



SAMSUNG

Wireless LAN Option User's Guide

CLX-NWA20L

Wireless Network Install Guide

Your machine is a network compatible machine. To enable your machine to work with your network you will need to perform some configuration procedures. Before you begin the wireless configuration procedure, make sure you have the following:

- A wireless router (access point) already connected to, and configured for, your network.
- The **Printer Software CD-ROM** provided with your machine. If you have lost the **Printer Software CD-ROM**, download the program from the Samsung web site www.samsung.com/printer.



- Refer to your network administrator, or the person that set up your wireless network, for information about your network configuration.
- Setting the network environment and installing the driver software and wireless hardware may differ according to the machine you are using. Refer to the User's Guide included on the **Printer Software CD-ROM** provided with the machine.
- If you want to see more information about wireless printer security, refer to the appendix section on the **Wireless Network Install Guide** CD-ROM.

This guide is organized into sections that contain the various procedures required to configure your machine to work with specific network environments.

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Using a wireless network

Choosing your network connection

Typically, you can only have connection type between your computer and the machine at a time. There are two types of network connections to consider.

- Wireless network without Access Point (Wi-Fi mode)
- Wireless network with an Access Point (Infrastructure mode)

How to print a network configuration report

You can identify the network settings of your machine by printing a network configuration report.

Network configuration report printing process differs in model.

Refer to the User's Guide included on the **Printer Software CD-ROM** provided with the machine.

You can find your machine's MAC address and IP address.

For example:

- MAC Address : 00:15:99:41:A2:78
- IP Address : 192.0.0.192

IP addresses

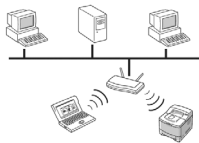

Every device in a network has a unique numerical address called an **IP Address**. Your machine came with a Default IP address of 192.0.0.192, which you can verify by printing out a **Network Configuration Report** or **Configuration Report**.

- **DHCP IP assignment:** Connect your machine to the network, and wait a few minutes for the DHCP server to assign an IP address to the machine. Then, print the **Network Configuration Report** as explained above. If the report shows that the IP address has changed, the assignment was successful. You will see the new IP address in the report.
- **Static IP assignment:** Use SetIP program to change the IP address from your computer. (See "Setting IP address" on page 4.)

In an office environment, we recommend that you contact a network administrator to set this address for you.

Wireless network name and Network Key

Wireless networks require higher security, so when an Access Point is first set up, a network name (SSID), the type of security used, and a Network Key are created for the network. Locate this information before proceeding with the machine installation.

| | |
|---|--|
|  A diagram showing three desktop computers connected to a central router. Below the router, a laptop and a printer are connected to the router via wireless signals, represented by curved lines with dots. | <p>Infrastructure mode wireless networks This is an environment generally used for homes and SOHOs. This mode uses Access Point to communicate with the wireless machine.</p> |
|  A diagram showing a laptop, a printer, and a smartphone. The printer is in the center, and the laptop and smartphone are on either side. All three devices are connected to each other via wireless signals, represented by curved lines with dots. | <p>Wi-Fi mode wireless networks This mode does not use Access Point, the wireless computer and wireless machine communicates directly.</p> |



After choosing your configuration, follow the simple directions for your computer operating system, but first locate the **Printer Software CD-ROM** supplied with the machine before proceeding.

Installing the wireless network

- **With a network cable:** You can set up a wireless network using the SyncThru™ Web Service program. (See "Setting a wireless network with network cable" on page 4.)
- **With the control panel:** You can set up a wireless network using the control panel. Some models may have different menu for installing the network or may not support this menu at all. Refer to the user's guide in **Printer Software CD-ROM** that comes with your product.

Setting a wireless network with network cable

Your machine is a network compatible machine. To enable your machine to work with your network you will need to perform some configuration procedures.



Refer to your network administrator, or the person that set up your wireless network, for information about your network configuration.

Items to prepare

Ensure you have next items ready.

- Access point
- Networked computer
- **Printer Software CD-ROM** that provided with your machine
- Wireless network your machine
- Network cable

Setting IP address

Firstly, you have to set up an IP address for network printing and managements. In most cases a new IP address will be automatically assigned by a DHCP (Dynamic Host Configuration Protocol) server located on the network.

In a few situations the IP address must be set manually. This is called a static IP and is often required in corporate Intranets for security reasons.

- **DHCP IP assignment:** Connect your machine to the network, and wait a few minutes for the DHCP server to assign an IP address to the machine. Then, print the **Network Configuration Report** as explained above. If the report shows that the IP address has changed, the assignment was successful. You will see the new IP address in the report. (See "How to print a network configuration report" on page 2.)
- **Static IP assignment:** Use SetIP program to change the IP address from your computer.

In an office environment, we recommend that you contact a network administrator to set this address for you.

IP setting using SetIP Program (Windows)

This program is for manually setting the network IP address of your machine using its MAC address to communicate with the machine. A MAC address is the hardware serial number of the network interface and can be found in the **Network Configuration Report**.


For using SetIP program, disable the computer firewall before continuing by performing the following:

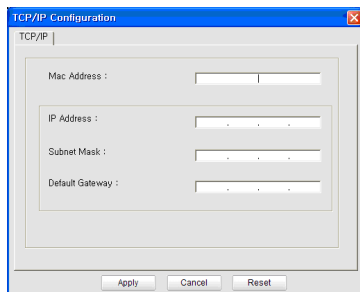
1. Open **Start > All programs > Control Panel**.
2. Double click **Security Center**.
3. Click **Windows Firewall**.
4. Disable the firewall.

Installing the program

1. Insert the **Printer Software CD-ROM** provided with your machine. When the driver CD runs automatically, close that window.
2. Start Windows Explorer and open the X drive. (X represents your CD-ROM drive.)
3. Double-click **Application > SetIP**.
4. Double-click **Setup.exe** to install this program.
5. Click **OK**. If necessary, select a language from the drop-down list.
6. Follow the instructions in the window and complete the installation.

Starting the program

1. Connect your machine to the network with a network cable.
2. Turned on the machine.
3. From the Windows **Start** menu, select **All Programs > Samsung Printers > SetIP > SetIP**.
4. Click on the  icon (third from left) in the SetIP window to open the TCP/IP configuration window.
5. Enter the machine's new information into the configuration window as follows. In a corporate intranet, you may need to have this information assigned by a network manager before proceeding.



- **MAC Address** : Find the machine's MAC address from the **Network Configuration Report** and enter it without the colons. For example, 00:15:99:29:51:A8 becomes 0015992951A8.
 - **IP Address**: Enter a new IP address for your machine.
For example, if your computer's IP address is 192.168.1.150, enter 192.168.1.X. (X is number between 1 and 254 other than the computer's address.)
 - **Subnet Mask**: Enter a Subnet Mask.
 - **Default Gateway**: Enter a Default Gateway.
6. Click **Apply**, and then click **OK**. The machine will automatically print the **Network Configuration Report**. Confirm that all the settings are correct.
 7. Click **Exit** to close the SetIP program.
 8. If necessary, restart the computer's firewall.

IP setting using SetIP Program (Macintosh)

For using SetIP program, disable the computer firewall before continuing by performing the following:




The path and UIs may differ by Mac OS version. Refer to the Mac OS manual.

1. Open **System Preferences**.
2. Click **Security**.
3. Click the **Firewall** menu.
4. Turn firewall off.



The following instructions may vary for your model.

1. Connect your machine to the network with a network cable.
2. Insert the Installation CD-ROM, and open the disk window, select **MAC_Installer > MAC_Printer > SetIP > SetIPApplet.html**.

3. Double click the file and **Safari** will automatically open, then select **Trust**. The browser will open the **SetIPApplet.html** page that shows the machine's name and IP address information.
4. Click on the  icon (third from left) in the SetIP window to open the TCP/IP configuration window.
5. Enter the machine's new information into the configuration window as follows. In a corporate intranet, you may need to have this information assigned by a network manager before proceeding.
 - **MAC Address** : Find the machine's MAC address from the **Network Configuration Report** and enter it without the colons. For example, 00:15:99:29:51:A8 becomes 0015992951A8.
 - **IP Address**: Enter a new IP address for your machine.
For example, if your computer's IP address is 192.168.1.150, enter 192.168.1.X. (X is number between 1 and 254 other than the computer's address.)
 - **Subnet Mask**: Enter a Subnet Mask.
 - **Default Gateway**: Enter a Default Gateway.
6. Select **Apply**, then **OK**, and **OK** again. The machine will automatically print the configuration report. Confirm that all the settings are correct. **Quit Safari**. You may close and eject the installation CD-ROM. If necessary, restart the computer's firewall. You have successfully changed the IP address, subnet mask, and gateway.

Configuring the machine's wireless network

Before starting you will need to know the network name(SSID) of your wireless network and the network key if it is encrypted. This information was set when the wireless router(access point) was installed. If you do not know about your wireless environment, please ask the person who has set up your network.

To configure wireless parameters, you can use **SyncThru™ Web Service**.



Internet Explorer 6.0 or higher is the minimum requirement for SyncThru™ Web Service.

Using SyncThru™ Web Service

Before starting wireless parameter configuration, make sure cable connection status.

1. Check whether the network cable is connected to the machine. If not, connect the machine with a standard network cable.
2. Start a web browser such as Internet Explorer, Safari or Firefox and enter your machine's new IP address in the browser window.
For example,



3. Click **Login** on the upper right of the SyncThru™ Web Service website.
A log-in page appears.
4. Type in the **ID** and **Password** then click **Login**.
If it's your first time logging into SyncThru™ Web Service, type in the below default ID. Password, contact your administrator.
 - **ID**: admin
 - **Password**: xxxxx
5. When the **SyncThru™ Web Service** window opens, click **Network Settings**.
6. Click **Interface > Wi-Fi > Wi-Fi**.



Wizard will help you setup the wireless network configuration. However, if you want to set the wireless network directly, select **Custom**.

7. Select the one **Network Name(SSID)** in the list.
 - **SSID:** SSID (Service Set Identifier) is a name that identifies a wireless network. Access points and wireless devices attempting to connect to a specific wireless network must use the same SSID. The SSID is case-sensitive.
8. Click **Next**.

If wireless security setting window appears, enter the registered password (network key) and click **Next**.
9. The confirmation window appears, please check your wireless setup. If the setup is right, click **Apply**.

Now installing network connected machine's driver. Refer to the User's Guide included on the **Printer Software CD-ROM** provided with the machine.

Completing the Installation

After you have installed your Samsung wireless network machine, print another copy of the Network Configuration Report and keep it for future reference. You are now ready to use your new Samsung wireless machine on your network.

Troubleshooting

Solving problems that might occur during wireless setting and installing the machine driver

Printers Not Found

- Your machine may not be turned on.
Turn on your computer and the machine.
- USB cable is not connected between your computer and machine.
Connect machine to your computer using the USB cable.
- The machine does not support wireless network.
Check the machine's user's guide included on the **Printer Software CD-ROM** supplied with your machine and prepare a wireless network machine.

Connecting Failure - Not found SSID

- The machine is unable to search network name (SSID) which you have selected or typed in.
Check the network name (SSID) on your access point and try connecting again.
- Your access point is not turned on. Turn on your access point.

Connecting Failure - Invalid Security

- You configured security incorrectly.
Check the configured security on your access point and machine.

Connecting Failure - General Connection Error

- Your computer is not receiving a signal from your machine. Check the USB cable and your machine power.

Connecting Failure - Connected Wired Network

- Your machine is connected with wired network cable. Remove the wired network cable from your machine.

PC Connection Error

- The configured network address is unable to connect between your computer and machine.
- For DHCP network environment
The print receives the IP address automatically (DHCP) when computer is configured to DHCP.
- For Static network environment
The machine uses the static address when computer is configured to static address.
If your computer has following addresses,
 - IP address: 192.168.1.100
 - Subnet address: 255.255.255.0
 - Gateway address: 192.168.1.1,Type in the following address for your machine.
 - IP address: 192.168.1.101
 - Subnet address: 255.255.255.0
 - Gateway address: 192.168.1.1

Solving other problems

If problems occur while using the machine on a network, check the followings.



For information on Access Point (or wireless router), refer to its own user's guide.

- Your computer, access point or machine may not be turned on.
- Check the wireless reception around the machine. If the reception is far from the machine or there is an obstacle, you might have difficulty receiving the signal.
- Cycle the power for Access Point (or wireless router), machine and computer. Sometimes cycling the power can recover network communication.
- Check whether firewall software (V3 or Norton) is blocking the communication. If the computer and the machine is connected on a same network it cannot be searched, firewall software might be blocking the communication. Refer to the user's guide for the software to turn it off and try searching the machine again.
- Check whether the machine's IP address is allocated correctly. You can check the IP address by printing the network configuration report.
- Check whether Access Point (or wireless router) has a configured security (password). If it has a password, refer to the Access Point (or wireless router) administrator.
- Check whether the machine's IP address. Reinstall the machine driver and change the settings to connect to the machine on the network. Due to the characteristics of DHCP, the allocated IP address could change if the machine is not used for a long time or if the Access Point has been reset.
- Check the wireless environment. You might not be able to connect to the network in the infrastructure environment where you need to type in a user's information before connecting to Access Point (or wireless router).
- This machine only supports IEEE 802.11 b/g/n and Wi-Fi. Other wireless communication (Bluetooth) is not supported.

- Check whether the machine is within the range of the wireless network.
- Check whether the machine is located away from obstacles that could block the wireless signal. Remove any large metal objects between the access point (or wireless router) and the machine. Make sure the machine and wireless access point (or wireless router) are not separated by poles, walls, or support columns containing metal or concrete.
- Check whether the machine is located away from other electronic devices that may interfere with the wireless signal. Many devices can interfere with the wireless signal, including a microwave oven and some Bluetooth devices.

Appendix_Wiress Printer Security

1. WEP

IEEE 802.11 authentication

IEEE 802.11 authentication is a process of identifying an individual who is attempting to access a wireless LAN or an Access Point. The IEEE 802.11 standard defines two types of authentication services:

- **Open System:** Authentication is not used, and encryption may or may not be used, depending on the need for data security.
- **Shared Key:** Authentication is used. A device that has the proper WEP key can access the network. Samsung Network Printer supports both authentication methods.

WEP encryption

WEP (Wired Equivalent Privacy) is a security protocol preventing an unauthorized access to your wireless network suggested by IEEE 802.11 standard. Wireless LANs, which are over radio waves, do not have the physical structure that can be protected from unauthorized access and therefore are vulnerable to tampering.

WEP is designed to provide a wireless LAN with a security level equal to what is found on a wired network. WEP encrypts the data portion of each packet exchanged on the wireless network using a 64-bit or 128-bit WEP encryption key. Sometimes 64-bit WEP is called 40-bit and 128-bit is 104-bit. Both 40-bit and 64-bit encryption are really the same, as are 104-bit and 128-bit encryption, because an additional 24 initialization vector (IV) bits are automatically added for a total of 64 bit and 128 bits. To encrypt data, Samsung Network Printer uses four encryption keys.

You should select a key and enter the key value. The key value must be the same as the other wireless devices or the access point of your wireless network. In 64-bit mode, each key value is 10 hexadecimal digits (0-9 and A-F) or 5 alphanumeric characters. In 128-bit mode, each key value is 26 hexadecimal digits or 13 alphanumeric characters. Contact with your network administrator for this configuration.

2. WPA-Personal, WPA2-Personal

WPA announced by Wi-Fi Alliance uses WPA(WPA2)-Enterprise(802.1x) or WPA(WPA2)-Personal(WPA-PSK) for authentication. WPA(WPA2)-Personal authorizes and identifies users based on a secret key between wireless user (station) and wireless supplier (access point). WPA uses TKIP (Temporal Key Integrity Protocol) and AES (Advanced Encryption Standard) for data encryption.

3. WPA-Enterprise, WPA2-Enterprise

WPA(WPA2)-Enterprise is an authentication method to use IEEE802.1x standard based on an additional EAP(Extensible Authentication Protocol). WPA(WAP2)-Enterprise authorizes and identifies users based on an authentication server called RADIUS(Remote Authentication Dial In User Server).



- WPA(WPA2)-Enterprise configuration is supported through a network cable. You can set up a wireless printer security using the SyncThru™ Web Service program.
- Supporting specifications about WPA-Enterprise can differ according to the models.
- **EAP-TLS (EAP using Transport Layer Security) :**
EAP-TLS (EAP using Transport Layer Security) : EAP-Transport Layer Security or EAP-TLS, defined in RFC 5216, is an IETF open standard, and is well-supported among wireless vendors. It uses PKI(Public Key Infrastructure) to secure authentication between an authentication server and client. EAP-TLS uses X.509-compliant digital certificates for both client and network server authentication. So you have to install root certificate and client certificate on the Samsung Network Printer.
- **EAP-TTLS (EAP using Tunneled Transport Layer Security):**
EAP-TTLS (EAP using Tunneled Transport Layer Security) : EAP-TTLS is an EAP protocol that extends TLS. EAP-TLS is widely supported, however no native OS supports EAP-TTLS in Microsoft Windows. EAP-TTLS uses X.509-compliant digital certificate for network server authentication. This also requires 802.1x user name, user password and TTLS identity used by inner authentication protocol for client authentication over a secure connection.
- **PEAP (Protected Extensible Authentication Protocol) :**
PEAP (Protected Extensible Authentication Protocol) : PEAP is similar in design to EAP-TTLS. PEAP is widely supported and provides very good security. Samsung Network Printer supports PEAPv0/EAP-MSCHAPv2. PEAP also uses X.509-compliant digital certificate for network server authentication and requires 802.1x user name, user password used by inner authentication protocol for client authentication over a secure connection.

Certificates are used to validate the identity of clients and network servers and allow encrypted data communications for EAP/802.1x authentication. Certificates may be issued and signed by a trusted third party, called Certificate Authority, or CA.

In EAP/802.1x authentications such as EAP-TLS, EAP-TTLS, and PEAP, Samsung print server may require to configure one or both of the following certificates:

- **Root Certificate** : A certificate from a trusted Certificate Authority (CA) is used to validate the identity of a network authentication server while EAP authentication methods such as EAP-TLS, EAP-TTLS, PEAP, are performed. The network authentication server's identity will be validated when information of root certificate installed on Samsung print server is identical to the information on a certificate received from the network authentication server, such as RADIUS server. Root certificate that can be installed on Samsung Network Printer must be the form of Base64 Encoded X.509 with .cer extension and be less than 3072 bytes.
- **Client Certificate** : Client Certificate is used to the identity validation of Samsung Network Printer from the network authentication server, such as RADIUS server, while EAP-TLS authentication method is performed. Client certificate that can be installed on Samsung Network Printer must be the form of PKCS #12 / Personal Information Exchange with .pfx extension and be less than 3072 bytes.

