



Multi-Protocol On-board Ethernet Print Server



NETWORK USER'S GUIDE

This Network User's Guide provides useful information of network settings and security settings using your Brother machine. You can also find supported protocol information and detailed troubleshooting tips.

To find basic information about network and advanced network features of your Brother machine, see the *Network Glossary*. To download the latest manual, please visit the Brother Solutions Center at (<http://solutions.brother.com/>). You can also download the latest drivers and utilities for your machine, read FAQs and troubleshooting tips or learn about special printing solutions from the Brother Solutions Center.

Definitions of notes

We use the following icons throughout this User's Guide:

 IMPORTANT	IMPORTANT indicates a potentially hazardous situation which, if not avoided, may result in damage to property or loss of product functionality.
 Note	Notes tell you how you should respond to a situation that may arise or give tips about how the operation works with other features.

IMPORTANT NOTE

- This product is approved for use in the country of purchase only. Do not use this product outside the country of purchase as it may violate the power regulations of that country.
- Windows[®] XP in this document represents Windows[®] XP Professional, Windows[®] XP Professional x64 Edition and Windows[®] XP Home Edition.
- Windows Server[®] 2003 in this document represents Windows Server[®] 2003 and Windows Server[®] 2003 x64 Edition.
- Windows Server[®] 2008 in this document represents Windows Server[®] 2008 and Windows Server[®] 2008 R2.
- Windows Vista[®] in this document represents all editions of Windows Vista[®].
- Windows[®] 7 in this document represents all editions of Windows[®] 7.
- Not all models are available in all countries.

Table of Contents

1	Introduction	1
	Network features.....	1
	Other Network features	1
2	Changing your machine's network settings	2
	How to change your machine's network settings (IP address, Subnet mask and Gateway).....	2
	Using the BRAdmin Light utility	2
	Other Management Utilities	5
	Web Based Management (web browser)	5
	BRAdmin Professional 3 utility (Windows®)	5
	Web BRAdmin (Windows®).....	6
	BRPrint Auditor (Windows®).....	6
3	Control panel setup	7
	Overview.....	7
	Reset the network settings to the factory default.....	8
	Printing the Printer Settings Page.....	8
4	Web Based Management	9
	Overview.....	9
	How to configure the machine settings using Web Based Management (web browser).....	10
5	Security features	11
	Overview.....	11
	Sending an E-mail securely	12
	Configuration using Web Based Management (web browser)	12
	Sending an E-mail with user authentication	13
	Secure Management using BRAdmin Professional 3 (Windows®).....	13
	To use the BRAdmin Professional 3 utility securely, you need to follow the points below	13
6	Troubleshooting	14
	Overview.....	14
	Identifying your problem	14
A	Appendix A	19
	Supported protocols and security features	19
B	Index	20

Network features

Your Brother machine can be shared on a 10/100 MB wired Ethernet network using the internal network print server. The print server supports various functions and methods of connection depending on the operating system you are running on a network supporting TCP/IP. The following chart shows what network features and connections are supported by each operating system.

Operating Systems	Windows® 2000/XP Windows Vista® Windows® 7	Windows Server® 2003/2008	Mac OS X 10.4.11 - 10.6.x
Printing	✓	✓	✓
BRAdmin Light See page 2.	✓	✓	✓
BRAdmin Professional 3¹ See page 5.	✓	✓	
Web BRAdmin¹ See page 6.	✓	✓	
Web Based Management (web browser) See page 9.	✓	✓	✓
Status Monitor See <i>User's Guide</i> .	✓	✓	✓
Driver Deployment Wizard	✓	✓	
Vertical Pairing See <i>Network Glossary</i> .	✓ ²		

¹ BRAdmin Professional 3 and Web BRAdmin are available as a download from <http://solutions.brother.com/>.

² Windows® 7 only.

Other Network features

Security

Your Brother machine employs some of the latest network security and encryption protocols available. (See *Security features* on page 11.)

How to change your machine's network settings (IP address, Subnet mask and Gateway)

Using the BRAdmin Light utility

The BRAdmin Light utility is designed for initial setup of Brother network connected devices. It also can search for Brother products in a TCP/IP environment, view the status and configure basic network settings, such as IP address.

Installing BRAdmin Light

■ Windows®

- 1 Please make sure that your machine is ON.
- 2 Turn on your computer. Close any applications running before configuration.
- 3 Put the supplied CD-ROM into your CD-ROM drive. The opening screen will appear automatically. If the model name screen appears, choose your machine. If the language screen appears, choose your language.
- 4 The CD-ROM main menu will appear. Click **Install Other Drivers or Utilities**.
- 5 Click **BRAdmin Light** and follow the on-screen instructions.

■ Macintosh

The BRAdmin Light software will be installed automatically when you install the printer driver. If you have already installed the printer driver, you do not have to install BRAdmin Light again.

Setting the IP address, Subnet Mask and Gateway using BRAdmin Light

Note

- You can download Brother's latest BRAdmin Light utility from <http://solutions.brother.com/>.
- If you require more advanced machine management, use the latest version of the BRAdmin Professional 3 utility that is available as a download from <http://solutions.brother.com/>. This utility is only available for Windows® users.
- If you are using a firewall function of anti-spyware or antivirus applications, temporarily disable them. Once you are sure that you can print, configure the software settings following the instructions.
- Node name: Node name appears in current BRAdmin Light window. The default node name of the print server in the machine is "BRNxxxxxxxxxxx". ("xxxxxxxxxxx" is your machine's MAC Address / Ethernet Address.)
- The default password for Brother print servers is "access".

1 Start the BRAdmin Light utility.

■ Windows®

Click **Start / All Programs**¹ / **Brother / BRAdmin Light / BRAdmin Light**.

¹ **Programs** for Windows® 2000 users

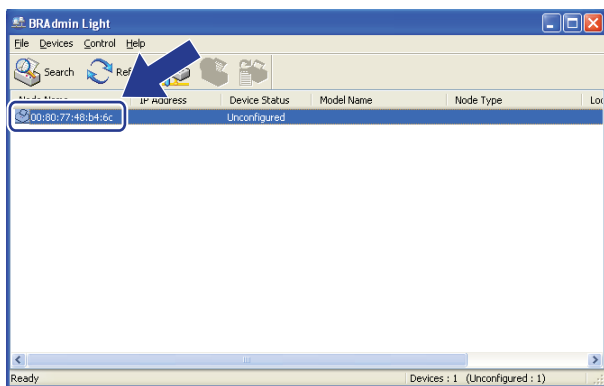
■ Macintosh

Double-click **Mac OS X or Macintosh HD (Startup Disk) / Library / Printers / Brother / Utilities / BRAdmin Light.jar** file.

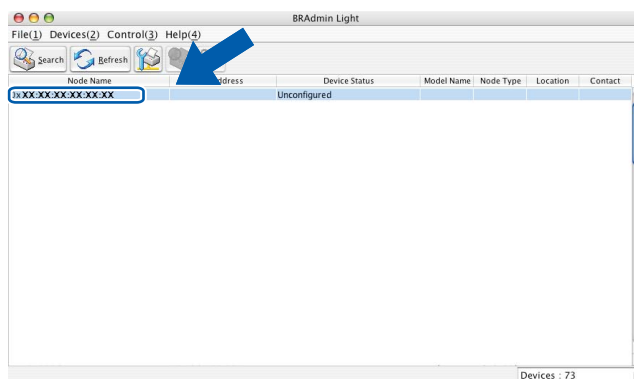
2 BRAdmin Light will search for new devices automatically.

3 Double-click the unconfigured device.

Windows®



Macintosh

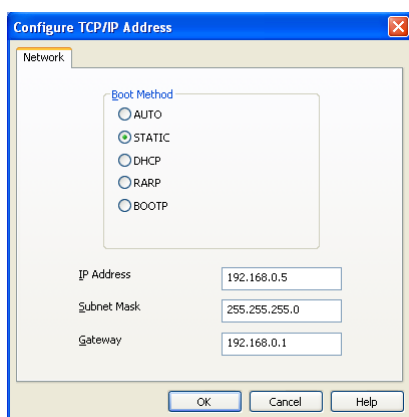


 **Note**

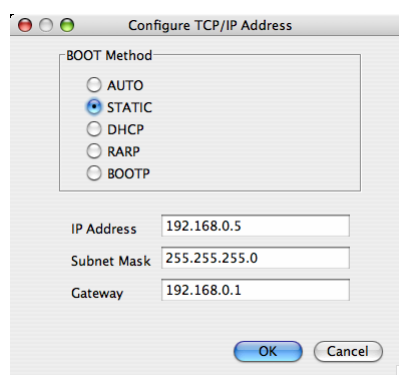
- If the print server is set to its factory default settings (if you do not use a DHCP/BOOTP/RARP server), the device will appear as **Unconfigured** in the BRAdmin Light utility screen.
- You can find the Node Name and MAC Address (Ethernet Address) by printing the Printer Settings Page. (See *Printing the Printer Settings Page* on page 8 for information on how to print the Printer Settings Page.)

- 4 Choose **STATIC** from **Boot Method (BOOT Method)**. Enter the **IP Address**, **Subnet Mask** and **Gateway** (if needed) of your print server.

Windows®



Macintosh



- 5 Click **OK**.
- 6 With the correctly programmed IP address, you will see the Brother print server in the device list.

Other Management Utilities

Your Brother machine has the following management utilities other than the BRAdmin Light utility. You can change your network settings using these utilities.

Web Based Management (web browser)

A standard web browser can be used to change your print server settings using the HTTP (Hyper Text Transfer Protocol). (See *How to configure the machine settings using Web Based Management (web browser)* on page 10.)

BRAdmin Professional 3 utility (Windows®)

BRAdmin Professional 3 is a utility for more advanced management of network connected Brother devices. This utility can search for Brother products on your network and view the device status from an easy to read explorer style window that changes color identifying the status of each device. You can configure network and device settings along with the ability to update device firmware from a Windows® computer on your LAN. BRAdmin Professional 3 can also log activity of Brother devices on your network and export the log data in an HTML, CSV, TXT or SQL format.

For users who want to monitor locally connected machines, install the Print Auditor Client software on the client PC. This utility allows you to monitor machines that are connected to a client PC via the USB or parallel interface from BRAdmin Professional 3.

For more information and to download the software, visit us at <http://solutions.brother.com/>.



Note

- Please use the latest version of the BRAdmin Professional 3 utility that is available as a download from <http://solutions.brother.com/>. This utility is only available for Windows® users.
 - If you are using a firewall function of anti-spyware or antivirus applications, temporarily disable them. Once you are sure that you can print, re-enable the application.
 - Node name: The Node name for each Brother device on the network appears in BRAdmin Professional 3. The default Node name is "BRNxxxxxxxxxxxx". ("xxxxxxxxxxxx" is your machine's MAC Address / Ethernet Address.)
-

Web BRAdmin (Windows®)

Web BRAdmin is a utility for managing network connected Brother devices. This utility can search for Brother products on your network, view the status and configure the network settings.

Unlike BRAdmin Professional 3, which is designed for Windows® only, Web BRAdmin is a server based utility that can be accessed from any client PC with a web browser that supports JRE (Java Runtime Environment). By installing the Web BRAdmin server utility on a computer running IIS¹, administrators can connect to the Web BRAdmin server using a web browser, which then communicates with the device itself.

For more information and to download the software, visit us at <http://solutions.brother.com/>.

¹ Internet Information Server 4.0 or Internet Information Services 5.0/5.1/6.0/7.0

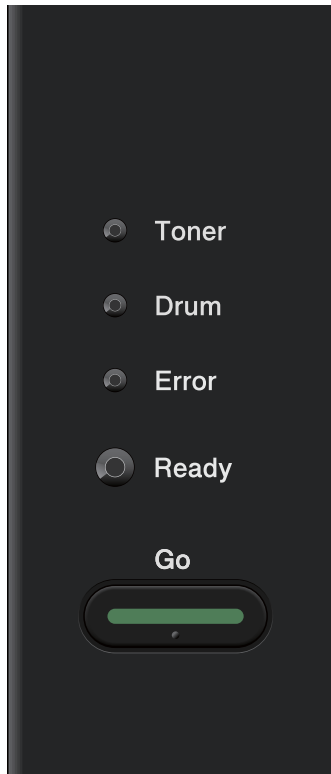
BRPrint Auditor (Windows®)

The BRPrint Auditor software brings the monitoring power of Brother network management tools to locally connected machines. This utility allows a client computer to collect usage and status information from a Brother machine connected via the parallel or USB interface. The BRPrint Auditor can then pass this information to another computer on the network running BRAdmin Professional 3 or Web BRAdmin 1.45 or greater. This allows the administrator to check items such as page counts, toner and drum status and the firmware version. In addition to reporting to Brother network management applications this utility can E-mail the usage and status information directly to a predefined E-mail address in a CSV or XML file format (SMTP Mail support required). The BRPrint Auditor utility also supports E-mail notification for reporting warning and error conditions.

3

Control panel setup

Overview



With the control panel you can do the following:

Reset the network settings to the factory default

See *Reset the network settings to the factory default* on page 8.

Print the Printer Settings Page

See *Printing the Printer Settings Page* on page 8.

Reset the network settings to the factory default

You can reset the print server back to its default factory settings (resetting all information such as the password and IP address information).



Note

- This function resets all network settings to the factory default.
- You can also reset the print server back to its factory default settings using the BRAdmin applications or Web Based Management (web browser). (For more information, see *Other Management Utilities* on page 5.)

- 1 Turn off the machine.
- 2 Make sure that the front cover is closed and the power cord is plugged in.
- 3 Hold down **Go** as you turn on the power switch. Keep **Go** pressed down until all the LEDs light up, and then the **Ready** LED turns off.
- 4 Release **Go**. Make sure that all the LEDs turn off.
- 5 Press **Go** six times. Make sure that all the LEDs light up to indicate the print server has been reset to its factory default settings. The machine will restart.

Printing the Printer Settings Page



Note

Node name: Node name appears on the Printer Settings Page. The default node name is "BRNxxxxxxxxxxxx". ("xxxxxxxxxxxx" is your machine's MAC Address / Ethernet Address.)

The Printer Settings Page prints a report listing all the current printer settings including the network print server print server settings.

You can print the Printer Settings Page using **Go** of the machine.

- 1 Make sure that the front cover is closed and the power cord is plugged in.
- 2 Turn on the machine and wait until the machine is in the Ready state.
- 3 Press **Go** three times within 2 seconds. The machine will print the current Printer Settings Page.



Note

If the **IP Address** on the Printer Settings Page shows **0.0.0.0**, wait for one minute and try again.

Overview

A standard Web Browser can be used to manage your machine using the HTTP (Hyper Text Transfer Protocol). You can get the following information from a machine on your network using a web browser.

- Machine status information
- Change network settings such as TCP/IP information
- Software version information of the machine and print server
- Change network and machine configuration details



Note

We recommend Microsoft® Internet Explorer® 6.0 (or greater) or Firefox 3.0 (or greater) for Windows® and Safari 3.0 (or greater) for Macintosh. Please also make sure that JavaScript and Cookies are always enabled in whichever browser you use. If a different web browser is used, make sure it is compatible with HTTP 1.0 and HTTP 1.1.

You must use the TCP/IP protocol on your network and have a valid IP address programmed into the print server and your computer.

How to configure the machine settings using Web Based Management (web browser)

A standard web browser can be used to change your print server settings using the HTTP (Hyper Text Transfer Protocol).

- 1 Start your web browser.
- 2 Type “http://machine’s IP address/” into your browser (where “machine’s IP address” is the machine’s IP address).

- For example:

```
http://192.168.1.2/
```



Note

- If you are using a Domain Name System or enable a NetBIOS name, you can enter another name such as “Shared_Printer” instead of the IP address.

- For example:

```
http://Shared_Printer/
```

If you enable a NetBIOS name, you can also use the node name.

- For example:

```
http://brnxxxxxxxxxxxxxx/
```

The NetBIOS name can be seen in the Printer Settings Page. (To learn how to print the Printer Settings Page, see *Printing the Printer Settings Page* on page 8.)

- For Macintosh users, you can have easy access to the Web Based Management System by clicking the machine icon on the **Status Monitor** screen. For more information, see the *User’s Guide*.

- 3 Click **Network Configuration**.
- 4 Enter a user name and a password. The default User Name is “**admin**” and the default password is “**access**”.
- 5 Click **OK**.
- 6 You can now change the print server settings.



Note

If you have changed the protocol settings, restart the machine after clicking **Submit** to activate the configuration.

Overview

In today's world there are many security threats to your network and the data that travels over it. Your Brother machine employs some of the latest network security and encryption protocols available today. These network features can be integrated into your overall network security plan to help protect your data and prevent unauthorized access to the machine. This chapter explains how to configure them.

You can configure following security features:

- Sending an E-mail securely (See *Sending an E-mail securely* on page 12.)
- Secure Management using BRAdmin Professional 3 (Windows®) (See *Secure Management using BRAdmin Professional 3 (Windows®)* on page 13.)



Note

We recommend to disable the FTP and TFTP protocols. Accessing the machine using these protocols is not secure. (For how to configure the protocol settings, see *How to configure the machine settings using Web Based Management (web browser)* on page 10.)

Sending an E-mail securely

Configuration using Web Based Management (web browser)

You can configure secured E-mail (for Notification and reports) sending with user authentication on the Web Based Management screen.

- 1 Start your web browser.
- 2 Type “http://printer’s IP address/” into your browser (where “printer’s IP address” is the printer’s IP address).
 - For example:
`http://192.168.1.2/`
- 3 Click **Network Configuration**.
- 4 Enter a user name and a password. The default User Name is “**admin**” and the default Password is “**access**”.
- 5 Click **Configure Protocol**.
- 6 Click **Advanced Setting** of **POP3/SMTP** and make sure that the status of **POP3/SMTP** is **Enable**.
- 7 You can configure the **POP3/SMTP** settings on this page.



Note

- For more information, see the Help text in Web Based Management.
 - You can also confirm whether the E-mail settings are correct after configuration by sending a test E-mail.
-
- 8 After configuring, click **Submit**. The Test E-mail Send Configuration dialog appears.
 - 9 Follow the instructions on-screen if you want to test with the current settings.

Sending an E-mail with user authentication

This machine supports POP before SMTP and SMTP-AUTH methods to send an E-mail via an E-mail server that requires a user authentication. These methods prevent an unauthorized user from accessing the E-mail server. You can use Web Based Management, BRAdmin Professional 3 and Web BRAdmin to configure these settings. You can use POP before SMTP and SMTP-AUTH methods for E-mail Notification and E-mail reports.

E-mail server settings

You need to match the settings of SMTP authentication method with the method used by your E-mail server. Contact your network administrator or your ISP (Internet Service Provider) about the E-mail server configuration.

You will also need to check **SMTP-AUTH** of **SMTP Server Authentication Method** to enable the SMTP server authentication.

SMTP settings

- You can change the SMTP port number using Web Based Management. This is useful if your ISP (Internet Service Provider) implements the “Outbound Port 25 Blocking (OP25B)” service.
- By changing the SMTP port number to a specific number which your ISP is using for the SMTP server (for example, port 587), you would then be able to send an E-mail via the SMTP server.
- If you can use both POP before SMTP and SMTP-AUTH, we recommend choosing SMTP-AUTH.
- If you choose POP before SMTP for the SMTP Server Authentication Method, you need to configure the POP3 settings. You can also use the APOP method if needed.

Secure Management using BRAdmin Professional 3 (Windows[®])

To use the BRAdmin Professional 3 utility securely, you need to follow the points below

- We strongly recommend to use the latest version of the BRAdmin Professional 3 utility or Web BRAdmin that are available as a download from <http://solutions.brother.com/>. If you use an older version of BRAdmin ¹ to manage your brother machines the user authentication will not be secure.
- If you want to avoid access to your machine from older versions of BRAdmin ¹, you need to disable the access from older versions of BRAdmin ¹ from **Advanced Setting** of **SNMP** on **Configure Protocol** page using Web Based Management (web browser). (See *How to configure the machine settings using Web Based Management (web browser)* on page 10.)
- If you are managing a mixed group of older print servers ² and the new print servers with BRAdmin Professional 3, we recommend using a different password in each group. This will ensure security is maintained on the new print servers.

¹ BRAdmin Professional older than Ver. 2.80, Web BRAdmin older than Ver. 1.40, BRAdmin Light for Macintosh older than Ver. 1.10

² NC-2000 series, NC-2100p, NC-3100h, NC-3100s, NC-4100h, NC-5100h, NC-5200h, NC-6100h, NC-6200h, NC-6300h, NC-6400h, NC-8000, NC-100h, NC-110h, NC-120w, NC-130h, NC-140w, NC-8100h, NC-9100h, NC-7100w, NC-7200w, NC-2200w

Overview

This chapter explains how to resolve typical network problems you may encounter when using Brother machine. If, after reading this chapter, you are unable to resolve your problem, please visit the Brother Solutions Center at: <http://solutions.brother.com/>.

Identifying your problem

Make sure that the following items are configured before reading this chapter.

First check the following:
The power cord is connected properly and the Brother machine is turned on.
The router or hub is turned on and its link button is blinking.
All protective packaging has been removed from the machine.
The toner cartridge and drum unit are installed properly.
The front and back covers are fully closed.
Paper is inserted properly in the paper tray.
A network cable is securely connected to Brother machine and the router or hub.

Go to the page for your solution from the lists below


- The Brother machine is not found on the network during the printer driver installation. (See page 15.)
- The Brother machine cannot print over the network. (See page 15.)
- The Brother machine is not found on the network even after successful installation. (See page 15.)
- I'm using security software. (See page 17.)
- I want to check my network devices are working properly. (See page 18.)

The Brother machine is not found on the network during the printer driver installation.

Question	Solution
Are you using security software?	<ul style="list-style-type: none"> ■ Choose to search for Brother machine again on the installer dialog. ■ Allow access when the alert message of the security software appears during the printer driver installation. ■ For more information about security software, see <i>I'm using security software.</i> on page 17.






The Brother machine cannot print over the network.

The Brother machine is not found on the network even after successful installation.

Question	Solution
Are you using security software?	See <i>I'm using security software.</i> on page 17.
Is your Brother machine assigned with an available IP address?	<ul style="list-style-type: none"> ■ Confirm the IP address and the Subnet Mask Verify that both the IP addresses and Subnet Masks of your computer and the Brother machine are correct and located on the same network. For more information on how to verify the IP address and the Subnet Mask, ask the network administrator or visit the Brother Solution Center at http://solutions.brother.com/. ■ (Windows®) Confirm the IP address and the Subnet Mask using the Network Connection Repair Tool. Use the Network Connection Repair Tool to fix the Brother machine's network settings. It will assign the correct IP address and the Subnet Mask. To use the Network Connection Repair Tool, ask to the network administrator for the details and then follow the steps below: <p> Note</p> <ul style="list-style-type: none"> • (Windows® 2000 Professional/XP/XP Professional x64 Edition/Windows Vista®/Windows® 7) You must log on with Administrator rights. • Make sure that the Brother machine is turned on and is connected to the same network as your computer.

The Brother machine cannot print over the network.

The Brother machine is not found on the network even after successful installation. (continued)


Question	Solution
<p>Is your Brother machine assigned with an available IP address?</p>	<p>1 (Windows® 2000/XP, Windows Server® 2003/2008) Click the Start button, All Programs (Programs for Windows® 2000), Accessories and Windows Explorer, and then My computer.</p> <p>(Windows Vista®/Windows® 7) Click the  button and Computer.</p> <p>2 Double-click Local Disk (C:), Program Files or Program Files (x86), Brown02, Brother, BrotherNetTool.exe to run the program.</p> <hr/> <p> Note</p> <p>If the User Account Control screen appears, (Windows Vista®) Click Continue. (Windows® 7) Click Yes.</p> <hr/> <p>3 Follow the on screen instructions. 4 Check the diagnosis by printing the Printer Settings Page.</p> <hr/> <p> Note</p> <p>The Network Connection Repair Tool will start automatically if you check Enable Network Connection Repair Tool from the Options tab on the status monitor. This is not recommended when your network administrator has set the IP address to static, since it will automatically changes the IP address.</p> <hr/> <p>If the correct IP address and the Subnet mask are still not assigned even after using the Network Connection Repair Tool, ask the network administrator for this information, or visit the Brother Solution Center at http://solutions.brother.com/.</p>
<p>Did your previous printing job fail?</p>	<ul style="list-style-type: none"> ■ If the failed printing job is still in the print queue of your computer, delete it. ■ Double-click the printer icon in the following folder and then choose the Cancel All Documents in the Printer menu: <p>(Windows® 2000) Start, Settings and then Printers.</p> <p>(Windows® XP) Start and Printers and Faxes.</p> <p>(Windows Vista®) , Control Panel, Hardware and Sound and then Printers.</p> <p>(Windows® 7) , Devices and Printers and then Printers and Faxes.</p>

The Brother machine cannot print over the network.

The Brother machine is not found on the network even after successful installation. (continued)

Question	Solution
I have checked and tried all of above, however the Brother machine does not print. Is there anything else I can do?	Uninstall the printer driver and reinstall it.

I'm using security software.

Question	Solution
Did you choose to accept the security alert dialog during the printer driver installation, applications' start-up process or when using the printing features?	<p>If you did not choose to accept the security alert dialog, the firewall function of your security software may be rejecting access. Some security software might block access without showing a security alert dialog. To allow access, see the instructions of your security software or ask the manufacturer.</p> <p> Note</p> <hr/> <p>Allow access when the alert message to block the following programs of the security software appears during the installation.</p> <ul style="list-style-type: none"> BrnIPMon Brother Status Monitor (Network) Generic Host Process f... Setup.exe Spooler SubSystem App
I want to know the necessary port number for the security software settings.	<p>The following port numbers are used for Brother network features:</p> <ul style="list-style-type: none"> ■ Network printing → Port number 137 / Protocol UDP ■ BRAdmin Light → Port number 161 / Protocol UDP <p>For details on how to open the port, see the instructions of the security software or ask the manufacturer.</p>

I want to check my network devices are working properly.

Question	Solution
Is your Brother machine, access point/router or network hub turned on?	Make sure you have confirmed all instructions in <i>First check the following</i> : on page 14.
Where can I find Brother machine's network settings, such as IP address?	Print the Printer Settings Page. See <i>Printing the Printer Settings Page</i> on page 8.
How can I check the link status of Brother machine?	Print the Printer Settings Page and check that Ethernet Link Status is Link OK . If the Link Status shows Link Down , start over again from the <i>First check the following</i> : on page 14.
Can you “ping” Brother machine from your computer?	Ping to Brother machine from your computer using the IP address or the node name. <ul style="list-style-type: none"> ■ Successful → Your Brother machine is working correctly and connected to the same network as your computer. ■ Unsuccessful → Your Brother machine is not connected to the same network as your computer. (Windows®) Ask the network administrator and use the Network Connection Repair Tool to fix the IP address and the subnet mask automatically. (Macintosh) Confirm if the IP address and the Subnet Mask are set correctly.

A

Appendix A

Supported protocols and security features

Interface	Ethernet	10/100BASE-TX
Network (common)	Protocol (IPv4)	ARP, RARP, BOOTP, DHCP, APIPA (Auto IP), WINS / NetBIOS name resolution, DNS Resolver, mDNS, LLNMR responder, LPR / LPD, Custom Raw Port / Port 9100, IPP, FTP Server, SNMPv1 / v2c, HTTP Server, TFTP Client and Server, SMTP Client, ICMP, LLTD responder, Web Services (Print)
	Protocol (IPv6)	NDP, RA, DNS Resolver, mDNS, LLNMR responder, LPR / LPD, Custom Raw Port / Port 9100, IPP, FTP server, SNMPv1 / v2c, HTTP Server, TFTP Client and Server, SMTP Client, ICMPv6, LLTD responder, Web Services (Print)
Network (Security)		APOP, POP before SMTP, SMTP-AUTH

B Index

B

BRAdmin Light	1, 2
BRAdmin Professional 3	1, 5, 13
Brother Solutions Center	3, 5
BRPrint Auditor	6

D

Driver Deployment Wizard	1
--------------------------------	---

F

Factory default	8
-----------------------	---

H

Hyper Text Transfer Protocol	5
------------------------------------	---

M

MAC Address	3, 5, 8
-------------------	---------

N

Network Connection Repair Tool	15
--------------------------------------	----

O

Operating systems	1
-------------------------	---

P

POP before SMTP	13
Printer Settings Page	8

R

Reset the network settings	8
----------------------------------	---

S

SMTP-AUTH	13
Status Monitor	1

V

Vertical Pairing	1
------------------------	---

W

Web Based Management (web browser)	1, 5
Web BRAdmin	1, 6
Web browser (HTTP)	5

Network Glossary


In this Network Glossary, you will find basic information about advanced network features of Brother machines along general networking and common terms.

The supported protocols and the network features differ depending on the model you are using. To find what features and network protocols are supported, see the *Network User's Guide* we have provided. To download the latest manual, please visit the Brother Solutions Center at (<http://solutions.brother.com/>).

You can also download the latest drivers and utilities for your machine, read FAQs and troubleshooting tips or learn about special printing solutions from the Brother Solutions Center.

Definitions of notes

We use the following icon throughout this User's Guide:

 Note	Notes tell you how you should respond to a situation that may arise or give tips about how the operation works with other features.
--	---

IMPORTANT NOTE

- Your product is approved for use in the country of purchase only. Do not use this product outside the country of purchase as it may violate the wireless telecommunication and power regulations of that country.
- Windows[®] XP in this document represents Windows[®] XP Professional, Windows[®] XP Professional x64 Edition and Windows[®] XP Home Edition.
- Windows Server[®] 2003 in this document represents Windows Server[®] 2003 and Windows Server[®] 2003 x64 Edition.
- Windows Server[®] 2008 in this document represents Windows Server[®] 2008 and Windows Server[®] 2008 R2.
- Windows Vista[®] in this document represents all editions of Windows Vista[®].
- Windows[®] 7 in this document represents all editions of Windows[®] 7.
- Please go to the Brother Solutions Center at <http://solutions.brother.com/> and click Manuals on your model page to download the other manuals.

Table of Contents

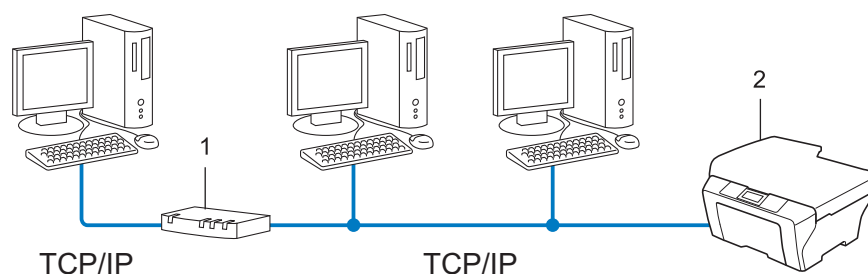
1	Types of network connections and protocols	1
	Types of network connections	1
	Wired network connection example.....	1
	Protocols.....	3
	TCP/IP protocols and functions	3
	Other protocol.....	6
2	Configuring your machine for a network	7
	IP addresses, subnet masks and gateways	7
	IP address	7
	Subnet mask.....	8
	Gateway (and router).....	8
	IEEE 802.1x Authentication	9
3	Wireless network terms and concepts	11
	Specifying your network.....	11
	SSID (Service Set Identifier) and channels	11
	Security terms.....	11
	Authentication and encryption	11
	Authentication and Encryption methods for a personal wireless network	12
	Authentication and Encryption methods for an enterprise wireless network	13
4	Additional network settings from Windows®	15
	Types of additional network settings.....	15
	Network printing Installation when using Web Services (Windows Vista® and Windows® 7)	15
	Network printing installation for Infrastructure mode when using Vertical Pairing (Windows® 7).....	17
5	Security terms and concepts	18
	Security features.....	18
	Security terms.....	18
	Security protocols	19
	Security methods for E-mail Sending and Receiving	20
A	Appendix A	21
	Using services	21
	Other ways to set the IP address (for advanced users and administrators).....	21
	Using DHCP to configure the IP address	21
	Using RARP to configure the IP address	22
	Using BOOTP to configure the IP address.....	23
	Using APIPA to configure the IP address.....	23
	Using ARP to configure the IP address.....	24
	Using the TELNET console to configure the IP address	25

Types of network connections

Wired network connection example

Peer-to-Peer printing using TCP/IP

In a Peer-to-Peer environment, each computer directly sends and receives data to each device. There is no central server controlling file access or machine sharing.



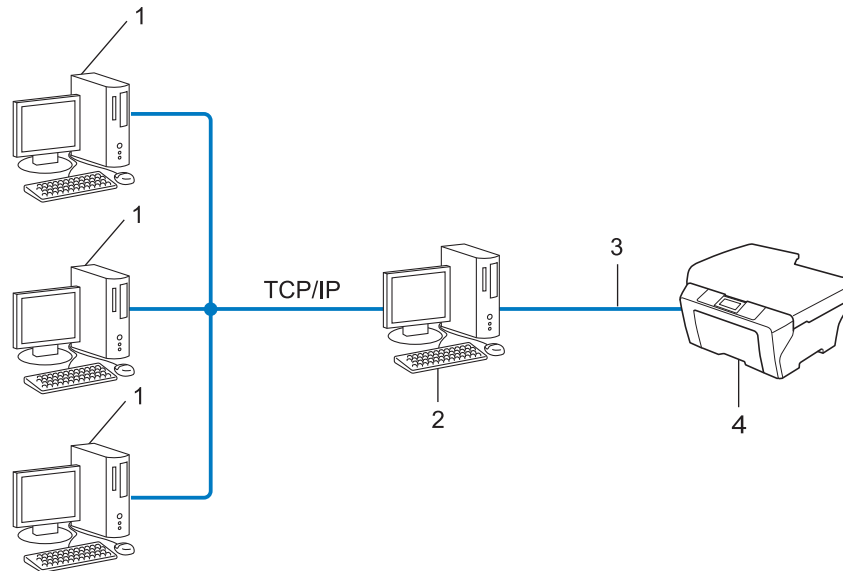
1 Router

2 Network machine (your machine)

- In a smaller network of 2 or 3 computers, we recommend the Peer-to-Peer printing method as it is easier to configure than the Network Shared printing method. See *Network Shared printing* on page 2.
- Each computer must use the TCP/IP Protocol.
- The Brother machine needs an appropriate IP address configuration.
- If you are using a router, the Gateway address must be configured on the computers and the Brother machine.

Network Shared printing

In a Network Shared environment, each computer sends data via a centrally controlled computer. This type of computer is often called a “Server” or a “Print Server”. Its job is to control the printing of all print jobs.



1 Client computer

2 Also known as “Server” or “Print server”

3 TCP/IP, USB or parallel (where available)

4 Network machine (your machine)

- In a larger network, we recommend a Network Shared printing environment.
- The “server” or the “print server” must use the TCP/IP print protocol.
- The Brother machine needs to have an appropriate IP address configuration unless the machine is connected via the USB or the parallel interface at the server.

Protocols

TCP/IP protocols and functions

Protocols are the standardized sets of rules for transmitting data on a network. Protocols allow users to gain access to network connected resources.

The print server used on the Brother machine supports the TCP/IP (Transmission Control Protocol/Internet Protocol) protocol.

TCP/IP is the most popular set of protocols used for communication such as Internet and E-mail. This protocol can be used in almost all operating systems such as Windows[®], Windows Server[®], Mac OS X and Linux[®]. The following TCP/IP protocols are available on the Brother machine.



Note

- You can configure the protocol settings by using the HTTP interface (web browser). (See the *Network User's Guide*.)
 - To find what protocols your Brother machine supports, see the *Network User's Guide*.
 - For information about supported security protocols, see *Security protocols* on page 19.
-

DHCP/BOOTP/RARP

By using the DHCP/BOOTP/RARP protocols, the IP address can be automatically configured.



Note

To use the DHCP/BOOTP/RARP protocols, please contact your network administrator.

APIPA

If you do not assign an IP address manually (using the control panel (for LCD models) of the machine or the BRAdmin software) or automatically (using a DHCP/BOOTP/RARP server), the Automatic Private IP Addressing (APIPA) protocol will automatically assign an IP address from the range 169.254.1.0 to 169.254.254.255.

ARP

Address Resolution Protocol performs mapping of an IP address to MAC address in a TCP/IP network.

DNS client

The Brother print server supports the Domain Name System (DNS) client function. This function allows the print server to communicate with other devices by using its DNS name.

NetBIOS name resolution

Network Basic Input/Output System name resolution enables you to obtain the IP address of the other device using its NetBIOS name during the network connection.

WINS

Windows Internet Name Service is an information providing service for the NetBIOS name resolution by consolidating an IP address and a NetBIOS name that is in the local network.

LPR/LPD

Commonly used printing protocols on a TCP/IP network.

SMTP client

Simple Mail Transfer Protocol (SMTP) client is used to send E-mails via the Internet or Intranet.

Custom Raw Port (Default is Port 9100)

Another commonly used printing protocol on a TCP/IP network. It enables interactive data transmission.

IPP

The Internet Printing Protocol (IPP Version 1.0) allows you to print documents directly to any accessible machine via the internet.



Note

For the IPPS protocol, see *Security protocols* on page 19.

mDNS

mDNS allows the Brother print server to automatically configure itself to work in a Mac OS X Simple Network Configured system.

TELNET

The TELNET protocol allows you to control the remote network devices on a TCP/IP network from your computer.

SNMP

The Simple Network Management Protocol (SNMP) is used to manage network devices including computers, routers and Brother network ready machines. The Brother print server supports SNMPv1, SNMPv2c and SNMPv3.



Note

For the SNMPv3 protocol, see *Security protocols* on page 19.

LLMNR

The Link-Local Multicast Name Resolution protocol (LLMNR) resolves the names of neighboring computers, if the network does not have a Domain Name System (DNS) server. The LLMNR Responder function works in both the IPv4 or IPv6 environment when using a computer that has the LLMNR Sender function such as Windows Vista® and Windows® 7.

Web Services

The Web Services protocol enables Windows Vista® or Windows® 7 users to install the Brother printer driver by right-clicking the machine icon from the **Network** folder. (See *Network printing Installation when using Web Services (Windows Vista® and Windows® 7)* on page 15.) The Web Services also lets you check the current status of the machine from your computer.

HTTP

The HTTP protocol is used to transmit the data between a web server and a web browser.



Note

For the HTTPS protocol, see *Security protocols* on page 19.

FTP (For the Scan to FTP feature)

The File Transfer Protocol (FTP) allows the Brother machine to scan black and white or color documents directly to an FTP server located locally on your network or on the internet.

SNTP

The Simple Network Time Protocol is used to synchronize computer clocks on a TCP/IP network. You can configure the SNTP settings using Web Based Management (web browser). (For the details, see the *Network User's Guide*.)

CIFS

The Common Internet File System is the standard way that computer users share files and printers in Windows®.

LDAP

The Lightweight Directory Access Protocol (LDAP) allows the Brother machine to search for information such as fax numbers and E-mail addresses from an LDAP server.

IPv6

IPv6 is the next generation internet protocol. For more information on the IPv6 protocol, visit the model page for the machine you are using at <http://solutions.brother.com/>.

Other protocol

LLTD

The Link Layer Topology Discovery protocol (LLTD) lets you locate the Brother machine easily on the Windows Vista®/Windows® 7 **Network Map**. Your Brother machine will be shown with a distinctive icon and the node name. The default setting for this protocol is Off. You can activate LLTD using Web Based Management (web browser) (See the *Network User's Guide*.), and the BRAdmin Professional 3 utility software. Visit the download page for your model at <http://solutions.brother.com/> to download BRAdmin Professional 3.

IP addresses, subnet masks and gateways

To use the machine in a networked TCP/IP environment, you need to configure its IP address and subnet mask. The IP address you assign to the print server must be on the same logical network as your host computers. If it is not, you must properly configure the subnet mask and the gateway address.

IP address

An IP address is a series of numbers that identifies each device connected to a network. An IP address consists of four numbers separated by dots. Each number is between 0 and 255.

■ Example: In a small network, you would normally change the final number.

- 192.168.1.1
- 192.168.1.2
- 192.168.1.3

How the IP address is assigned to your print server:

If you have a DHCP/BOOTP/RARP server in your network the print server will automatically obtain its IP address from that server.



Note

On smaller networks, the DHCP server may also be the Router.

For more information on DHCP, BOOTP and RARP, see:

Using DHCP to configure the IP address on page 21.

Using BOOTP to configure the IP address on page 23.

Using RARP to configure the IP address on page 22.

If you do not have a DHCP/BOOTP/RARP server, the Automatic Private IP Addressing (APIPA) protocol will automatically assign an IP address from the range 169.254.1.0 to 169.254.254.255. For more information on APIPA, see *Using APIPA to configure the IP address* on page 23.

Subnet mask

Subnet masks restrict network communication.

■ Example: Computer 1 can talk to Computer 2

- Computer 1

IP Address: 192.168. 1. 2

Subnet Mask: 255.255.255.000

- Computer 2

IP Address: 192.168. 1. 3

Subnet Mask: 255.255.255.000

Where the 0 is in the Subnet mask, there is no limit to communication at this part of the address. What this means in the above example is, we can communicate with any device that has an IP address that begins with 192.168.1.x. (where x. are numbers between 0 and 255).

Gateway (and router)

A gateway is a network point that acts as an entrance to another network and sends data transmitted via the network to an exact destination. The router knows where to direct data that arrives at the gateway. If a destination is located on an external network, the router transmits data to the external network. If your network communicates with other networks, you may need to configure the Gateway IP address. If you do not know the Gateway IP address then contact your Network Administrator.

IEEE 802.1x Authentication

IEEE 802.1x is an IEEE standard for wired and wireless network that limits an access from unauthorized network devices. Your Brother machine (supplicant) sends an authentication request to a RADIUS server (Authentication server) through your access point (Authenticator). After your request has been verified by the RADIUS server, your machine can have an access to the network.

Authentication methods

■ LEAP (For wireless network)

Cisco LEAP (Light Extensible Authentication Protocol) has been developed by Cisco Systems, Inc. which uses a user ID and password for authentication.

■ EAP-FAST

EAP-FAST (Extensible Authentication Protocol-Flexible Authentication via Secured Tunnel) has been developed by Cisco Systems, Inc. which uses a user ID and password for authentication, and symmetric key algorithms to achieve a tunneled authentication process.

The Brother machine supports the following inner authentications:

- EAP-FAST/NONE
- EAP-FAST/MS-CHAPv2
- EAP-FAST/GTC

■ EAP-MD5 (For wired network)

EAP-MD5 (Extensible Authentication Protocol-Message digest algorithm 5) uses a user ID and password for challenge-response authentication.

■ PEAP

PEAP (Protected Extensible Authentication Protocol) has been developed by Microsoft Corporation, Cisco Systems and RSA Security. PEAP creates an encrypt SSL (Secure Sockets Layer)/TLS (Transport Layer Security) tunnel between a client and an authentication server, for sending a user ID and password. PEAP provides mutual authentication between the server and the client.

The Brother machine supports the following inner authentications:

- PEAP/MS-CHAPv2
- PEAP/GTC

■ EAP-TTLS

EAP-TTLS (Extensible Authentication Protocol Tunneled Transport Layer Security) has been developed by Funk Software and Certicom. EAP-TTLS creates a similar encrypt SSL tunnel to PEAP, between a client and an authentication server, for sending a user ID and password. EAP-TTLS provides mutual authentication between the server and the client.

The Brother machine supports the following inner authentications:

- EAP-TTLS/CHAP
- EAP-TTLS/MS-CHAP
- EAP-TTLS/MS-CHAPv2
- EAP-TTLS/PAP

■ EAP-TLS

EAP-TLS (Extensible Authentication Protocol Transport Layer Security) requires digital certificate authentication both at a client and an authentication server.

Specifying your network

SSID (Service Set Identifier) and channels

You need to configure the SSID and a channel to specify the wireless network you want to connect to.

■ SSID

Each wireless network has its own unique network name and it is technically referred to as SSID or ESSID (Extended Service Set Identifier). The SSID is a 32-byte or less value and is assigned to the access point. The wireless network devices you want to associate to the wireless network should match the access point. The access point and wireless network devices regularly send wireless packets (referred to as a beacon) which has the SSID information. When your wireless network device receives a beacon, you can identify the wireless network that is close enough for the radio waves to reach your device.

■ Channels

Wireless networks use channels. Each wireless channel is on a different frequency. There are up to 14 different channels that can be used when using a wireless network. However, in many countries the number of channels available are restricted.

Security terms

Authentication and encryption

Most wireless networks use some kind of security settings. These security settings define the authentication (how the device identifies itself to the network) and encryption (how the data is encrypted as it is sent on the network). **If you do not correctly specify these options when you are configuring your Brother wireless machine, it will not be able to connect to the wireless network.** Therefore care must be taken when configuring these options. Please refer to the information in the *Network User's Guide* to see which authentication and encryption methods your Brother wireless machine supports.

Authentication and Encryption methods for a personal wireless network

Personal wireless network is a small network, for example using your machine in a wireless network at home, without IEEE 802.1x support.

If you want to use your machine in an IEEE 802.1x supported wireless network, see *Authentication and Encryption methods for an enterprise wireless network* on page 13.

Authentication methods

- Open system

Wireless devices are allowed to access the network without any authentication.

- Shared key

A secret pre-determined key is shared by all devices that will access the wireless network.

The Brother wireless machine uses the WEP key as the pre-determined key.

- WPA-PSK/WPA2-PSK

Enables a Wi-Fi Protected Access Pre-shared key (WPA-PSK/WPA2-PSK), which enables the Brother wireless machine to associate with access points using TKIP for WPA-PSK or AES for WPA-PSK and WPA2-PSK (WPA-Personal).

Encryption methods

- None

No encryption method is used.

- WEP

By using WEP (Wired Equivalent Privacy), the data is transmitted and received with a secure key.

- TKIP

TKIP (Temporal Key Integrity Protocol) provides per-packet key mixing a message integrity check and rekeying mechanism.

- AES

AES (Advanced Encryption Standard) is the Wi-Fi® authorized strong encryption standard.

Network key

■ Open system/Shared key with WEP

This key is a 64-bit or 128-bit value that must be entered in an ASCII or hexadecimal format.

- 64 (40) bit ASCII:

Uses 5 text characters. e.g. “WLAN” (this is case sensitive).

- 64 (40) bit hexadecimal:

Uses 10 digits of hexadecimal data. e.g. “71f2234aba”

- 128 (104) bit ASCII:

Uses 13 text characters. e.g. “Wirelesscomms” (this is case sensitive)

- 128 (104) bit hexadecimal:

Uses 26 digits of hexadecimal data. e.g. “71f2234ab56cd709e5412aa2ba”

■ WPA-PSK/WPA2-PSK and TKIP or AES

Uses a Pre-Shared Key (PSK) that is 8 or more characters in length, up to a maximum of 63 characters.

Authentication and Encryption methods for an enterprise wireless network

Enterprise wireless network is a large network, for example using your machine in a business enterprise wireless network, with IEEE 802.1x support. If you configure your machine in an IEEE 802.1x supported wireless network, you can use following authentication and encryption methods.

Authentication methods

■ LEAP

For LEAP, see *LEAP (For wireless network)* on page 9.

■ EAP-FAST

For EAP-FAST, see *EAP-FAST* on page 9.

■ PEAP

For PEAP, see *PEAP* on page 9.

■ EAP-TTLS

For EAP-TTLS, see *EAP-TTLS* on page 10.

■ EAP-TLS

For EAP-TLS, see *EAP-TLS* on page 10.

Encryption methods

- TKIP

For TKIP, see *TKIP* on page 12.

- AES

For AES, see *AES* on page 12.

- CKIP

The original Key Integrity Protocol for LEAP by Cisco Systems, Inc.

User ID and password

The following security methods use the user ID less than 64 characters and the password less than 32 characters in length.

- LEAP

- EAP-FAST

- PEAP

- EAP-TTLS

- EAP-TLS (For user ID)

Types of additional network settings

Following features are available to use if you want to configure additional network settings.

- Web Services (Windows Vista[®] and Windows[®] 7)
- Vertical Paring (Windows[®] 7)



Note

Verify the host computer and the machine are either on the same subnet, or that the router is properly configured to pass data between the two devices.

Network printing Installation when using Web Services (Windows Vista[®] and Windows[®] 7)

The Web Services feature allows you to monitor its machine information which is connected to the network. This also enables the printer driver installation from the printer icon and the Web Services port (WSD port) will be made.



Note

- You must configure the IP address on your machine before you configure this setting.
- For Windows Server[®] 2008, you must install Print Services.
- Only printer support is installed with Web Services.

- 1 Insert the installation CD-ROM.
- 2 Choose your CD-ROM drive/**install/driver/gdi/32** or **64**.
- 3 Choose your language and then double-click **DPInst.exe**.





Note

If the **User Account Control** screen appears,

(Windows Vista[®]) Click **Allow**.

(Windows[®] 7) Click **Yes**.

- 4 (Windows Vista®)
Click , then choose **Network**.
(Windows® 7)
Click , **Control Panel, Network and Internet**, and then **View network computers and devices**.
- 5 The machine's Web Services Name will be shown with the printer icon. Right-click the machine you want to install.



Note

The Web Services Name for the Brother machine is your model name and the MAC Address (Ethernet Address) of your machine (e.g. Brother MFC-XXXX (model name) [XXXXXXXXXXXX] (MAC Address / Ethernet Address)).

- 6 From the pull down menu, click **Install**.

Network printing installation for Infrastructure mode when using Vertical Pairing (Windows® 7)


Windows® Vertical Pairing is a technology to allow your Vertical Pairing supported wireless machine to connect to your Infrastructure network using the PIN Method of Wi-Fi Protected Setup and the Web Services feature. This also enables the printer driver installation from the printer icon that is in the **Add a device** screen.

If you are in Infrastructure mode, you can connect your machine to the wireless network and then install the printer driver using this feature. Follow the steps below:



Note

- If you have set your machine's Web Services feature to Off, you must set back to On. The default setting of the Web Services for the Brother machine is On. You can change the Web Services setting by using the Web Based Management (web browser) or BRAdmin Professional 3.
- Make sure your WLAN access point/router includes the Windows® 7 compatibility logo. If you are not sure about the compatibility logo, contact your access point/router manufacturer.
- Make sure your computer includes Windows® 7 compatibility logo. If you are not sure about the compatibility logo, contact your computer manufacturer.
- If you are configuring wireless network using an external wireless NIC (Network Interface Card), make sure the wireless NIC includes Windows® 7 compatibility logo. For more information, contact your wireless NIC manufacturer.
- To use a Windows® 7 computer as a Registrar, you need to register it to your network in advance. See the instruction supplied with your WLAN access point/router.

- 1 Turn on your machine.
- 2 Set your machine in Wi-Fi Protected Setup (PIN Method).
See Wi-Fi Protected Setup (PIN Method) wireless configuration in the *Network User's Guide*, on how to set your machine in the PIN Method.
- 3 Click the  button and then **Devices and Printers**.
- 4 Choose **Add a device** on the **Devices and Printers** dialog.
- 5 Choose your machine and input the PIN which your machine has indicated.
- 6 Choose the Infrastructure network that you want to connect to, and then click **Next**.
- 7 When your machine appears in the **Devices and Printers** dialog, the wireless configuration and the printer driver installation are successfully completed.

Security features

Security terms

■ CA (Certificate Authority)

A CA is an entity that issues digital certificates (especially X.509 certificates) and vouches for the binding between the data items in a certificate.

■ CSR (Certificate Signing Request)

A CSR is a message sent from an applicant to a CA in order to apply for issue of a certificate. The CSR contains information identifying the applicant, the public key generated by the applicant and the digital signature of the applicant.

■ Certificate

A Certificate is the information that binds together a public key with an identity. The certificate can be used to verify that a public key belongs to an individual. The format is defined by the x.509 standard.

■ CA Certificate

A CA Certificate is the certification that identifies the CA (Certificate Authority) itself and owns its private key. It verifies a certificate issued by the CA.

■ Digital signature

A Digital signature is a value computed with a cryptographic algorithm and appended to a data object in such a way that any recipient of the data can use the signature to verify the data's origin and integrity.

■ Public key cryptosystem

A Public key cryptosystem is a modern branch of cryptography in which the algorithms employ a pair of keys (a public key and a private key) and use a different component of the pair for different steps of the algorithm.

■ Shared key cryptosystem

A Shared key cryptosystem is a branch of cryptography involving algorithms that use the same key for two different steps of the algorithm (such as encryption and decryption).

Security protocols



Note

You can configure the protocol settings using Web Based Management (web browser). For the details, see the *Network User's Guide*.

SSL (Secure Socket Layer) / TLS (Transport Layer Security)

These security communication protocols encrypt data to prevent security threats.

HTTPS

The internet protocol that the Hyper Text Transfer Protocol (HTTP) uses SSL.

IPPS

The printing protocol that the Internet Printing Protocol (IPP Version 1.0) uses SSL.

SNMPv3

The Simple Network Management Protocol version 3 (SNMPv3) provides user authentication and data encryption to manage network devices securely.

Security methods for E-mail Sending and Receiving



Note

You can configure the security methods settings using Web Based Management (web browser). For the details, see the *Network User's Guide*.

POP before SMTP (PbS)

The user authentication method for sending E-mail from a client. The client is given permission to use the SMTP server by accessing the POP3 server before sending the E-mail.

SMTP-AUTH (SMTP Authentication)

SMTP-AUTH expands SMTP (the Internet E-mail sending protocol) to include an authentication method that ensures the true identity of the sender is known.

APOP (Authenticated Post Office Protocol)

APOP expands POP3 (the Internet receiving protocol) to include an authentication method that encrypts the password when the client receives E-mail.

SMTP over SSL

SMTP over SSL feature enables sending encrypted E-mail using SSL.

POP over SSL

POP over SSL feature enables receiving encrypted E-mail using SSL.

Using services

A service is a resource that can be accessed by computers that wish to print to the Brother print server. The Brother print server provides the following predefined services (do a SHOW SERVICE command in the Brother print server remote console to see a list of available services): Enter HELP at the command prompt for a list of supported commands.

Service (Example)	Definition
BINARY_P1	TCP/IP binary
TEXT_P1	TCP/IP text service (adds carriage return after each line feed)
PCL_P1	PCL service (switches PJL-compatible machine to PCL mode)
BRNxxxxxxxxxxxx	TCP/IP binary
BRNxxxxxxxxxxxx_AT	PostScript® service for Macintosh
POSTSCRIPT_P1	PostScript® service (switches PJL-compatible machine to PostScript® mode)

Where “xxxxxxxxxxxx” is your machine’s MAC Address (Ethernet Address).

Other ways to set the IP address (for advanced users and administrators)

Using DHCP to configure the IP address

The Dynamic Host Configuration Protocol (DHCP) is one of several automated mechanisms for IP address allocation. If you have a DHCP server in your network, the print server will automatically obtain its IP address from the DHCP server and register its name with any RFC 1001 and 1002-compliant dynamic name services.



Note

If you do not want your print server configured via DHCP, BOOTP or RARP, you must set the Boot Method to static so that the print server has a static IP address. This will prevent the print server from trying to obtain an IP address from any of these systems. To change the Boot Method, use the machine’s control panel Network menu (for LCD models), BRAdmin applications, Remote Setup or Web Based Management (web browser).

Using RARP to configure the IP address

The Brother print server's IP address can be configured using the Reverse ARP (RARP) facility on your host computer. This is done by editing the `/etc/ethers` file (if this file does not exist, you can create it) with an entry similar to the following:

```
00:80:77:31:01:07    BRN008077310107 (or BRW008077310107 for a wireless network)
```

Where the first entry is the MAC Address (Ethernet Address) of the print server and the second entry is the name of the print server (the name must be the same as the one you put in the `/etc/hosts` file).

If the RARP daemon is not already running, start it (depending on the system the command can be `rarpd`, `rarpd -a`, `in.rarpd -a` or something else; type `man rarpd` or refer to your system documentation for additional information). To verify that the RARP daemon is running on a Berkeley UNIX based system, type the following command:

```
ps -ax | grep -v grep | grep rarpd
```

For AT&T UNIX-based systems, type:

```
ps -ef | grep -v grep | grep rarpd
```

The Brother print server will get the IP address from the RARP daemon when the machine is powered on.

Using BOOTP to configure the IP address

BOOTP is an alternative to RARP that has the advantage of allowing configuration of the subnet mask and gateway. In order to use BOOTP to configure the IP address make sure that BOOTP is installed and running on your host computer (it should appear in the `/etc/services` file on your host as a real service; type `man bootpd` or refer to your system documentation for information). BOOTP is usually started up via the `/etc/inetd.conf` file, so you may need to enable it by removing the “#” in front of the `bootp` entry in that file. For example, a typical `bootp` entry in the `/etc/inetd.conf` file would be:

```
#bootp dgram udp wait /usr/etc/bootpd bootpd -i
```

Depending on the system, this entry might be called “`bootps`” instead of “`bootp`”.



Note

In order to enable BOOTP, simply use an editor to delete the “#” (if there is no “#”, then BOOTP is already enabled). Then edit the BOOTP configuration file (usually `/etc/bootptab`) and enter the name, network type (1 for Ethernet), MAC Address (Ethernet Address) and the IP address, subnet mask and gateway of the print server. Unfortunately, the exact format for doing this is not standardized, so you will need to refer to your system documentation to determine how to enter this information (many UNIX systems also have template examples in the `bootptab` file that you can use for reference). Some examples of typical `/etc/bootptab` entries include: (“BRN” below is “BRW” for a wireless network.)

```
BRN310107 1 00:80:77:31:01:07 192.168.1.2
```

and:

```
BRN310107:ht=ethernet:ha=008077310107:\ip=192.168.1.2:
```

Certain BOOTP host software implementations will not respond to BOOTP requests if you have not included a download filename in the configuration file. If this is the case, simply create a null file on the host and specify the name of this file and its path in the configuration file.

As with RARP, the print server will load its IP address from the BOOTP server when the machine is powered on.

Using APIPA to configure the IP address

The Brother print server supports the Automatic Private IP Addressing (APIPA) protocol. With APIPA, DHCP clients automatically configure an IP address and subnet mask when a DHCP server is not available. The device chooses its own IP address in the range 169.254.1.0 through to 169.254.254.255. The subnet mask is automatically set to 255.255.0.0 and the gateway address is set to 0.0.0.0.

By default, the APIPA protocol is enabled. If you want to disable the APIPA protocol, you can disable it using control panel of the machine (for LCD models), BRAdmin Light or Web Based Management (web browser).

Using ARP to configure the IP address

If you are unable to use the BRAdmin application and your network does not use a DHCP server, you can also use the ARP command. The ARP command is available on Windows[®] systems that have TCP/IP installed as well as UNIX systems. To use ARP enter the following command at the command prompt:

```
arp -s ipaddress ethernetaddress  
ping ipaddress
```

Where `ethernetaddress` is the MAC Address (Ethernet Address) of the print server and `ipaddress` is the IP address of the print server. For example:

■ Windows[®] systems

Windows[®] systems require the dash “-” character between each digit of the MAC Address (Ethernet Address).

```
arp -s 192.168.1.2 00-80-77-31-01-07  
ping 192.168.1.2
```

■ UNIX/Linux systems

Typically, UNIX and Linux systems require the colon “:” character between each digit of the MAC Address (Ethernet Address).

```
arp -s 192.168.1.2 00:80:77:31:01:07  
ping 192.168.1.2
```



Note

You must be on the same Ethernet segment (that is, there cannot be a router between the print server and operating system) to use the `arp -s` command.

If there is a router, you may use BOOTP or other methods described in this chapter to enter the IP address. If your administrator has configured the system to deliver IP addresses using BOOTP, DHCP or RARP your Brother print server can receive an IP address from any one of these IP address allocation systems. In which case, you will not need to use the ARP command. The ARP command only works once. For security reasons, once you have successfully configured the IP address of a Brother print server using the ARP command, you cannot use the ARP command again to change the address. The print server will ignore any attempts to do this. If you wish to change the IP address again, use a Web Based Management (web browser), TELNET (using the SET IP ADDRESS command) or factory reset the print server (which will then allow you to use the ARP command again).

Using the TELNET console to configure the IP address

You can also use the TELNET command to change the IP address.

TELNET is an effective method to change the machine's IP address. But a valid IP address must already be programmed into the print server.

Type `TELNET <command line>` at the command prompt of the system prompt, where `<command line>` is the IP address of the print server. When you are connected, push the Return or Enter key to get the “#” prompt. Enter the password “**access**” (the password will not appear on the screen).

You will be prompted for a user name. Enter anything in response to this prompt.

You will then get the `Local>` prompt. Type `SET IP ADDRESS ipaddress`, where `ipaddress` is the desired IP address you wish to assign to the print server (check with your network administrator for the IP address to use). For example:

```
Local> SET IP ADDRESS 192.168.1.3
```

You will now need to set the subnet mask by typing `SET IP SUBNET subnet mask`, where `subnet mask` is the desired subnet mask you wish to assign to the print server (check with your network administrator for the subnet mask to use). For example:

```
Local> SET IP SUBNET 255.255.255.0
```

If you do not have any subnets, use one of the following default subnet masks:

255.0.0.0 for class A networks

255.255.0.0 for class B networks

255.255.255.0 for class C networks

The leftmost group of digits in your IP address can identify the type of network you have. The value of this group ranges from 1 through 127 for Class A networks (e.g., 13.27.7.1), 128 through 191 for Class B networks (e.g., 128.10.1.30), and 192 through 255 for Class C networks (e.g., 192.168.1.4).

If you have a gateway (router), enter its address with the command `SET IP ROUTER routeraddress`, where `routeraddress` is the desired IP address of the gateway you wish to assign to the print server. For example:

```
Local> SET IP ROUTER 192.168.1.4
```

Type `SET IP METHOD STATIC` to set the method of IP access configuration to static.

To verify that you have entered the IP information correctly, type `SHOW IP`.

Type `EXIT` or `Ctrl-D` (i.e., hold down the control key and type “D”) to end the remote console session.

B Index

A

AES	12
APIPA	3, 23
APOP	20
ARP	3, 24
Authentication	12

B

BINARY_P1	21
BOOTP	3, 23
BRNxxxxxxxxxxxx	21
BRNxxxxxxxxxxxx_AT	21

C

CA	18
CA Certificate	18
Certificate	18
Channels	11
CIFS	6
CKIP	14
CSR	18
Custom Raw Port	4

D

DHCP	3, 21
Digital signature	18
DNS client	4

E

EAP-FAST	9
EAP-MD5	9
EAP-TLS	10
EAP-TTLS	10
Encryption	12

F

FTP	5
-----------	---

H

HTTP	5
HTTPS	19

I

IEEE 802.1x	9
IP address	7
IPP	4
IPPS	19
IPv6	6

L

LDAP	6
LEAP	9
LLMNR	5
LLTD	6
LPR/LPD	4

M

MAC Address	16, 21, 22, 23, 24
mDNS	4

N

NetBIOS name resolution	4
Network Key	13
Network printing	15
Network shared printing	2

O

Open system	12
-------------------	----

P

PCL_P1	21
PEAP	9
Peer-to-Peer	1
POP before SMTP	20
POP over SSL	20
Port 9100	4
POSTSCRIPT_P1	21
Protocol	3
Public key cryptosystem	18

R

RARP	3, 22
RFC 1001	21

S

Security terms	18
Service	21
Shared key	12
Shared key cryptosystem	18
SMTP client	4
SMTP over SSL	20
SMTP-AUTH	20
SNMP	5
SNMPv3	19
SNTP	6
SSID	11
SSL/TLS	19
Subnet mask	8

T

TCP/IP	3
TCP/IP printing	15
TELNET	5, 25
TEXT_P1	21
TKIP	12

V

Vertical Paring	15
-----------------------	----

W

Web Services	5, 15
WEP	12
WINS	4
Wireless network	11
WPA-PSK/WPA2-PSK	12