



Printer and
Fastener Solutions

MONARCHNET2™ OPERATING INSTRUCTIONS



**Avery Dennison®
Monarch® Tabletop
Printer 1**

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TABLE OF CONTENTS

GETTING STARTED	1-1
Audience	1-1
System Requirements	1-1
Specifications	1-2
Verifying a Wireless Connection.....	1-2
Printing a MonarchNet2 Test Label.....	1-2
USING A WEB BROWSER	2-1
Logging In	2-1
Configuring the Printer	2-3
Changing the Printer Setup	2-3
Changing the System Setup	2-4
Configuring the Network Settings	2-5
Changing TCP/IP Settings.....	2-5
Changing SNMP Settings	2-6
Changing Wireless Settings.....	2-7
Basic Security Configurations.....	2-8
Using WEP.....	2-10
Configuring Certificates	2-11
Alerts.....	2-12
Receiving An Alert.....	2-13
Reset/Reboot Network.....	2-13
Reading the Virtual Panel.....	2-13
Using Custom Commands.....	2-14
Using Custom Data	2-15
Admin Settings	2-15
Enable Web Timeout.....	2-15
Changing the Password	2-16
CONSOLE COMMANDS	3-1
Conventions	3-1
Accessing Telnet Console Mode.....	3-2
Help Commands	3-3
General Commands.....	3-4
Setup Commands.....	3-5
RFID Commands.....	3-7
802.11b/g Wireless Commands	3-7
TCP/IP Commands.....	3-8
SNMP Commands	3-8
Using the Network Packet.....	3-9
TROUBLESHOOTING	4-1
Printing a MonarchNet2 Test Label.....	4-1
General Troubleshooting Information.....	4-2
Troubleshooting Wireless Configuration Problems	4-3
GLOSSARY	A-1

Your Avery Dennison Monarch® Tabletop Printer 1 may contain a wireless module with MonarchNet2™ software. A wireless module allows remote access to configure and control your printers using a WLAN (wireless local area network) or WWW (world-wide web) connection. The wireless module communicates on an 802.11a/b/g/n wireless network.

Refer to your network manuals for more information. This manual does not include information about setting up your wireless network.

Audience

This manual is written for the System Administrator who sets up printers on the network and is familiar with basic networking principles.

System Requirements

To use the wireless module for printing from a wireless network, you need an 802.11a/b/g/n wireless network. The wireless network consists of either of the following:

- ◆ An 802.11a/b/g/n wireless-enabled computer printing straight to the printer (Ad-Hoc mode).
- ◆ An 802.11a/b/g/n wireless access point allowing wireless and wired Ethernet-enabled computers to print to the wireless module (infrastructure mode).

To configure and print, you need the following:

1. The MAC address from the label of the wireless module (for example: 004017023F96).

Note: With version 1.6 or greater firmware, the Ethernet and wireless interfaces share the same MAC Address. When using DHCP, Ethernet and wireless will receive the same IP address from a DHCP server.

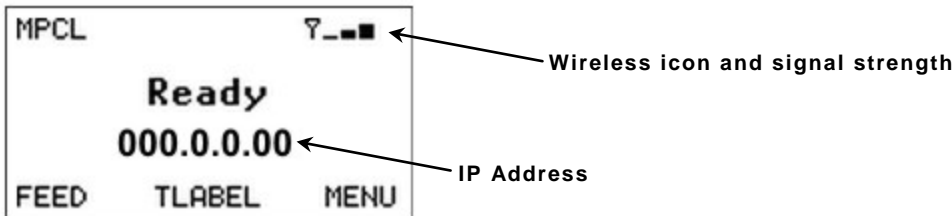
2. The following information from your wireless network administrator:
 - ◆ Wireless mode (infrastructure or Ad-Hoc).
 - ◆ The SSID (service set identifier) for your wireless network.
 - ◆ If you are using TCP/IP (recommended for Windows Networks) and are not connected to a DHCP server (for obtaining an IP address automatically), you need a unique IP address for the wireless module (for example: 192.0.0.192) and a subnet mask. If the wireless module is not on the same IP subnet as the computers you are printing from, you need a router. A wireless module with an IP address of 192.0.0.192 will not be seen by a network looking for devices with a prefix of 10.1.xxx.xxx. A router (default gateway) address is optional.
 - ◆ Wireless security settings.

Specifications

Link Layer:	802.3 or optional 802.11a/b/g/n
Protocols:	TCP/IP Passthru DHCP LPD/LPR Telnet RSH (remote shell) FTP SNMP HP JetAdmin™
802.3 Communication Rate:	10 Mbps or 100 Mbps
Frequency:	2.4 GHz range, direct sequence
Communication Rate:	1, 2, 5.5, 11, 12, 18, 24, 36, 48, or 54 megabits per second
Channels	1 to 11
Mode:	Ad-Hoc or infrastructure
Encryption:	WEP 64 or WEP 128 WPA or WPA2
Authentication:	EAP-FAST LEAP PEAP TLS TTLS PSK

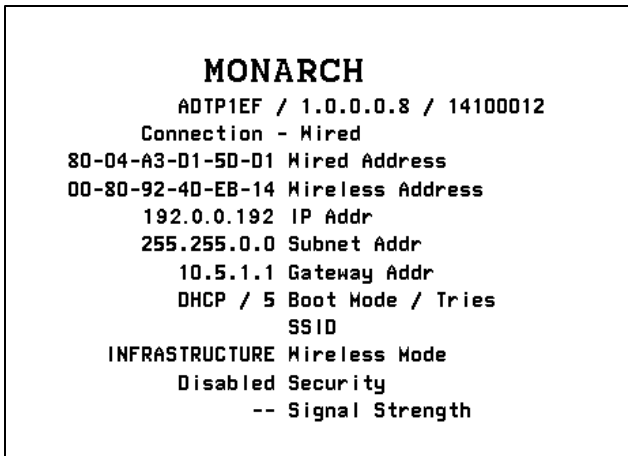
Verifying a Wireless Connection

When the printer is turned on, the wireless module runs through a set of power-up diagnostics for a few seconds. Then the display shows the wireless connection icon, wireless connection signal strength, and your printer's IP (Internet Protocol) address.



Printing a MonarchNet2 Test Label

Press **TLABEL** and select *Mnet2 Label*



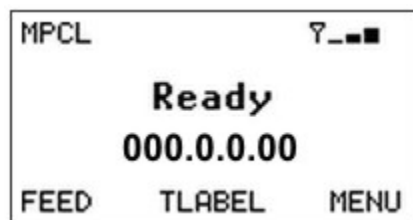
USING A WEB BROWSER

You can configure and manage the printer using a Web browser. The recommended minimum screen resolution for your computer is 1024 x 768 pixels. Before you begin, you need to know your printer's IP address. The printer should be turned on and ready to receive data.

Note: The screens shown in this manual may not exactly match what you see.

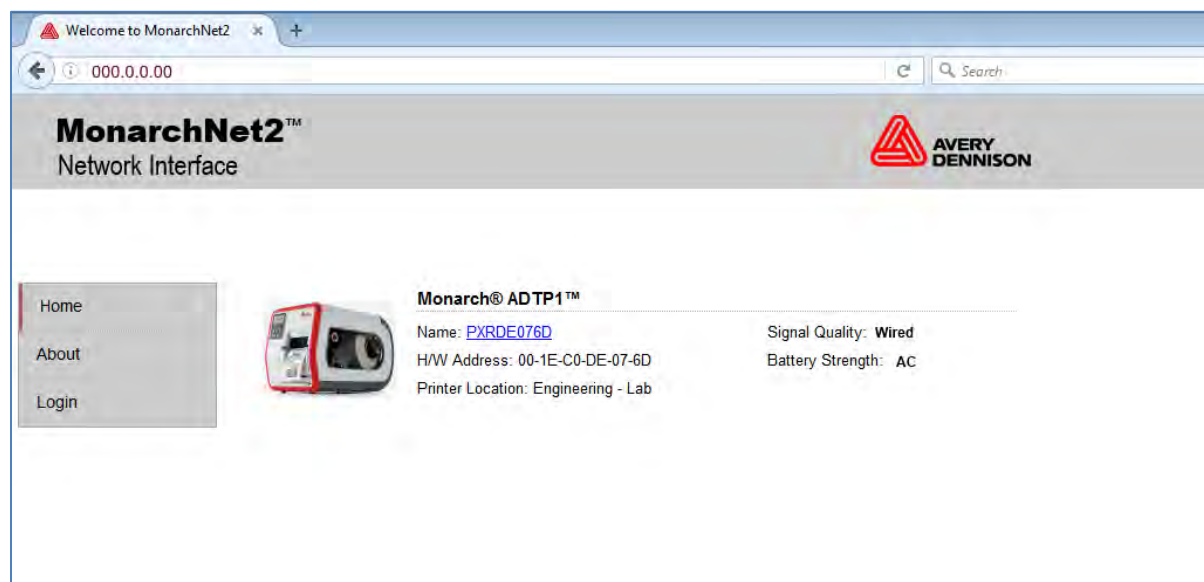
It may take about a minute, depending on network traffic, for the printer to connect to an access point. When the printer is connected and ready to receive data you see:

The printer's display shows the antenna symbol when the printer is connected and ready to receive data.



Logging In

1. Start your Web browser.
2. Type in your printer's IP address and press **Enter**.



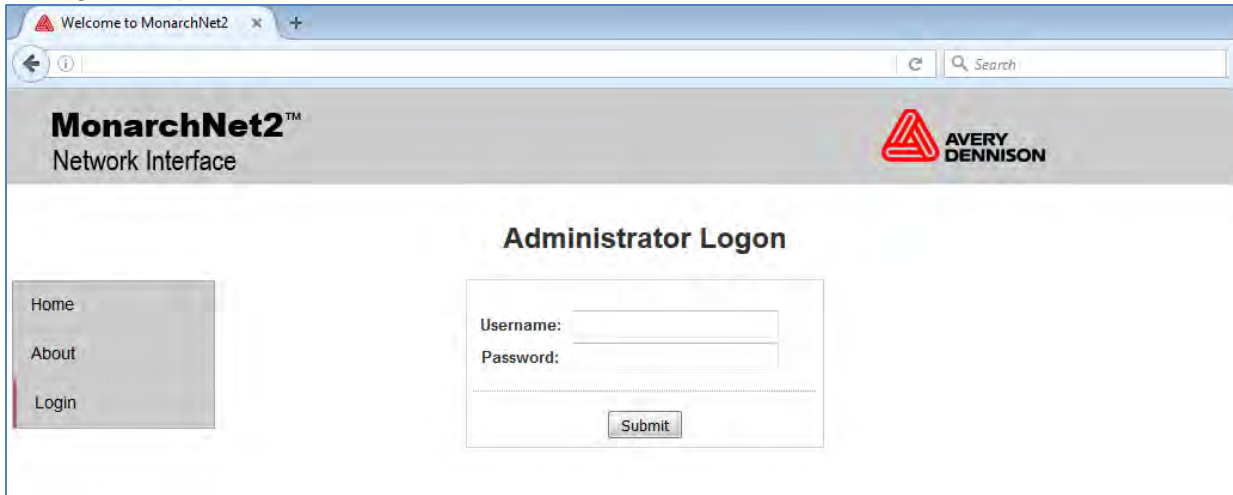
If the printer is experiencing a ribbon or supply problem, the icon for Printer Status appears with a red background.

If the printer has a wireless connection, the signal strength icon appears.

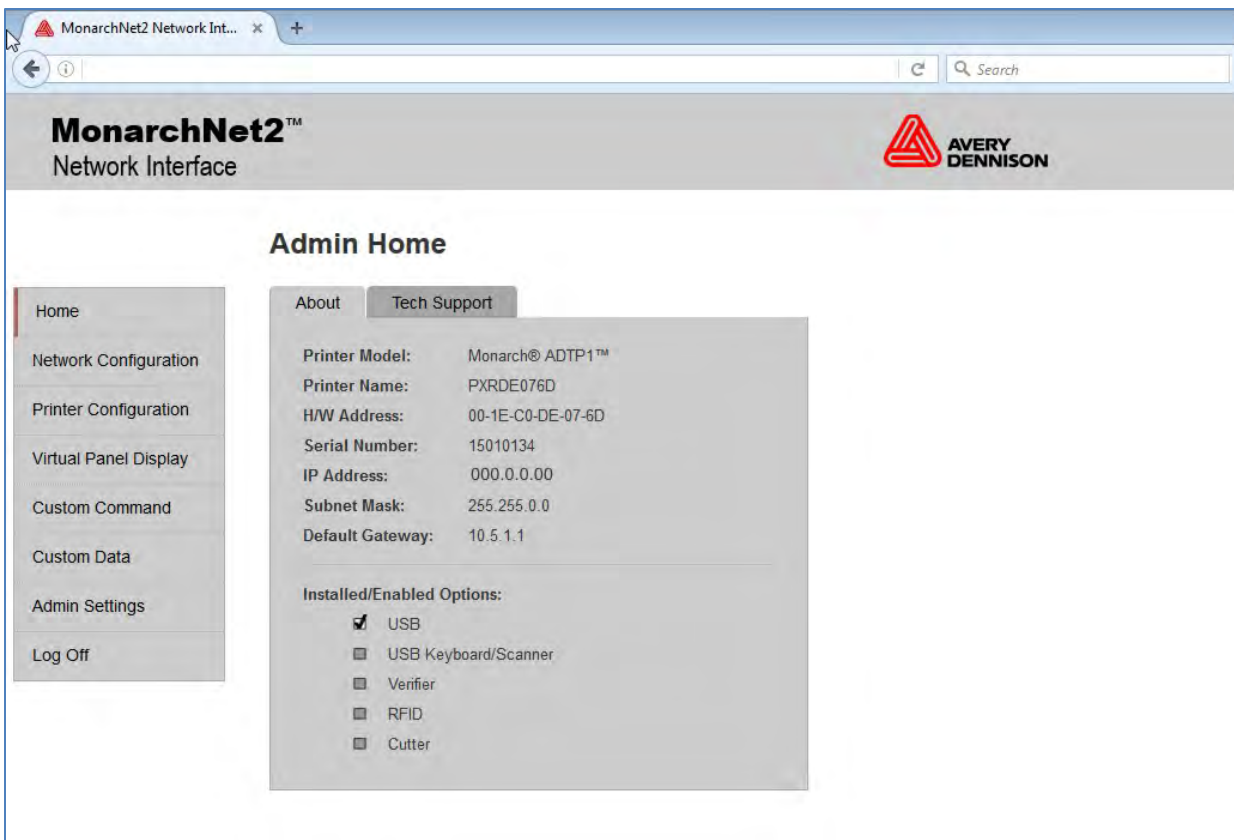
The power status shows AC or DC (using a Mobile Work Station) depending on your connection.

3. Click **Log In** or the printer's name (for example: PXRDE076D).

4. Type **access** for the password and click **Submit**. You do not need a user name. The password is case-sensitive and saved in the printer's flash memory. See "[Changing the Password](#)" to change the password.



The About tab appears with information about your printer, including printer name, IP address, installed/enabled options, and more.



Click the Tech Support tab to see Avery Dennison contact information.

Configuring the Printer

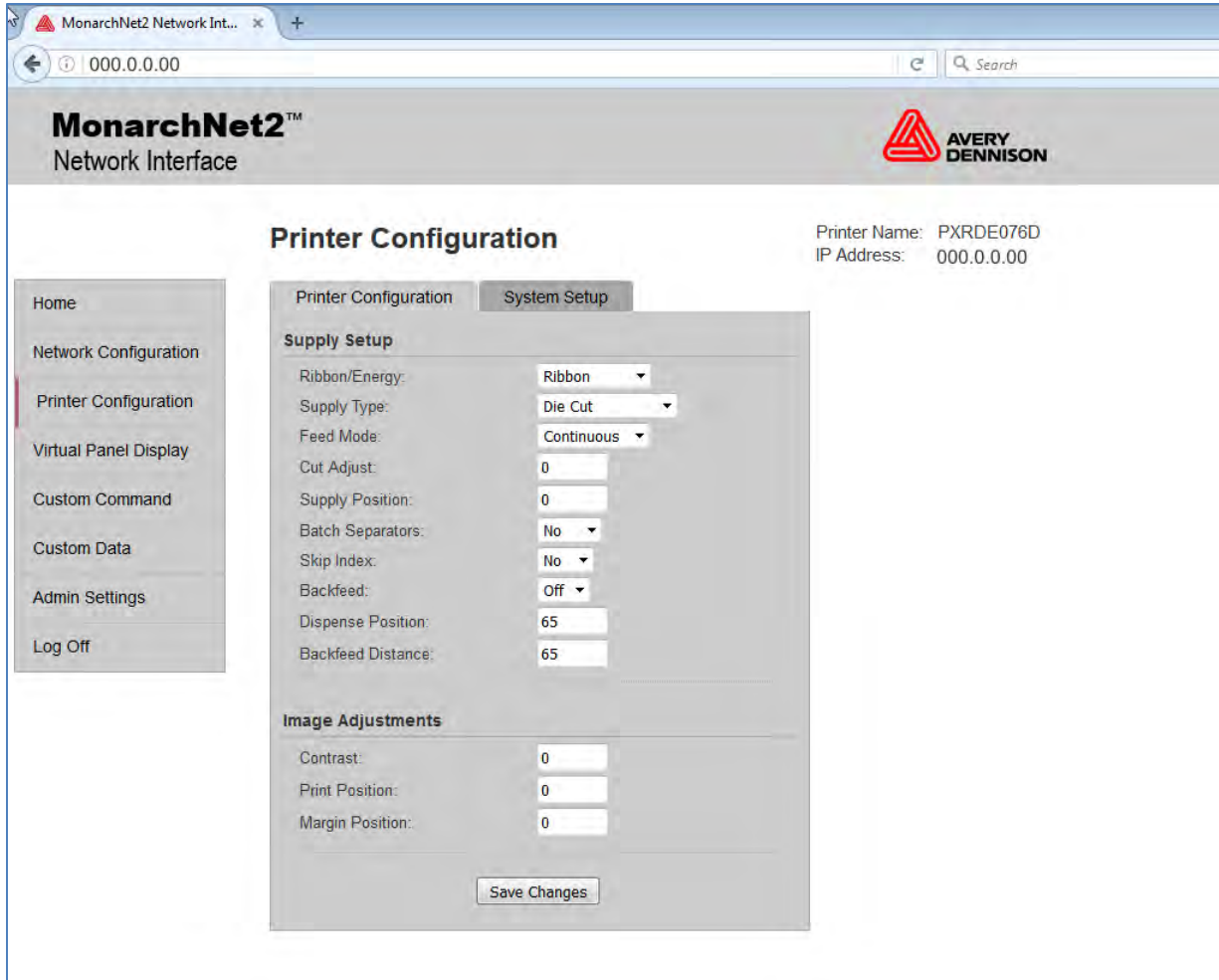
You can configure the printer using your Web browser.

1. From the side Menu Bar, click **Printer Configuration**.
2. Select one of the following tabs: **Printer Setup** or **Supply Setup**.

Changing the Printer Setup

Only configure the settings required for your network/printer.

Note: Only the available options for your printer are displayed.



1. On the **Printer Setup** tab, set the **Ribbon**: None, Ribbon, or High Energy.
2. Set the **Supply Type**: Edge Aperture, Edge Die Cut, Edge Black Mark, Continuous, Center Aperture, Center Die Cut, or Center Black Mark.
3. Set the **Feed Mode**: Continuous, On Demand, or Liner take-up (optional).
4. Enter a value for the **Cut Adjust** (Position). The range is –300 to 300. This adjusts where the tag is cut.
5. Enter a value for the **Supply Position**. The range is –300 to 300. This adjusts the printer to print at the vertical 0,0 point. Only adjust on initial printer setup.
6. Set the **Batch Separators**: No, Yes, or Long.
7. Set the **Skip Index** mode: No or Yes. Skip index allows you to print an image over multiple labels.
8. Set the **Backfeed**: Off or On. Backfeed advances each printed label to the specified dispense position and then backs up the next label to be printed underneath the printhead.

9. Enter a value for the **Dispense Position** (range is 50 to 200). This adjusts the stopping point of the label *after* it is printed.
10. Enter a value for the **Backfeed Distance** (range is 20 to 200). This is the amount to move the label backwards *before* printing.
11. Enter a value for the **Contrast** (range is –699 to 699). This adjusts the darkness of printing on the supply.
12. Enter a value for the **Print Position** (range is –450 to 450). This adjusts where data prints vertically on the supply.
13. Enter a value for the **Margin Position** (range is –99 to 99). This adjusts where data prints horizontally on the supply.
14. Click **Submit** when finished.

Changing the System Setup

Only configure the settings required for your printer.

1. On the **System Setup** tab, set the **Flash Storage**: Enabled or Disabled. Flash storage allows packets with “R” or “N” selectors to be stored in Flash Memory, instead of volatile RAM. Packets stored in flash memory are saved when the printer is turned off.
2. Set the **Speed Adjustment**: Default, 2.5, 4.0, 6.0, 8.0 10.0, or 12.0 ips. If you select “Default,” serial bar codes print at 2.5 ips; parallel bar codes print at 6.0 ips.
3. Set the **Power Up Mode**: Online or Offline.
4. Select the **Language**.
5. Set the **Monetary Sign**: None, USA, UK, Japan, Germany, France, Spain, Italy, Sweden, Finland, Austria, India, Russia, Korea, Thailand, China, Euro-Dollar.
6. Set the **Secondary Sign**: No or Yes.
7. Set the number of **Decimal Places**: 0, 1, 2, or 3.
8. Select **Slashed Zero** to print zeros with a slash (Ø): No or Yes.
9. Click **Save Changes** when finished.

Configuring the Network Settings

You can configure the printer to operate on your network.

The screenshot displays the MonarchNet2 Network Interface. At the top left, it says "MonarchNet2™ Network Interface". At the top right is the Avery Dennison logo. Below the title bar, the printer name "PXRDE076D" and IP address "000.0.0.00" are shown. The main content area is titled "Network Configuration" and has four tabs: "Protocols", "SNMP", "Wireless", and "Alerts". The "Protocols" tab is active. On the left is a vertical menu with options: Home, Network Configuration (highlighted), Printer Configuration, Virtual Panel Display, Custom Command, Custom Data, Admin Settings, and Log Off. The main configuration area is divided into sections: "Boot Settings" (Boot Method: DHCP, Boot Tries: 5, IP Address: 00.00.00.00, Subnet Mask: 255.255.0.0, Gateway: 00.00.00.00, MAC: 00-1E-C0-DE-07-6D), "Domain Name Server Settings" (Automatic DNS Settings: unchecked, Domain Name: monarch.local, Primary DNS Server: 192.5.2.1, Secondary DNS Server: 0.0.0.0), "Network Time Server Settings" (Enable Network Time: checked, Time Server IP: 192.5.1.1, Adjust: -4:00), and "TCP Settings" (TCP Port: 9100, TCP Timeout: 600 min, Keepalive Timer: 0 min). At the bottom are "Save Changes" and "Save/Reboot" buttons.

1. From the side Menu Bar, click **Network Configuration**.
2. Select one of the following tabs: Protocols, SNMP, Wireless, or Alerts.

Changing TCP/IP Settings

Only configure the settings required for your network/printer.

1. On the **Protocols** tab, set the **Boot Method**: Auto, DHCP, or Static.
2. Set the number of **Boot Tries**: 1-10. The default is 3. If you are having a problem receiving an IP address with BOOTP, set this number to 10.
3. Change the **IP Address** if necessary.
4. Set or change the **Subnet Mask**.
5. Set or change the **Gateway**.
6. Select **Automatic DNS Settings** to automatically configure the domain name settings.
7. Enter the **Domain Name**.

8. Enter the **Primary DNS Server's** IP address.
 9. Enter the **Secondary DNS Server's** IP address.
 10. Select **Enable Network Time** to enable the network time protocol, which allows the printer to query a time server on the network and synchronize the clock in the printer.
 11. Enter the **Time Server's IP** address. The printer waits 20 seconds for the server to respond. The status is displayed within parentheses: "Waiting for Server," "Time Server Error," or the current date and time.
 12. Enter the **Time Zone Adjustment** in hours and minutes, from Greenwich Mean Time (GMT). This offset varies by location and time zone. For example, Eastern/Standard time is five hours behind GMT. Use -5:00 for the offset. For an offset of 3.5 hours, use 3:30.
- Note:** Changes for Daylight Savings Time are not made automatically. If your time zone participates in Daylight Savings Time, change the time zone offset accordingly.
13. Set the **TCP Window**. 10240 is the default.
 14. Set the **TCP Port**. Port 9100 is the default.
 15. Set the **TCP Timeout** (in minutes). The default is 0, which is no timeout.
 16. Set the **Keepalive Timer** (in minutes). The default is 1 minute.
 17. Click **Save Changes** to save changes or click **Save/Reboot** to save the changes and re-initialize the network with the new settings. Any changes made on this screen or other screens do not take effect until you click **Save/Reboot**. This process takes a few minutes.

Changing SNMP Settings

Only configure the settings required for your network/printer.

The screenshot shows the MonarchNet2 Network Interface web page. The browser address bar shows '000.0.0.00'. The page title is 'MonarchNet2™ Network Interface' with the Avery Dennison logo. The main heading is 'Network Configuration'. On the right, it displays 'Printer Name: PXRDE076D' and 'IP Address: 000.0.0.00'. A navigation menu on the left includes 'Home', 'Network Configuration', 'Printer Configuration', 'Virtual Panel Display', 'Custom Command', 'Custom Data', 'Admin Settings', and 'Log Off'. The 'SNMP' tab is selected, showing the following configuration fields:

Field	Value
System Name:	PXRDE076D
System Contact:	Lab printer
System Location:	Engineering - Lab
Read Community Name:	public
Read/Write Community Name:	public?

A 'Save Changes' button is located at the bottom of the configuration form.

1. Click the **SNMP** tab to change SNMP settings.
2. Enter the **System Name**, if it does not automatically appear.
3. Enter the **System Contact**.
4. Enter the **System Location**.
5. Verify the **Read Community Name** and change if necessary.

6. Verify the **Read/Write Community Name** and change if necessary.
7. Click **Save Changes** when you are finished.
8. Click the **Protocols** tab.
9. Click **Save/Reboot** (on the **Protocols** tab) before any changes take effect. Even though you submitted your changes on the previous screen, they do not take effect until you click **Save/Reboot**. This process takes a few minutes.

Changing Wireless Settings

Only configure the settings required for your network/printer.

The screenshot shows the MonarchNet2 Network Interface web interface. The browser address bar displays '000.0.0.00'. The page title is 'MonarchNet2™ Network Interface' with the Avery Dennison logo. The main content area is titled 'Network Configuration' and includes printer information: 'Printer Name: PXRDE076D' and 'IP Address: 000.0.0.00'. A navigation sidebar on the left lists: Home, Network Configuration (selected), Printer Configuration, Virtual Panel Display, Custom Command, Custom Data, Admin Settings, and Log Off. The 'Wireless' tab is active, showing 'Radio Settings' and 'Authentication Settings'. The 'Radio Settings' section includes: SSID (ADTP-AP9Int), Reg. Domain (United States), Roam Hysteresis (6), and Mode (Infrastructure). The 'Authentication Settings' section includes: Encryption Mode (WPA2), Authentication Type (TLS), Authentication Protocol (MSCHAP_V2), User ID, and Password (masked with dots). There is a link for 'Upload Authentication Server Certificate' and a section for 'Installed Certificate Files' with checkboxes for Root Certificate, Client Certificate, and Private Key. A 'Save Changes' button is at the bottom.

1. Click the **Wireless** tab to configure the wireless network (802.11a/b/g/n) settings.
2. Set the **Mode**: Ad-Hoc or infrastructure. In Ad-Hoc mode, you do not need an access point. Infrastructure mode requires an access point to communicate.
3. Set the **SSID**. The SSID is a unique identifier that must match for all nodes on a subnetwork to communicate with each other.
4. Set the **Regulatory Domain**, which is the country of use.

5. Set the **Roam Hysteresis**. The range is 1 – 15. Whenever the printer’s signal strength gets below this value, the printer connects to another access point in range with better signal strength. This prevents excessive roaming between access points if the printer is located near two access points.
6. Set the **Encryption Mode**: Disable, 64 BIT Encryption, 128 BIT Encryption, WPA, WPA2, WPA2-WPA, and DYNAMIC WEP. The encryption mode determines the algorithm used to encrypt messages.
7. Set the **Authentication Type**: Open, Shared, TLS, TTLS, LEAP, PEAP, or EAP-FAST. The authentication type specifies how users are identified and verified on a network. These options vary depending on what was selected as the Encryption Mode. See “[Basic Security Configurations](#)” for more information.
8. Set the **Authentication Protocol**: PAP, or MSCHAP_V2. See “[Basic Security Configurations](#)” for more information.
9. Enter the **User ID**.
10. Enter the **Password**.
11. Click **Submit** when you are finished.
12. Click the **Protocols** tab.
13. Click **Save/Reboot** (on the **Protocols** tab) before any changes take effect. Even though you submitted your changes on the previous screen, they do not take effect until you click **Save/Reboot**. This process takes a few minutes.

Basic Security Configurations

There are two main decisions to be made when choosing wireless security: encryption method and authentication protocol.

The encryption method determines the algorithm used to encrypt the message. The authentication type specifies how users are identified and verified on a network. Is the device seeking connection what (and who) it claims to be?

Select an Encryption Method from the following table:

Encryption Method			
Type	Algorithm	Size (bits)	Description
WEP	RC4	64/128	This is the 64 or 128 bit WEP Key that must match other nodes’ encryption keys in order to communicate. The user can only define 10 hex characters (40 bits) for 64 bit WEP or 26 characters (104 bits) for 128 bit WEP.
WPA	RC4	64/128	Improves on WEP by using TKIP* (Temporal Key Integrity Protocol), which dynamically changes the encryption key and MIC (Message Integrity Code), which replaces CRC.
WPA2	AES	128	Improves on WPA by replacing RC4 with AES (Advanced Encryption Standard) for encryption. The user can only define 26 characters (104 bits) for 128 bit WPA2.

Dynamic WEP cannot be selected directly, so select 128 for the encryption mode and select an authentication mode from one of the following: LEAP, PEAP, EAP-FAST, TLS, or TTLS.

Authentication Protocol					
Type		RADIUS Server Protocol	User ID & Password	Certificate	Private Key Info File
Enterprise	LEAP	PAP or MSCHAPv2	Required	No	N/A
	PEAP*				N/A
	TLS			Optional*	Required*
	TTLS				N/A
	EAP-FAST			PAC*	N/A

*PEAP This is only for server-side certificates.

*Optional Leaving the Certificate Root Key and the Certificate CN (common) names blank, no validation of the host certificate is performed. The values are set to "null" and all host certificates are accepted.

*Required The Wireless module comes with a default Private Key Information File. You can either download that file from the wireless module and add it to the TLS authentication server, or overwrite a new one on the wireless module.

*PAC EAP-FAST does not use certificates to authenticate, but a PAC (Protected Access Credential), which is managed dynamically by the server. The PAC is distributed one at a time to the client manually or automatically.

See the following table of acceptable combinations:

Authentication	Encryption	
	WEP	WPA, WPA (TKIP), WPA2
Open	Static	No
Shared		
LEAP	Dynamic	Yes
PEAP		
EAP-FAST		
TLS*		
TTLS		

*Load the local key before enabling TLS.

Using WEP

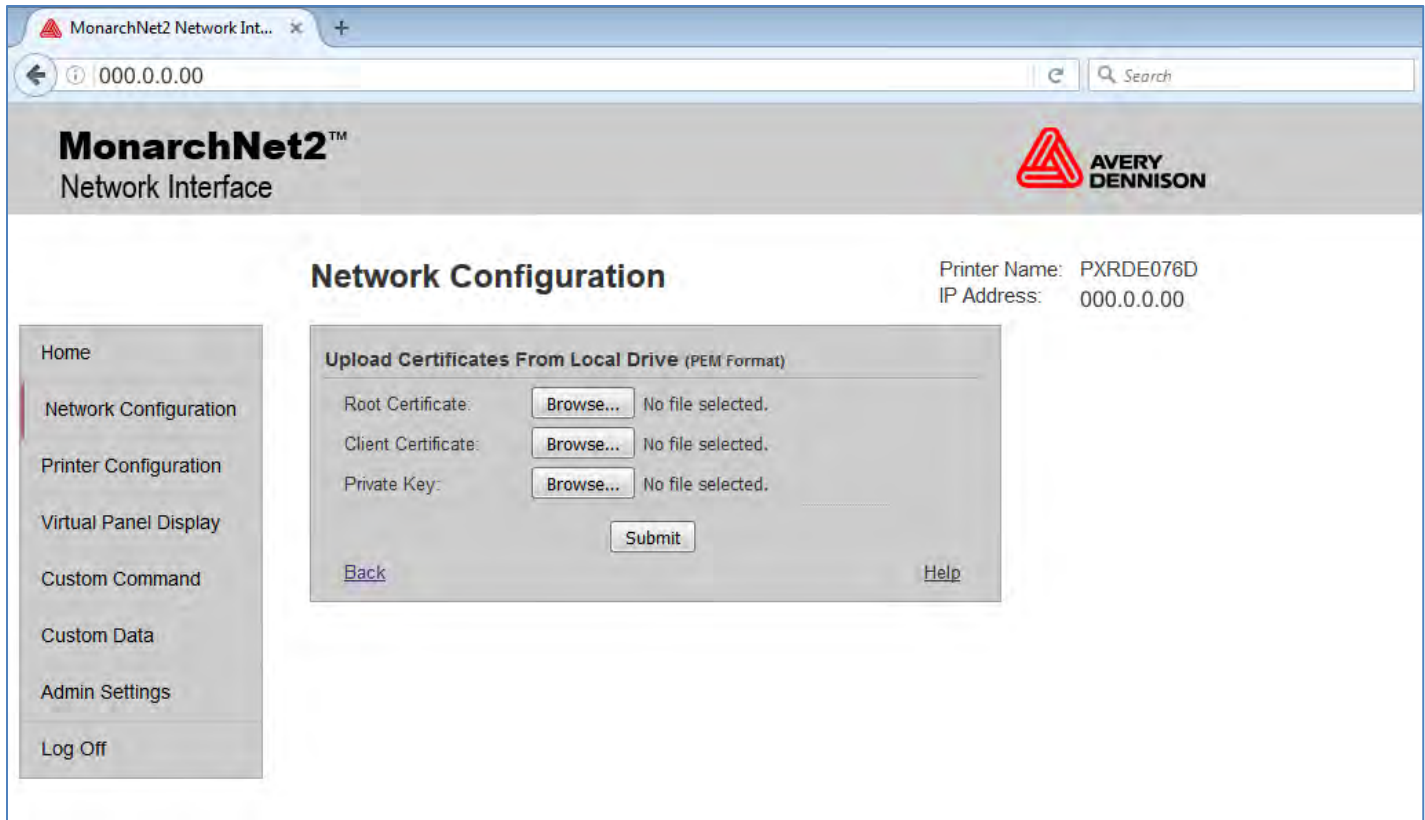
If you select 64 BIT Encryption or 128 BIT Encryption, you need to enter the WEP keys.

The screenshot shows the MonarchNet2 Network Interface in a web browser. The browser address bar shows '000.0.0.00'. The page title is 'MonarchNet2 Network Interface' with the Avery Dennison logo. The main content area is titled 'Network Configuration' and includes printer information: 'Printer Name: PXRDE076D' and 'IP Address: 000.0.0.00'. There are four tabs: 'Protocols', 'SNMP', 'Wireless', and 'Alerts'. The 'Wireless' tab is active, showing 'Radio Settings' and 'Authentication Settings'. Under 'Radio Settings', the SSID is 'ADTP-AP9Int', Reg. Domain is 'United States', Roam Hysteresis is '6', and Mode is 'Infrastructure'. Under 'Authentication Settings', Encryption Mode is '64 BIT Encryption', Authentication Type is 'Open', and Key Selection is '1'. There are four input fields for 'Key #1' through 'Key #4', each containing a series of asterisks. A 'Save Changes' button is located at the bottom of the form.

1. Determine which **Key Selection** to use: 1-4.
 2. Set the **WEP Key** values. You must use the same key values for devices to communicate with each other on the network.
- Note:** As you enter the values for the WEP keys, you can see the characters. However, the next time you view this tab, the values are displayed as asterisks (*).
3. Click **Submit** when finished.
 4. Click the **Protocols** tab.
 5. Click **Save/Reboot** (on the **Protocols** tab) before any changes take affect. Even though you submitted your changes on the previous screen, they do not take affect until you click **Save/Reboot**. This process takes a few minutes.

Configuring Certificates

For TLS and TTLS authentication, you may need to upload the Authentication Server Certificate. The certificate must be in PEM format.



1. Click **Browse** to upload the appropriate **Root Certificate**, **Client Certificate**, and **Private Key**.
 - **Root Certificate** - A root certificate is one issued by a trusted certificate authority.
 - **Client Certificate** - A client certificate is one used by client systems to make authenticated requests to a remote server.
 - **Client Private Key** - The authentication key used to verify the root certificate.
2. Click **Submit**.
3. Click **Back** to return to the previous screen.
4. Click the **Protocols** tab.
5. Click **Save/Reboot** (on the **Protocols** tab) for changes to take effect. Even though you submitted your changes on the previous screen, they do not take effect until you click **Save/Reboot**. This process takes a few minutes.

Alerts

1. Click the **Alerts** tab to setup the mail server and select users to receive messages about printer status.

MonarchNet2™
Network Interface

Printer Name: PXRDE076D
IP Address: 000.0.0.00

Home
Network Configuration
Printer Configuration
Virtual Panel Display
Custom Command
Custom Data
Admin Settings
Log Off

Protocols | SNMP | Wireless | Alerts

Setup Mail Server (SMTP)

SMTP Server: 0.0.0.0
SMTP Port: 25
Domain Name:

Setup Alerts

Send all users test message.

Alert User 1:
Alert User 2:
Alert User 3:

	User 1	User 2	User 3
Printer Offline:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Printhead Interlock Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Printhead Status Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ribbon Failure:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stock Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cutter, Stacker, etc., Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verifier Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RFID Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Print Job Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MPCL II Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Battery Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System Error:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ALL ALL ALL

Save Changes

2. Enter the **Mail Server IP Address**.
3. Enter the **Mail Server Port**.
4. Enter the **Mail Domain Name**.
5. Specify up to three users who will receive alert messages.
6. Select the alerts for each user. ALL is a toggle switch to select or deselect all the boxes for each user. The “Printer Offline” alert only appears if the operator presses **Escape** on the printer, not **Enter**.
7. Click **Save Changes** to save your alert settings.
8. Click the **Protocols** tab.
9. Click **Save/Reboot** (on the **Protocols** tab) before any changes take effect. Even though you submitted your changes on the previous screen, they do not take effect until you click **Save/Reboot**. This process may take a few minutes.

Receiving An Alert

You receive an email when the printer goes offline, has a ribbon error, or for any other selected error. The email looks similar to:

Sender	Subject	Date
ADTP1@averydennison.com	Alert #4: ERROR #754 Check Ribbon.	08/02/2016 10:01
ADTP1@averydennison.com	Alert #1: Going Off-line	08/02/2016 09:33

The text of the email follows:

MonarchNet2 Printer Alert!!!
Prn IP:192.0.0.192
Prn Name:PX8A97CA
Going Off-Line

Please DO NOT REPLY to this message.

Perform the appropriate action to correct the problem. Make sure the printer is ready to receive data. The display shows either the wireless or wired symbol after the problem is corrected.

Reset/Reboot Network

Click **Save/Reboot** (on the **Protocols** tab) to reset and initialize the network interface. Any changes made on previous screens **do not** take effect until you click **Save/Reboot**.

This process takes a few minutes for the printer to respond with the new settings.

Reading the Virtual Panel

The virtual panel operates just like the printer's control panel. You can use the virtual panel to clear errors, feed labels, and more.

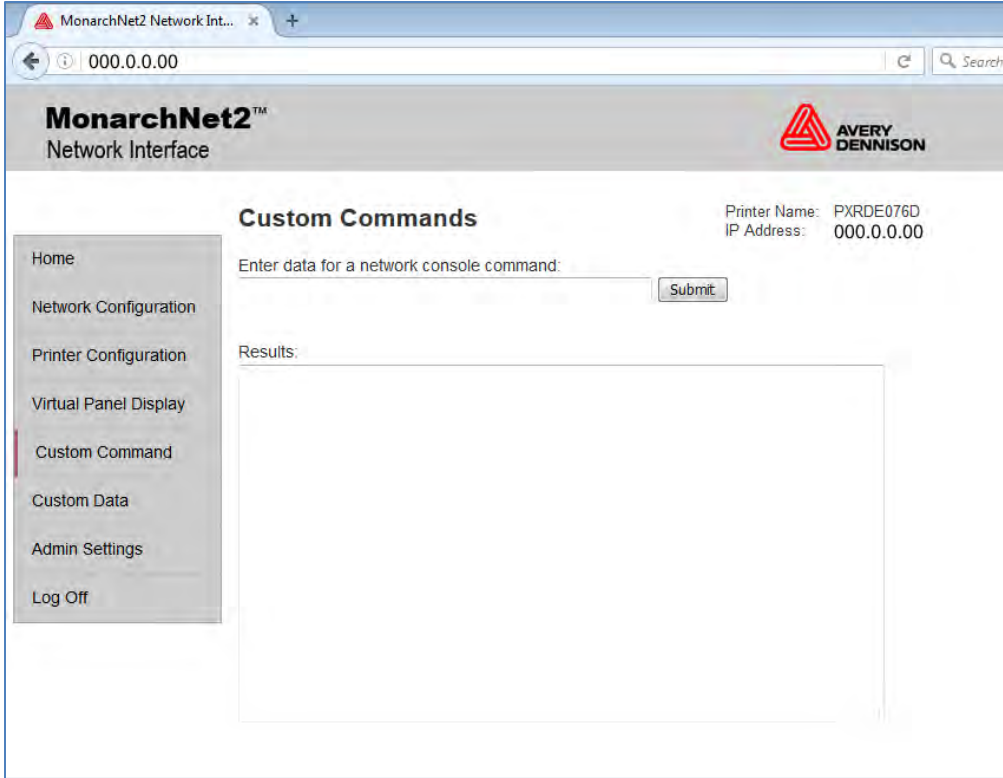
1. From the side Menu Bar, click **Virtual Panel Display**.
2. The current status of the printer appears on the virtual panel's display.
3. If there is an error, click **Escape/Clear** to clear the error. If you want to feed a label, click **Feed**.



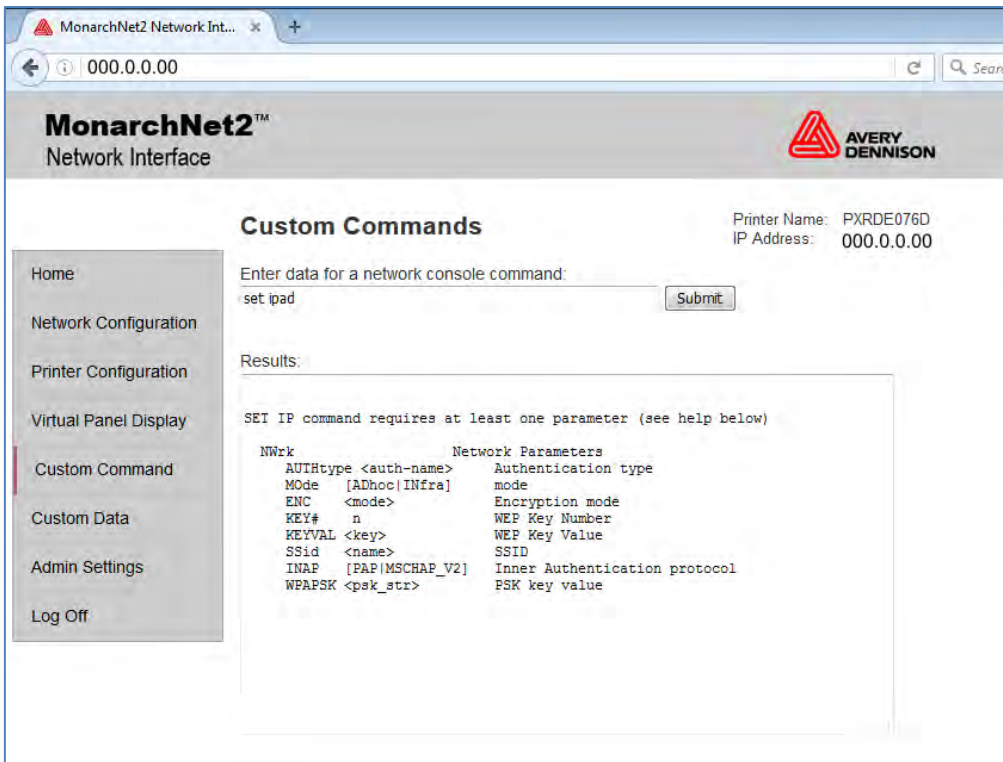
Using Custom Commands

The Custom Commands menu allows you to enter MPCL format and batch data to print a label or enter Telnet console commands.

1. From the side Menu Bar, click **Custom Command**.



2. Enter any MCPL format and batch data or enter a Telnet console command. See Chapter 3, “[Console Commands](#),” for more information.
3. **Click Submit.** The MPCL format is sent or results from a Telnet console command appear.



Using Custom Data

The Custom Data menu allows you to enter MPCL format and batch data to print a label.

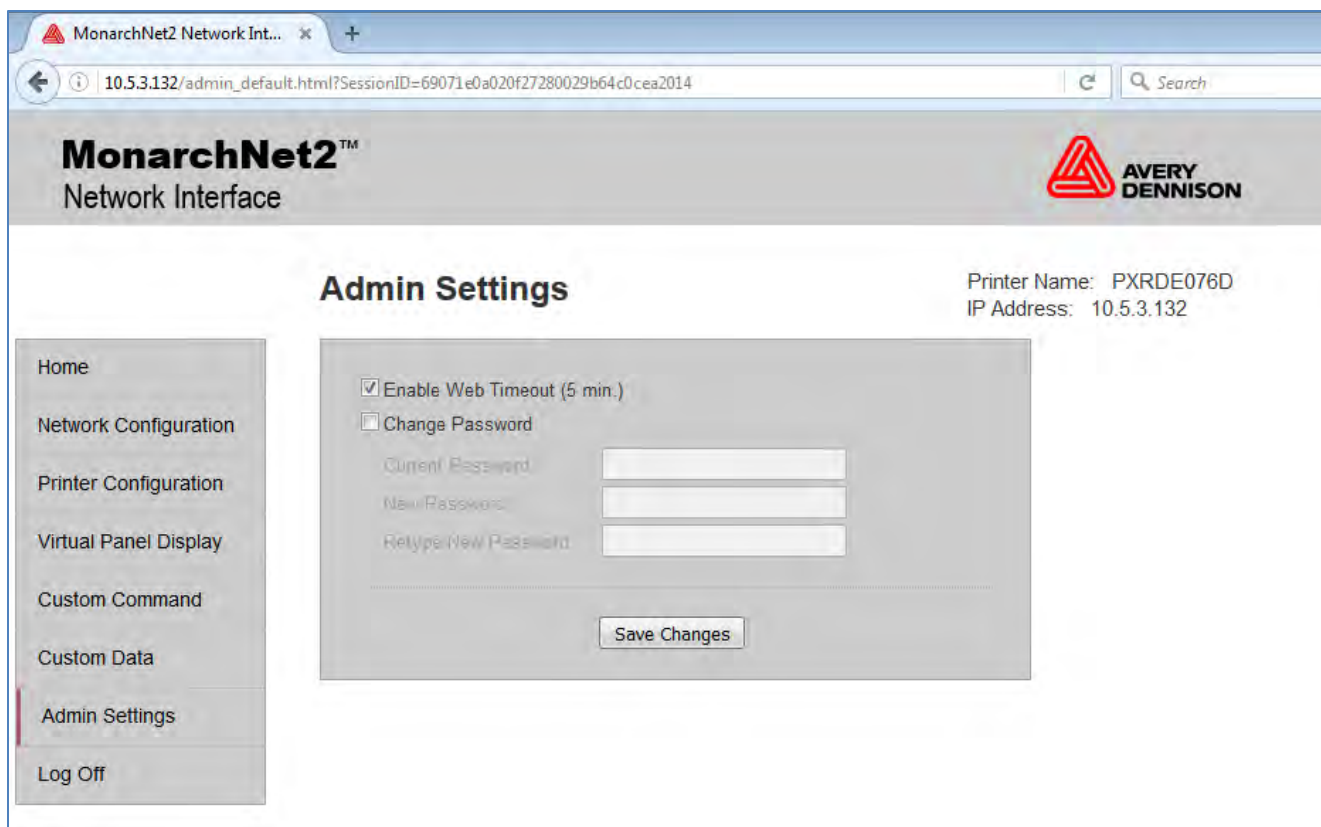
1. From the side Menu Bar, click **Custom Data**.
2. Enter any MCPL format and batch data.
3. Click **Submit**. The MPCL format is sent and the label prints.

Admin Settings

The Admin Settings menu allows you to enable Web Timeout and/or change the Admin Password.

Enable Web Timeout

Enable the Web Timeout setting to automatically logout after 5 minutes of inactivity.



The screenshot shows a web browser window displaying the MonarchNet2 Network Interface Admin Settings page. The browser address bar shows the URL: 10.5.3.132/admin_default.html?SessionID=69071e0a020f27280029b64c0cea2014. The page header includes the MonarchNet2 logo and the Avery Dennison logo. The main content area is titled "Admin Settings" and displays the following options:

- Enable Web Timeout (5 min.)
- Change Password

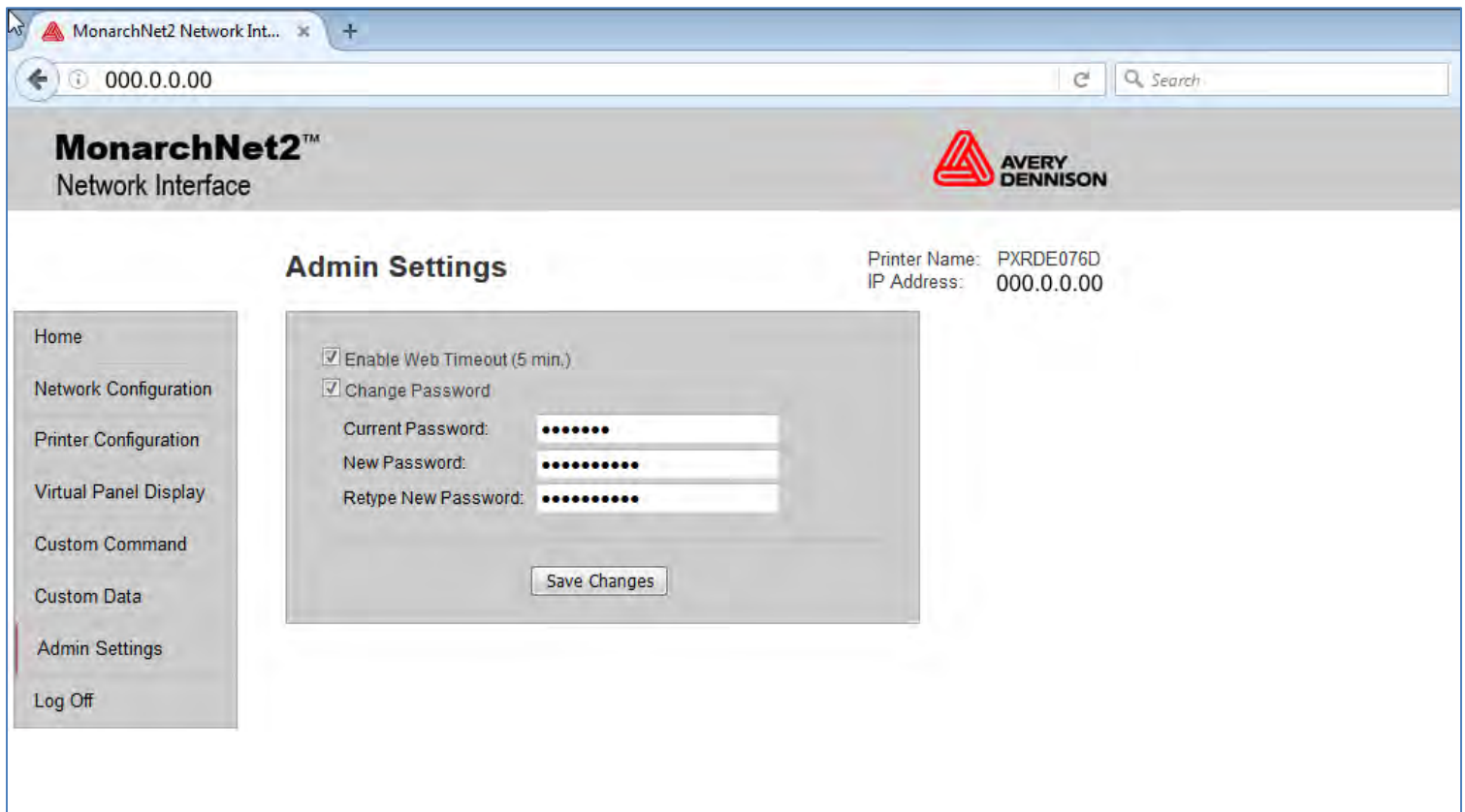
Below the "Change Password" option, there are three input fields for "Current Password", "New Password", and "Retype New Password". A "Save Changes" button is located at the bottom of the form. On the right side of the page, the printer name "PXRDE076D" and IP address "10.5.3.132" are displayed. A left-hand navigation menu contains the following items: Home, Network Configuration, Printer Configuration, Virtual Panel Display, Custom Command, Custom Data, Admin Settings (highlighted), and Log Off.

1. Click the Enable Web Timeout (5 min.) checkbox.
2. Click **Save Changes**.

Changing the Password

You can change the access password for MonarchNet2. This should only be done by your System Administrator. The default password is **access**. **The password is case-sensitive** and saved in the printer's flash memory.

Note: Make a note of the password if you change it. Changing the password also restricts access to Telnet sessions.



The screenshot shows a web browser window with the URL 000.0.0.0. The page title is "MonarchNet2™ Network Interface" and it features the Avery Dennison logo. The main content area is titled "Admin Settings" and displays the printer name "PXRDE076D" and IP address "000.0.0.00". A sidebar menu on the left includes options like Home, Network Configuration, Printer Configuration, Virtual Panel Display, Custom Command, Custom Data, Admin Settings (highlighted), and Log Off. The Admin Settings panel contains two checked checkboxes: "Enable Web Timeout (5 min.)" and "Change Password". Below these are three password input fields: "Current Password:", "New Password:", and "Retype New Password:", each with a masked password of dots. A "Save Changes" button is located at the bottom of the form.

1. From the side Menu Bar, click **Admin Settings**.
2. Enter the **Current Password**.
3. Enter the **New Password**.
4. Retype the **New Password** to confirm it.
5. Press **Save Changes** when finished.

Use this chapter to configure the Wireless module using Telnet. You must have a basic understanding of the Telnet application. For initial setup, do not use Telnet, use auto-discover mode. Once you have the IP address, you can use Telnet or a Web browser.

RSH (remote shell) support is available. Remote shell support is a common UNIX® application that provides remote command execution capability for networked devices. For more information, refer to your UNIX documentation.

- ◆ You can use Telnet if you do not have access to the MonarchNet2 software.
- ◆ This chapter also includes information about the Network Packet (Console Passthru).

Note: The default port is Port 23.

Conventions

This section uses the following conventions:

- KEYwords** Type the capitalized letters of each keyword instead of the whole keyword. Some keywords require more capitalized letters than others. For example,
`SEt`
`KEYVAL`
`RAdio`
- [options]** Mutually-exclusive options are included within square brackets and separated by a forward slash. Select only ONE of the options. For example,
`[DISable/STRICT/FLEXible]`
- <values>** Values are included within brackets. Values that contain spaces (multiple words) must be enclosed within quotation marks (""). For example,
`SEt EN PW <value>`
`SEt EN PW "Store 876"`
- n** Numeric digits are indicated by the letter (n). For example,
`SEt IP BOot n`
`SEt IP BOot 5`
`SEt EN CHannelnn`
`SEt EN CHannel 11`

Accessing Telnet Console Mode

1. Start a Telnet session.
2. Type telnet [your printer's IP address] (for example, 192.0.0.192)then press **Enter**.
3. You see "Welcome to MonarchNet2 Enter Password:"
Type **access** as the password then press **Enter** (**access** is the default password.).

The password is case-sensitive. You may not be prompted for a username.

Note: The Telnet session times out after 10 minutes of inactivity.

4. To view the current wireless (or network) settings, type **sh en** (show wireless settings) then press **Enter**:

```
WiFi Mode = INFRASTRUCTURE
WiFi SSID: ABC123
Speed = 54
International Roaming: Flexible
Dynamic Frequency Selection: Unsupported
Regulatory Domain = USI
WiFi FW Ver = 2.13.10.0 LMAC, 2.12.18.0 UMAC
AP density = LOW
Authentication type= OPEN SYSTEM
Encryption is Disabled
Local certificate loaded
AP MAC Address = 00 A0 F8 51 B4 FC
Signal Quality = Excellent (100%)
Connected to SSID ENG4121 on channel 11
```

5. To show the current IP settings, type **ship** (show TCP/IP settings) then press **Enter**.

```
IP is enabled
IP address192.0.0.192 Boot tries      3
Subnet mask      255.255.0.0      Boot method      AUTO
IP Gateway192.1.1.192 Max window    10240
(via DHCP 192.2.2.192)
LPD bannerdisabled Timeout          0 min
LPD retries are disabled Keepalive      1 min
Service  Port  TCP port
PXR1E8580_X1  X1    9100
```

6. To change the SSID, type **set en ssidtestsystem**thenpress **Enter**.
7. To set the IP address, type **set ipad 192.0.0.192**then press**Enter**.
8. To set the subnet mask, type **set ipsub 255.255.0.0**then press**Enter**.
9. Type **INIT** and press **Enter** to save the settings and initialize the unit.
10. Type **EXIT** to exit Telnet.

See the following sections for a list of the most frequently used commands.

Help Commands

For help at any time, type “Help” and a list of available commands appears. The Help command builds on itself, because for each command you type, more details appear for each option.

Note: There are help menus for all supported commands. To access a help menu for a specific command, type **Help<command>**.

Syntax: Help set

```
DEFAULT Set parameters to factory defaults
EN Network Parameters
LOAD Firmware update parameters
PAssword<password> Set console password
PORT<name> . Parameter for port <name>
SERVER Server and LAT parameters
SERVICE<name> Service Parameters
SNMP SNMP Variables
Syslog Syslog Parameters
DNS DNS Parameters
STRing n "... " BOT/EOT string
IP LPD/TCP Parameters
POWERON <delay-sec> Power on delay
```

Displays a list of the available help commands for “Set.”

Syntax: Help set ip

```
IP LPD/TCP Parameters
Address aa.bb.cc.dd IP node address
ARP [EN/DIS] IP set via ARP
BAnner [EN/DIS] LPD banner printing
CHKSUM [EN/DIS] IP receive checksum
BOot n Number of DHCP/BOOTP tries
ENable/DISable Enable or Disable IP Processing
FTIME [EN/DIS] Fast timeout
FTP [EN/DIS] FTP protocol
HTTTP [EN/DIS] HTTP protocol
KEepalive n Keepalive interval (min)
LPD [EN/DIS] LPD protocol
METHod<type> Set method of getting IP address
PING aa.bb.cc.dd Test connection to IP host
PRObe [EN/DIS] TCP connection probes
RANGE [EN/DIS/ALL] aa.bb.cc.dd {MAxee.ff.gg.hh}
RARp flags nn 1=no subnet, 2=no router, 3=neither
REtry [EN/DIS] LPD retry continuation
ROuter aa.bb.cc.dd Default router address
SUBnet aa.bb.cc.dd Subnet mask
TCP [EN/DIS] Raw TCP (9100) protocol
TELnet [EN/DIS] TELNET protocol
TFTP [EN/DIS] TFTP protocol
TIMEout n Inactivity timeout (minutes)
TRAP n [ADDR/PORT/TRIG] TRAP configuration
WIndownn LPD/TCP maximum window size
```

Displays a list of the available help commands for “Set IP.”

General Commands

From the list of commands, the brackets - [] indicate to pick one of the options listed, the items inside curly braces - {} are optional and do not need to be specified.

Set/Clear/Delete/Purge

Used in conjunction with additional parameters.

EXIT

Exits console mode.

HElp

Displays the list of available commands.

SET

Sets a specified parameter.

SHoW

Displays current settings.

INIT

Saves settings and initializes unit.

SET DEFAULT

Sets wireless module to factory defaults.

SET PAssword

Sets console password. The user is prompted for old password, new password, and to verify new password. The default password is **access**.

Note: The password is case-sensitive.

SET SERVERName<name>

Sets server node name.

SHoW FREE

Shows amount of available memory.

SHoW PRN FEEDlabel

Feeds a label.

SET PRN FIRMWARE

Sets the printer in boot loader mode to reload the firmware.

SHoW PRN KEYPad

Shows the current status of the keypad lock.

SET PRN KEYPad [LOCK/UNlock]

Locks or unlocks the printer's keypad.

SET PRN RESET

Rests the printer (Telnet and remote shell only).

SHoW PRN STATus

Shows the printer's current status (decoded ENQ status bytes).

SHoW PRN TESTlabel

Prints a test label.

SHoW PRN UPASSwordstatus

Shows the current status of the offline menu user password (on or off).

SET PRN UPASSwordstatus [YES/NO]

Turns the offline menu user password on or off.

SHoWSERVER

Shows the server parameters.

SHoWVersion

Shows the server firmware version.

UPTIME

Shows how long the printer has been on in format **hh:mm:ss up N day(s), hh:mm:ss**.

Setup Commands

SET PRN BACKfeedcontrol [Action/ DISPenseposition/ DISTance] value

Sets the specified backfeedcontrol parameter to the specified value.

SHOW PRN BACKfeedcontrol {Action/ DISPenseposition/ DISTance}

Shows the specified backfeedcontrol parameter's current setting. If no parameter is specified, it shows the current settings of all parameters in the backfeedcontrol category.

SET PRN BATchoptions[CLearfields/ NUmberofparts/ CUTOption/ CUTMultiple/ Printmultiple/ QUantity] PRompt [YES/ NO]

Turns on or off the specified batch entry prompt. These parameters also have corresponding values, such as "cut last ticket" for CUTOption.

SET PRN BATchoptions [CLearfields/ NUmberofparts/ CUTOption/ CUTMultiple/ Printmultiple/ QUantity] value

Sets the specified batchoptions parameter to the specified value.

SET PRN BATchoptions [CUTLTicketprompt/ CUTAfterbatchprompt/ NOCutbeforeprompt/ CUTLStripprompt] [YES/ NO]

Sets the specified batchoptions parameter's current setting. If no parameter is specified, it shows the current setting of all parameters in the batchoptions category.

SHOW PRN BATchoptions {CLearfields/ NUmberofparts/ CUTOption/ CUTMultiple/ CUTLTicketprompt/ CUTAfterbatchprompt/ NOCutbeforeprompt/ CUTLStripprompt/ Printmultiple/ QUantity}

Shows the specified batchoptions parameter's current setting. If no parameter is specified, it shows the current settings of all parameters in the batchoptions category.

SET PRN COMMunication [BAudrate/ WOrdlength/ STopbits/ PArity/ FLOWcontrol/ PPort/ PMode] value

Sets the specified communication parameter to the specified value.

SHOW PRN COMMunication {BAudrate/ WOrdlength/ STopbits/ PArity/ FLOWcontrol/ PPort/ PMode}

Shows the specified communication parameter's current setting. If no parameter is specified, it shows the current settings for all parameters in the communication category.

SET PRN CONTrOlcharacters [SStartheader/ PParamseparator/ QUotedstrings/ FFieldseparator/ ENDheaderDATAescape/ IMmediatecmd/ ENQRequest/ ENQTerminator/ JOBterminator] value

Sets the specified control character to the specified value. Setting the immediate command character enables immediate commands; setting the ENQ status request character enables ENQ status polling.

SHOW PRN CONTrOlcharacters {SStartheader/ PParamseparator/ QUotedstrings/ FFieldseparator/ ENDheader/ DATAescape/ IMmediatecmd/ ENQRequest/ ENQTerminator/ JOBterminator}

Show the specified control character's current setting. If no parameter is specified, it shows the current settings of all parameters in the control characters category.

CLear PRN CONTrOlcharacters [DATAescape/ IMmediatecmd/ ENQRequest/ ENQTerminator/ JOBterminator]

Clears the specified control character. Clearing the immediate command character disables immediate commands. Clearing the ENQ status request character disables ENQ status polling.

SHOW PRN INFO {MODEL/ SERIAL/ FIRMversion/ BOotversion/ CONtrastpot/ PICversion/ KNifeversion/ RFidversion/ NETworkversion/ TOTAals}

Shows the specified info parameter. If no parameter is specified, it shows all parameters in the info category.

SET PRN MEMoryconfig [DownLoadablefonts/ FORmat/ IMage/ REceive/ TRansmit/ VECtorfonts] value

Sets the specified buffer's size the specified value.

SHOW PRN MEMoryconfig [DownLoadablefonts/ FORmat/ IMage/ REceive/ TRansmit/ VECtorfonts]

Shows the specified buffer's current size. If no buffer is specified, it shows the current sizes of all buffers.

SET PRN MONetary [MONetarysign/ SEcondarysign/ DECimaldigits] value

Sets the specified monetary parameter to the specified value.

SHOW PRN MONetary {MONetarysign/ SEcondarysign/ DECimaldigits}

Shows the specified monetary parameter's current setting. If no parameter is specified, it shows the current settings of all parameters in the monetary category.

SET PRN PRIntcontrol [CONtrast/ PRIntoposition/ MArginposition/ SPeed/ PHeadwidth] value

Sets the specified printcontrol parameter to the specified value.

SHOW PRN PRIntcontrol {CONtrast/ PRIntoposition/ MArginposition/ SPeed/ PHeadwidth}

Shows the specified printcontrol parameter's current setting. If no parameter is specified, it shows the current settings of all parameter's in the print control category.

SET PRN QUEuecontrolREpeat

Repeats last printed batch.

CLear PRN QUEuecontrol [ALlcancel/ CUrrentcancel/ ABorterror/ Reseterror]

Performs the specified action.

SHOW PRN STOrageFLash

Shows the amount of unused flash memory.

SHOW PRN STOrageFORMats {format # or ALl}

Shows headers for individual or all formats. Note that '0' is shorthand for 'ALI'.

SHOW PRN STOrageFONts

Shows headers for all fonts.

CLear PRN STOrage [RAM/ FLash] FORMats [format # or ALl]

Clears the specified format or all formats from volatile RAM or flash memory. Note that '0' is shorthand for 'ALI'.

CLear PRN STOrage [RAM/ FLash] FONts [font # or ALl]

Clears the specified font or all fonts from volatile RAM or flash memory. Note that '0' is shorthand for 'ALI'.

CLear PRN STOrage [RAM/ FLash] GRaphics [graphic # or ALl]

Clears the specified graphic or all graphics from volatile RAM or flash memory. Note that '0' is shorthand for 'ALI'.

CLear PRN STOrage [RAM/ FLash] CDigits [CD scheme #]

Clears the specified check digit scheme from volatile RAM or flash memory.

SET PRN SUPply [TYpe/ RiBbon/ FEedmode/ SUPplyposition/ CUtposition/ SKipindex/ KNifecontrol/ ERroraction] value

Sets the specified supply parameter to the specified value.

SHOW PRN SUPply [TYpe/ RiBbon/ FEedmode/ SUPplyposition/ CUtposition/ SKipindex/ KNifecontrol/ ERroraction]

Shows the specified supply parameter's current setting. If no parameter is specified, it shows the current settings of all parameter's in the supply category.

SHOW PRN SUPplySYncsupply

Resynchronizes the supply.

**SET PRN SYSTEM [Powerupmode/ LLanguage/
Batchseparators/SLashedzero/Symbolset] value**

Sets the specified system parameter to the specified value.

**SHOW PRN SYSTEM {Powerupmode/ LLanguage/
Batchseparators/SLashedzero/Symbolset}**

Shows the specified system parameter's current setting. If no parameter is specified, it shows the current settings of all parameters in the system category.

SET PRN SCRIPTS [Load/ ENable/ DISable/ DELETE]

Loads, enables, disables, or deletes a script. Note that LOad, ENable, DISable, and DELETE take no arguments.

SET PRN SCRIPTS [ENQpollbeforescript/ IMmcmdbeforescript] value

Sets the specified scripts parameter to the specified value.

SHOW PRN SCRIPTS {Status/ INfo/ ENQpollbeforescript/ IMmcmdbeforescript}

Shows the specified scripts parameter's current setting. If no parameter is specified, it shows the current settings of all parameters in the scripts category.

SET PRN VERIFIER [State/ SCanbeam/ CAbledetect] value

Sets the specified verifier parameter to the specified value.

SHOW PRN VERIFIER {State/ SCanbeam/ CAbledetect/ SUMmary}

Shows the specified verifier parameter's current setting. If no parameter is specified, it shows the current settings of all parameters in the verifier category.

CLear PRN VERifierSUMmary

Clears the verifier summary data (number of good and bad verifier labels).

RFID Commands

**SHOW PRN RFID {Moduletype/ VErSION/ WRiteattempts/ PRotocol/ RPower/ WPower/
REgion/ FRequency/ SUMmary}**

Shows the specified RFID parameter's current setting. If no parameter is specified, it shows the current settings of all parameters in the RFID category.

CLear PRN RFIDSUMmary

Clears RFID summary data (number of good and bad RFID tags).

802.11b/g Wireless Commands

In the following commands, EN and NW (network settings) are interchangeable.

CLear EN SSID

Clears the SSID, so the server connects to any access point.

SET EN AUTHtype [OPEN/SHARED/TTLS/LEAP/PEAP/WPA-PSK]

Sets the authentication type. See Chapter 3, "Using the Web Browser" for more information.

**SET EN ENC [DISable/64/128/WPA/WPA2/WPA2-WPA/
Dynamic WEP]**

Sets the encryption mode. See Chapter 3, "Using the Web Browser" for more information.

SET EN INAP [PAP/MSCHAP_V2]

Sets the EAP inner authentication protocol.

SET EN KEY# <1/2/3/4>

Sets which WEP key number to use (default is 1).

SET EN KEYVAL <WEPkey>

Sets WEP key value. Must be hexadecimal.

SET EN MODE [IN/AD]

Sets 802.11b/g/n wireless mode to infrastructure or Ad-Hoc mode.

SET EN ROAM

Sets the Roam Threshold.

SET EN SSID "<ssid>"

Sets 802.11b/g/n wireless SSID. Use quotes if there is a space in SSID. This is case sensitive.

SET EN WPAPSK <WPAkey>

Sets the WPA pre-shared key or pass-phrase. Use 64 hex characters for the PSK or 8-63 characters for the pass-phrase. This is only valid when authentication mode is WPA-PSK.

TCP/IP Commands

SET IP Address

Sets IP address of wireless module.

SET IP BOot n

Sets number of retries (n) for DHCP, BOOTP, RARP

SET IP KEepalive n

Sets keep alive interval (n) in minutes.

SET IP MEthod [DHCP/STATIC]

Sets method of getting IP address.

SET IP SUBnet aa.bb.cc.dd

Sets default subnet mask.

SET IP TImeout n

Sets timeout (n) in minutes.

SNMP Commands

CLear SNMP CONtact<string>

Removes SNMP SysContact.

CLear SNMP LOcation<string>

Removes SNMP SysLocation.

SET SNMP GETCOMM <string>

Gets SNMP community.

SET SNMP SETCOMM1 <string> or SET SNMP SETCOMM2 <string>

Sets SNMP community 1 or community 2 name.

Note: An incoming set request can use either name for comm1 or comm2.

SET SNMP CONtact<string>

Sets SNMP SysContact.

SET SNMP LOcation<string>

Sets SNMP SysLocation.

Using the Network Packet

Use the Network Packet to send console commands directly to the network card via the printer's serial port. If the network card does not appear to be communicating with the printer, you can use the Network Packet to change the SSID, IP address, etc. of the network card.

Note: You can use Network Packet even if MonarchNet2 is disabled or not installed. Printer console commands are available but network console commands are not.

Syntax {N,number,action,device,"name"}
C,"con_cmds" | }

N1. N Network Console Packet.

N2. number Number from 0-999 to identify the network console packet.

N3. action Enter **A** to add to packet to the printer.

N4. device Enter **T** to pass the packet through the printer and stores the packet in the network card.

N5. "name" Packet name, 0-8 characters, enclose within quotation marks.

C1. C Command field.

C2. "con_cmds" Console commands. Must be enclosed within quotation marks. Each command must be on a separate line. The maximum number of characters per command is 100. See the list of commands earlier in this chapter for more information.

Note: The maximum number of commands per packet is twenty-five (25).

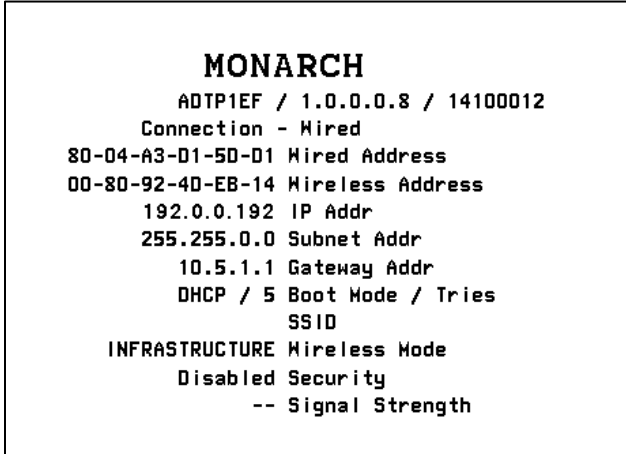
Example {N,1,A,T,"mystore"}
C, "set ip me static"
C, "init" |
C, "exit" | }

Sends the Network Packet 1 "**my store**" directly to the network card (**T**) and **sets** the **IP** method to **static** for determining IP addresses. Init and Exit commands must be used to save changes and initialize the network card.

If you have difficulty communicating with the wireless module, verify that the printer is operating properly, is online, and supplies are loaded correctly.

Printing a MonarchNet2 Test Label

Press **TLABEL** and select *Mnet2 Label*



The test label displays the settings for the IP address, subnet address, IP gateway, boot tries, boot method, SSID, wireless mode, WiFi WEP, WiFi signal, packets received, bad packets received, and packet collisions. It also lists Smart Relay information. See Chapter 2 or 3 if you need to change any of the IP or wireless settings.

Use this table to solve some common printer/network problems.

Problem	Action
Printer does not appear to save IP, subnet, or gateway address.	The value for each segment must be less than 255 in these addresses.
Printer does not communicate with access point.	If you have reset network or wireless settings, allow time for the printer to reset and connect to an access point. This may take a minute or more, depending on network traffic.
The printer does not communicate with your network.	The network settings must match the printer's settings for: <ul style="list-style-type: none"> ◆ IP address, gateway, and subnet mask ◆ SSID ◆ Ad-Hoc or infrastructure mode ◆ Security
Cannot see the printer on the network.	The devices must be on the same logical network and the subnet masks should be the same.
Configuration/test label shows "searching" or "set manually" for boot method/DHCP.	The message "searching" indicates the printer has not yet connected to the network. The message "set manually" indicates the boot method is Static. If the boot method is not Static, the printer was not able to connect to the network.

Use this table to solve some common MonarchNet2 Web browser problems.

Problem	Action
Verifier does not appear as an installed/enabled option through your Web browser.	The optional verifier must be enabled and properly connected. For more information, see your verifier's <i>Operating Instructions</i> .
"Error sending the discovery request" message on your computer/Web browser.	The printer is not communicating on the network. Verify network and wireless settings, including IP address, etc.
MonarchNet2 does not appear to be working.	Turn off the printer and turn it back on. Print a MN2 test label to confirm the IP address, etc. Enter the correct IP address in your Web browser.
"Authorization Failure" message from MonarchNet2 on your computer/Web browser.	Enter the correct password when logging into MonarchNet2. The default password is access.

General Troubleshooting Information

Use the following information if your wireless printer is not operating properly.

1. Verify that the printer is turned on.
If the printer is used on a Monarch® Mobile Work Station (MWS), the MWS unit's power AND the printer must be turned on.
2. If you are switching between wired and wireless mode on different subnets, turn off the printer and then turn it back on to reinitialize the wireless module.
3. Verify the wireless module is functioning.
There is a wireless icon indicator on the printer's display.
4. Print an MN2 test label.
Use four-inch supply. If you are using supply that is shorter than four inches long, temporarily change your supply type to "continuous" to print the entire test label. After printing the test label, change your supply type to your previous setting.
Once you see "Ready" on the display, print a test label. If this does not print or the printer does not display "Ready," the printer is locked up. Turn off the printer, wait 15 seconds and then turn it back on.
5. On the test label, verify your IP and WiFi settings. The "wired/wireless:" value should be "WIRED" for Ethernet cable and "WIRELESS" for RF.
Check the "WiFi SSID" and the "signal strength." Is the SSID correct? Is the signal strength greater than zero? If the signal strength is 0, there is no connection with the access point; 30 (or less) indicates you may be experiencing interference or close to being out of the access point's range, and below 50, printing performance could be affected. If the signal strength is low, increase the number of retries. To improve the signal strength, try moving the printer closer to the access point and away from other radio devices such as Bluetooth® wireless devices, microwave ovens, or 2.4-GHz cordless phones.

6. Telnet to the printer.

Note: After the wireless module has been reset, you may need to re-enable Telnet.

Once you have verified connectivity, Telnet to the printer. (i.e. `telnet aa.bb.cc.dd`)

You see "Welcome to MonarchNet2 Enter Password:"

Type `access` as the password and press **Enter**. (`access` is the default password.)

The password is case-sensitive. You may not be prompted for a user name. Once here, you have verified operation to the wireless module.

7. Ping the printer.

Pinging the printer tells you if it is "seen" on the network. If you cannot ping the printer, turn the printer off and then on. Then ping every device in the path to the printer – access points, routers, etc. Any device you cannot ping needs attention.

`Ping ip address` (i.e. `ping 192.0.0.192`)

8. Verify connection to the data port by starting a Telnet session to the printer using Port 9100 (i.e. `telnet aa.bb.cc.dd 9100`).

Press **Ctrl-E** on your keyboard. This sends an ENQ request.

The printer responds with three characters. Depending upon the Telnet being used, you may not see the first character, as it is a hex 05 value. The other two characters are ASCII characters. You will see

`A@`

which means the printer is online and waiting. Alternatively, you can type

`{J,2}`

Note: The **J** must be capital.

The printer responds with `{J,0,0,"",""}`.

No response means that the printer may have an open session to some other connection. Either terminate the other connection or turn off the printer and turn it back on.

Troubleshooting Wireless Configuration Problems

1. Your computer's wireless adapter and/or access point should be configured to match your printer's wireless settings.
2. The printer should be within range (90 meters or 300 feet) of your computer and away from metal objects and other devices with radio signals (Bluetooth®, 2.4 GHz cordless phones, and microwaves).
3. Use infrastructure mode to connect through an access point.
Use Ad-Hoc mode to connect without an access point.
4. To use encryption or to password protect your wireless network, and your wireless adapter or access point normally uses a password or pass-phrase instead of WEP, it should allow you to enter 0x followed by a ten digit (for 40-bit or 64-bit WEP) or twenty-six digit (for 128-bit WEP) key in hexadecimal format (0-9 or A-F).
5. Change the RF channel (**Ad-Hoc mode only**) to correct intermittent connection problems or slow performance. Change it to at least three channels lower or higher than any other wireless networks within range.

GLOSSARY

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Absolute Pathname	The full path of a file, including the computer system and any directories or subdirectories. For example, c:\program files\monarch software\mpcl toolbox\9855.phu
Access Point	An interface between a wireless network and a wired network. Access points can be used with Ethernet or other communications to enable roaming throughout a facility.
Ad-Hoc Network/Mode	A wireless network composed of devices that contain a network interface card and no access point. Ad-Hoc mode is also called peer-to-peer (point-to-point) communications or BSS network. As long as the devices are in range and are on the same channel and SSID, they connect and communicate. Use this mode if a wireless infrastructure does not exist or where services are not required.
Authentication Method	This method identifies users on a network, based on a username and password. There are two types: open and shared. Authentication protocols include LEAP, PEAP, TLS, TTLS, EAP-FAST, and PSK.
Auto Method	One of the available boot methods. Auto tries DHCP, BOOTP, and RARP, then sets to the last IP address used if the IP address is not automatically set using any of the previous methods.
BOOTP or Bootstrap Protocol	One of the available boot methods. It is a protocol used by devices that know their MAC address, but do not know their IP address. The device broadcasts its hardware address and the BOOTP server responds with the IP address for it. The network administrator must enter the MAC address in the BOOTP Config file to obtain the IP address from the server.
Boot Method	The wireless module uses this method to obtain an IP address. This can be set to Auto, DHCP, BOOTP, RARP, or Static.
Boot Tries	The number of times the device tries to get an IP address from the server when using the BOOTP and DHCP methods.
BSS or Basic Service Set	A set of 802.11b/g/n devices operating as a fully connected wireless network.
BSSID	See <i>MAC Address</i> .
Channel or RF Channel	You can select which channel your network devices use to communicate. All devices must be on the same channel to communicate in Ad-Hoc mode. Other radio devices such as Bluetooth® wireless devices, microwave ovens, or 2.4-GHz cordless phones may operate/interfere if they are on the same channel as your network.
DHCP or Dynamic Host Configuration Protocol	One of the available boot methods. It is a protocol that issues IP addresses automatically within a specified range to devices (such as printers) when they are first turned on. The device keeps the IP address for a defined period of time set by your System Administrator; however, a device could have a different IP address every time it connects to the network.
EAP (Extensible Authentication Protocol)	Defines how to pass authentication information between the device and authentication server. The authentication is handled by the EAP type: FAST, TLS, TTLS, etc.
FAST (Flexible Authentication via Secure Tunneling)	Cisco Systems® developed this authentication protocol. It does not use certificates to authenticate, but a PAC (Protected Access Credential), which is managed dynamically by the server. The PAC is distributed one at a time to the client manually or automatically.
Gateway Infrastructure Mode	Allows connections (communications) between different subnets on a network. Requires an access point to communicate with other devices on the network. In infrastructure mode, wireless devices can communicate with each other or with a wired network.
IP Address	An Internet Protocol identifier for a device on a network. It consists of four 3-digit numeric fields, separated by periods. Each number can be zero to 255. An IP address has two components, the network address and the host address. Most company networks have ranges for their IP addresses.
LAN or Local Area Network	A computer network that connects personal computers, workstations, servers, and printers. This allows each user on the network the ability to share devices, such as printers, and communicate with each other via email, etc. LANs can be connected to each other by telephone lines or radio waves. See <i>WLAN</i> .
LEAP (Lightweight)	Cisco Systems® introduced this authentication protocol and provides mutual authentication with unique WEP keys for each user. New keys are issued based on a time limit. Changing

Extensible Authentication Protocol)	the WEP key time limits provides additional security.
LPD/LPR	A printer protocol that uses TCP/IP to establish connections between printers on a network. Also known as Line Printer Daemon/Line Printer Remote.
MAC Address or Media Access Control	A hardware address (6-byte) that uniquely identifies each node of a network. The MAC address is set during manufacturing and does not change. Also, two Network Interface Cards (NIC) will not have the same value.
MSCHAPv2 (Challenge Handshake Authentication Protocol)	MSCHAPv2 is the Microsoft® version of CHAP. It is a three-way handshake protocol that is more secure than PAP. It provides mutual authentication between devices.
NIC or Network Interface Card Node	An adapter (board or card) that can be inserted into a device, so the device can be connected to a network. The NIC converts data from the device into the form transmitted or received from the network A processing location on a network. The location can be a workstation, computer, or printer. Each Node has a unique MAC address.
Open Authentication	This allows any device to authenticate and then attempt to communicate with the access point. Any wireless device can authenticate with the access point, but if WEP is used, the device can communicate only if its WEP keys match the access point's. There is no challenge that occurs, you either have the correct key or not when you communicate with the access point. By eliminating the challenge process, it actually makes this more secure than shared key authentication.
PAP (Password Authentication Protocol)	A simple authentication protocol used with PPP (Point-to-Point Protocol). It is a plain text password system, which is not very secure.
Pathname	The location of a particular file or directory that includes the full path to the needed filename or directory. This is a combination of path and filename.
PEAP (Protected Extensible Authentication Protocol)	Authenticates clients into a network using only server-side certificates, which makes implementing and administering a wireless LAN easier.
Ping	A way to determine if a device is accessible. It sends a packet to the specified address and waits for a reply.
Protocol	This is the way two devices transmit data between each other, including error checking, data compression, and how messages start and end.
PSK (Pre-Shared Key)	Authentication mode of WPA used in SOHO environments. The key value (or pass-phrase) is used for network authentication only (not data encryption). It does not use a RADIUS server like the other modes, but uses a shared key to provide the initial authentication with the access point or host.
RADIUS (Remote Authentication Dial-In Server)	This is an authentication server, such as the Cisco® ACS, Microsoft® IAS, etc.
RARP or Reverse Address Resolution Protocol	One of the available boot methods. The device sends an RARP request and the RARP server responds with an IP address. The device knows its MAC address and the server responds with the IP address for it.
Relative Pathname	The file or directory location on the user's system relative to the user's current location on the system (what directory the user is currently in). For example, mpcl toolbox\9855.phu
Router	Any device that forwards data along networks. Routers are located at gateways.
Shared Authentication	The access point sends an unencrypted challenge text string to any device attempting to communicate with it. The device requesting authentication encrypts the challenge text and sends it back to the access point. If the challenge text is encrypted correctly, the access point allows the requesting device to authenticate. Both the unencrypted challenge and the encrypted challenge can be monitored; however, this leaves the access point open to attack. Because of this weakness, shared key authentication can be less secure than open authentication.

Signal Strength	A percentage (1 to 100) of the connection between the device and access point. If the signal strength is 0, there is no connection with the access point; 30 or less indicates you may be experiencing interference or close to being out of access point range, and below 50, printing performance could be affected. To improve the signal strength, try moving the printer closer to the access point and away from other radio devices such as Bluetooth® wireless devices, microwave ovens, or 2.4-GHz cordless phones.
Speed or Transmit Rate	Sets the maximum rate of communication between the devices on the network. It is also called transmit rate. The speeds are in megabits per second (Mbps) and include: 1, 2, 5.5, 11, 12, 18, 24, 36, 48, and 54.
SSID or Service Set Identifier	A unique identifier that must match for all nodes on a subnetwork to communicate with each other. It consists of up to 32 characters (any printable character, including spaces). If using the space character, it must be enclosed in quotation marks. It is case-sensitive.
Static Method	One of the available boot methods. Use static if your network uses fixed configuration. The IP address remains the same every time the device connects to the network.
Subnet	A portion of a network that shares a common address component. On TCP/IP networks, subnets are all devices with the same prefix. For example, all devices that start with 192.192.192 are part of the same subnet. Dividing a network into subnets is useful for both security and performance reasons.
Subnet Mask	A mask is used to determine what subnet an IP address belongs to. Companies often have ranges of IP addresses that can be described by one or more masks. For example, a mask of 255.255.255.0 allows variation in the last position only, because the first three positions are fixed.
Telnet	A Terminal Emulation program for TCP/IP networks that runs on your computer and connects your computer to a server on the network. You enter commands through the Telnet program and they run as if you were entering them directly on the server console.
TCP/IP	A way that two devices can transmit data between each other. TCP/IP (Transmission Control Protocol/ Internet Protocol) is generally the standard for transmitting data over a network.
TKIP (Temporal Key Integrity Protocol)	Changes the encryption keys regularly and has time limits before new keys are created. Changing the key periodically provides additional security.
TLS (Transport Layer Security)	A cryptographic protocol that uses client-side and server-side certificates to authenticate users on the Web. It can dynamically create user-based and session-based keys.
TTLS (Tunneled Transport Layer Security)	Provides certificate-based, server-side, mutual authentication of the client and network through an encrypted channel (or tunnel). It can dynamically create user-based and session-based keys.
Transmit Rate	See <i>Speed</i> .
WEP or Wired Equivalent Privacy	A security protocol for wireless local area networks. WEP was designed to provide the same level of security as that of a wired network, which is inherently more secure than a wireless network because wired networks are easily protected against unauthorized access. Wireless networks use radio waves to communicate and can be vulnerable to unauthorized users. WEP provides security by encrypting data over radio waves so that it is protected as it is transmitted. However, it has been found that WEP is not as secure as once believed. Note: If one part of a wireless network has WEP enabled, they all must have it enabled with the same key or they cannot communicate.
128 Bit / 64 Bit WEP Key	This is the 64 or 128 bit WEP key that must match other Nodes' encryption keys in order to communicate: 10 hex characters for 64 bit (40 user-specified characters), or 26 hex characters for 128 bit (104 user-specified characters). You must use the same key values for devices to communicate with each other.
WLAN or Wireless Local Area Network	A LAN that uses high-frequency radio waves to communicate between nodes, rather than telephone wires, etc.
WPA (Wi-Fi Protected Access)	A network security protocol that uses improved authentication and temporal keys. It was created to address the weaknesses of WEP encryption.
WPA2 (or IEEE 802.11i)	A network security protocol with stronger encryption than WPA. It was created to address the weaknesses of WEP encryption.



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