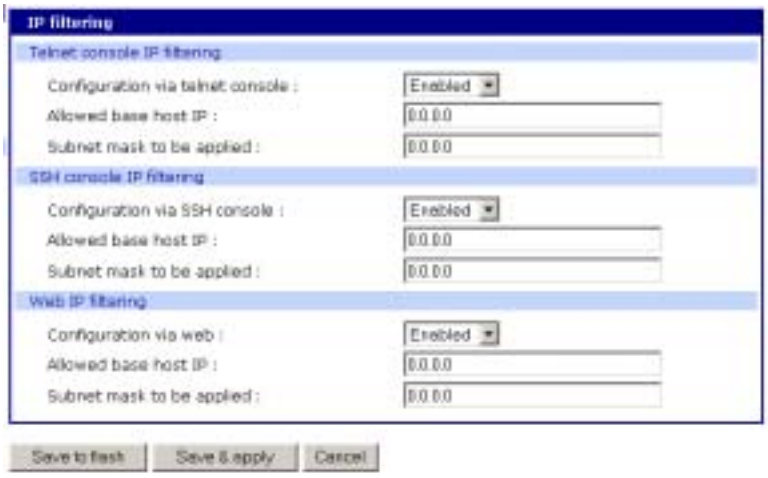
Configuration via telnet console, SSH console, or web - Enabled or disabled

Allowed base host IP - IP address of the base host that can access the CM.

Subnet mask to be applied - IP address of subnet mask of base host.

To configure the Digi CM for IP filtering, do the following:

1. Access the web interface.
2. Under the **Network** heading, choose **IP filtering**.
3. Choose Enabled for either Remote console or Web IP filtering or both.
4. Enter the IP address and subnet mask for the remote host.
5. Click Save & apply.



The following table displays examples of allowed remote hosts..

Allowable Hosts	Input format	
	Base Host IP Address	Subnet mask
Any host	0.0.0.0	0.0.0.0
192.168.1.120	192.168.1.120	255.255.255.255
192.168.1.1 - 192.168.1.254	192.168.1.0	255.255.255.0
192.168.0.1 - 192.168.255.254	192.168.0.0	255.255.0.0
192.168.1.1 - 192.168.1.126	192.168.1.0	255.255.255.128

Allowable Hosts	Input format	
	Base Host IP Address	Subnet mask
192.168.1.129 - 192.168.1.254	192.168.1.128	255.255.255.128

Serial Port IP Filtering

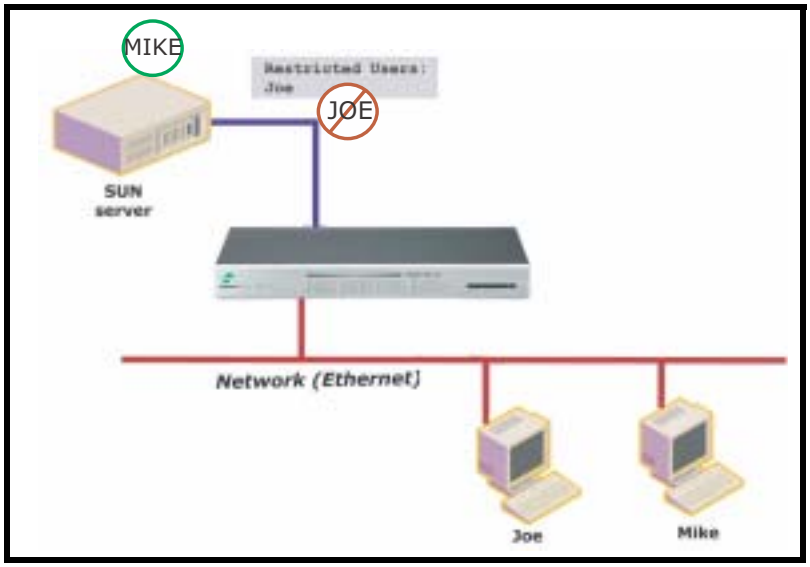
You can configure each serial port individually for IP filtering. To configure a serial port for IP filtering, do the following:

1. Access the web interface.
2. Under the **Serial port** heading, choose **Configuration**.
3. Choose All under All port configuration to configure all the ports or a specific port under Individual port configuration > **Port IP filtering**.
4. Enter the IP address and subnet mask for the remote host that is allowed access.
5. Choose Save & apply.

Using IP Tables

Linux and UNIX systems have an IP filtering program called IPtables. Administrators desiring to add further security by controlling access to the Digi CM should look at this program. Information about IP tables can be found on most Linux or UNIX systems by viewing the man pages.

Configuring User Access Control



Another method to control access to the serial ports on the Digi CM is through the User Access Control configuration. This configuration can be done on a per port basis or globally by selecting the All Ports option. Users must have already been added to the system (through System administration > Users administration) before their access rights can be modified.

Note: Users do not necessarily need to be local, but can be users on any configured authentication server.

Under the User access control screen, you must decide how you want users to access the ports and what levels of access they will have. There are three ways to grant access:

Everyone - meaning any user registered on an authentication server has access. The access may be full or partial.

"Restricted" - these specific users are restricted from all or partial access rights. You may restrict Everyone or permit Everyone access and restrict individuals. The restricted access may also be full or partial.

"Permitted" - these specific users are permitted partial or full access rights. You may permit Everyone or restrict Everyone and permit individuals. The permitted access may also be full or partial.

Type of Users	Access Types	How to Permit or Restrict
Only specific users have access "Permitted Users"	Access type is unchecked for Everyone (meaning All other users) does not have access	by listing specific users and checking the access types - (Permitting them access)
All users have access except for a few "Restricted Users"	Everyone has access to every-thing by checking the access types. If an access type is unchecked, all users are restricted from that access type.	by listing users and unchecking the access type they are restricted from using

All access rights may also be limited. Any user can be given three levels of access. The three levels are defined below:

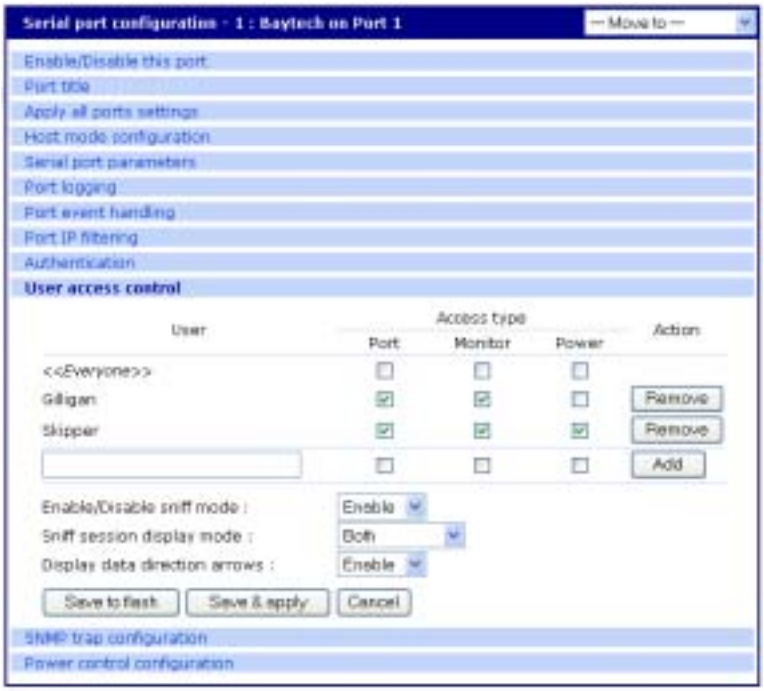
Port - Port access allows the user read and write access on the port.

Monitor - Monitor access allows the user read only or sniff rights on the port.

Power - Power access allows the user power management rights (if they are available) on the port.

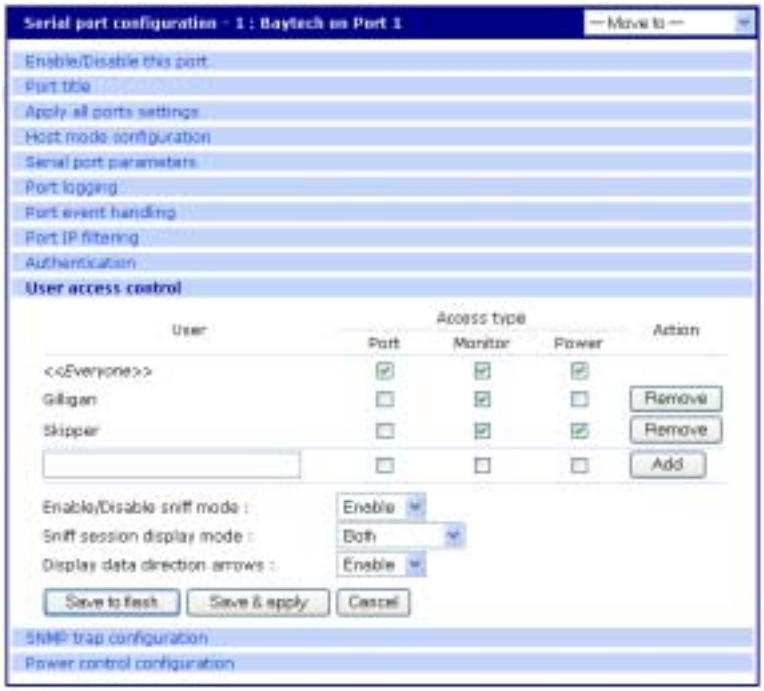
Note: You may permit or restrict users any combination of access rights.

Example of Permitted User List



Note: This User access control screen shows a permitted user list. Everyone is denied access except the two users listed. Their access is limited to Access types that are checked.

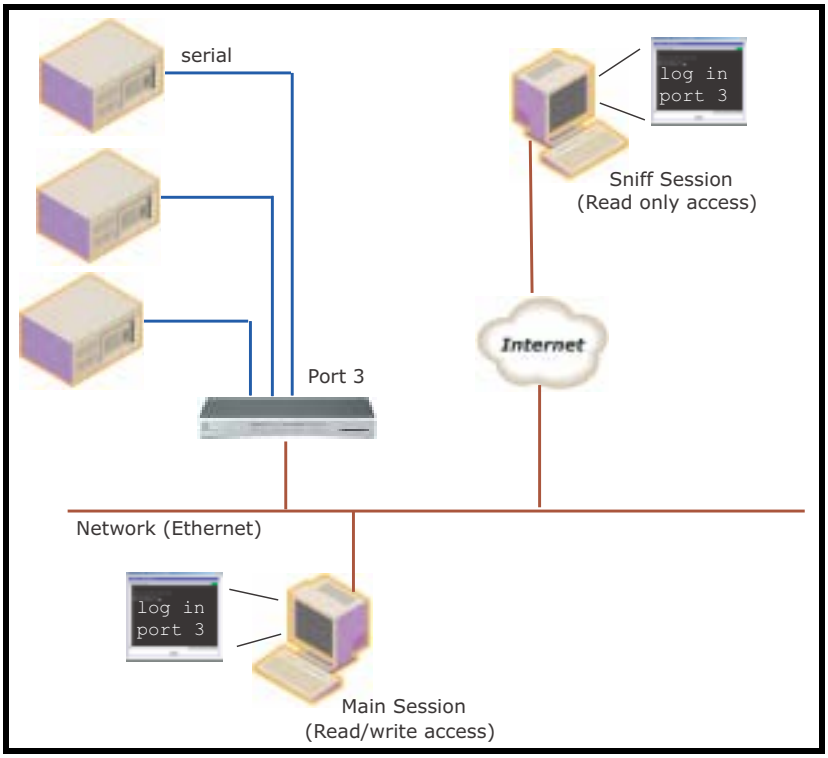
Example of Restricted User List



Note: This User access screen shows a restricted user list. Everyone has complete access. The listed users are restricted from the Access types that are not checked.

Sniff Session

A sniff session enables multiple users to access a single serial port for viewing the data stream. Users who are registered for a sniff session can access a specific serial port even if another user is using the port. The Digi CM supports multiple concurrent sniff sessions.



There are four options for a Sniff Session mode, disabled, input, output, and both. You can configure sniff session mode on a per-port basis from the Serial port configuration page.

Enable/Disable sniff mode

- Disabled -The sniff mode is disabled and no user can enter a sniff session after the first user is logged on.
- Enabled - - Allows all users with access the following options while in sniff mode:

Sniff session display mode:

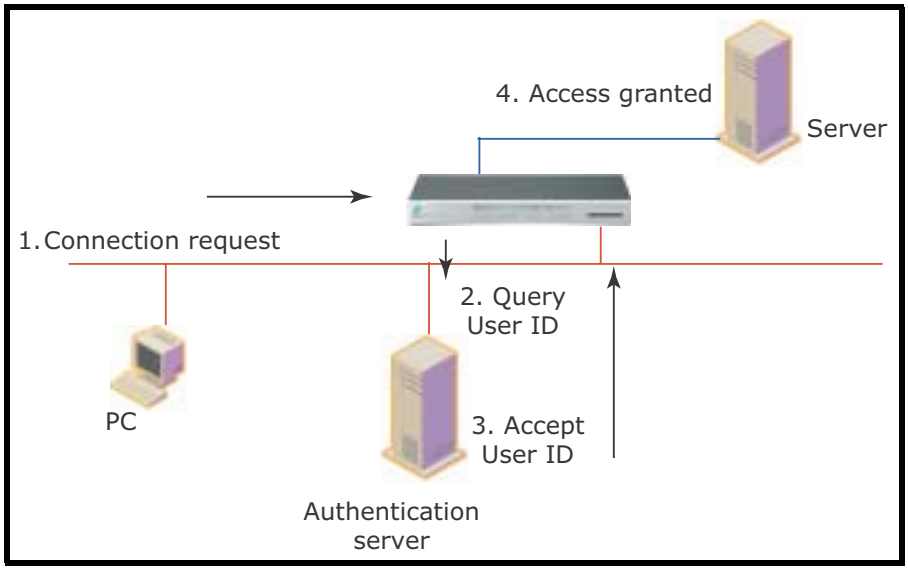
- server output - A sniff user can view all data to a serial port from a remote connection
- user input - A sniff user can view all data from a serial port to a remote connection
- both - A sniff user can see all data transmitted or received through a serial port

Display data direction arrows - Enable/Disable - displays arrows to indicate

direction of data to or from the server.

Authentication

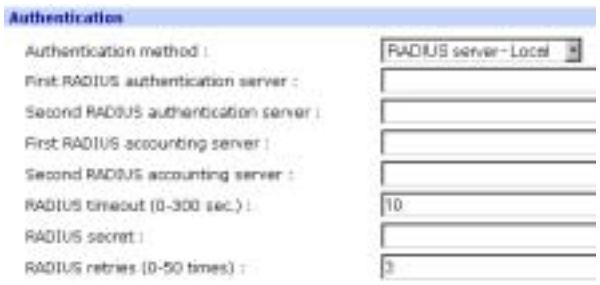
The Digi CM supports multiple methods of user authentication. The following methods are supported: Local, TACACS+, RADIUS, LDAP, and Kerberos. The type of authentication protocol you use is dependent on your environment.



Configuring Authentication Methods for Port Access

Users can choose between having a single authentication method, such as RADIUS, or an authentication method where a Local authentication service is used in addition to the RADIUS, LDAP, TACACS+ server, or Kerberos. These options are listed when you configure the Digi CM for authentication. To configure a Digi CM for authentication, do the following:

1. Access the web interface.
2. Under the **Serial port** heading, choose **Configuration**.
3. Choose All or an Individual port > **Authentication**.
4. From the drop down menu, choose an authentication method. A configuration screen for that particular authentication method is displayed. The following figure displays the parameters for setting up a RADIUS server as the primary authentication server and Local authentication if the primary authentication method fails.



Note: Remote authentication to Port access menu can be obtained from Serial port >

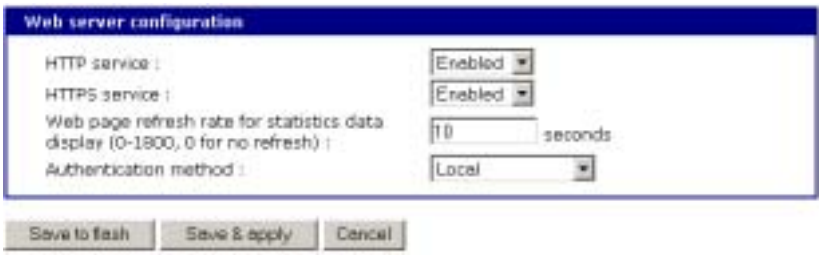
Configuration > Port access Menu

5. Fill in the appropriate fields.
6. Choose Save & apply changes.

Configuring Authentication for the Web Server

1. Access the web interface.
2. Choose **Network** > **Web server configuration**.

   The following screen appears.



3. Choose an authentication method and then Save & apply.

   When using remote authentication for the web server, such as Radius, TACACS+, LDAP or Kerberos, you must also add the user to the local database. The **user password** must be different from local authentication or it will do local authentication instead of remote. See "Administering Users" on page 88 for details.

   Once the user's password is approved by the authentication server, the Digi CM uses the local permission rights to provide proper access privileges for the user to ports and the configuration.

Chapter 8 Custom and Default Menus

Introduction

The Digi CM has several default menus for easy configuration and access by different users. Depending on access privileges, the menus available are the Web Interface, Configuration Menu, and Port Access menu. A custom menu feature for creating menus is also available through the web interface.

The custom menu feature enables system administrators to create menus for specific users, which provide each with a customized interface to selected ports.

Making Custom Menus

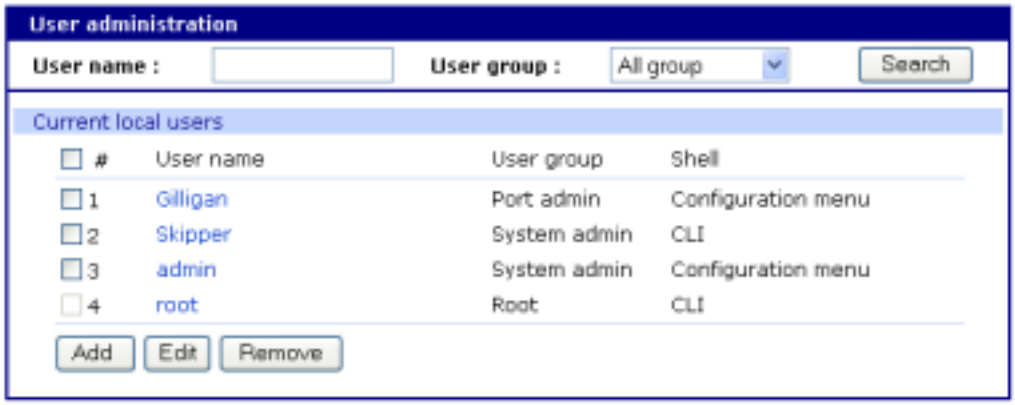
Before making custom menus, plan the kind of menus and menu items you want available to your users. A good plan would be to:

1. Add users to the system.
2. Create a menu name with sort and display features.
3. Add menu items and submenus to the new menu.
4. Assign users to the menus.

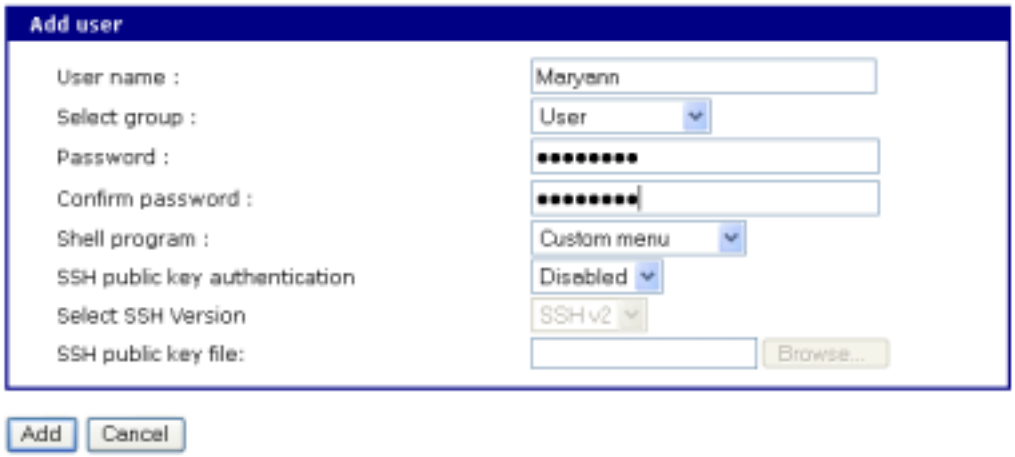
Adding Users

You cannot assign users to a menu until you have added users to the system. To add users, do the following:

1. Access the web interface.
2. **System administration > Users administration** > Add



3. Enter the User name and User group from the drop down menu.Select Custom menu from the drop down menu for the Shell program.



4. Click Add to add the user.
5. Continue to add users as needed.

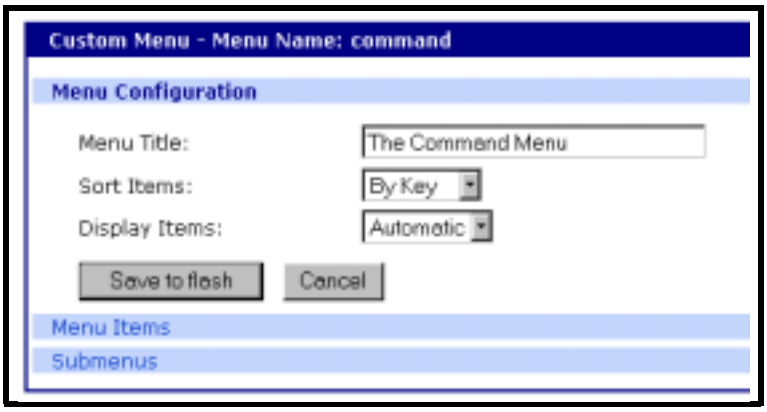
   Note: You do not need to Save to flash or Apply changes to add users.

Creating Menu Names

To make a custom menu, do the following:

1. Access the web interface.
2. **Custom Menu** > **Configuration**.
3. Enter the Menu Name to assign and click the Add Menu button.

   The menu is added.
4. Click the hyperlink to the menu you just created.
5. From the drop down menu, select the way to Sort and Display items.



6. Click Save & apply.
7. Repeat as required to create additional menus.

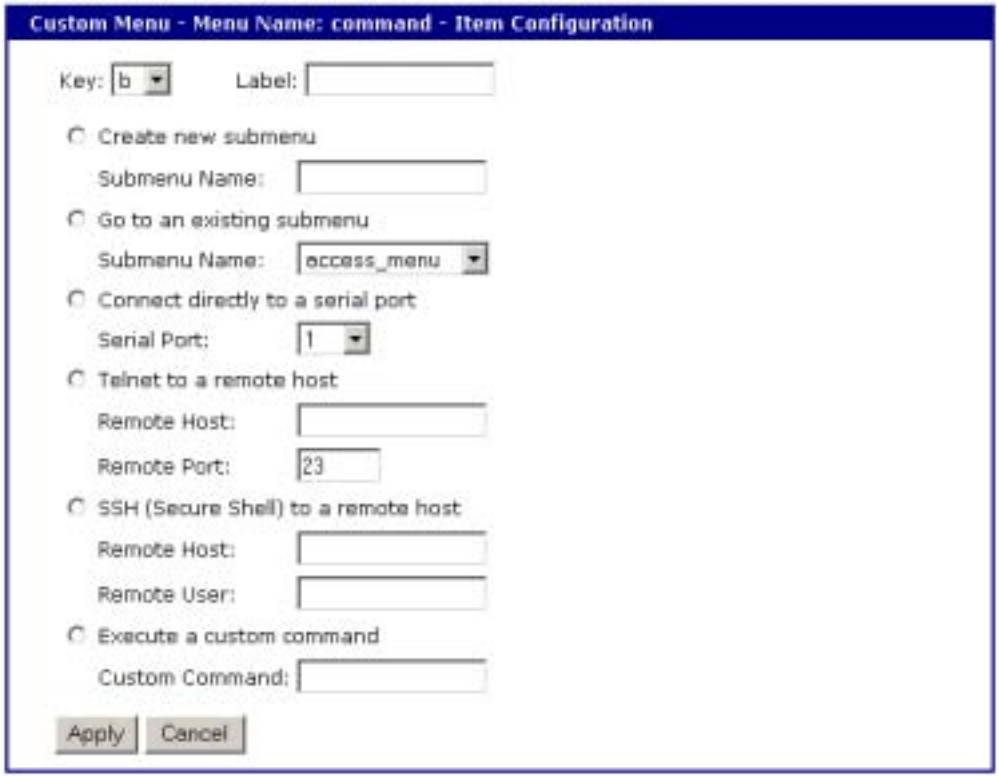
Adding Menu Items

Once you have defined a menu name and added users, you can then add menu items. To add menu items, do the following:

1. **Custom Menu** > **Configuration** > Menu Name hyperlink for the menu you want to configure.

2. Choose **Menu Items** > Add Item.

   The following screen appears.



3. Fill in the desired parameters. The parameters are:

   Key - Assign any letter or number except a value already used by another menu item.

   Label - Assign a label or name for the menu item.

   Create new submenu - Assign a name for a new submenu that this menu item will be assigned or linked to.

   Go to existing submenu - Choose an existing submenu from the drop down menu that this menu item will be assigned or linked to.

   Connect directly to a serial port - Connects the user to a specified port.

   Telnet to a remote host - Enter a remote host's IP address or hostname.

   SSH to a remote host - Enter the hostname or IP address of a remote host and the remote username.

   Execute a custom command - Enter a customized command that is any valid command on the command line with acceptable user privileges.

4. Choose Apply.

5. Repeat this procedure to add more menu items.

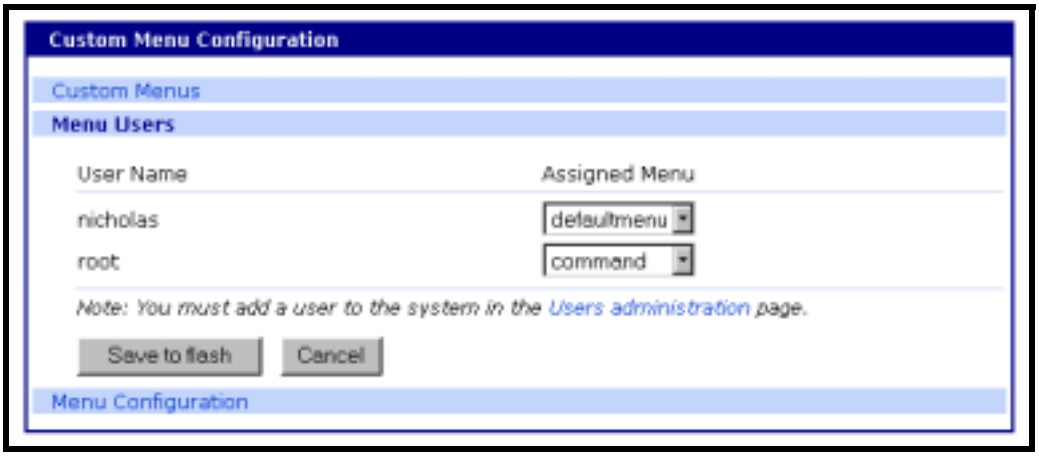
   Note: To add or configure submenus, select the Submenus hyperlink on the Menu Configuration page.

Assigning Users to a Menu

Once a menu has been created, users can be assigned to the menu by doing the following:

1. Access the web interface.
2. **Configuration > Custom Menu** > **Menu Users**.

   A list of available users is displayed.



3. Choose a menu for a user by selecting a menu from the drop down Assigned Menu list.
4. Choose Save & apply.

Chapter 9 Microsoft SAC Support

About Digi CM Support for Microsoft Windows Server 2003

The Digi CM provides a browser-based user interface to Microsoft's text-based Special Administration Console (SAC), an integral part of Windows Server 2003 Emergency Management Services (EMS). Both the English and Japanese versions of SAC are now supported. When a server running Windows Server 2003 is connected to a Digi CM serial port, key SAC functions--normally accessed from the command line--are available from a graphical user interface (GUI). SAC features accessible from this interface include:

- Reset and shutdown
- Show ID
- Show and configure IP settings per interface
- Show the process list and kill processes

Note: While the EMS port is available at all times using Telnet or SSH, the special GUI is available only while SAC is active.

Set Up Overview

Set up for Digi CM SAC support is a three-step process:

1. Set up the Windows Server 2003 for SAC support. To do this, ensure that the COM port used for console traffic is properly set up. This includes designating a COM port for console communication and setting the port speed (baud) appropriately. See the information on page 63.
2. Cable the console port on the Windows Server 2003 to a Digi CM port. See the cabling information in Chapter 16.
3. Set up the Digi CM for SAC support. See "Setting Up the Digi CM for SAC Support" on page 64.

Setting Up the Windows Server 2003 Port

1. Sign on to the Windows Server 2003 as the administrator.
2. Access the command line.
3. Use the bootcfg command to redirect console traffic to the correct COM port. The following is the command syntax and an example. See the Microsoft documentation for additional information on the SAC feature.

Command Syntax

`bootcfg /ems on /port com# /id # /baud 115200`

where *com#* is the COM port to which console traffic will be redirected, # is the

is the number of the boot entry, and the port speed is set to the Digi - recommended rate (although you can use any rate supported by Windows Server 2003).

Command Example

In this example, console output is redirected to COM 2, the boot entry is specified as 1, and the port speed set to 115200.

```
bootcfg /ems on /port com2 /id 1 /baud 115200
```

Setting Up the Digi CM for SAC Support

To set up a serial port to provide access to the Windows Server 2003 console port, do the following:

1. Access the web interface.
2. Choose **Serial port** > **Configuration**.
3. Choose a port .
4. Choose **Host mode configuration**.

   The Host mode configuration page appears.
5. Set the Host mode to Console server and the Type of console server to MS SAC -English (or Japanese) console as shown in the following figure.

6. Set other fields as appropriate.

7. Click Save & apply.
8. Configure serial port communication settings, by doing the following:
   a. Choose Serial port parameters from the menu.
   b. Adjust settings as required. This includes ensuring that the Baud rate matches the setting on the Windows Server 2003 serial port and Flow control is set to None. Ignore the DTR behavior field.
   c. Click Save & apply.

Accessing the Windows Server 2003 Console Port from the Digi CM GUI

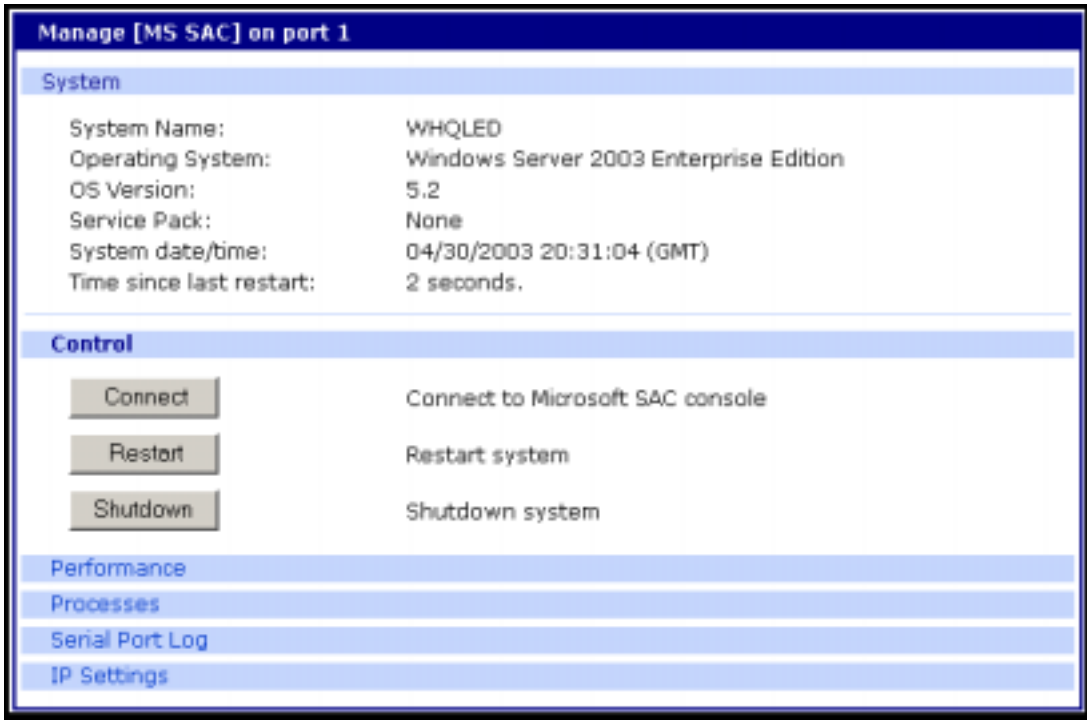
To access the Windows Server 2003 console port, do the following:

1. Access the web interface.
2. Choose **Serial port** > **Connection**.

   A screen similar to the following appears.

3. Click on the title of the port to which the Windows Server 2003 console port is connected.

   A screen similar to the following appears.



4. Use the Digi CM GUI to perform SAC functions. The following table describes attributes of the controls on the GUI.

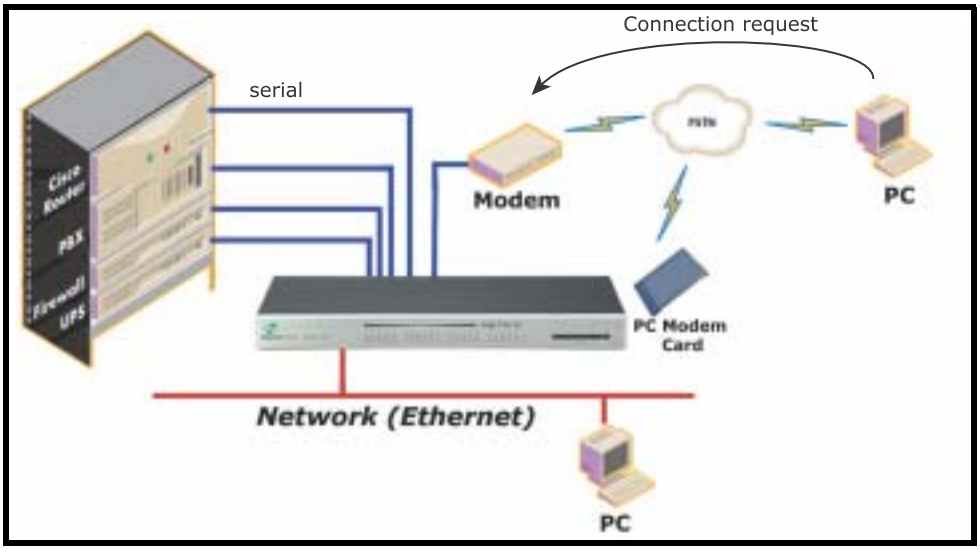
Field	Description
Connect	Connects to the SAC console port via the command line interface.
Restart	Reboots the Microsoft Server 2003.
Shutdown	Shuts down the Microsoft Server 2003.
Performance	Provides access to Microsoft Server 2003 status information.
Process	Provides access to the process list, which allows you to view and kill active processes.
Serial Port Log	Provides access to port logging information.
IP Settings	Provides access to IP settings, enabling you to verify and change settings.

Chapter 10 Configuring Remote Dial-In Access

Introduction

The Digi CM supports dial-in connections from remote sites for out-of-band access. In this configuration, the Digi CM has serial ports configured for external modems and waits for dial-in connections from remote sites. If users dial-in using a terminal application, the Digi CM accepts the connection and displays a menu of available serials ports. In a dial-in terminal server mode, the Digi CM makes a TCP connection with either a Telnet or SSH client to a pre-defined server. RawTCP is also an option for dial-in users.

For more information on the different types of Host mode configuration, see "Host Mode Configuration" on page 31.



Configuring For Dial-In Modem Access

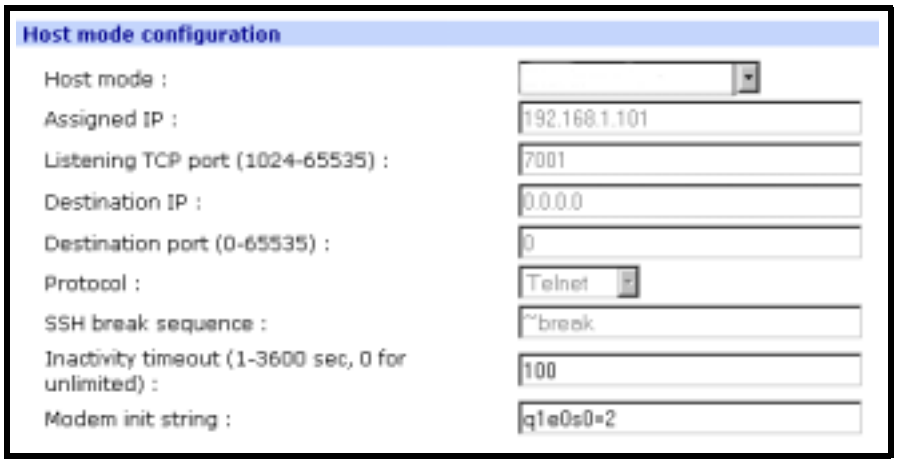
To configure a serial port for a dial-in modem, enter the values for these fields: Host mode, Modem init string, and Inactivity timeout. To access the Host mode configuration screen, do the following:

1. Access the web interface.
2. Under the **Serial port** heading, choose **Configuration**.
3. Choose a specific port under Individual port configuration and then choose **Host mode configuration**.
4. Select Dial-in modem for the Host mode in the drop down menu.
5. Enter the information for Inactivity timeout and Modem init string.

   Inactivity timeout -The default value is 100 seconds. You can set the timeout for 1 to 3600 seconds or 0, for unlimited timeout.

Modem init string - The default modem init string is q1e0s0=2. The init string sets the modem to quiet mode, echo off, and Auto Answer on two rings. The modem init string is used for initializing an external modem attached to a Digi CM serial port. See your modem user manual for more information.

6. Click Save & apply.



Adding a PC Modem

A PC card slot is provided on the front panel of the Digi CM. The graphic below has an arrow indicating the PC card slot.

Digi CM 32 shown

To install and configure the PC modem on the Digi CM, do the following.

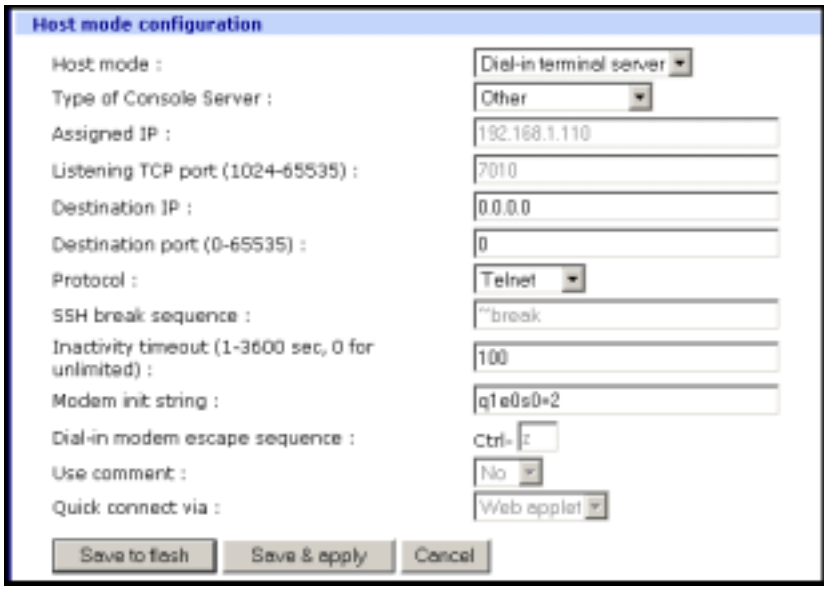
1. Insert the card into the PC slot.
2. Access the web interface.
3. From the menu, choose **Configuration** under the **PC card** heading.
4. Choose Discover a new card.

   The Digi CM searches for a PC card and displays a configuration menu.
5. Enter the appropriate parameters in the configuration menu.
6. Click Save & apply.

Configuring For Dial-In Terminal Server Access

To configure a serial port for a dial-in terminal server access, enter the values for these fields: Host mode, Destination IP, Base Port, Protocol, Inactivity timeout, and Modem init string. To access the Host mode configuration screen, do the following:

1. Access the web interface.
2. Under the **Serial port** heading, choose **Configuration**.
3. Choose a specific port under Individual port configuration and then choose **Host mode configuration**.
4. Select Dial-in terminal server for the Host mode from the drop down menu.



5. Fill in the appropriate fields as they apply to your configuration.

   Host mode - The options are console server mode, terminal server mode, dial-in modem mode, and dial-in terminal server mode.

   Type of Console Server -The options are MS SAC console or Other.

   Assigned IP - This is also known as alternate IP, where the user can Telnet directly to a serial port using an IP address.

   Listening TCP port. - This is also known as reverse Telnet, where a user Telnets to a port using an IP address and a port number.

   Destination IP In terminal server mode. -The user connects directly to a port using an IP address.

   Destination port. - In terminal server mode, the user connects directly to a port with an IP address and port number.

   Protocol. -The options are SSH, RawTCP, and Telnet.

   SSH break sequence. -This is a sequence of characters that sends a break character to a device.

Inactivity timeout - The timeout length ranges from 1 to 3600 seconds; 0 is unlimited timeout.

Modem init string - Use the default string or enter your own string.

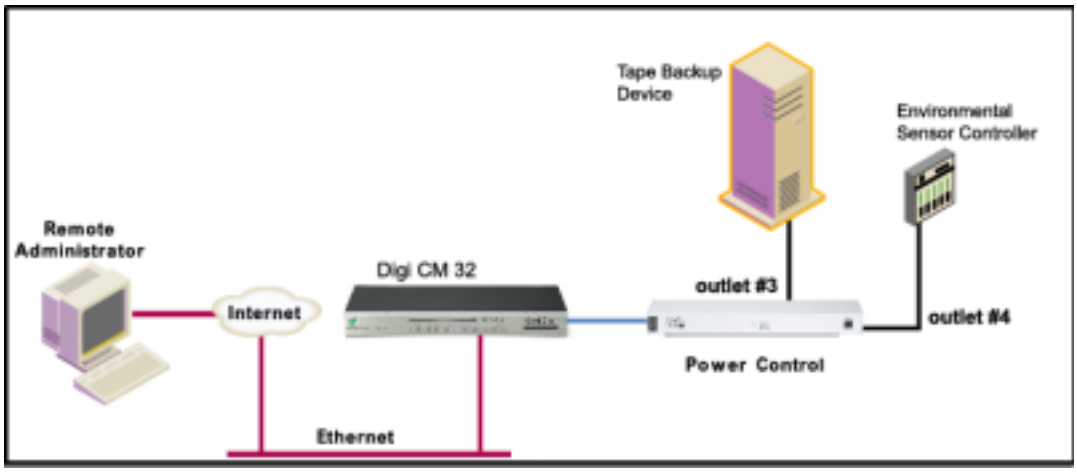
6. Click Save & apply.

Chapter 11 Power Controller

Introduction

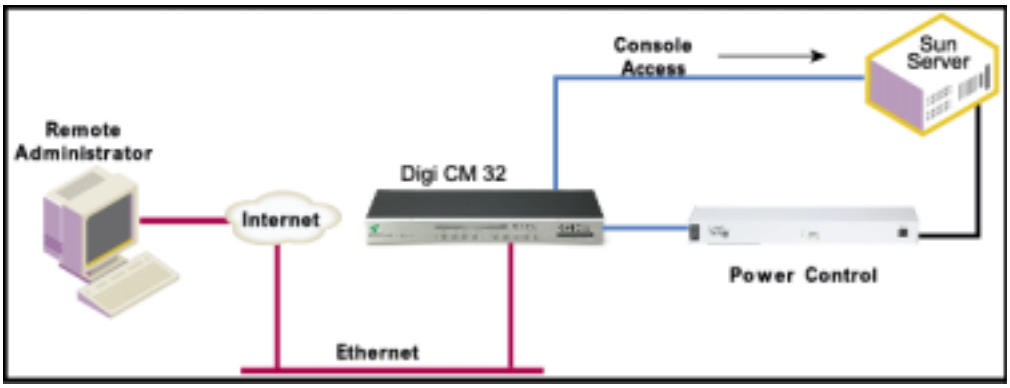
The Power Controller feature allows the administrators of the Digi CM to use console management to control power functions. Power control consists of three basic functions: on, off, and reboot (power cycle).There are two typical scenarios when using a power controller. The simplest scenario is a non-serial device connected to a power controller (for example, an environmental sensor controller or a tape backup device). The power controller is configured and accessed through the Digi CM.

This illustration shows the a power controller configured through the Digi CM for non-serial devices.



The second scenario is a serial device (such as a router or server) managed through a port on the Digi CM with its power supply mapped through the power control feature. After configuration is complete, users need only reference the console management port on the Digi CM to also manage power. The Power Controller feature handles the relationship of a specific outlet to a serial device as if the power supply was also connected to the same port as the serial device. In other words, you don’t need to see the physical connection or remember which outlet controls a specific serial device after configuration - the Digi CM does that for you.

The following illustration shows a Sun server configured through a serial port connection on the Digi CM 32.



Installing the Power Controller

Connect a serial cable from the serial port of the power controller to one of the serial ports on the Digi CM. Depending on the manufacturer of the power controller, a serial cable may be provided or may require using one of the provided cable adapters of the Digi CM. Refer to "About Serial Port Cabling" on page 115 for more information. Connect the power controller to an appropriate power source.

Configuring Power Controller

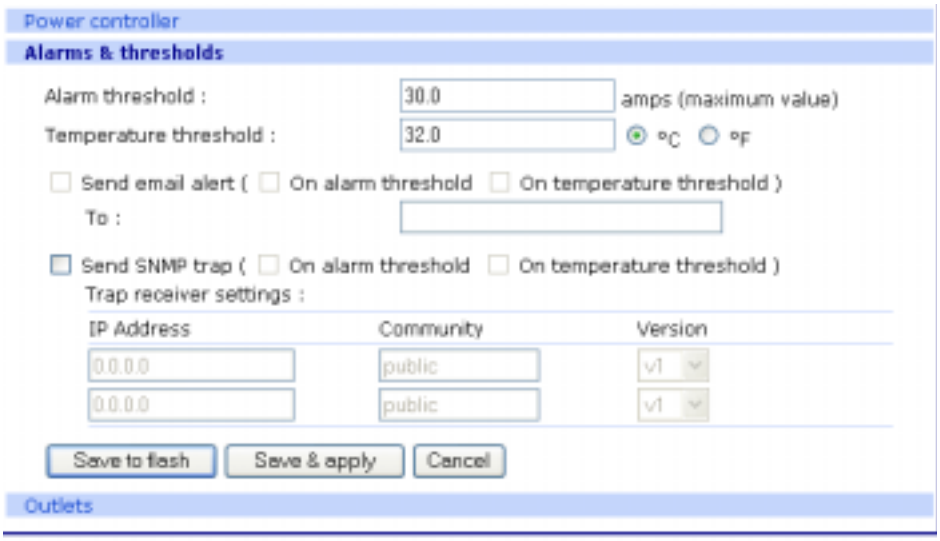
System administrators are the only users that can add a power controller although authorized users may reconfigure outlets or serial ports. To add a power controller, follow the procedure listed below.

1. Log in to the Digi CM (username root, password dbps)
2. Click **Power Controller** > **Configuration**

3. Select the port number the power controller is connected to and click Add controller. (The default title is the Manufacturer brand and the port number it is connected to. You have the ability to change this title in step 5 if needed.)
4. Click the port number or the controller title to set up the outlets.
5. Enter the correct number of outlets and edit the title for the power controller on the port.
6. Click Save & apply.
7. To complete the configuration for the Power Controller, go to "Setting Alarms and Thresholds" on page 73 to set notifications.

Setting Alarms and Thresholds

Power Controller allows administrators to set an alert via E-mail notification or an SNMP trap when environmental conditions exceed specifications.



1. Under **Power Controller** click **Alarms & thresholds**.
2. Enter the appropriate parameters. Select the condition(s) for an alert and enter the information for the alert (E-mail or SNMP trap or select both).

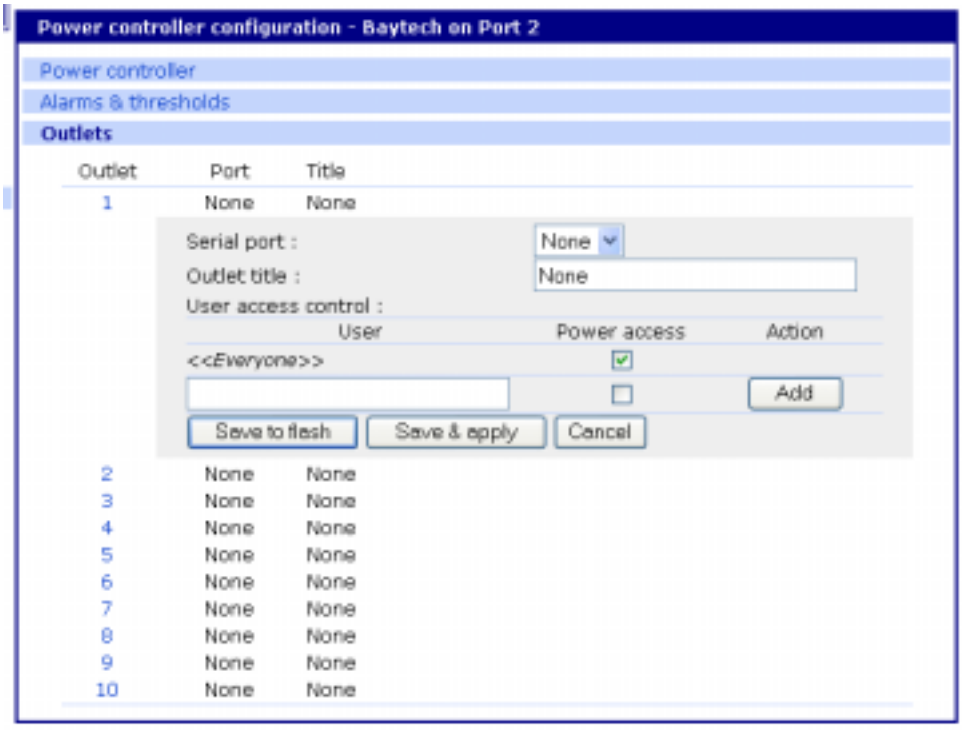
   Note: To set up an E-mail alert it is assumed that the mail server has already been set up. If not, go to "Configuring SMTP Alerts" on page 44. If the SMTP server is not set up, the E-mail option will not be available.

3. Click Save & apply
4. Go to "Outlet Configuration" on page 73.

Outlet Configuration

The following procedure allows the user to setup the power supplied to your device from the power controller.

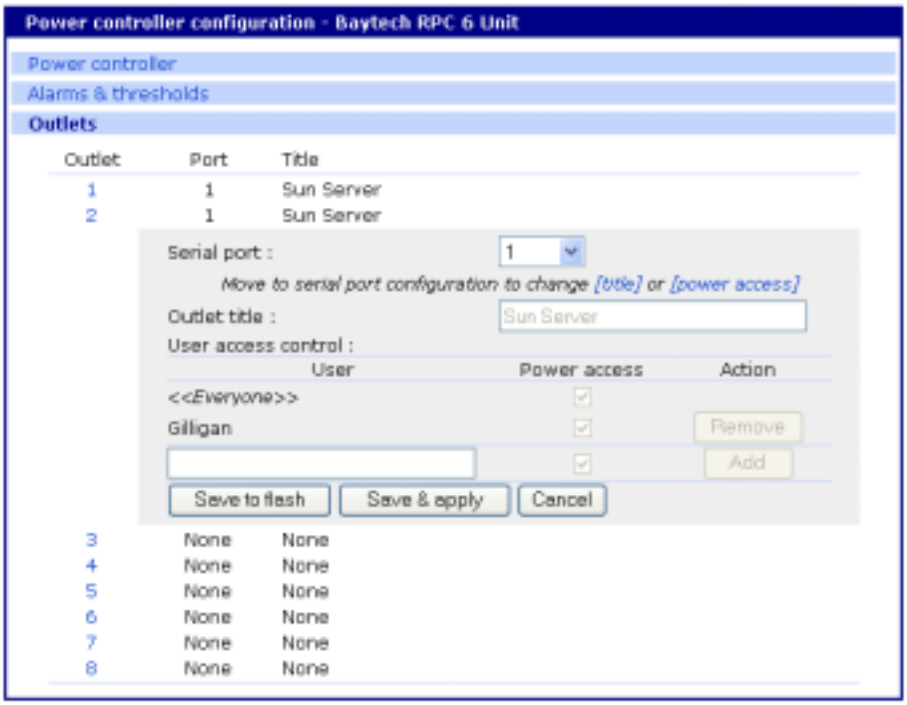
1. From **Power controller**, click **Outlets**.



2. Click the outlet number to configure.
3. Select the serial port number that controls the device connected to the Digi CM (if any). If the port number has a title, it will appear.

   Note: If you want to add a title or change the existing title, go to Serial port > Configuration and select the port number that you want to add or change the title. Enter the title and click Save & apply. Go back to Power Controller > Configuration > Title > Outlets and select the outlet you are configuring to continue.

4. If you are not selecting a serial port number you can modify the user access on this screen. Enter the User access Control parameters - see "User Access for Power Controller" on page 75.
5. Click Save to flash and repeat steps 2- 4 for each outlet you want to configure.
6. Click Save & apply.



Note: The screen above shows that serial port one on the Digi CM is connected to a Sun Server that is supplied power from outlets 1 and 2 on the power controller. The user Gilligan, has access to the power outlets.

7. To select the parameters for the User Access Control, click the **User Access** link. You may allow specific users access to an outlet or restrict specific users from an outlet. For more information see "User Access for Power Controller" on page 75.

User Access for Power Controller

The Digi CM can be configured to allow all users or specific users access to the power controller feature as well as restricting specific users to the power controller feature. User Access is configured on an outlet by outlet basis or the whole power controller.

Note: User Access to a serial device that is connected to the power controller in configured under Serial Port > Configuration > Port # > User Access

Configuring to Allow Specific Users Access

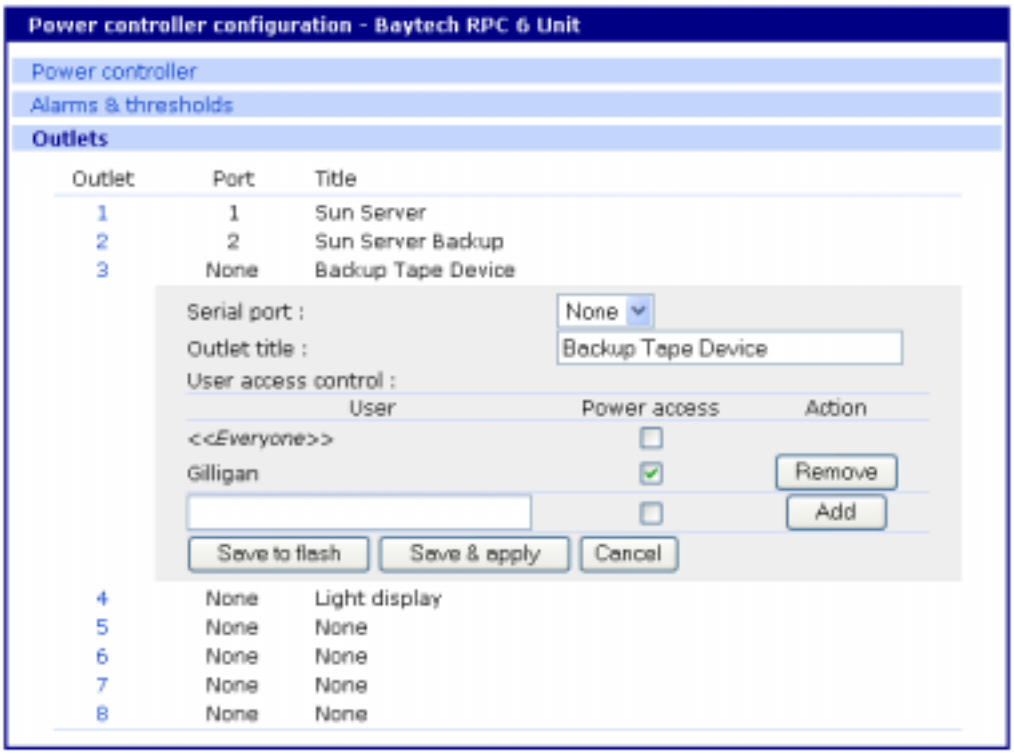
To configure the Digi CM for specific users, you must turn off everyone's access and add the specific user and their access as in the following steps.

1. Log in to the Digi CM (username root, password dbps)
2. Click **Power Controller** > **Configuration** > **Outlets** > Select the outlet # to configure.

3. Select the port to configure to the outlet. If it is a non-serial device select None.
4. Edit the outlet title. If there is a serial port, the port title will appear and cannot be edited from this screen.
5. Click Save & apply.
6. Under Everyone uncheck the Access type and click Save to flash.
7. Enter the user that will have access and check the Access type.

   Note: Port is access to the port. Monitor is access to sniff. Power is access to the power management.

8. Click Save to flash. Repeat steps 7 and 8 for additional users.
9. Click Save & apply after all users have been entered.



Note: The screen above shows outlets 1 & 2 control power to the Sun Server configured on port 1 of the Digi CM. Outlets 3 and 4 are not serial devices. Gilligan has been designated the specific user to control outlet 4.

Configuring to Restrict Specific Users

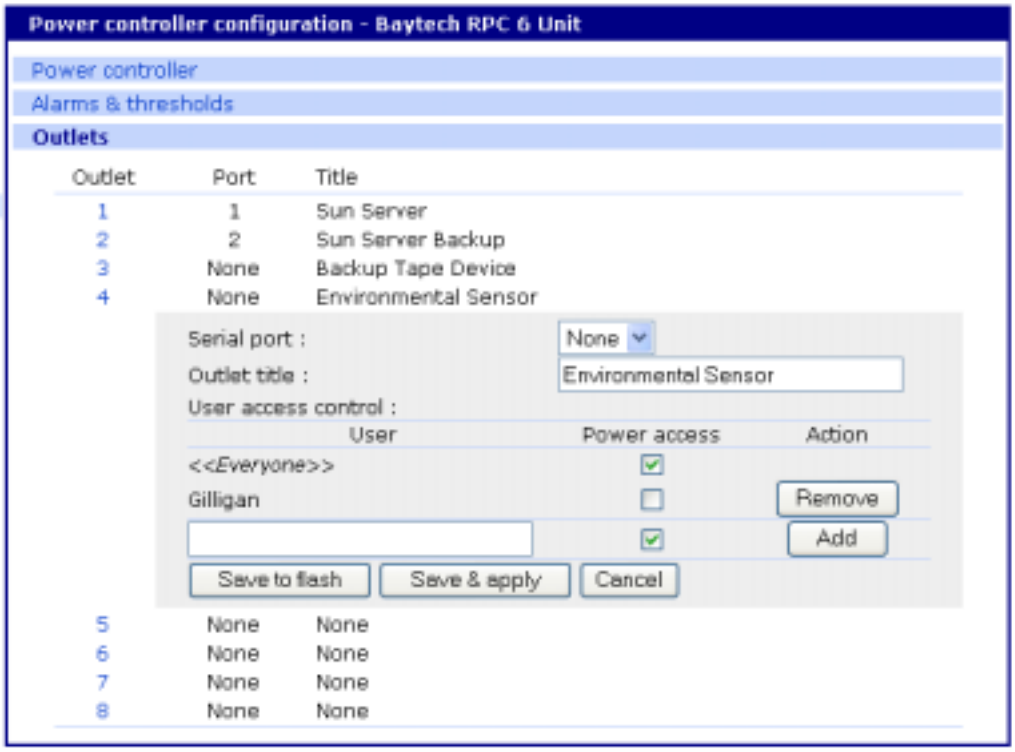
To restrict specific users, you must turn on access for Everyone and add the restricted user by turning off their access.

1. Log in to the Digi CM (username root, password dbps)
2. Click **Power Controller** > **Configuration** > **Outlets** > Select the outlet # to configure.
3. Select the port to configure to the outlet. If it is a non-serial device select None.

4. Edit the outlet title. If there is a serial port, the port title will appear and cannot be edited from this screen.
5. Click Save & apply
6. Check Everyone and click Save to flash
7. Enter the username that will NOT have access, uncheck the Access types that are restricted, and click Add.

   Note: Port is access to the port. Monitor is access to sniff. Power is access to the power management.

8. Click Save to flash and repeat steps 7 and 8 for additional users.
9. When all users have been added Click Save & apply.



Note: Gilligan does not have access to Outlet # 4.

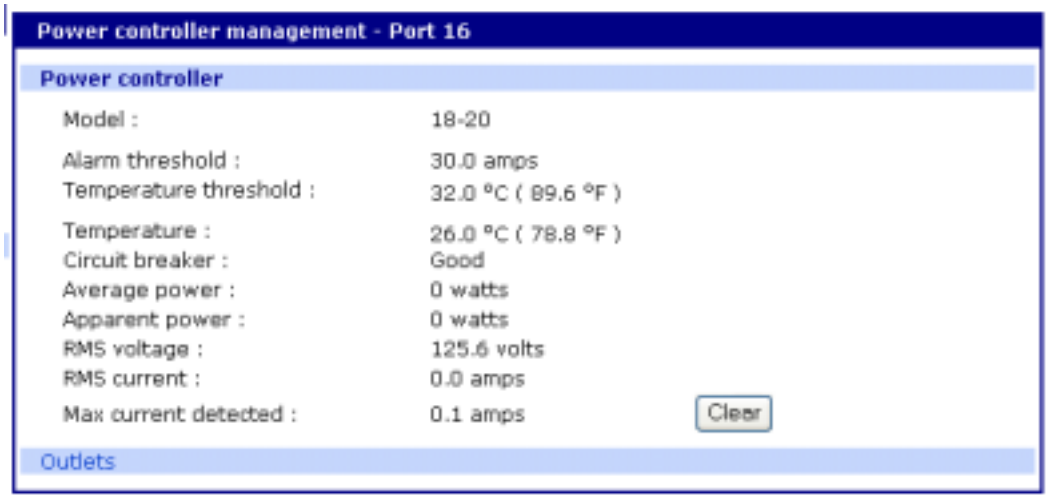
Power Controller Management

The Power Controller Management option allows the user to change outlet settings or get a quick update of the power controller status.

1. Under **Power Control** click **Management**.

The Power controller management screen gives a quick view of all the power controllers and the current status of the connection. The Port # and Manufacturer fields are a link to the specific power controller statistic page which displays information for the power controller. If the status is 'Disconnected' the links are inactive.

2. Click either the Port # or the power controller title.

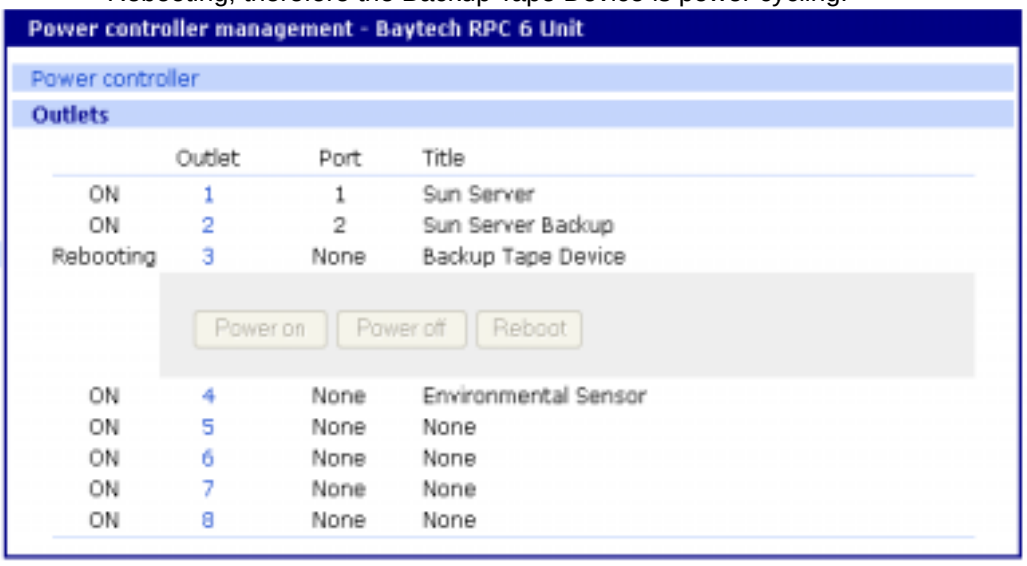


The Power controller statistics screen appears to show the Alarm threshold, Temperature threshold, Current temp, Circuit breaker condition, Average power, Apparent power, RMS voltage, RMS current, and Max current detected.

The Clear button will reset the Max current detected to 0.0 amps. From this screen click Outlets.

3. Select the outlet number that you would like to manage.

Note: The screen below shows that all the outlets are powered On and outlet 3 is Rebooting, therefore the Backup Tape Device is power cycling.



4. Click Power on, Power off, or Reboot depending on what you want the outlet to do.

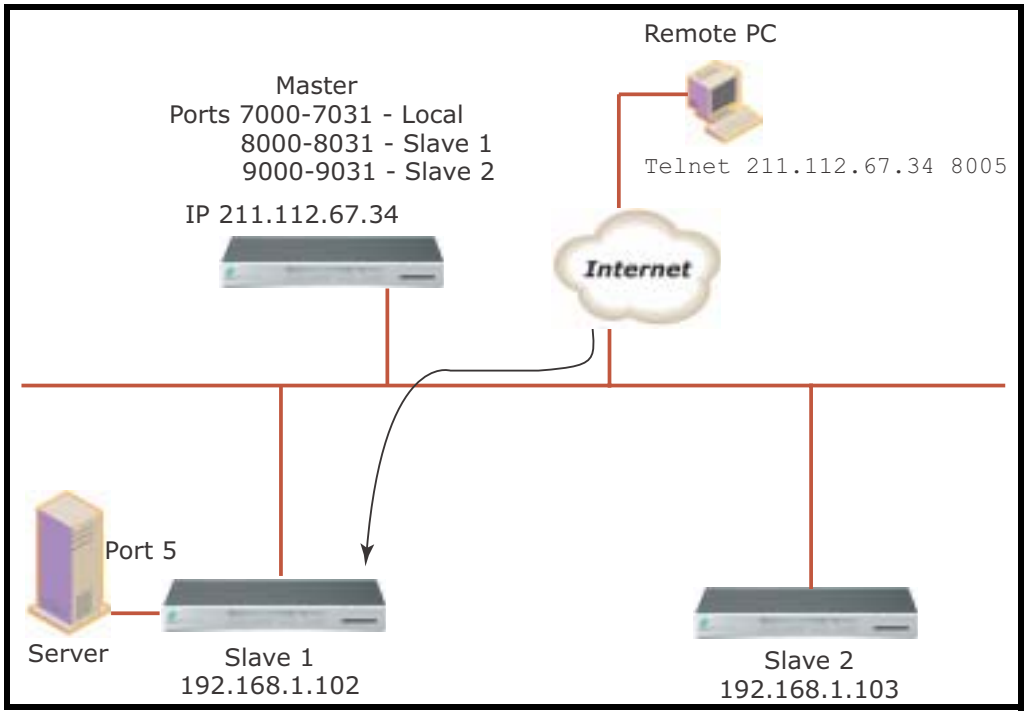
Chapter 12 Port Clustering

Introduction

Port clustering is the ability to manage many serial ports on one or multiple slave devices from one master device using a single IP address. For instance, the Digi CM can manage up to 16 slave devices or a maximum 816 serial ports with one Master device. Ports can be configured either collectively or individually depending on user preference. Each master and slave device is configured separately; they cannot be configured from one master console.

To set up the Digi CM for port clustering you will need to:

- Configure all Digi CM serial ports
- Assign one Digi CM as the master clustering device; all other Digi CMs default to slave devices.
- Import slave configuration to the Digi CM master device



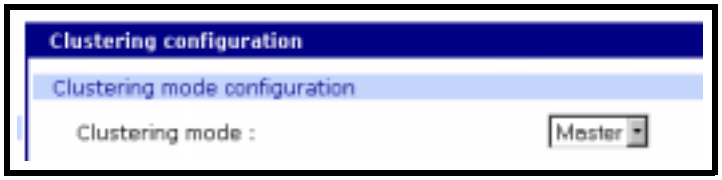
Configuring Port Clustering

Assigning Master Clustering Mode

To assign a Digi CM as the master cluster device, do the following:

1. Access the Digi CM through the web interface. This Digi CM needs to be the unit you want as the Master.
2. Under the **Clustering** heading, choose **Configuration**.
3. Choose Master from the drop down menu.

   Subsequent units will be configured in Slave mode by default.
4. Choose Save & apply.

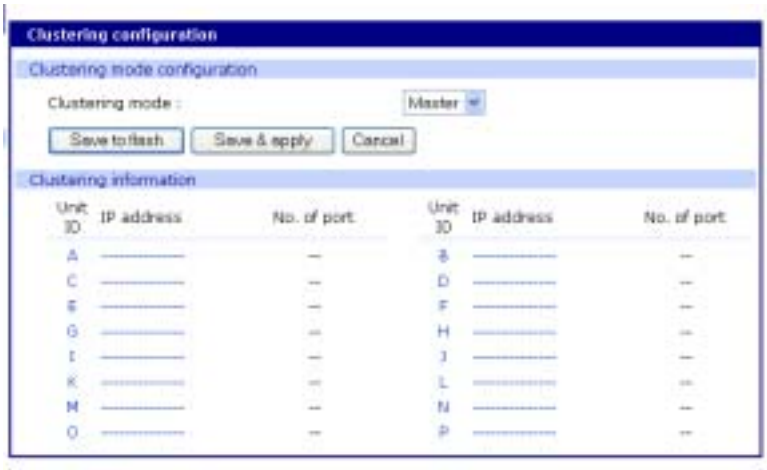


Configuring Slave Ports on the Master Unit with Auto Config

Ports on slave units are automatically enabled and set to the Telnet protocol. If you want to disable some or all of the ports or you want to use a different protocol, make these changes to the slave units before you autoconfigure the slave ports on the master unit.

To configure the slave serial ports on the master unit, do the following:

1. Access the Digi CM through the web interface.
2. Under the **Clustering** heading, choose **Configuration**.
3. Select the hyperlinked number under Unit# or the dashed line under IP address.



4. Select Enable from the Enable/Disable this unit drop down menu.

   A new configuration screen appears.

5. Enter the IP address of the slave unit in the IP address field.
6. Select the Auto Config button and the Master Digi CM automatically imports the configuration of the Slave serial ports to the Master Digi CM.

   The following figure displays serial port configuration imported from a slave unit.

7. Choose Save & apply.

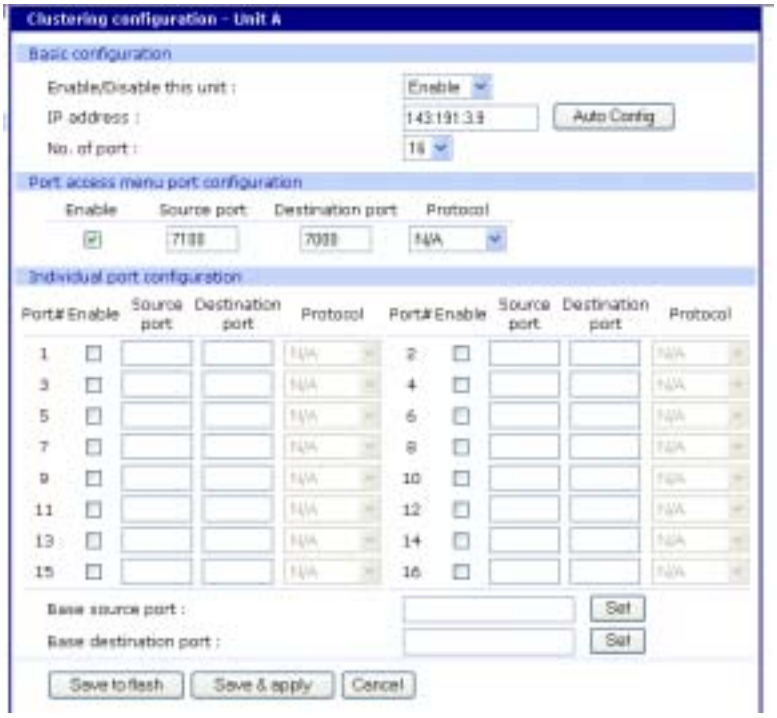
   Note: If Auto Config fails, Clear your cache (delete temporary Internet files) under Tools > Internet Options on the tool bar.

Configuring Slave Ports on the Master Unit Manually

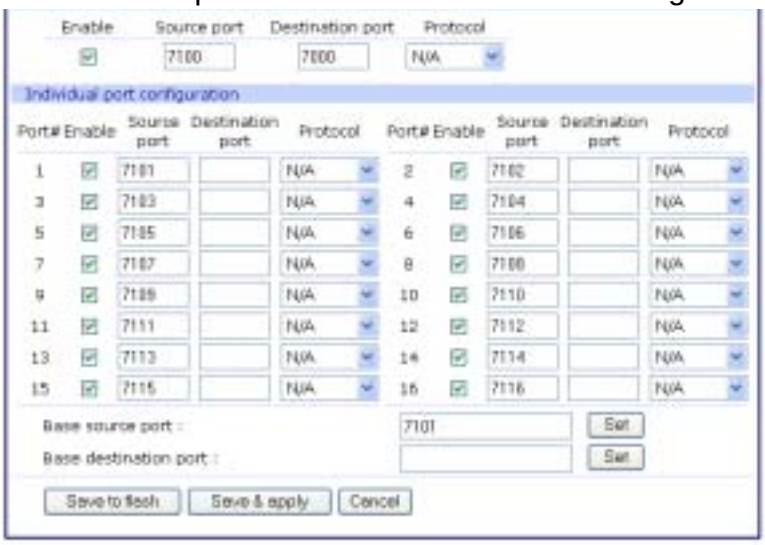
If you do not use Auto Config you may set the port numbers to any range of numbers.

1. Enter the IP address that you wish to configure.

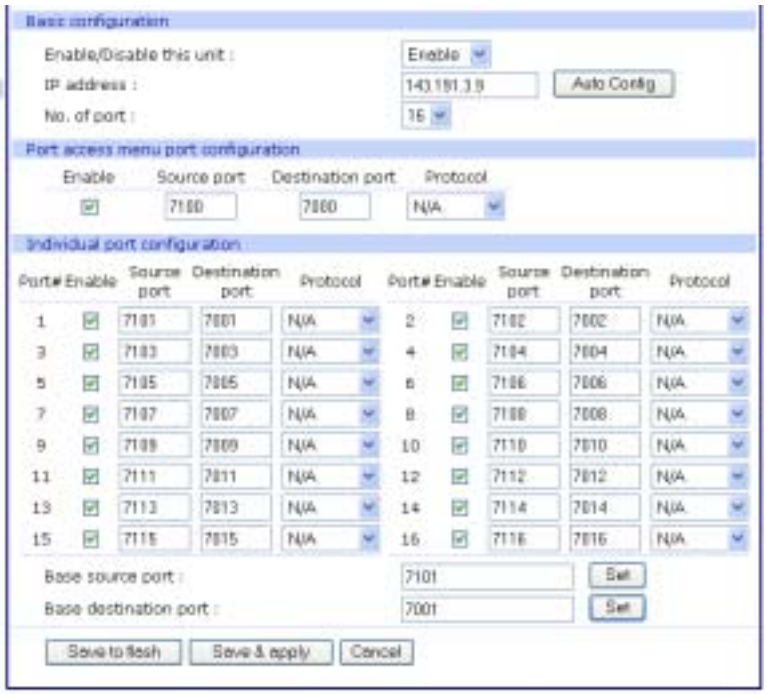
2. Select Enable from the drop down menu and enter the number of ports.
3. Enter the Port access menu Source port number (the port number to access the device.)
4. Enter the Port access menu Destination port number (the physical port number on the Slave unit for the Port access menu.)
5. Select a protocol if appropriate.
6. Click Save to flash



7. Enable all the ports you wish to use.
8. Enter the Base source port number to start the numbering and click Set.



9. Enter the Base destination port number and click Set.



Note: The Source ports and Destination ports can be understood as the Destination port number is the actual physical port number on the Slave unit and the Source port number is the extention number of the Slave unit to the Master unit. In other words, the Master device port number 7051 = Slave port device number 7001.

10. Click Save & apply.

Clustering Parameters

Below is a list and brief description of clustering parameters:

Enable - This shows whether the port is enabled or disabled. All ports are enabled by default.

Source port - This is the port number that you would access to get to the slave on the master unit. The first slave port defaults to 7050 for the port access menu and the port numbers increase according to the number of ports on the CM.

Destination port - The destination port is the corresponding port number on the slave unit. On a 32-port slave unit, the destination port numbers range from 7001 to 7032.

Protocol - The four options are N/A (not available), SSH, Telnet, and RawTCP.

Base source port -If you choose not to use AutoConfig, you can set these ports manually. Base source port is the first port number on a master unit. By default the base source port on the master unit is 7001. The base source ports extend the master's ports via the slave ports. For example, starting the base source port number with 7051 results in a 32-port unit

being numbered from 7051 to 7082. Port number 7050 is the port access menu of the slave. If you configure the device manually, the port access menu must also be configured separately.

Base destination port - The physical port numbers of the slave device.

Note: However, you can change the base source port number to another number and the rest of the ports on the unit will be sequentially numbered from the base source port.

.Accessing the Cluster Ports

You can connect to the slave port using the web, Telnet or SSH client. You can access the port access menu of each slave device or connect directly to each slave port.

— Web Access

1. Click **Clustering** > **Connection** > Port number.
2. Log in to the port
3. Enter the port escape sequence (listed on page)

— Telnet

1. Telnet to the IP and the port number of the device.

   ```
   telnet 143.191.3.9 7051
   ```

2. Login and enter your password

   ```
   root
   dbps
   ```

3. Enter the port escape sequence (listed on page).

— SSH

1. Click on the port with SSH protocol
2. Login
3. Enter the port escape sequence (listed on the page)

Depending on your access rights you can sniff (read only) or monitor (read/write), or manage power of the ports.

Chapter 13 System Administration

Introduction

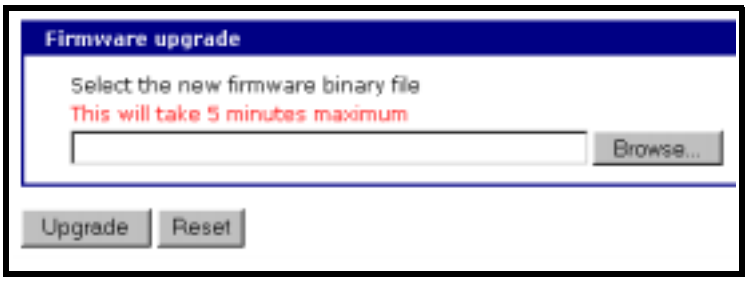
This chapter describes how to perform tasks performed either by root or the system administrator. These tasks fall under the general heading of system administration and include firmware upgrades, resetting the unit to defaults, and disaster recovery procedures.

Upgrading the Firmware

Web Interface

You will need to download the latest firmware version to a system on the same subnet as the Digi CM. The latest firmware can be downloaded from the Digi support site at: http://cm.digi.com. Do the following to upgrade the firmware:

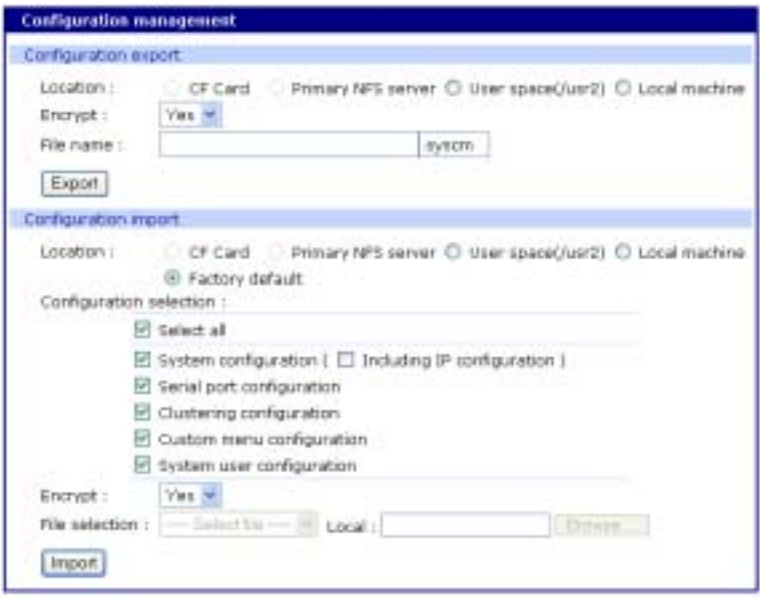
1. Access the web interface.
2. Under the System administration heading, choose Firmware upgrade.
3. Choose the Browse button and locate the firmware download.
4. Choose Upgrade. The Digi CM will automatically reboot when the upgrade is complete.



Configuration Management

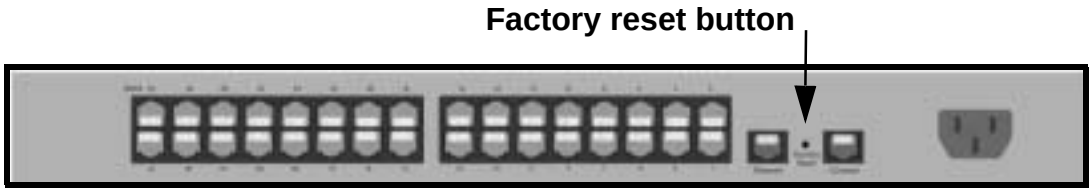
Configuration management allows you to save all or parts of your configuration. The Digi CM saves all configurations when the Save & apply button is used or the **Apply changes** link is used. These configurations are saved to the local CM in /tmp/cnf directory by default. Manage these configurations by exporting the files to your location of choice.

1. Click **System administration** > **Configuration management**. The Configuration management screen appears.
2. Under Configuration Export, select the file locations that you wish to save enter a name and click Export.



Resetting Factory Defaults

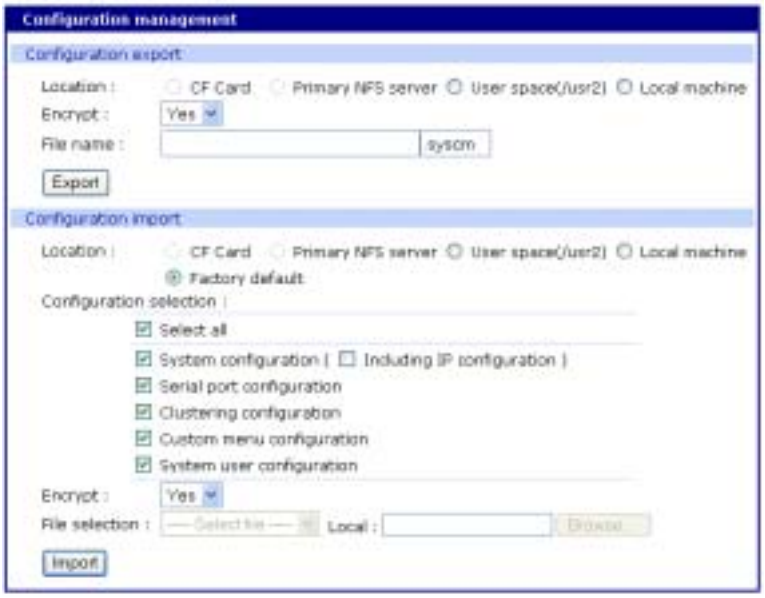
There are two ways to reset the unit to the factory defaults. The quickest and simplest method is to push and hold the hardware factory default reset button until the Ready light on the front panel goes out. The reset button is located on the back panel of the unit next to the Ethernet port. The arrow points to the reset button's location.



Digi CM 32 shown

The alternative method to reset the unit is through the web interface. The web interface provides the option of retaining the IP settings. To use the web interface to reset the Digi CM, do the following:

1. Access the web interface.
2. **System administration** > **Configuration mangagement**
3. Under Configuration import select Factory default.



4. Select the Configuration factory default you want to restore.
5. Click Import. The Digi CM will automatically reboot.

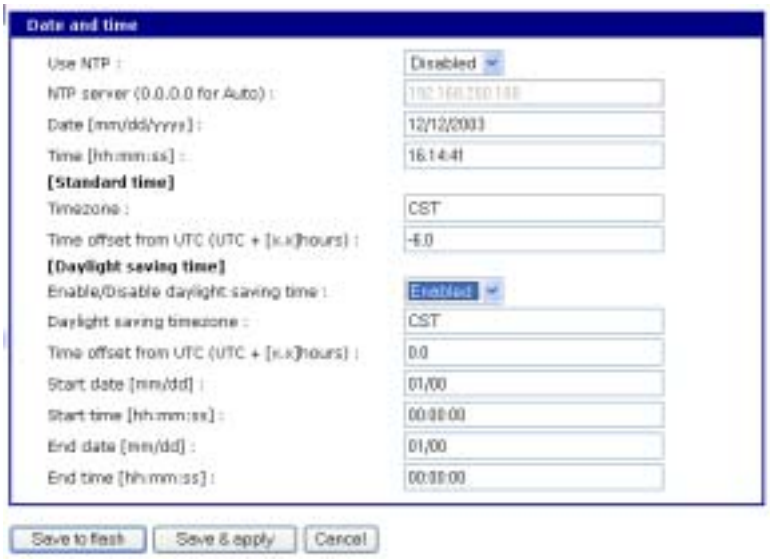
The following are the default values when the Digi CM is reset to the factory defaults.

- Static IP Address: 192.168.161.5
- Port Access Menu IP Address: 192.168.1.100
- Port Access Menu TCP Port Number: 7000
- Serial Port IP Address: 192.168.1.101-
- Serial Port TCP Port Number: 7001-

Setting Date and Time

The Digi CM provides two options for keeping system time. The first is by using an NTP server and the other is through an internal battery backup. To configure the Digi CM for date and time, do the following:

1. Access the web interface.
2. **System administration** > **Date and time**.



3. To use an NTP server, choose Enable, the NTP server's IP address, the Time offset, and the Date and Time fields.
   or
   To use the internal battery, fill in the Date and Time fields only.

   Note: If you change your time zone, you must go back and reconfigure your time for the time zone change to be effective.

4. Choose Save & apply.

Configuring a Host Name

The system administrator can assign a Host name to the Digi CM. This is often helpful for administration purposes to locate a specific Digi CM on the network. To assign the Digi CM a device name, do the following:

1. Access the web interface.
2. **System administration** > **Device name**.
3. Enter the name you want to assign the Digi CM.
4. Choose Save & apply.

Administering Users

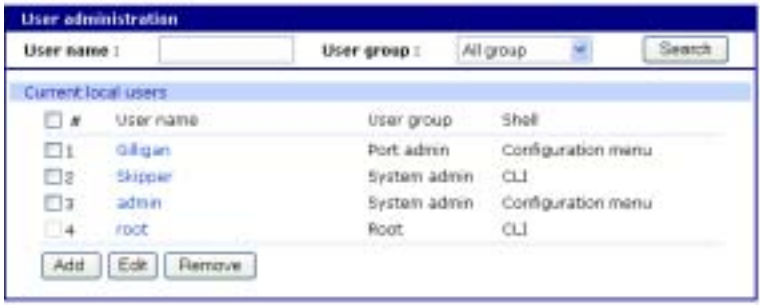
Required Privileges

Only root and admin can administer users. The root user has unlimited user administration privileges. Admin can view and change all attributes except those that belong to the root user.

Procedure

1. Access the web interface.
2. Under **System administration**, choose **Users administration**.

   The following screen appears.



3. Do one of the following:

To...	Do the Following...
Add a user	A. Click **Add**. B. Fill in the user attribute fields. See the table that follows for information on attribute fields. C. Click **Add**.
Edit a user	A. Click on the user name. B. Fill in the user attribute fields. See the table that follows for information on attribute fields. C. Click **Submit**.
Remove a user	A. Check the box that corresponds to the user you want to remove. B. Click **Remove**. C. Choose **OK** at the prompt.

4. Click **Apply changes**.

User Fields

Field	Description
User name	Name for the user, which must be between 3 and 29 characters and cannot include colons (:), less than or greater than signs (< >), ampersand (&), spaces, or quotation marks. The at sign @ and period . are acceptable.

User Fields

Field	Description
Select group	Group to which the user is assigned. Groups include Root, System Admin, Port Admin and User. See "User Groups" on page 10 for more information
Password	Password to assign to the user. This must conform to the rules stipulated above for a user name.
Confirm password	Confirms the password.
Shell program	Interface presented to the user when he/she logs on to the system from a Telnet or SSH connection.
SSH public key authentication	Alternative method of identifying yourself to a login server. More secure than just a password.
SSH public key to use	Current public file key or create a new public file key
Select new SSH public key version	SSH1 only supports one type of key SSH2 supports both RSA and DSA key types
Select new SSH public key file	Location for the SSH public key file

Chapter 14 Command Line Interface

Introduction

The Digi CM runs the embedded Hard Hat Linux operating system. The command line interface for configuration purposes is accessible only by the root user. The system administrator has read only privileges from the command line. By default the root user is connected to the CLI (command line interface) when accessing the Digi CM through Telnet or SSH. To gain access to the command prompt, the root user uses the username **root** and the root password. The default root password is **dbps**.

This chapter includes the Linux commands available on the embedded Linux operating system and the location of files useful to the root user for administrative purposes.

Note: The root user should be aware that deleting or corrupting files may prevent the Digi CM from booting properly. Before editing any files, be sure to back up your configuration files.

Linux Commands

The purpose of this section is to list the various Linux commands available on the Digi CM. This is simply a listing of commands and does not detail what the commands do or give their particular parameters. If you need more information, see the man pages on a Linux system.

Two commands that are very important for saving and applying changes to the configuration files are:

- `saveconf`: The saveconf command saves the configuration files to flash memory.
- `applyconf`: The applyconf command immediately applies the configuration changes.

The configuration files are located in /tmp/cnf directory.

Two system utility menus that are important for configuring the Digi CM and the serial ports are the `portaccessmenu` and `configmenu.`

- `portaccessmenu`: This menu allows the user to configure the serial ports on a Digi CM.
- `configmenu`: This menu enables the system administrator to configure the Digi CM. It has essentially the same functionality as the web interface for configuring a unit with the exception of the ability to create custom menus.

Shell and Shell Utilities				
sh	ash	bash	echo	sed
env	false	grep	more	which
pwd				

File and Disk Utilities				
ls	cp	mv	rm	mkdir
rmdir	ln	mknod	chmod	touch
sync	gunzip	gzip	zcat	tar
dd	df	du	find	cat
vi	tail	mkdosfs	mke2fs	e2fsck
fsck	mount	umount	scp	

System Utilities				
date	free	hostname	sleep	stty
uname	reset	insmod	rmmod	lsmod
modprobe	kill	killall	ps	half
shutdown	poweroff	reboot	telnet	init
useradd	userdel	usermod	whoami	who
id	su			

Network Utilities				
ifconfig	iptables	route	telnet	ftp
ssh	ping			

Important File Locations

The Digi CM has several files that are important for administrative use. Below is a brief listing of some files that the root user or system administrator might desire to either monitor or edit.

Default Script

The default script file is executed whenever the Digi CM is booted. The file is /usr/rc.user and can be modified with the vi editor. The modified script becomes effective when the system is rebooted.

Booting Sequence

When the Digi CM boots, it decompresses the /cnf/cnf.tar.gz file to /tmp/cnf/* and unmounts the /cnf file. If the configuration files are modified in the /tmp/cnf

file and the configuration is saved to flash (saveconf), the unit mounts the /cnf file and compresses the /tmp/cnf/* to /cnf/cnf.tar.gz.

Config Files

All config files are in /tmp/cnf and /tmp/cnf subdirectories. The following table lists the filenames and a brief description.

File Name	Description
chap-secrets	Chap authentication information when using “PPPoE”
client.pem	Web certificate
./cluster/cluster.conf	Cluster “Master” port information
./cluster/unit#.conf	Cluster “Slave” port infomation
./digi/digi.cnf	Auto Backup configuration via the PC Flash Card stored automatically (time?)
ez-ipupdate.conf	“Dynamic DNS” information for IP assigning
group	User group information
host.cnf	Host name look up order
hosts	Host name table
interfaces	Basic loopback (lo) and ethernet interface (eth0) information (IP, gateway, etc)
./keywords	Keywords for alert configuration
./menu	All custom menu information, .xml files
pap-secrets	PAP auth via PPPoE
passwd	User password file
./power/power.cnf	Power management configuration
pppoe.conf	Config file for PPPoE
redirect.cnf	Basic port and portaccessmenu config information?
resolv.conf	DNS information
server.pem	Private key for SSH with key certification information
shadow	Secure password file
snmpd.conf	SNMP information
system.cnf	Basic network config information (IP, gateway, etc)
timezone	Time zone configuration
version	Firmware version

User Storage Space

The Digi CM comes with 1 megabyte of user storage space. This storage space can be used to store custom scripts. The location is /usr2. Custom scripts such as simple commands, are simply dropped into /usr2. If a file needs to be edited, copy the file into usr2/rc.usr, kill the process, then restart the process from the new file. Scripts from the user storage may be created to run during boot after the network is up. The following are some examples of various ways to create a script stored in the user storage space.

- Saving IP tables options permanently
- Changing radius socket ports
- Limiting root access to the console on Digi CM products
- Sending a break

Example Script: Saving IP tables options permanently

Add the following command in the '/usr2/rc.user' script file just above "exit 0". Disabling telnet is just shown as one example.

1. Create a new script file '/usr2/run.user' which includes the commands you want.

   ```
   iptables -A INPUT -p tcp --dport 23 -j DROP
   ```

2. Run the following command to make the script executable

   ```
   chmod 755 /usr2/run.user
   ```

3. Add the following command in the '/usr2/rc.user' script, just above "exit 0"

   ```
   ln -s /usr2/run.user /etc/rc.d/rc2.d/S60runuser
   ```

4. Reboot

   ```
   reboot
   ```

   Note: If you factory default the unit, the '/usr2/rc.user' script file is moved to '/usr2/rc.user.old#' and the default rc.user file will be restored.

Example Script: Changing radius socket ports

The radius client obtains the radius socket ports to use via the '/etc/services' file. The client only looks up the lines starting with 'radius' and 'radacct'.

1. Modify the /etc/services file as follows. Change lines starting with 'radius' and 'radacct' to the socket numbers you wish. For example:

   ```
   radius 1645/tcp
   radius 1645/ucp
   radacct 1646/tcp
   radacct 1646/ucp
   ```

2. After editing /etc/services copy it to /usr2

   ```
   cp /etc/services /usr2
   ```

3. Edit /usr2/rc.user and add the following line just above "exit 0":

   ```
   cp -a /usr2/services /etc/services
   ```

4. Reboot

   ```
   reboot
   ```

   Note: If you factory default the unit, the '/usr2/rc.user' script file is moved to '/usr2/

rc.user.old#' and the default rc.user file will be restored.

Example Script: Limiting root access to the console on Digi CM products (for SSH only)

This prevents root access from any means except physically logging in on the Digi CM console.

1. Modify '/etc/inetd.conf' and append *-f /usr2/sshd_config* to the sshd line.

   ```
   cp /etc/inetd.conf /usr2/inetd.conf
   ```

2. Edit '/etc/ssh/sshd_config'. Change "PermitRootLogin" to *no*.

   ```
   cp /etc/ssh/sshd_config /usr2
   ```

3. Add the following commands in the '/usr2/rc.user' script. Add these commands just above "exit 0":

   ```
   cp -a /usr2/inetd.conf /etc/inetd.conf
   while killall inetd 2>/dev/null;
   do sleep 5;
   done
   /usr/sbin/inetd
   ```

4. Reboot

   ```
   reboot
   ```

   Note: If you factory default the unit, the '/usr2/rc.user' script file is moved to '/usr2/rc.user.old#' and the default rc.user file will be restored.

Example Script: Sending a break from an existing session with the Digi CM.

From a telnet session - If the telnet was initiated from a unix command line telnet client. Issuing the telnet escape sequence '^]' (control-right_square_bracket) will take you to the 'telnet>' prompt.

```
telnet>send brk
```

Note: Other telnet clients often have a "send break" option.

From an ssh session - Type the [tilde-break] which is the default ssh break characters.

```
~break
```

The ssh break can changed from the Web UI or config menu under **Serial ports** > **Configuration** > **Host mode configuration** > SSH break sequence

Additional binaries or applications can be added to /usr2 such as:

- crontab
- netstat
- fuser

To download these utilities go to: http://ftp.digi.com/support/utilities/digicm/

Adding Users

Add or edit users from the command line by accessing the Digi CM and log in.

1. Enter the useradd command:

   ```
   useradd -d /tmp -g 502 -s /bin/editconf -p test1 test1
   ```

2. Enter the user information within the parameters available.

3. Continue with additional configurations.

Chapter 15

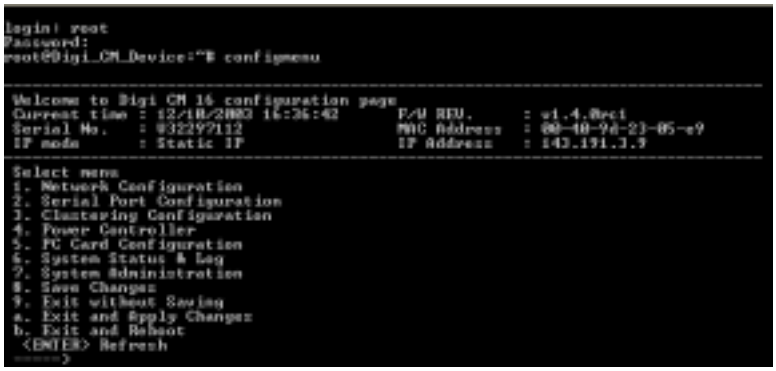
Configuration Menu

The configuration menu presents the same functionality in configuring the Digi CM as does the web interface, excluding the creation of custom menus. The configuration menu is navigated by using the number representing the menu item and the ESC key to return to earlier menus. Telnet to the Digi CM, log in (username `root`, password `dbps`) and enter `configmenu` to start any configuration. If you log in as admin, the configuration menu will automatically appear.

Accessing the Configuration Menu

The configuration menu is available through a Telnet or SSH session to the root user, system administrator, or port administrator. (Port administrator can only change serial port parameters.) The configuration menu enables the authorized users to configure the Digi CM with the same functionality as is available with the web interface. The only functionality missing from the configuration menu is the ability to create custom menus.

The root user, by default, is connected from a Telnet session to the Linux command line. In order to access the configuration menu, the root user enters `configmenu` at the command prompt. The configuration menu follows the layout of the web interface.



Choices for the configuration menu are made by selecting the number of a menu item. The ESC key allows the user to move back a menu each time it is selected. Sometimes only one menu item is presented; however, that single menu item has two or more options that have to be configured.

Configuring SSH

1. Choose Serial Port Configuration and then an individual port number or 0 (zero) for all ports.
2. Choose Host mode configuration > Protocol > SSH.

The Save changes option saves changes to flash memory only.

3. Use the ESC key to return to the main configuration menu.
4. Choose Exit and apply changes.

Choose Exit and apply changes when you have made all your changes.

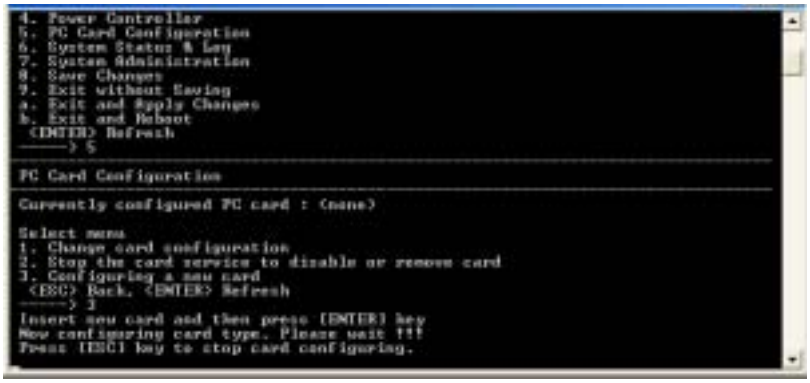
Adding, Editing, and Removing Users

1. Choose System administration > User administration and then choose an operation to perform (Add, Remove, or Edit)
2. Configure the user as required.
3. Use the ESC key to return to the main configuration menu.
4. Choose Exit and apply changes.

Adding and Configuring a PC Card

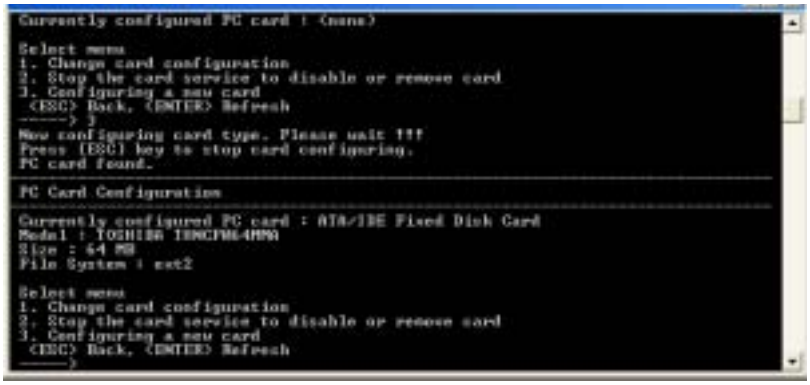
To add a modem card, compact-flash card, wireless LAN card, or a network card to the Digi CM using the configuration menu, do the following:

1. Access the configuration menu.
2. Choose PC Card configuration



3. Configure the card by choosing Change card configuration.

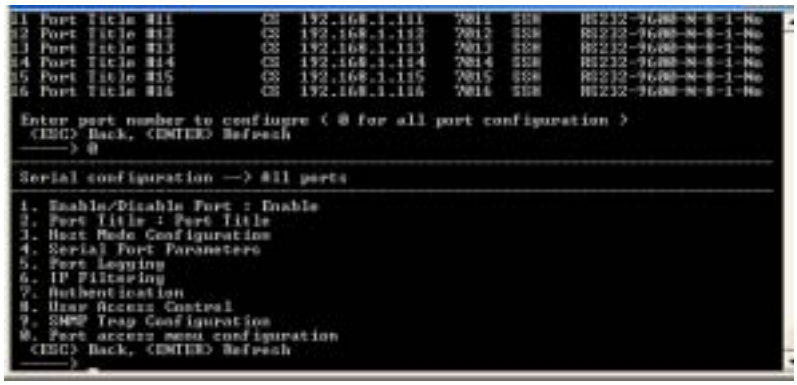
Note: The system searches for the card and displays information on the product model number and type of card.



4. Use the ESC key to back out to the main configuration menu.
5. Choose Save Changes.

Host Mode Configuration

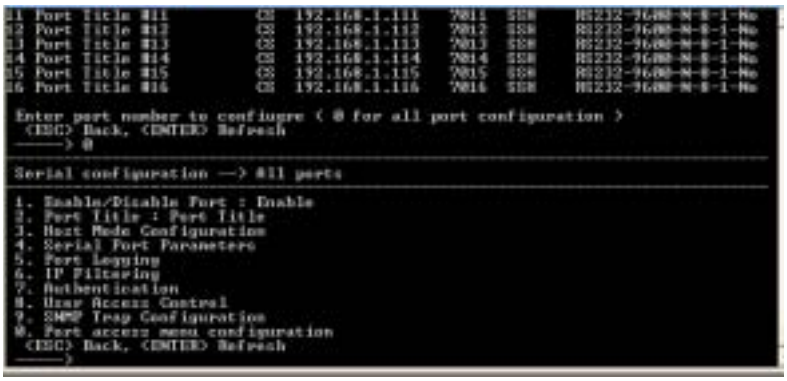
1. Access the configuration menu.
2. Choose Serial Port Configuration > an individual port number or 0 (zero) for all ports > Host Mode Configuration.



3. Enter the desired parameters for each menu item.
4. Use the ESC key when all parameters are entered to return to the main menu.
5. Choose Save changes.

Port Parameters

1. Access the configuration menu.
2. Choose Serial Port Configuration > an individual port number or 0 (zero) for all ports.

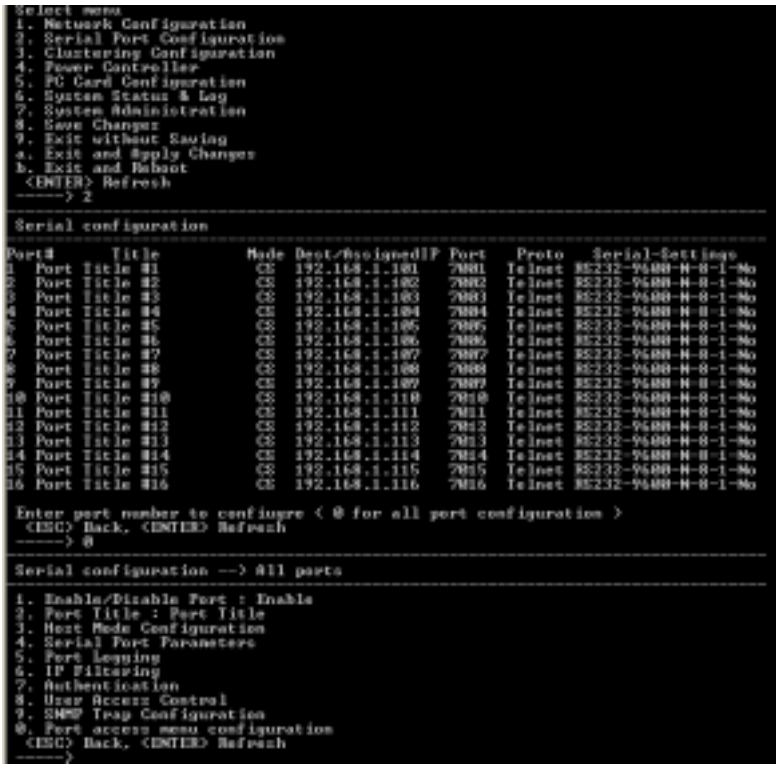


3. Enter the desired parameters for each menu item.
4. Use the ESC key when all parameters are entered to return to the main menu.
5. Choose Save changes.

Port Access Menu

Another default menu is the Port Access Menu, which is available to all users.

1. Access Configuration menu
2. Select Serial Port Configuration.
3. Select a port number or 0 for all ports.
4. Select Port access menu configuration..



Users access this menu through a Telnet or SSH session using the IP address of the Digi CM followed by the port number 7000 as in the following example:

```
telnet 192.168.100.200 7000
```

By default root is connected to the command line interface and the preceding option allows the root user access to the port access menu.

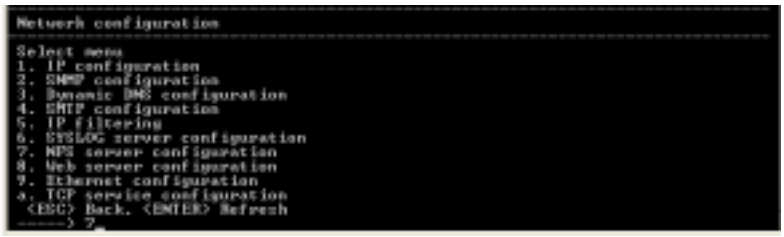
System Logging

System logging is a two part process. First, the device being used to record the system logs must be configured. Secondly, system logging must be configured for the system under System status and log. System logs can be saved to the Digi CM system memory (there is no need to configure the memory), a compact-flash card, an NFS server, or a Syslog server.

Configure the System Log Device

To configure the compact-flash card for system logging, see "Adding a Compact-flash Card" on page 25. Adding a Compact-flash Card For an NFS or Syslog server, do the following:

1. Access the configuration menu.
2. Choose Network configuration > NFS or SYSLOG server configuration.



3. Disable or enable the server.
4. Use the ESC key when all parameters are entered to return to the main menu.
5. Choose Save changes.

Configure System Logging

1. Access the configuration menu.
2. Choose System Status & log > System logging.

1. Enter the desired parameters for the menu items.
2. Use the ESC key when all parameters are entered to return to the main

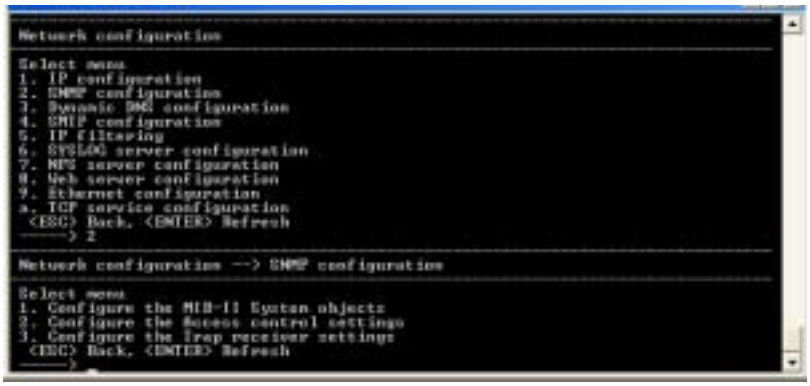
menu.

3. Choose Save changes.

Configuring SNMP

To configure SNMP from the configuration menu, do the following:

1. Access the configuration menu.
2. Choose Network Configuration > SNMP configuration.



3. Enter the desired parameters for the menu items.
4. Use the ESC key when all parameters are entered to return to the main menu.
5. Choose Save changes.

Configuring SMTP

To configure SMTP from the configuration menu, do the following:

1. Access the configuration menu.
2. Choose Network configuration > SMTP configuration.

3. Enter the desired parameters for the menu items.
4. Use the ESC key when all parameters are entered to return to the main menu.
5. Choose Save changes.

Network IP Filtering

To configure the Digi CM for Network IP filtering, do the following:

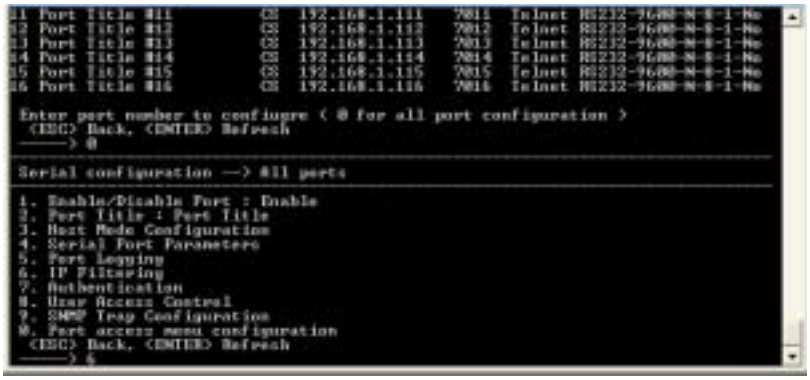
1. Access the configuration menu.
2. Choose Network configuration > IP filtering.

3. Choose a menu item and enter the desired parameters for the menu items.
4. Use the ESC key to return to the main menu.
5. Choose Save changes.

Port IP Filtering

To configure the Digi CM for Port IP filtering, do the following:

1. Access the configuration menu.
2. Choose Serial port configuration.
3. Choose an individual port number or 0 (zero) for all ports > IP filtering.



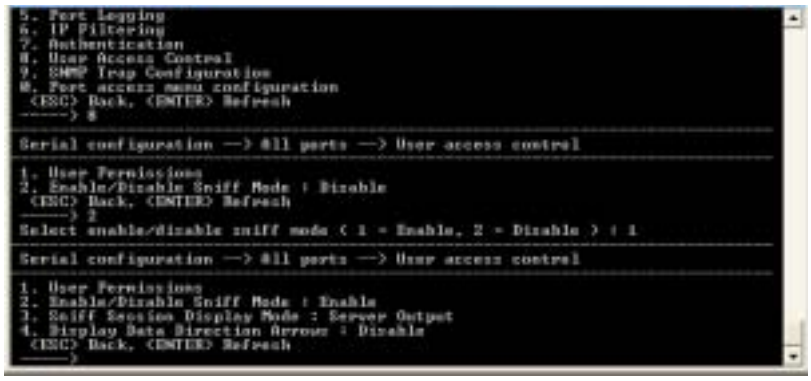
4. Choose a menu item and enter the desired parameters for the menu items.
5. Use the ESC key when all parameters are entered to return to the main menu.
6. Choose Save changes.

Sniff Sessions

To configure a port or all ports for sniff users, do the following:

1. Access the configuration menu.
2. Choose Serial port configuration.

3. Choose an individual port number or 0 (zero) for all ports > User access control.
4. Choose User Access Control.
5. Choose Enable/Disable Sniff Mode.



6. Choose a menu item and enter the desired parameters.
7. Use the ESC key when all parameters are entered to return to the main menu.
8. Choose Save changes.

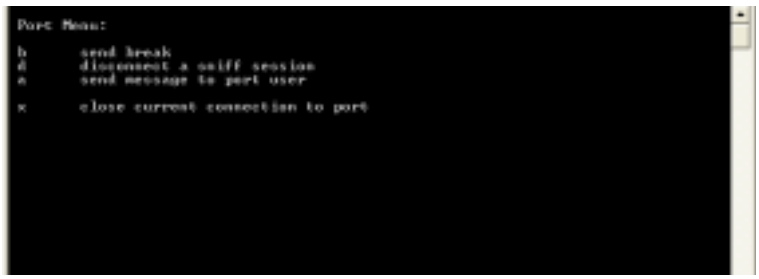
For information on entering a sniff session, see the next section, "Viewing A Sniff Session" on page 104.

Viewing A Sniff Session

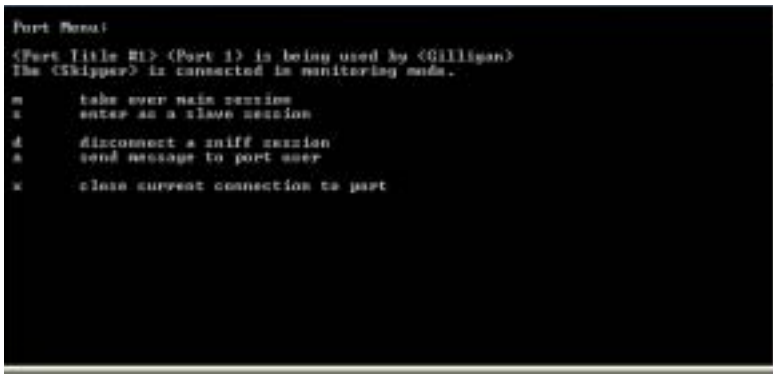
A sniff user enters a sniff session by starting a Telnet session on a specified port. In the following example, a sniff user Telnets to port 7 of a Digi CM. From the command prompt enter the following command:

```
telnet 192.168.100.42 7007
```

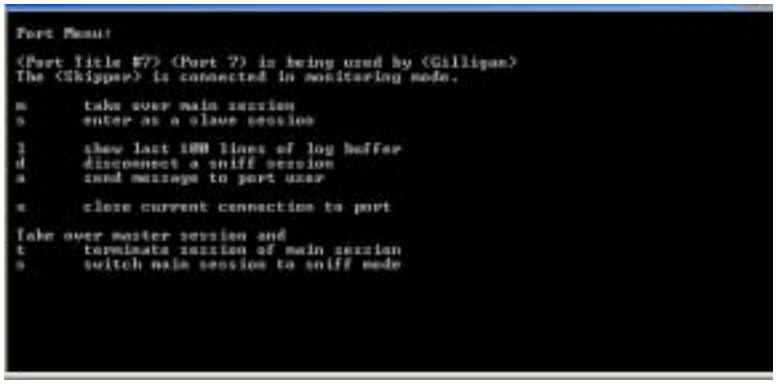
1. Log in and enter your password
2. Enter the port escape sequence.



When sniff users login to a port from a Telnet session, a sniff session menu is displayed with the user's permitted options. The first user (with port access rights) to login to the port is in the main session.



The next user (with port access rights) to enter the port will be given the option to take over the main session. The user is given the option to take over the main session by either terminating the first user or switching the user to sniff (read only).

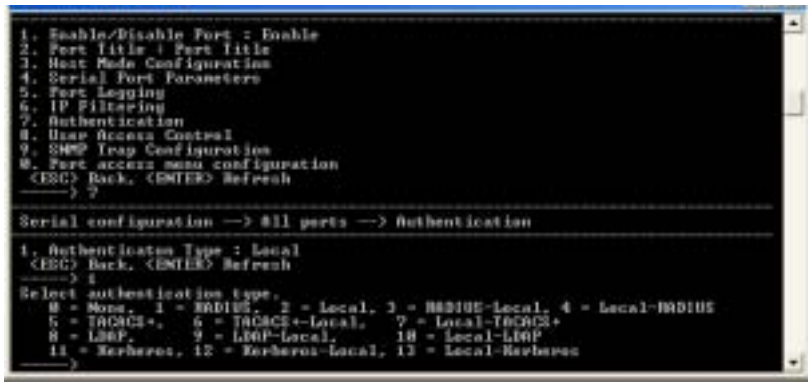


Field Descriptions for Sniff Sessions

Escape Sequence Ctrl+	Description of Action	Occurrence
m	take over main session (read/write)	only presented to users with read/write access upon entering a session
s	enter as a slave session (read only)	only presented to users with read/write access upon entering a session
b	send break	not functional for sniff users
l	show last 100 lines of log buffer	must enable logging for this option
d	disconnect a sniff session	only functional to admin
a	send message to port user(s)	not available to sniff users
r	reboot device using power-switch	only if power management is available on this port
p	power device on/off	(show only on or off) only if power management is available on this port
x	close current connection to port	closes the sniff session connection

Authentication

1. Access the configuration menu.
2. Choose Serial port configuration.
3. Choose an individual port number or 0 (zero) for all ports > Authentication.
4. Choose Authentication type.



5. Use the ESC key to return to the main menu.
6. Choose Save changes.

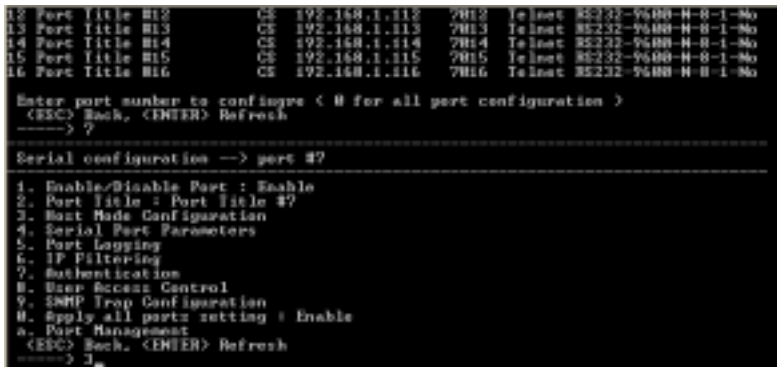
Dial-in Modem Access

Individual serial ports on the Digi CM can be configured for dial-in modem access. To use dial-in modem mode, an external modem is first attached to a serial port and then the serial port is configured for dial-in modem access. In

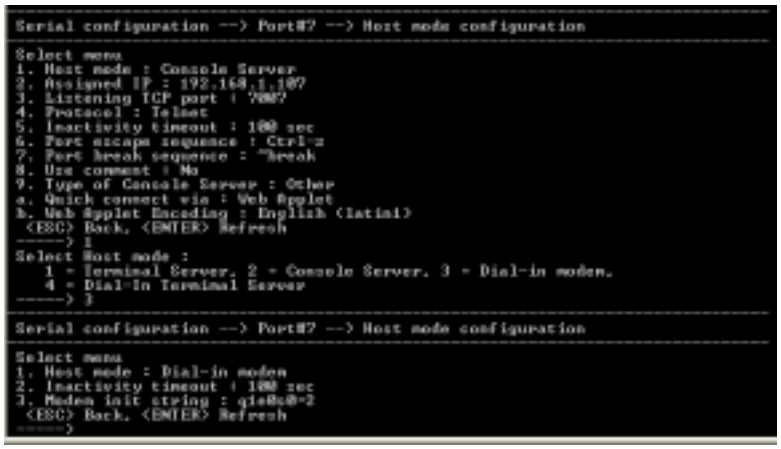
the illustration below, port 7 is configured for a dial-in modem.

To configure a serial port for a dial-in modem, do the following:

1. Access the configuration menu.
2. Choose Serial Port Configuration.
3. Choose an individual port number and then Host Mode Configuration.



4. Select Dial-in modem.



5. Use the ESC key to return to the main menu.
6. Choose Save changes.

Dial-in Terminal Server Access

Individual serial ports on the Digi CM can be configured for a dial-in terminal server access. To use dial-in terminal server access, an external modem is first attached to a serial port on the Digi CM and then the serial port is configured for dial-in terminal server mode. In the illustration below, port 7 is configured for dial-in terminal server mode.

In terminal server mode, the user is connected directly to a server.

To configure a serial port for a dial-in terminal server, do the following:

1. Access the configuration menu.
2. Choose Serial port configuration.
3. Choose an individual port number and then Host Mode Configuration.

4. Choose Terminal Server and configure the other configuration parameters.
5. Use the ESC key to return to the main menu.
6. Choose Save changes.

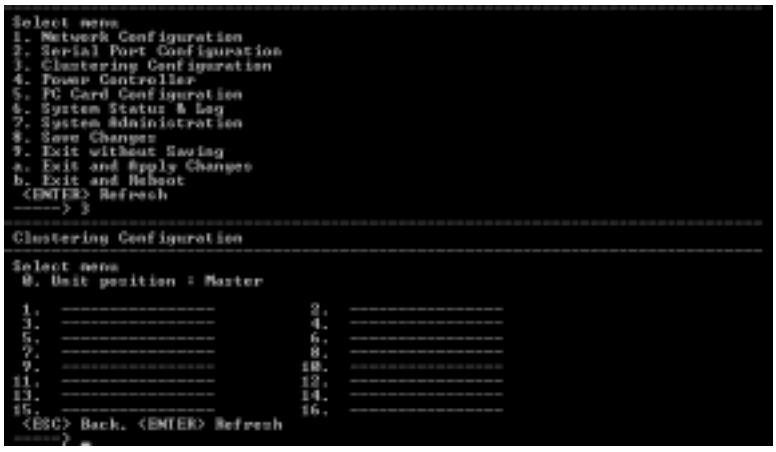
Clustering

By default clustered slave devices are configured using the Telnet protocol and port parameters of the following: bps=9600, data bits=8, parity=none, stop bits=1, flow control=none. When the master device autoconfigures a slave device, it simply imports the information from the slave unit. If you want other protocols or other port parameters, you should configure your slave unit first with those parameters before autoconfiguring.

Before you start this configuration procedure, the slave units should already be configured unless you want them set to the default values. To set up the Digi CM for clustering, do the following:

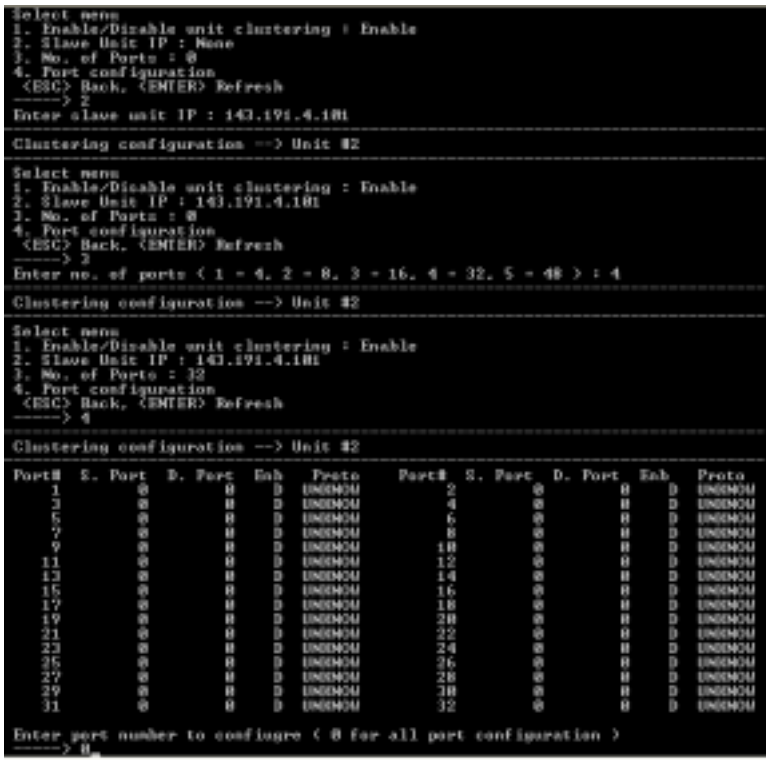
1. Access the configuration menu.
2. Choose Clustering configuration > Unit position.
3. Assign the unit as the master device.

   A new screen is displayed.



4. Enter the number 1 for the first slave unit.
5. Choose Enable/Disable unit clustering > Enable.

6. Enter the values for Slave Unit IP, No. of ports, and Port configuration.



7. Select the port number to configure or 0 for all ports.
8. Select Enable configuration
9. Select Auto Configuration
10. Choose Exit and apply changes.

Firmware Upgrade

Before upgrading firmware from the configuration menu you should have:

- Downloaded the firmware to a system on the same subnet
- Set up a terminal emulation program that supports Zmodem transfer protocol

To upgrade the firmware with the configuration menu, do the following:

1. Access the configuration menu.
2. Choose System administration.

3. Choose Firmware upgrade. Enter y for Yes when asked if you want to upgrade the firmware.

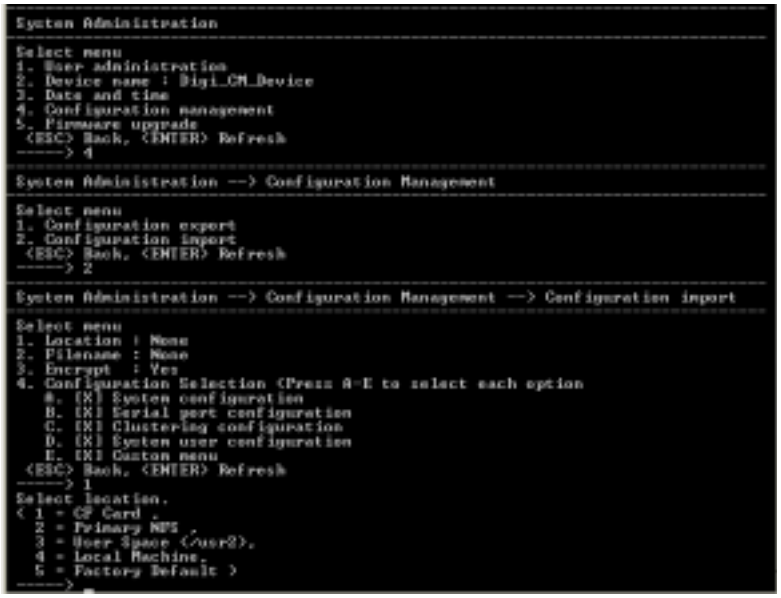
If the firmware upgrade is successful, the Digi CM will reboot automatically. If a **Firmware upgrade failed!** warning appears, do not reboot the unit but repeat

the upgrade process.

Restoring Factory Defaults

You have two choices to restore the unit to its factory defaults. The options are restoring all factory defaults or restoring all factory defaults except IP settings. To restore your unit to the factory defaults, do the following:

1. Access the configuration menu.
2. Choose System administration.
3. Select Configuration import.
4. Select Location



5. Select Factory Default.

The system will restore factory defaults, and the unit will automatically reboot.

Note: Use System Administration to save your configuration in case you need to reload it later or onto another system. See "Adding and Configuring a PC Card" on page 98 for more information.

Setting Date and Time

Date and time on the Digi CM can either be kept internally or by an NTP server. To set the parameters for date and time on the Digi CM, do the following:

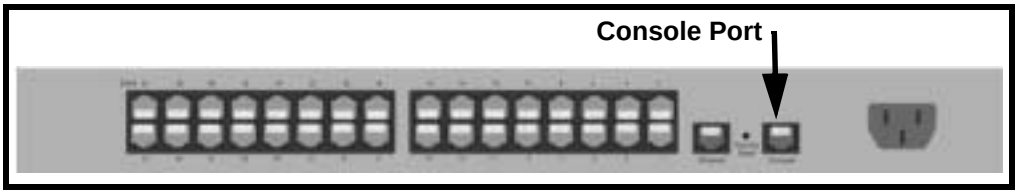
1. Access the configuration menu.
2. Choose System administration.
3. Choose Date and Time.
4. Enter the desired parameters.
5. Choose Save changes.

Accessing the Boot Loader Program

The Boot Loader program can be accessed during the boot process. The main function of the program is to provide a backup means for restoring the firmware if the Digi CM will no longer boot. It also provides a hardware testing module that detects and tests hardware components on the unit.

To access the Boot Loader program, do the following:

1. Connect the Ethernet cable from the console port on the rear panel of the Digi CM to a serial port on a workstation. Use the Ethernet cable packaged with the Digi CM and attach the DB-9 adapter. The arrow in the following graphic points to the Console Port.



back of Digi CM 32 shown

2. Set up a terminal emulation program, such as HyperTerminal, using the following port parameters: bps=9600, data bits=8, parity=none, stop bits=1, and flow control=none.
3. Turn the power on to the unit.
4. Press ESC within 3 seconds of booting the unit to get Boot Loader menu.

Hardware Test Menu

The Boot Loader program provides a hardware test for detecting and testing hardware components on the Digi CM. From the Boot Loader menu, choose the number 3 to access the Hardware test. Options for several components appear.

Disaster Recovery

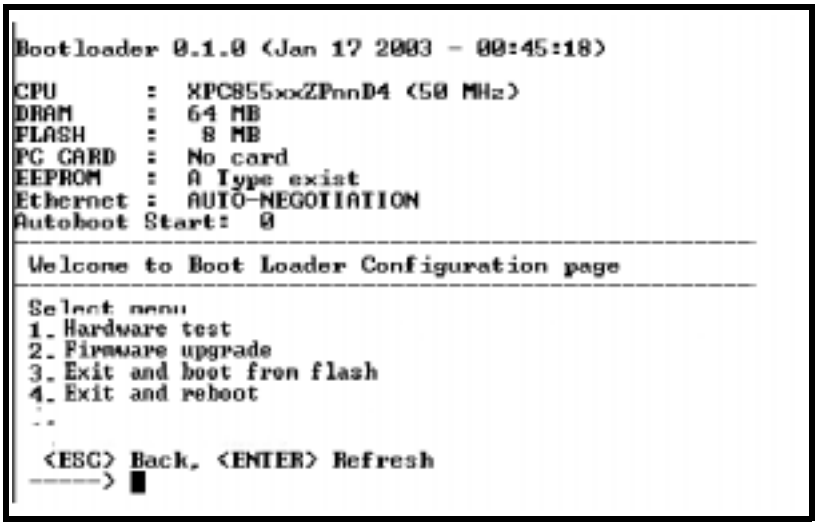
The Digi CM provides a disaster recovery procedure in the event the configuration data is destroyed or corrupted. The Digi CM automatically restores a corrupted configuration file system to the factory default settings. However, if the Digi CM fails to boot in spite of being reset to the factory default settings, the firmware can be restored by using the Boot Loader program.

To restore the Digi CM to the factory default configuration settings, you will need to use a TFTP or BOOTP server. To use the Boot Loader program to flash new firmware, do the following:

1. Connect the console port on the rear panel of the Digi CM to a serial port on a workstation. Use an Ethernet cable with a DB-9 adapter.
2. Set up a terminal emulation program such as HyperTerminal. Use the following port parameters: bps=9600, data bits=8, parity=none, stop bits=1, flow control=none
3. Reboot or power on the Digi CM.
4. Press the ESC key within three seconds of applying power to the device.

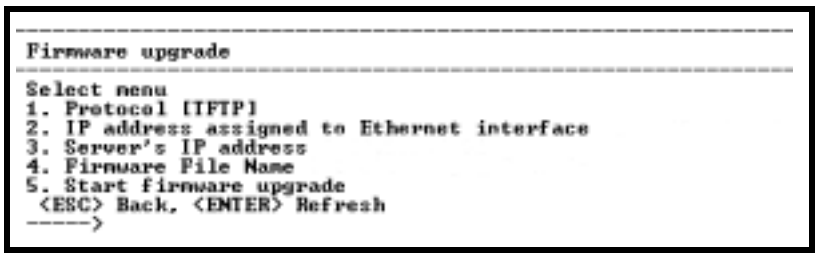
The following screen appears.

Use the ESC key to return to an earlier menu screen.



5. Choose Firmware upgrade by entering 2.

   The following screen appears.



6. Enter the information for the first menu items.
   - Protocol: The choices are BOOTP or TFTP
   - IP address assigned: Enter the IP address of the Digi CM
   - Server's IP address: The IP address of the BOOTP or TFTP server
   - Firmware File Name: The filename for the firmware

   Note: Use the ESC key to back up to earlier menu screens.

7. Choose Start firmware upgrade.

   The firmware upgrade will take several minutes to process.

8. When the upgrade process is complete, choose ESC to return to the main menu.
9. Choose Exit and boot from flash.

Chapter 16 Hardware Information

Introduction

This chapter provides information on Digi CM hardware. Among the topics covered are the hardware specifications, LED descriptions, pinouts for the Ethernet cable, pinouts for the cable adapters, and rack mounting specifications.

Hardware Specifications:

Digi CM 48

Hardware Specifications		
Attribute	**Value AC Powered**	**Value DC Powered**
Operating temperature	40°F to 120°F (5°C to 50°C)	40°F to 120°F (5°C to 50°C)
Storage temperature	-20°F to 140°F (-29°C to 60°C)	-20°F to 140°F (-29°C to 60°C)
Humidity	10% to 90% non-condensing	10% to 90% non-condensing
Power supply	Internal, 100 -240VAC, 50/60 Hz, 1.2A (max)	Internal, 36 - 72 Vdc, 1.2A (max)
Power consumption	0.37A /120VAC, 45W (typical), 150W (max)	0.4A /48Vdc, 19W (typical), 40W (max)
Fuse (internal)	FUSE (Type L) AC250V, 2A	Fuse (Type L) 250V, 5A
Operating system	Linux Hard Hat embedded	Linux Hard Hat embedded
SDRAM	256 megabytes	256 megabytes
Flash memory	32 megabytes	32 megabytes
Dimensions: unpackaged	17.5” x 10.0” x 1.75” (44.5 x 25.4 x 4.5 cm)	17.5” x 10.0” x 1.75” (44.5 x 25.4 x 4.5 cm)
Dimensions: packaged	20.375” x 15.25” x 4.75 (517.5 mm 387.3 mm x 120.6 mm)	20.375” x 15.25” x 4.75 (517.5 mm 387.3 mm x 120.6 mm)
Weight: unpackaged	6.5 lbs (2.95 kg)	6.7 lbs (3.05 kg)
Weight: packaged	9.95 lbs (4.51 kg)	10.2 lbs (4.61 kg)

Digi CM 16 and Digi CM 32

Attribute	AC Powered Value	DC Powered Value
Operating temperature	40°F to 120°F (5°C to 50°C)	40°F to 120°F (5°C to 50°C)
Storage temperature	-20°F to 140°F (-29°C to 60°C)	-20°F to 140°F (-29°C to 60°C)
Humidity	10% to 90% non-condensing	10% to 90% non-condensing
Power supply	Internal, 100 -240VAC, 50/60 Hz, 1.2A (max)	Internal, 36 - 72 Vdc, 1.2A (max)
Power consumption	0.1A /120VAC (type), 12W (typical), 40W (max)	0.25A /48Vdc, 12W (typical), 40W (max)
Fuse (internal)	FUSE (Type L) AC250V, 2A	
Operating system	Linux Hard Hat embedded	Linux Hard Hat embedded
SDRAM	64 megabytes	64 megabytes
Flash memory	8 megabytes	8 megabytes
Dimensions: unpackaged	17” x 8.5” x 1.75” (431.8 cm x 215.9 cm x 44.5 cm)	17” x 8.5” x 1.75” (431.8 cm x 215.9 cm x 44.5 cm)
Dimensions: packaged	20.375” x 15.25” x 4.75 (517.5 cm 387.3 cm x 120.6 cm)	20.375” x 15.25” x 4.75 (517.5 cm 387.3 cm x 120.6 cm)
Weight: unpackaged	5.8 lbs (2.63 kilograms)	5.8 lbs (2.63 kilograms)
Weight: packaged	8.6 lbs (3.9 kilograms)	8.6 lbs (3.9 kilograms)

Digi CM 8 AC Powered

Attribute	Value
Operating temperature	40°F to 120°F (5°C to 50°C)
Storage temperature	-20°F to 140°F (-29°C to 60°C)
Humidity	10% to 90% non-condensing
Power supply	External, 100 - 240VAC, 50/60 Hz, 1.0A (max)
Power consumption	AC input: 0.05A /120VAC, 6W (typical), 12W (max) DC input: 0.8A/5VAC, 4.5 W (typical), 8W (max)
Operating system	Linux Hard Hat embedded
SDRAM	64 megabytes
Flash memory	8 megabytes
Dimensions	9.5” x 6.25” x 1.25” (241.3 cm 158.75 x 31.75 cm)
Weight	2.5 lbs (1.13 kilograms)

LED Indicators

Use the LED indicators to confirm your attachment to the network and that the Digi CM is able to send and receive data.

LED		Function
System	Power	On when power is supplied
	Ready	On when system is ready to run
	PC	On when a PC device is running
Ethernet	100Mbps	On when 100Base-TX connection is detected
	LINK	On when connected to an Ethernet network
	Act	Blinks when there is activity on the Ethernet port
Serial port	In use	On when the serial port is ready to run
	Rx/Tx	Blinks when there is traffic on the serial port

About Serial Port Cabling

The Digi CM simplifies cabling. The RJ-45 8-pin configuration matches all SUN and Cisco RJ-45 console port configurations, enabling CAT 5 cabling without pinout concerns. Three DB-25 and one DB-9 adapters come in the package. A DB-25 male, a DB-25 female, and a DB-9 adapter support console management applications. A DB-25 male adapter provides a modem connection. See the cable adapter information that follows later in this chapter.

Note: The cable length restrictions common to RS-232 cables apply to the Digi CM serial cable as well.

Serial Port Pinouts

The Digi CM uses an RJ-45 connector for serial ports. Pin assignments are listed in the following table.

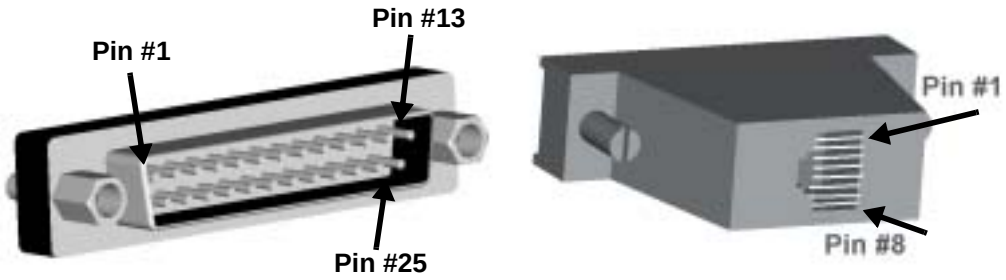
Pin	Description
1	CTS
2	DSR
3	RxD
4	GND
5	DCD Note: Inbound signal can also be used as a second ground.
6	TxD
7	DTR
8	RTS

Cable Adapters

The Digi CM comes with four cable adapters. The following illustrations show cable adapter pin outs. Additional adapters can be purchased from Digi in quantities of 8.

DB-25 Male Console Adapter

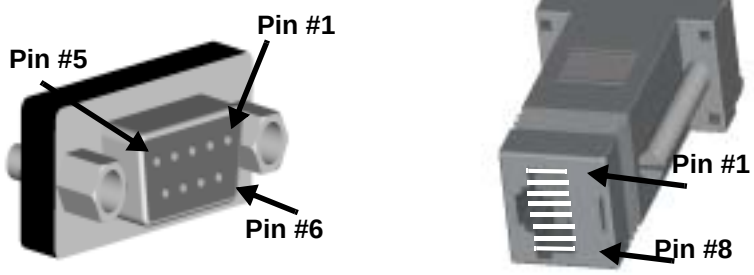
(Digi P/N 76000672)



DB-25 Male to RJ-45 Connector Pin Assignments

RJ-45	Signal		DB-25M	Signal
1	CTS	Connected to	4	RTS
2	DSR	Connected to	20	DTR
5	DCD			
3	RxD	Connected to	2	TxD
4	GND	Connected to	7	GND
6	TxD	Connected to	3	RxD
7	DTR	Connected to	6	DCD
			8	DSR
8	RTS	Connected to	5	CTS

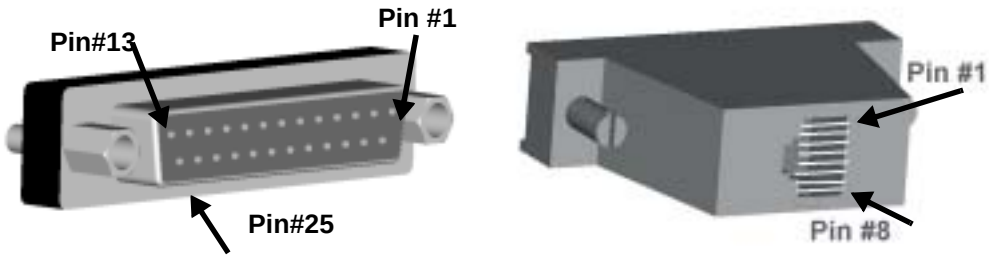
DB-9 Female Console Adapter
(Digi P/N 76000671)



DB-9 Female to RJ-45 Pin Assignments

RJ-45	Signal		DB-9F	Signal
1	CTS	Connected to	7	RTS
2	DSR	Connected to	4	DTR
5	DCD			
3	RxD	Connected to	3	TxD
4	GND	Connected to	5	GND
6	TxD	Connected to	2	RxD
7	DTR	Connected to	1	DCD
			6	DSR
8	RTS	Connected to	8	CTS

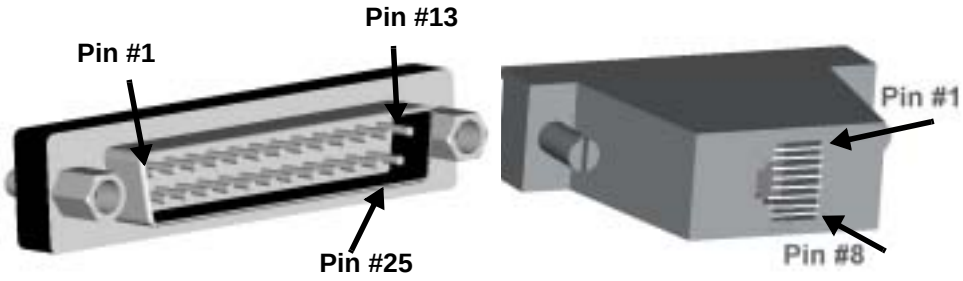
DB-25 Female Console Adapter
(Digi P/N 76000673)



DB-25 Female to RJ-45 Pin Assignments

RJ-45	Signal		DB-25M	Signal
1	CTS	Connected to	4	RTS
2	DSR	Connected to	20	DTR
5	DCD			
3	RxD	Connected to	2	TxD
4	GND	Connected to	7	GND
6	TxD	Connected to	3	RxD
7	DTR	Connected to	6	DCD
			8	DSR
8	RTS	Connected to	5	CTS

DB-25 Male Modem Adapter (Digi P/N 76000670)

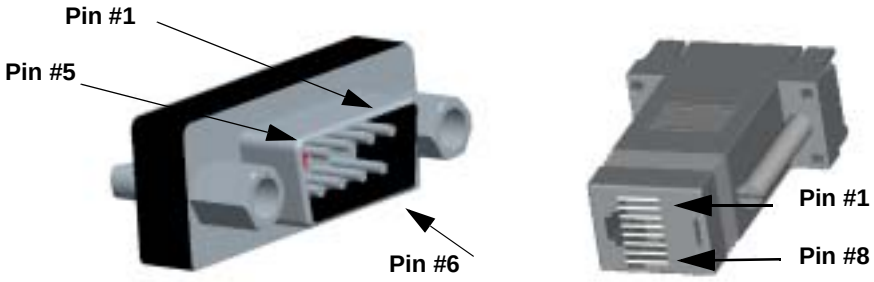


DB-25 Male Modem to RJ-45 Pin Assignment

RJ-45	Signal		DB-25M	Signal
1	CTS	Connected to	5	CTS
2	DSR	Connected to	6	DSR
3	RxD	Connected to	3	RxD
4	GND	Connected to	7	GND
5	DCD	Connected to	8	DCD
6	TxD	Connected to	2	TxD
7	DTR	Connected to	20	DTR
8	RTS	Connected to	4	RTS

DB-9 Male Modem Adapter (Digi P/N 76000702)

(Available but not included)



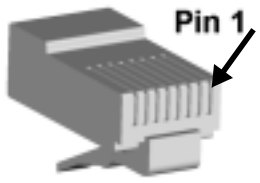
DB-25 Male Modem to RJ-45 Pin Assignment

RJ-45	Signal		DB-9M	Signal
1	CTS	Connected to	8	CTS
2	DSR	Connected to	6	DSR
3	RxD	Connected to	2	RxD
4	GND	Connected to	5	GND
5	DCD	Connected to	1	DCD
6	TxD	Connected to	3	TxD
7	DTR	Connected to	4	DTR
8	RTS	Connected to	7	RTS

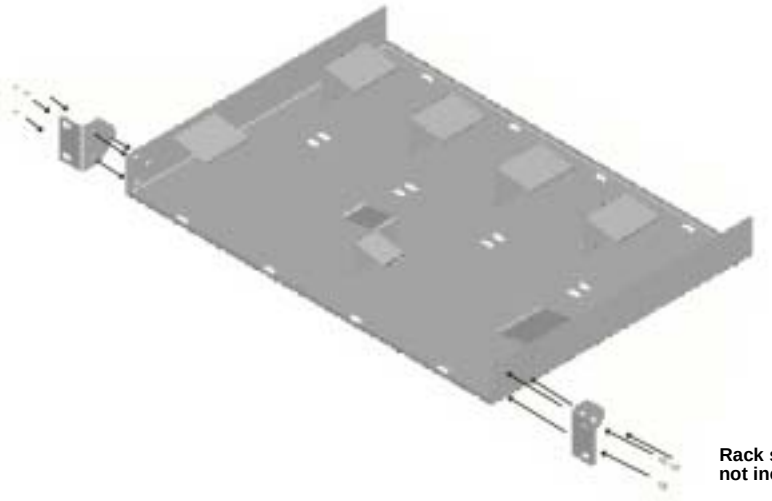
Ethernet Pinouts

The Digi CM uses a standard Ethernet connector, that is a shielded and compliant with AT&T 258 specifications.

Pin	Description
1	Tx+
2	Tx-
3	Rx+
4	NC
5	NC
6	Rx-
7	NC
8	NC



Rack Mounting Installation



Rack shown in illustration is not included with DIgi CM.

1. Attach enclosed bracket ears to rack as shown in illustration.
2. Follow safety precautions when placing Digi CM on rack.

Rack Mounting Safety Precautions

- Distribute weight evenly in the rack to avoid overloading.
- Ensure proper ventilation with at least 12 inches (30 centimeters) of clearance on all sides.
- Check equipment nameplate ratings before connecting to the supply circuit to avoid overloads which may damage over-current protection devices and supply wiring.
- Maintain reliable earthing for rack-mounting equipment, especially for supply connections.
- Install equipment in Restricted Access Areas only (dedicated equipment rooms/closets) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.
- Connect equipment to a DC supply source (reliably earthed) that is electrically isolated from the AC source.
- Directly connect the equipment chassis to the DC supply system-grounding electrode conductor or a bonding jumper from a grounding terminal bar (or bus) that is connected to the DC supply system grounding electrode conductor.
- Contain equipment that has a connection between the grounded conductor of the same DC supply circuit, the grounding conductor, and also the point of grounding of the DC system in the same immediate area. Do not ground the equipment elsewhere.

- Locate the DC supply source within the same premises as the equipment.
- Route away and secure all DC input wiring from sharp edges to prevent chaffing as well as provide strain relief.
- Provide a readily accessible disconnect device and protective device a fixed wiring for a DC power supply suitable for the specified rated voltage and current. Disconnect and protective devices to be rated 2A Amps maximum.

Chapter 17 Certifications

Safety

- US: UL1950
- Canada: CSA 22.2 No. 60950
- Europe: EN60950 (CB Scheme Report)

Working Inside the Digi CM

NOTICE: Do not attempt to service the Digi CM yourself, except when following the instructions from Digi Technical Support personnel. In such a case, first perform the following actions:

- Turn off the Digi CM.
- Ground yourself by touching an unpainted metal surface at the back of the equipment before touching anything inside your equipment.

Replacing the Battery

A coin-cell battery maintains date and time information. If you have to repeatedly reset time and date information after turning on your Digi CM, replace the battery.

CAUTION: A new battery can explode if it is incorrectly installed. Replace the 3 Volt CR2032 battery only with the same or equivalent type recommended by the battery manufacturer. Discard used batteries according to the battery manufacturer’s instructions.

Environmental Considerations and Cautions

The following is a list of environmental considerations that will ensure safe and efficient operation of your Digi CM:

- Ensure that the Digi CM has at least 12 inches (30 centimeters) of clearance on all sides to allow for proper ventilation. These devices generate heat and require adequate circulation to maintain proper operating temperatures. For the same reason, never cover or obstruct ventilation slots.
- Do not position the Digi CM near high-powered radio transmitters or electrical equipment, such as electrical motors or air conditioners. Interference from electrical equipment can cause intermittent failures.
- Avoid exceeding the maximum cabling distances discussed in the online cable guide.
- Do not install the Digi CM in areas where condensation, water, or other liquids may be present. These may cause safety hazards and equipment failure.

Safety Instructions

CAUTION: Do not operate your Digi CM with the cover removed.

- To avoid shorting out your Digi CM when disconnecting the network cable, first unplug the cable from the equipment and then from the network jack. When reconnecting a network cable to the equipment, first plug the cable into the network jack and then into the equipment.
- To help prevent electric shock, plug the Digi CM into a properly grounded power source. The cable is equipped with 3-prong plug to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from the cable. If you have to use an extension cable, use a 3-wire cable with properly grounded plugs.
- To help protect the Digi CM from transients in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply.
- Be sure that nothing rests on Digi CM cables and that the cables are not located where they can be stepped on or tripped over.
- Do not spill food or liquids on your Digi CM. If it gets wet, contact Digi Technical Support.
- Do not push objects into the openings of your Digi CM. Doing so can cause fire or electric shock by shorting out interior components.
- Keep your Digi CM away from heat sources and do not block cooling vents.

Emissions

- US: FCC part 15, Class A
- Canada: ICES 003 Class A
- Europe: EN55022
- Japan: VCCI
- Australia: AS3548

Immunity

Europe: EN55024:1998
EN61000-3-2: 2000
EN61000-3-3: 1998

Solaris Ready

All Digi CM products are Solaris Ready certified. This certification identifies these products have met the stringent testing requirements for system compatibility, interoperability, ease-of-installation, functionality, and network interoperability as defined and controlled by Sun Microsystems.

Index

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