

Wireless Bridge SX-BR-4600WAN

User's Guide



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Introduction

Thank you for purchasing the Wireless Bridge SX-BR-4600WAN (hereinafter the "SX-BR-4600WAN").

1-1. Introduction

This manual provides information on how to configure and use the SX-BR-4600WAN. Please read the Safety Instructions carefully before you begin.

Disclaimers

- The unauthorized transfer or copying of the content of this manual, in whole or in part, without prior written consent is expressly prohibited by law.
- The content of this manual is subject to change without notice.
- This manual was prepared to accurately match the content of each OS, but the actual information shown on the computer monitor may differ from the content of this manual due to future OS version upgrades, modifications, and other changes.
- Although every effort was made to prepare this manual with the utmost accuracy, Silex Technology will not be held liable for any damages as a result of errors, setting examples, or other content.

Trademarks



- Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.
- Android is registered trademark of Google Inc.
- Wi-Fi, Wi-Fi Direct, Wi-Fi Protected Setup, Wi-Fi Protected Access (WPA), WPA2 are trademarks or registered trademarks of Wi-Fi Alliance.
- Other company names and product names contained in this manual are trademarks or registered trademarks of their respective companies.

1-2. Safety Instructions







This page provides the safety instructions for safe use of SX-BR-4600WAN.

To ensure safe and proper use, please read the following information carefully before using SX-BR-4600WAN. The safety instructions include important information on safe handling of SX-BR-4600WAN and on general safety issues.

< Meaning of the warnings >

	Warning	"Warning" indicates the existence of a hazard that could result in death or serious injury if the safety instruction is not observed.
	Caution	"Caution" indicates the existence of a hazard that could result in serious injury or material damage if the safety instruction is not observed.

< Meaning of the symbols >

	This symbol indicates the warning and caution. (Example:  "Danger of the electric shock")
	This symbol indicates the prohibited actions. (Example:  "Disassembly is prohibited")
	This symbol indicates the actions users are required to observe. (Example:  "Remove the AC plug from an outlet")



Warning

	<p>* Do not allow physical impact. When damaged, turn off the connected devices, unplug the AC plug of SX-BR-4600WAN from a power outlet and contact your point of purchase. Failure to take this action could cause fire or an electrical shock.</p>
	<p>* In the following cases, turn off the connected devices and unplug the AC plug of SX-BR-4600WAN from a power outlet and contact your point of purchase. Failure to take this action could cause fire or an electrical shock.</p> <ul style="list-style-type: none"> * When SX-BR-4600WAN emits a strange smell, smoke or sound or becomes too hot to touch. * When foreign objects (metal, liquid, etc.) gets into SX-BR-4600WAN.
	<p>* Keep the cords and cables away from children. It may cause an electrical shock or serious injury.</p>
	<p>* If a ground wire is supplied with your device to use with, connect it to the ground terminal in order to prevent an electrical shock. Do not connect the ground wire to gas pipe, water pipe, lighting rod or telephone ground wire. It may cause malfunction.</p>
	<p>* Do not disassemble or modify SX-BR-4600WAN. It may cause fire, electrical shock or malfunction.</p> <p>* Do not disassemble or modify the AC adaptor that came with SX-BR-4600WAN. It may cause fire, electrical shock or malfunction.</p>



Caution

	<p>* Do not pull on the cord to disconnect the plug from the power supply. The cord may be broken, which could result in fire or an electrical shock.</p>
	<p>* When removing SX-BR-4600WAN, disconnect the AC plugs of both SX-BR-4600WAN and the other devices you are using with.</p> <p>* Use the AC adaptor supplied with SX-BR-4600WAN. Other AC adaptors may cause malfunction.</p> <p>* Verify all codes or cables are plugged correctly before using SX-BR-4600WAN.</p> <p>* When SX-BR-4600WAN will not be used for a long time, unplug the power cables of SX-BR-4600WAN and the other devices you are using with.</p>
	<p>* Do not use or store SX-BR-4600WAN under the following conditions. It may cause malfunction.</p> <ul style="list-style-type: none"> - Locations subject to vibration or shock - Shaky, uneven or tilted surfaces - Locations exposed to direct sunlight - Humid or dusty places - Wet places (kitchen, bathroom, etc.) - Near a heater or stove - Locations subject to extreme changes in temperature - Near strong electromagnetic sources (magnet, radio, wireless device, etc.)

1-3. User Registration and Customer Services

User registration

To enable us to provide better services (support and repair), please perform the user registration process from our website below:

URL	
USA	http://www.silexamerica.com/us/regist/index.html
Europe	http://www.silexeurope.com/en/home/support/registration/
Japan	http://www.silex.jp/register/



Note

- For user registration, a serial number is required.

Product Information

The services below are available from the Silex Technology website. For details, please visit the Silex Technology website.

URL	
USA	http://www.silexamerica.com/
Europe	http://www.silexeurope.com/
Japan	http://www.silex.jp/

- Latest firmware download
- Latest software download
- Latest manual download
- Support information (FAQ)

Customer Support Center

Customer Support is available by e-mail or telephone for any problems that you may encounter. If you cannot find the relevant problem in this manual or on our website, or if the corrective procedure does not resolve the problem, please contact Silex Technology Customer Support.

Contact Information		
USA	+1-801-748-1199	support@silexamerica.com
Europe	+49-(0)2154-88967-0	support@silexeurope.com
Japan	+81-(0)774-98-3981	support@silex.jp



Note

- Visit the Silex Technology website (<http://www.silexamerica.com/>) for the latest FAQ and product information.

2.

About SX-BR-4600WAN

SX-BR-4600WAN is the wireless bridge which allows to use a non-wireless devices (10/100/1000BASE-T network device) as a wireless device. Various wired products, such as printers, PC peripheral devices, monitoring camera, etc. can be connected over a wireless network. The wireless security feature will ensure safe and secure communication over wireless network.

2-1. Features

SX-BR-4600WAN has the following features:

Giving unlimited locations for your non-wireless devices

As you do not have to care wiring conditions in order to establish your environment, choices of location greatly expand in any kinds of scenes such as office, factory, school, commercial facility, etc. where the layout change is frequently required or effective layout of equipment needs to be carefully considered for a work line. Also, cost reductions is largely expected as you will no longer have to pay for wiring construction.

IEEE 802.11a/b/g/n

SX-BR-4600WAN supports communications at both 2.4GHz/5GHz bands. Using 5GHz band will help to avoid radio interference with 2.4GHz band which is most commonly used in the market.

Gigabit Ethernet

For connecting a non-wireless device, a LAN port (10/100/1000BASE-T auto-sensing) is installed.

Two types of operating mode

[Single Client Mode]

- Bridges a single non-wireless device connected to a LAN port of the SX-BR-4600WAN over wireless network.
- For the MAC address to use for wireless LAN connection, the MAC address of the device connected to a LAN port of the SX-BR-4600WAN will be used (MAC address transparent feature).
- Stops bridging when someone changed the device being connected to a wired LAN port of the SX-BR-4600WAN to the other one (security feature).

[Multi-Client Mode]

- Up to 16 non-wireless devices can be bridged over wireless network if a HUB is connected to a LAN port of the SX-BR-4600WAN.
- For the MAC address to use for wireless LAN connection, the MAC address of the SX-BR-4600WAN will be used.

Easy configuration (patented method)

By using the network cable came with the SX-BR-4600WAN, wireless configuration can easily be done.

Advanced security

The following security features are supported:

- WEP (64bit/128bit)
- WPA2-PSK (AES)
- IEEE 802.1X EAP-PEAP, EAP-TLS, EAP-TTLS, EAP-FAST, EAP-LEAP

Wi-Fi Direct

A wireless connection to non-wireless device can be made without using Access Point or Internet. In **Concurrent Mode**, you can use two types of wireless connection simultaneously, the one using Wi-Fi Direct and the other one using Access Point.

AMC Manager (non-free program) / AMC Finder (free program)

SX-BR-4600WAN supports the total management software, "AMC Manager" and "AMC Finder". The AMC Manager provides the useful features as follows:

- Remote device control and monitoring
- Bulk configuration and firmware updates



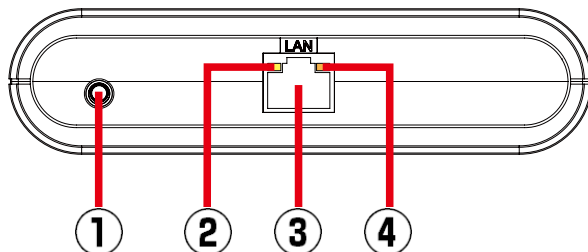
Note

- To use the functions above, your Access Point or wireless router needs to support the same functions.
- For details on the "AMC Manager" and "AMC Finder", please visit our homepage.
- To use the "AMC Manager" and "AMC Finder", an IP address needs to be configured to the SX-BR-4600WAN.

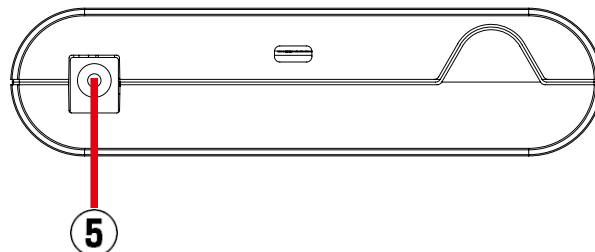
2-2. Parts and Functions

The parts name and functions are as follows:

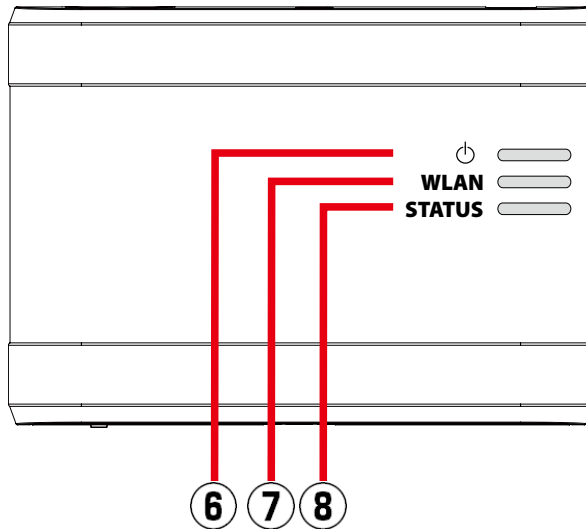
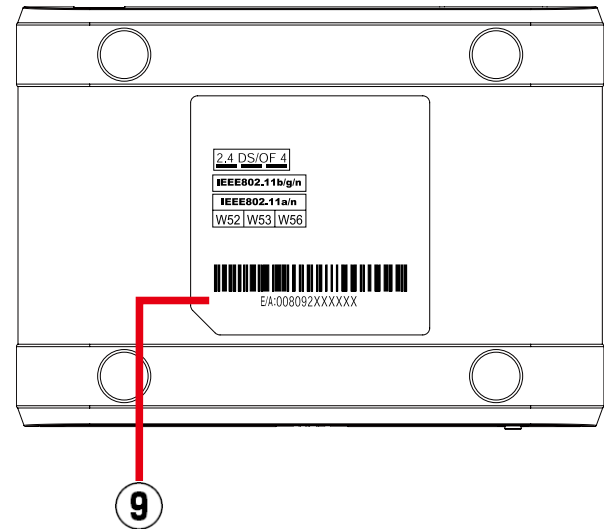
Front



Back



(1)	Push Switch	Start in Configuration Mode	Press and hold this switch for 5 sec while SX-BR-4600WAN is active.
		Wireless configuration using WPS	Press and hold this switch for 10 sec while SX-BR-4600WAN is active.
		Allow the Wi-Fi Direct connection request	Press this switch while receiving a connection request of Wi-Fi Direct.
		Factory default configuration	Press and hold this switch while turning on SX-BR-4600WAN. Release it when a Link LED of the LAN port turned on from Orange to Green.
(2)	Status LED (Yellow)	Blink	Waits for connection when the Link LED is turned off.
			Handles data communication when the Link LED is turned on.
(3)	LAN port	Connect a network cable.	
(4)	Link LED (Green/Orange)	ON (Green)	Has connected to 10BASE-T/100BASE-TX network.
		ON (Orange)	Has connected to 1000BASE-T network.
(5)	AC connector	Connect an AC adaptor.	

Top**Bottom**

(6)	POWER LED (Orange)	Turns ON when the SX-BR-4600WAN is powered on. * Flashes rapidly in case of an error.	
(7)	WLAN LED (Green)	ON	Operating in Infrastructure mode.
		OFF	Operating in Ad hoc mode.
		Blink	Processing the WPS function.
		Blink twice	Push Switch is pressed after a connection request of Wi-Fi Direct is received.
		* Blinks together with the STATUS LED when operating in Configuration Mode.	
(8)	STATUS LED (Green)	ON	Connection is established.
		Blink	Handles data communication.
		* Blinks together with the WLAN LED when operating in Configuration Mode.	
(9)	Ethernet Address	The Ethernet Address of the LAN port on SX-BR-4600WAN.	

2-3. Hardware Specification

Operating environment	Temperature : 0 degrees to +40 degrees
	Humidity : 20% to 80%RH (Non-condensing)
Storage environment	Temperature : -10 degrees to +50 degrees
	Humidity : 20% to 90%RH (Non-condensing)
EMI	VCCI Class B FCC Class B ICES Class B CE EN301489-1/-17 (EN55032 Class-B)
Wired network interface	10BASE-T/100BASE-TX/1000BASE-T (Auto-sensing) :1 port Auto MDI/MDIX
Wireless network interface	IEEE 802.11a/b/g/n (2Tx2R) (The channels you can use will differ depending on the regulations of each country.)
Channel	(US/CA) 2.4GHz: 1-11ch 5GHz: (W52) 36,40,44,48 (W53) 52,56,60,64 (W56) 100,104,108,112,116,132,136,140 (W58) 149,153,157,161,165 (EU) 2.4GHz: 1-13ch 5GHz: (W52) 36,40,44,48 (W53) 52,56,60,64 (W56) 100,104,108,112,116,120,124,128,132,136,140
Push Switch	1
LED	Top POWER (Orange) WLAN (Green) STATUS (Green)
	LAN Port Status (Yellow) Link (Green/Orange)
Compatible devices	Network devices with LAN port (RJ-45)
Max number of connectable devices	When operating in Single Client Mode : 1 device When operating in Multi-Client Mode : 16 devices

FCC / IC Notice



FCCID : N6C-SXPCEAN
IC : 4908B-SXPCEAN

Federal Communication Interference Statement (United States only)

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

following measures:

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

This radio module and its antenna(s) must not be co-located or operated in conjunction with any other antenna or transmitter.

Canadian Department of Communications Industry Canada Notice (Canada only)

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

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

FCC Rules, Part 15 / Industry Canadian

This device complies with Part 15 of FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

This device may not cause harmful interference, and

This device must accept any interference, including interference that may cause undesired operation of this device.

Le présent appareil est conforme aux la partie 15 des règles de la FCC et CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

l'appareil ne doit pas produire de brouillage, et

l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET65 and RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment should be installed and operated with the radiator at least 20cm or more away from person's body (excluding extremities: hands, wrists, feet and ankles).

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles des radioélectriques (RF) de la FCC lignes directrices d'exposition dans le Supplément C à OET65 et d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le dispositif rayonnant et le corps (à l'exception des extrémités : mains, poignets, pieds et chevilles).

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This radio transmitter 4908B-SXPCEAN has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio 4908B-SXPCEAN a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

For product available in the USA/Canada market, only channels 1~11 can be operated. Selection of other channels is not possible. If this device is to be operated in the 5.15~5.35GHz frequency range, it is restricted to indoor environment only.

Antenna information: Sleeve Antenna: 1.5dBi (2.4GHz), 2.1dBi (5GHz)

Frequency Tolerance: +/-20ppm

WARNING:

The FCC / Industry Canada regulations provide that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CE Notice



2-4. Software Specification

Configuration Mode

TCP/IP	Network layer	ARP, IP
	Transport layer	TCP, UDP
	Application layer	HTTP, DNS(simple reply function only), DHCP (simple server function only), NetBIOS over TCP/IP (Name Service only), JCP (Silex proprietary protocol), FLDP, FLDP/BR

Normal Mode (Single Client Mode)

TCP/IP	Application layer	FLDP, FLDP/BR (only on a LAN port), SMPD
--------	-------------------	--

- This bridges other protocols.

Normal Mode (Multi-Client Mode)

TCP/IP	Application layer	FLDP, FLDP/BR (only on a LAN port), SMPD
--------	-------------------	--

- This bridges TCP/IP (IPv4, IPv6) only.

2-5. Use of Radio Waves

Notes on Usage

Do not use SX-BR-4600WAN near the following devices or places.

- Microwave, scientific instruments, pacemaker or other medical equipment, etc.
- Licensed radio station in a factory
- Small power radio station (A non-licensed radio station)

These devices may use the same band. If you use SX-BR-4600WAN near these devices, the radio waves emitted from SX-BR-4600WAN may interfere with them.

Do not use SX-BR-4600WAN near a cellular phone, TV or Radio.

A cellular phone, TV and radio use a different radio band than our products. Generally, if they are used near SX-BR-4600WAN, it will not cause any problems. However, when they approximate SX-BR-4600WAN, sound or image noise may occur.

If there is reinforced concrete/metal between wireless devices, they may not connect.

SX-BR-4600WAN can connect through wood or glass, but may have troubles connecting through reinforced concrete/metal.

SX-BR-4600WAN complies with the certification of conformance to technical standards. Please pay attention to the following points:

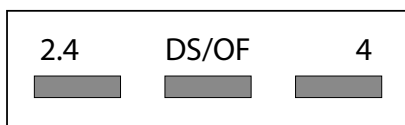
- Please do not disassemble or remodel the product. Such action is prohibited by law.
- Please do not remove the certificate label. Using the product without a label is prohibited.




Wireless devices using 2.4GHz band

The same frequency band of SX-BR-4600WAN is used for a microwave, industry, science, medical equipment and licensed in room or low power (non-licensed) radio stations.

- Before you use SX-BR-4600WAN, check that it does not interfere with other devices.
- If interference occurs, stop using SX-BR-4600WAN or change the wireless band. Please consider to create a wall between these devices to avoid interference. Contact us for possible solution.

*The meaning of the symbols in the bottom of the unit:



2.4	: Wireless devices using 2.4GHz frequency band
DS/OF	: DS-SS or OFDM is used as modulation.
4	: The range of interference is equal to or lower than 40m.
  	: All bands can be used to avoid interference.

Notes on using 5GHz band

- Use of 5.2GHz band (W52) and 5.3GHz band (W53) outdoors is prohibited by the radio regulations. Use only W56 channels then.
- SX-BR-4600WAN does not support Ad hoc mode at 5GHz band. Please use it in Infrastructure mode then.

2-6. OpenSSL License

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit.

(<http://www.openssl.org/>)

OpenSSL License

```

-----
/* =====
* Copyright (c) 1998-2005 The OpenSSL Project. All rights reserved.
*
* Redistribution and use in source and binary forms, with or without
* modification, are permitted provided that the following conditions
* are met:
*
* 1. Redistributions of source code must retain the above copyright
* notice, this list of conditions and the following disclaimer.
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* 2. Redistributions in binary form must reproduce the above copyright
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* the documentation and/or other materials provided with the
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* 3. All advertising materials mentioning features or use of this
* software must display the following acknowledgment:
* "This product includes software developed by the OpenSSL Project
* for use in the OpenSSL Toolkit. (http://www.openssl.org/)"
*
* 4. The names "OpenSSL Toolkit" and "OpenSSL Project" must not be used to
* endorse or promote products derived from this software without
* prior written permission. For written permission, please contact
* openssl-core@openssl.org.
*
* 5. Products derived from this software may not be called "OpenSSL"
* nor may "OpenSSL" appear in their names without prior written
* permission of the OpenSSL Project.
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* 6. Redistributions of any form whatsoever must retain the following
* acknowledgment:
* "This product includes software developed by the OpenSSL Project
* for use in the OpenSSL Toolkit (http://www.openssl.org/)"
*

```

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* PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR
* ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL,
* SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT
* NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES;
* LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
* HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
* STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE)
* ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED
* OF THE POSSIBILITY OF SUCH DAMAGE.

* =====

*

* This product includes cryptographic software written by Eric Young
* (eay@cryptsoft.com). This product includes software written by Tim
* Hudson (tjh@cryptsoft.com).

*

*/

Original SSLeay License

/* Copyright (C) 1995-1998 Eric Young (eay@cryptsoft.com)

* All rights reserved.

*

* This package is an SSL implementation written

* by Eric Young (eay@cryptsoft.com).

* The implementation was written so as to conform with Netscapes SSL.

*

* This library is free for commercial and non-commercial use as long as

* the following conditions are aheared to. The following conditions

* apply to all code found in this distribution, be it the RC4, RSA,

* lhash, DES, etc., code; not just the SSL code. The SSL documentation

* included with this distribution is covered by the same copyright terms

* except that the holder is Tim Hudson (tjh@cryptsoft.com).

*

* Copyright remains Eric Young's, and as such any Copyright notices in

* the code are not to be removed.

* If this package is used in a product, Eric Young should be given attribution

* as the author of the parts of the library used.

* This can be in the form of a textual message at program startup or

* in documentation (online or textual) provided with the package.

*

- * Redistribution and use in source and binary forms, with or without
- * modification, are permitted provided that the following conditions
- * are met:
- * 1. Redistributions of source code must retain the copyright
- * notice, this list of conditions and the following disclaimer.
- * 2. Redistributions in binary form must reproduce the above copyright
- * notice, this list of conditions and the following disclaimer in the
- * documentation and/or other materials provided with the distribution.
- * 3. All advertising materials mentioning features or use of this software
- * must display the following acknowledgement:
- * "This product includes cryptographic software written by
- * Eric Young (eay@cryptsoft.com)"
- * The word 'cryptographic' can be left out if the routines from the library
- * being used are not cryptographic related :-).
- * 4. If you include any Windows specific code (or a derivative thereof) from
- * the apps directory (application code) you must include an acknowledgement:
- * "This product includes software written by Tim Hudson (tjh@cryptsoft.com)"
- *
- * THIS SOFTWARE IS PROVIDED BY ERIC YOUNG ``AS IS" AND
- * ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE
- * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
- * PURPOSE
- * ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE
- * FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL
- * DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE
- * GOODS
- * OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION)
- * HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT,
- * STRICT
- * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY
- * OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF
- * SUCH DAMAGE.
- *
- * The license and distribution terms for any publicly available version or
- * derivative of this code cannot be changed. i.e. this code cannot simply be
- * copied and put under another distribution license
- * [including the GNU Public License.]
- */

3. Before You Begin

This chapter explains each operating mode and available configuration methods for SX-BR-4600WAN as well as the wireless setting information you need to check out before the configuration.

3-1. Operating Mode

SX-BR-4600WAN has 2 operating modes below.
Please use the one appropriate for your environment.

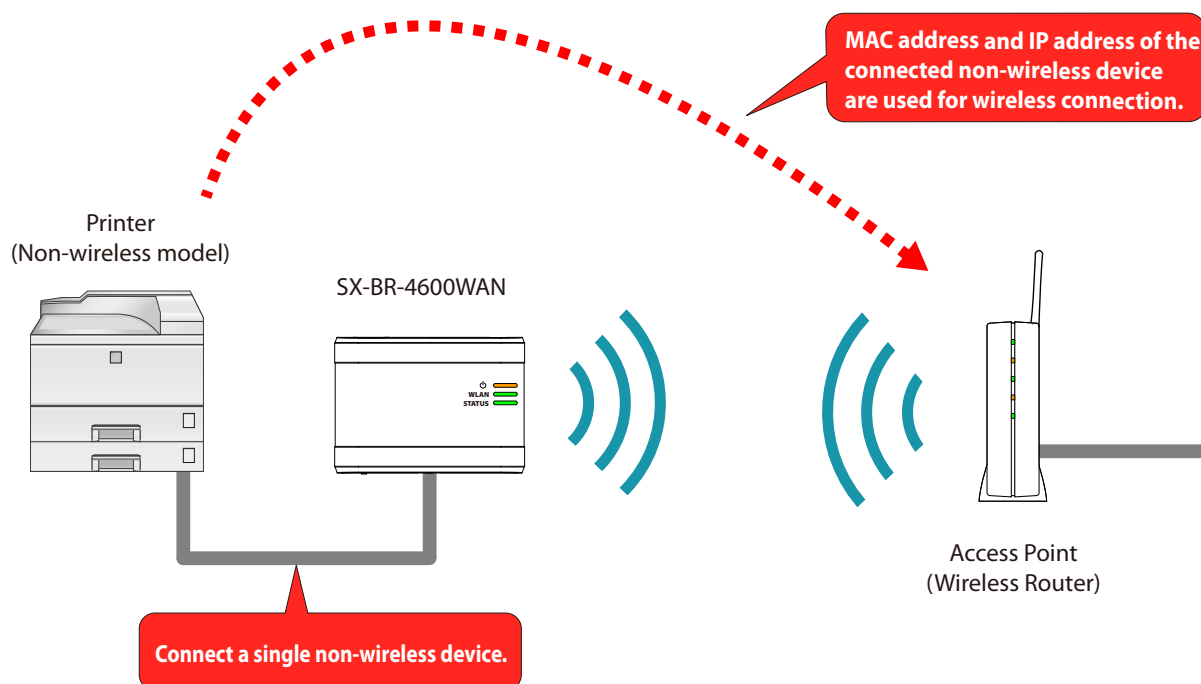
- Single Client Mode
- Multi-Client Mode

**Note**

- The operating mode can be configured on the Web configuration interface which can be accessed when the SX-BR-4600WAN operates in Configuration Mode.
- By defaults, the operating mode is set to **Single-Client Mode**.

Single Client Mode

Use this mode when you connect a single non-wireless device to the SX-BR-4600WAN. As the MAC address and IP address of the connected device are used for wireless LAN connection, you can use the device as if it is directly connected to a wireless LAN.



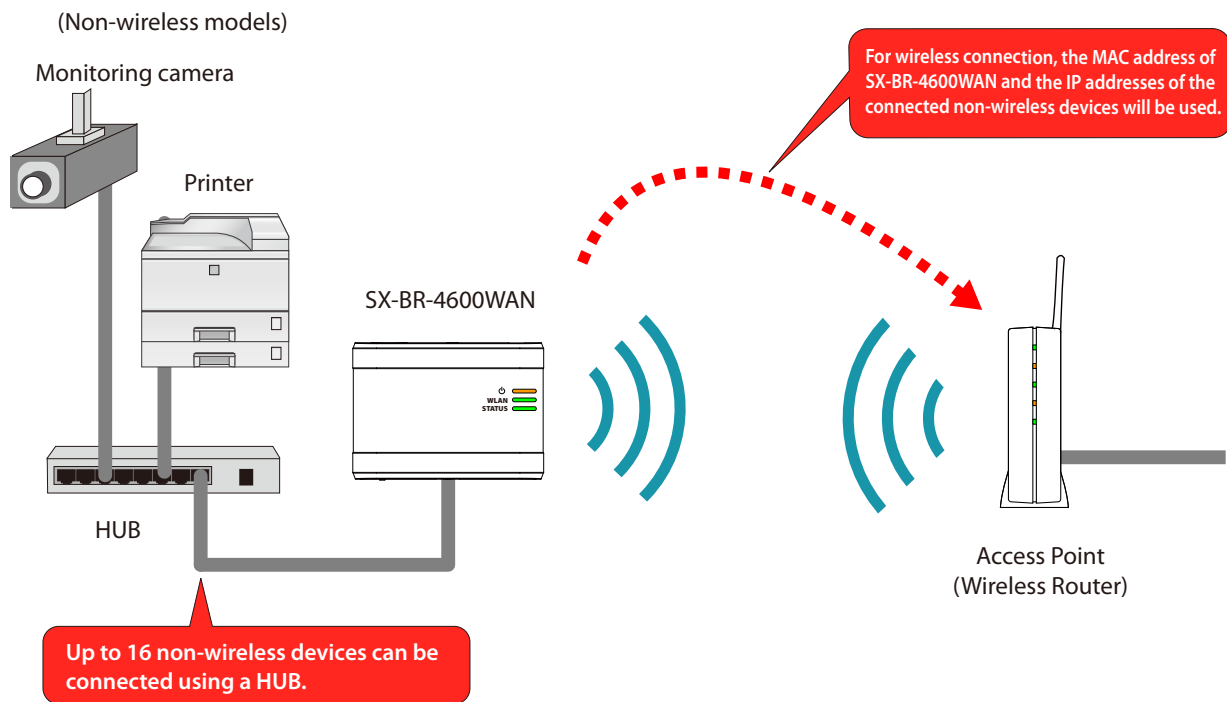
- Only one device can be connected to a LAN port.
- The following actions are treated as an error. If one of these occurs, the bridge function will abort.
 - Connecting multiple devices to a LAN port using a HUB
 - Changing the device connected to a LAN port to the other device while SX-BR-4600WAN is running.
- If the connection is lost on a LAN port while communication is in progress, wireless bridging will be disabled until it is reconnected.
- The devices with multiple MAC addresses cannot be used (e.g. PC with a load balancing feature, etc).
- Due to restrictions of the protocols, "**View full map**" of "**Network and Sharing Center**" is not fully supported on Windows Vista / 7.

Multi-Client Mode

Use this mode when you connect multiple non-wireless devices to SX-BR-4600WAN.

By using a HUB on the LAN port, up to 16 devices can be connected.

For wireless connection, the MAC address of SX-BR-4600WAN and IP addresses of the connected devices will be used.



TIP

- The devices with multiple MAC addresses cannot be used (e.g. PC with a load balancing feature, etc).
- SX-BR-4600WAN bridges TCP/IP (IPv4 and IPv6) only. Other protocols are not supported.
- SX-BR-4600WAN does not support bridging the following IPv6 packets.
 - Inverse Neighbor Advertisement
 - Fragment Header
 - Authentication Header
 - Encapsulating Security Payload

3-2. Configuration Method

There are 3 configuration methods as follows.

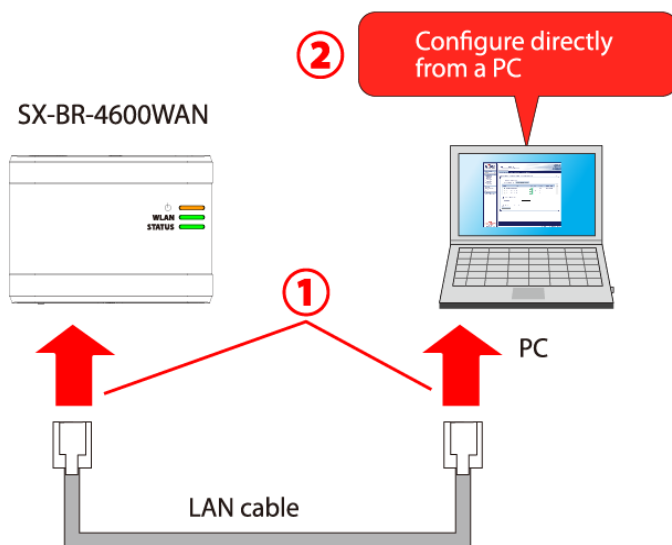
Please select the one appropriate for your environment.

- Easy configuration using Configuration Mode
- Wireless configuration using WPS (Push Switch)
- Wireless configuration using WPS (PIN code)

Easy Configuration Using Configuration Mode

In this configuration method, you connect the SX-BR-4600WAN to a PC using a network cable to configure the settings from the PC.

By connecting the SX-BR-4600WAN to the PC and starting it in Configuration Mode, the Web configuration interface can be accessed. Select the Access Point the SX-BR-4600WAN should wirelessly connect to and enter the Network Key on the configuration interface. Depending on your environment, you may need to check the wireless LAN information beforehand.

**Note**

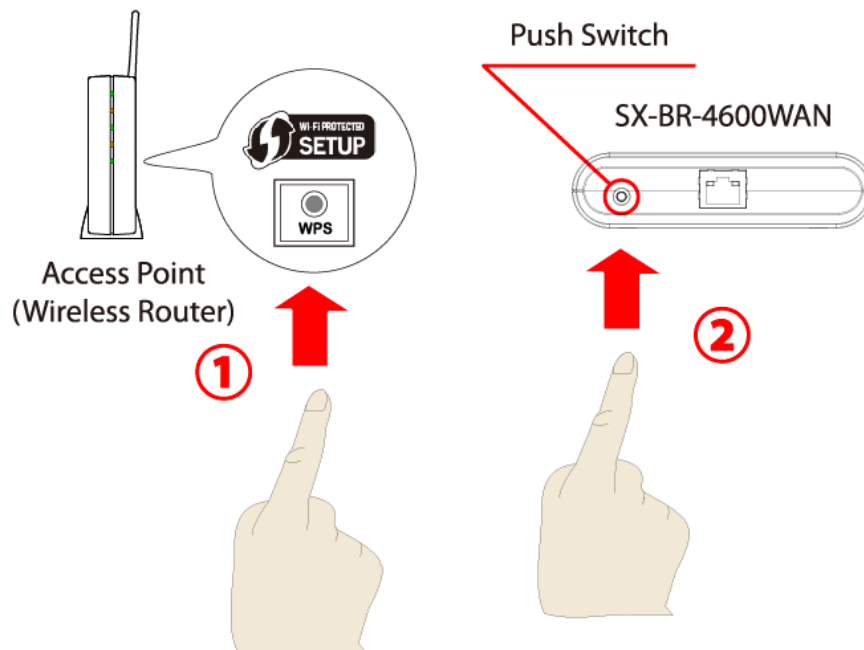
In this configuration method, only "**SSID**" and "**Network Key**" are needed to connect to a wireless LAN, however, further configuration is required in the following cases.

- Access Point is operating in a stealth mode.
- Access Point is using the Shared authentication
- Access Point is using the Open authentication and the WEP key index other than "1".
- Too many wireless networks are active (up to 32 wireless networks can be shown by SX-BR-4600WAN).

Wireless Configuration Using WPS (Push Switch)

In this configuration method, you can automatically configure the wireless settings by pressing the wireless connection button on your Access Point (wireless router) and the push switch on SX-BR-4600WAN. You will not have to get wireless setting information beforehand, as configuration is automatically handled by the SX-BR-4600WAN and your Access Point.

For this configuration method, an Access Point supporting WPS(Wi-Fi Protected Setup) is required. To see if your Access Point supports WPS, refer to the operation manual that came with your Access Point or contact the manufacturer.

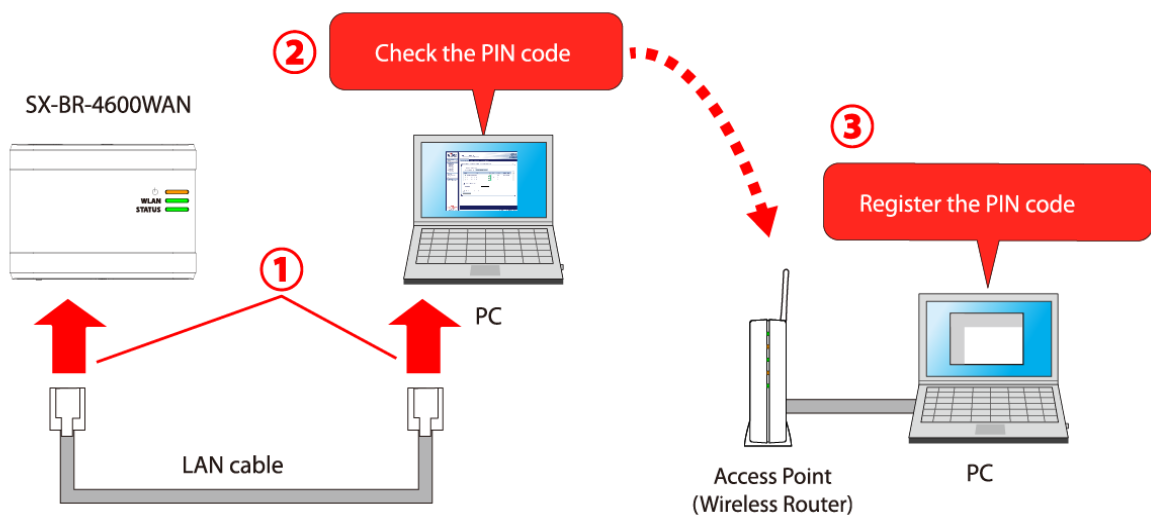


Wireless Configuration Using WPS (PIN Code)

In this configuration method, you can automatically configure the wireless settings by entering the PIN code of SX-BR-4600WAN on your Access Point (wireless router).

The PIN code can be identified from the Web configuration interface of SX-BR-4600WAN. To access the Web configuration interface, connect the SX-BR-4600WAN directly to a PC using a network cable and start it in Configuration Mode.

You will not have to get wireless setting information beforehand, as configuration is automatically handled by the SX-BR-4600WAN and your Access Point. For this configuration method, an Access Point supporting WPS(Wi-Fi Protected Setup) is required. To see if your Access Point supports WPS, refer to the operation manual that came with your Access Point or contact the manufacturer.



Note

- Two PCs are required for this configuration; one for the SX-BR-4600WAN and the other one for your Access Point.

3-3. Necessary Wireless Setting Information

When you configure SX-BR-4600WAN using the Configuration Mode, the wireless settings need to be configured appropriately for your environment. As the same wireless settings must be configured for both SX-BR-4600WAN and your Access Point, you need to get the necessary setting information of your Access Point beforehand.



Note

- If you plan to configure the SX-BR-4600WAN using WPS, you will not have to get the wireless setting information.



TIP

- The wireless setting information explained in this page is specific to your network and cannot be provided by Silex technical support. For how to confirm each setting, please refer to the operation manual that came with your router or contact the manufacturer.
- Depending on your Access Point, WPS may need to be enabled manually. For details, refer to the operation manual that came with your Access Point.
- If a security feature such as MAC Address filtering is enabled on your Access Point, change the setting so that SX-BR-4600WAN can communicate with your Access Point. For details, refer to the operation manual that came with your Access Point.
- For the IEEE802.1X authentication, refer to **5-2. IEEE802.1X Authentication**.

Wireless Mode	Select a method to connect to a wireless network. - Infra. (Infrastructure mode) Select this when you wish to connect to your network via an Access Point. - AdHoc (Ad hoc mode) Select this when you wish to make a direct connection to SX-BR-4600WAN from your PC without using an Access Point. When using Ad hoc mode, set the same channel as the PC.	
SSID	The SSID is an ID that distinguishes a wireless LAN network from others. For wireless devices to communicate with each other on a wireless network, they must share the same SSID. (The SSID is also referred to as "ESSID".) Depending on your Access Point, it may have several SSIDs. If there are different SSIDs for a game console and computer, use the one for the computer.	
Encryption Mode	No Encryption	Uses no encryption for wireless communication. (In this case, you do not have to get any of your settings beforehand.)
	WEP	If WEP encryption is used, wireless communication will be encrypted using the settings for "WEP Key 1-4" and "Key Index". Set the same "WEP Key Size(64bit/128bit)", "WEP Key" and "Key Index" as the wireless device you wish to connect.
	WPA / WPA2	Uses PSK for network authentication. The encryption key will be generated by communicating with the Access Point using a Pre-Shared key. WEP key setting is not used for this mode. Set the same "Pre-Shared key" and "Encryption Mode"(AES/AUTO) as the wireless device you wish to connect. The Pre-Shared key is also referred to as "Network Key" or "Password".

4. How to Configure SX-BR-4600WAN

This chapter explains how to configure SX-BR-4600WAN.

Following configuration methods are available:

- 1) Configuration using Configuration Mode
- 2) Configuration using WPS (Push Switch)
- 3) Configuration using WPS (PIN code)



Note

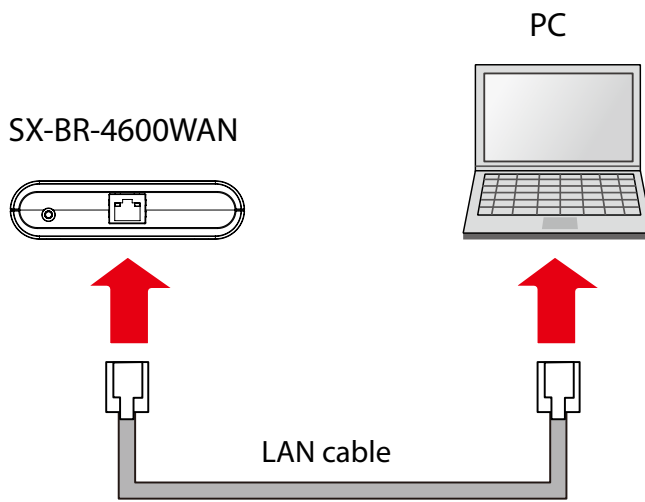
- For details on each configuration method, refer to **3-2. Configuration Method**.

4-1. Easy Configuration Using Configuration Mode

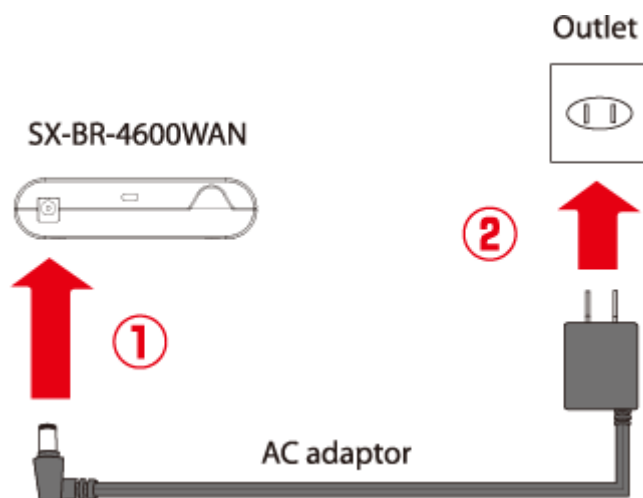
How to configure SX-BR-4600WAN using the Configuration Mode is explained.

Starting SX-BR-4600WAN in Configuration Mode

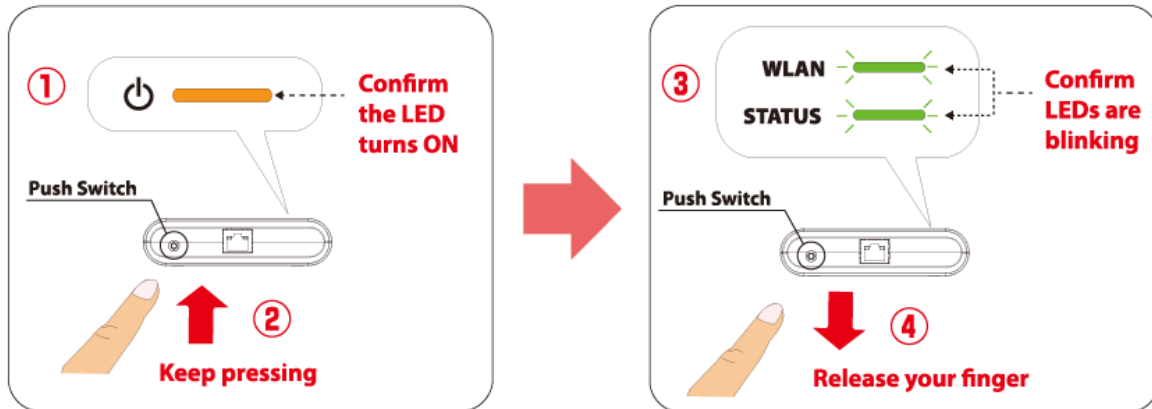
1. Connect SX-BR-4600WAN and the PC (to use for setup) using a network cable.



2. Connect the AC adaptor to SX-BR-4600WAN, and the AC adaptor's plug to an electrical outlet.

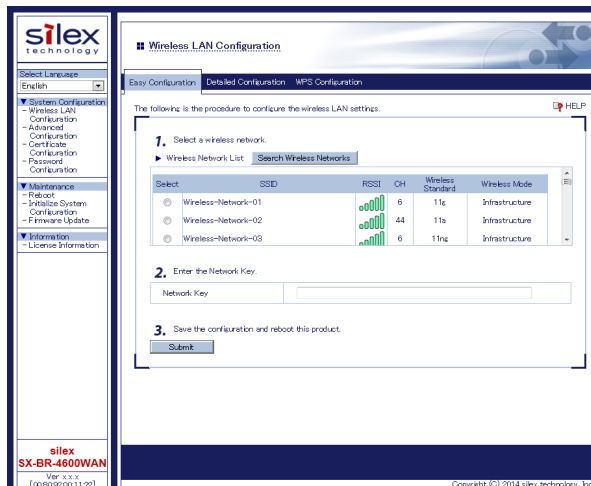


3. When the POWER LED on top of SX-BR-4600WAN turns on, press and hold the push switch on the front. Release the push switch when the WLAN LED and STATUS LED start blinking together (it may take 20sec until blinking). SX-BR-4600WAN will start operating in the Configuration Mode and you will be ready to configure SX-BR-4600WAN from the PC.



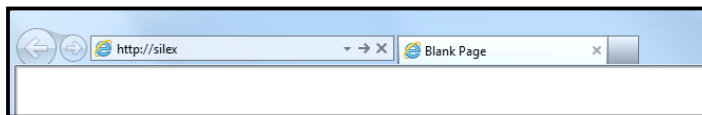
Configuration

1. Start a Web browser (Internet Explorer, Safari, etc) on the PC you are using for the setup. The Web page of SX-BR-4600WAN is displayed.

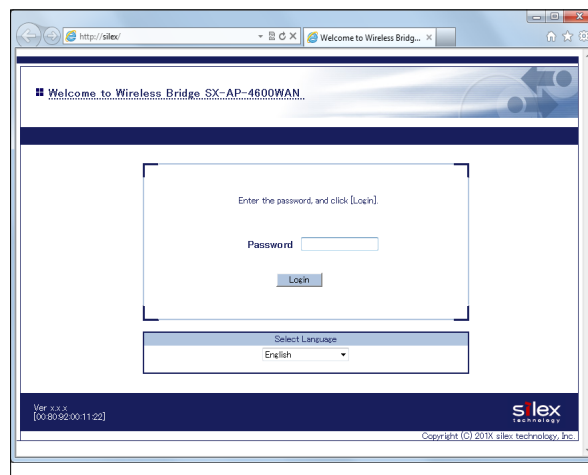


Note

- If the Web page is not displayed, enter "**http://silex**" in the address bar of the Web browser and press the Enter key.



- If a password is set to SX-BR-4600WAN, the password entry screen is displayed. Enter the password and click **Login**.
- By defaults, the password entry screen is not displayed. Go on to 2 then.



**TIP**

- To start the configuration, the PC and SX-BR-4600WAN need to communicate each other properly.
- Confirm that an IP Address is correctly configured to the PC.
- If a wireless LAN is enabled on your PC, please disable it.
- If a static IP address is set to the PC, the Web configuration interface cannot be displayed in the following cases:
 - An IP address of the different segment is entered to the address bar, when the default gateway address is not configured to the PC.
 - A URL ("www.silexamerica.com", etc.) is entered to the address bar when the name resolution is disabled (DNS server address is not registered or NetBIOS is disabled).

- 2.** In the Web configuration interface, select the Access Point from the **Wireless Network List** and enter the WEP key or Shared Key for the **Network Key**. Click **Submit** when finished.

Select	SSID	RSSI	CH	Wireless Standard	Wireless Mode
<input checked="" type="radio"/>	Wireless-Network-01		6	11g	Infrastructure
<input type="radio"/>	Wireless-Network-02		44	11a	Infrastructure
<input type="radio"/>	Wireless-Network-03		6	11n	Infrastructure

Step 2 shows a Network Key field with a masked key (12 dots).

Step 3 shows a Submit button.

**Note**

- To connect multiple network devices using an Ethernet HUB, click **Advanced Configuration** and select **Multi-Client Mode** for **Client Mode**.

Name	Value
LAN Interface	AUTO
Network Device Address	
Client Mode	Multi-Client Mode
IEEE802.11g Ad hoc Mode	ON

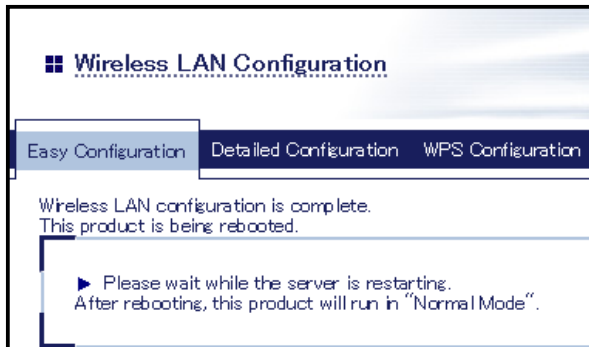
Buttons: Submit, Reset

- If the Access Point is operating in a stealth mode, it is not displayed at **Wireless Network List**. In such a case, click **Detailed Configuration** on the top, enter the detailed setting information of the Access Point and click **Submit**. For details on each setting, please refer to the HELP on Web configuration interface.
- To use the IEEE802.1X authentication, click the **Detailed Configuration** on the top, enter the detailed setting information of the Access Point and click **Submit**. For details on each setting, please refer to the HELP on Web configuration interface.
- Up to 32 Access Points can be displayed at **Wireless Network List**.
- If the Access Point you wish to connect is not displayed in the list, you may have reached the maximum number of wireless devices that SX-BR-4600WAN can detect and show in the list. In that case, use the SSID filter to display the necessary Access Point only.
To use the SSID filter, click the **Detailed Configuration** on the top, enter the SSID of the Access Point you wish to connect, select **ON** at **SSID Filter** and click **Submit**. The SSID filter will become active after the PC is restarted.

The screenshot shows the 'Wireless LAN Configuration' web interface. At the top, there are three tabs: 'Easy Configuration', 'Detailed Configuration' (which is selected), and 'WPS Configuration'. Below the tabs, a message states: 'Configure the wireless LAN parameters manually. Enter the values and click "Submit".' The main content area is titled 'Wireless LAN Basic Configuration' and contains a table with two columns: 'Name' and 'Value'.

Name	Value
Operating Mode	Infra. ▼
SSID	Wireless-Network-01
SSID Filter	OFF ▼

3. When the completion message is displayed on the Web configuration interface, finish the Web browser. The configuration has been completed.



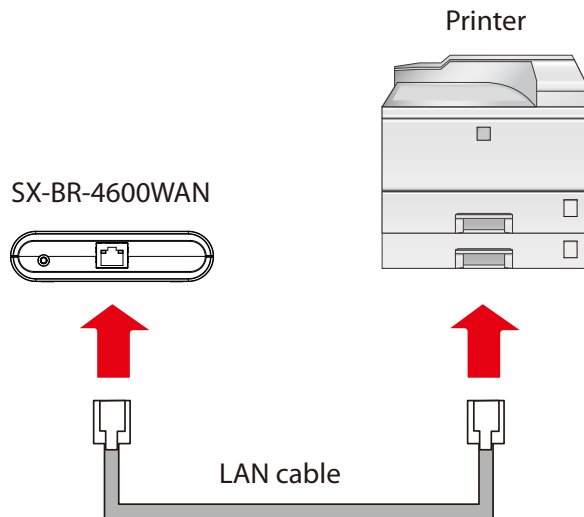
When you wish to bridge the PC used for this configuration wirelessly, restart the PC.

To bridge another device wirelessly, turn off both SX-BR-4600WAN and PC, remove the SX-BR-4600WAN from the PC and connect the SX-BR-4600WAN to the device you wish to use wirelessly using a network cable. For details, refer to **Connecting Non-wireless Devices** in the next page.

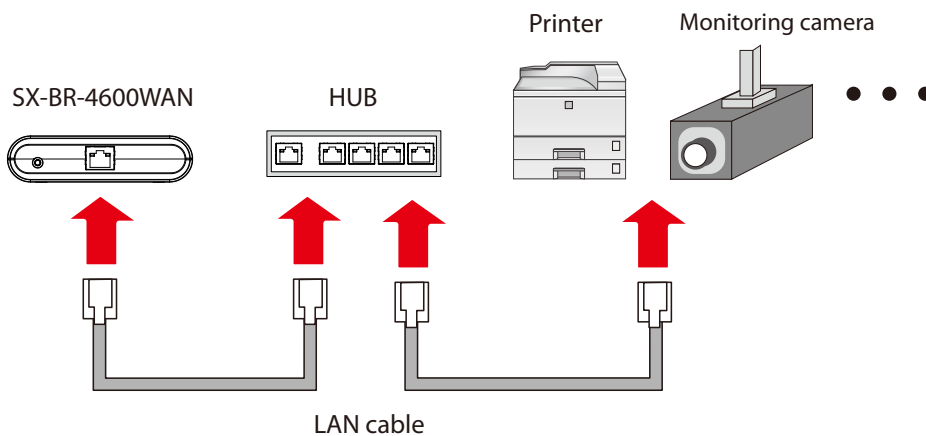
Connecting Non-wireless Devices

1. Turn off the non-wireless device that you wish to use wirelessly and connect the SX-BR-4600WAN to it using a network cable. The connection method will vary depending on each operating mode.

How to Connect in Single Client Mode



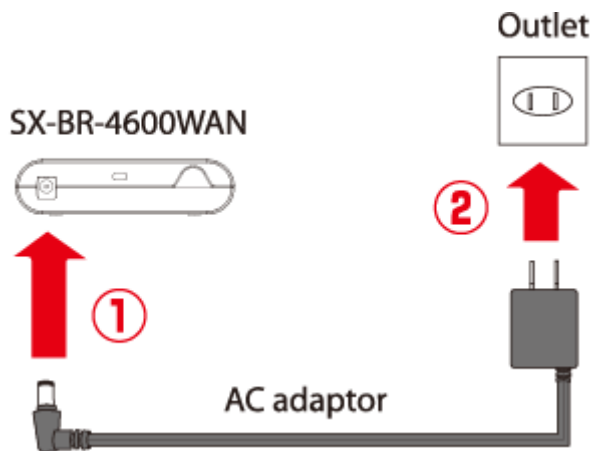
How to Connect in Multi-Client Mode



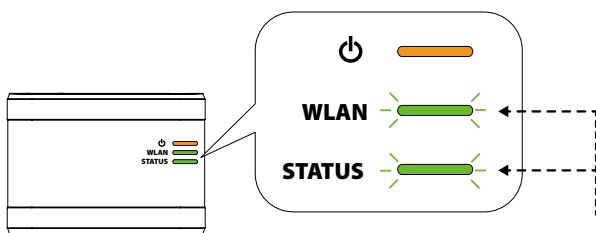
- For details on each operating mode, refer to **3.1 Operating Mode**.

Note

- 2.** Connect the AC adaptor to the SX-BR-4600WAN and the AC plug to the outlet.



- 3.** Turn on the non-wireless device connected to the SX-BR-4600WAN. During the MAC address resolution, the WLAN LED and STATUS LED will flash alternately. When it is finished, the SX-BR-4600WAN will be ready to use. You can use the non-wireless device over a wireless network.



The LEDs flash alternately during the MAC address resolution



Note

- Depending on the non-wireless device you have connected, further network settings may need to be configured to that device. In such a case, please configure it according to the operating manual that came with your device.
- When you turn on the SX-BR-4600WAN and your non-wireless device, be sure to turn on the SX-BR-4600WAN first. Do not press the push switch then.

4-2. Configuration Using WPS (Push Switch)

The wireless settings can be configured easily using the push switch if your Access Point supports WPS(Wi-Fi Protected Setup). How to configure the wireless settings using the push switch is explained below.



- Please check that the Access Point supporting WPS is installed on your network.
- This configuration method is not available if the Access Point is operating in a stealth mode.
- To ensure proper communication during this configuration, please temporarily move the SX-BR-4600WAN closer to the Access Point.
- The WPS feature may need to be enabled on your Access Point manually. For details, see the operating manual that came with your Access Point.
- If a security feature such as MAC address filtering is enabled on your Access Point, disable it temporarily.
- If the SSID filter is enabled on the SX-BR-4600WAN, this configuration method cannot be used. To disable the SSID filter, turn on the SX-BR-4600WAN in Configuration Mode and change the setting, or otherwise, initialize the SX-BR-4600WAN.
- To connect multiple devices using a HUB, use **Multi-Client Mode**. See **5-1. Configuration Mode** to change the operating mode.

Configuration

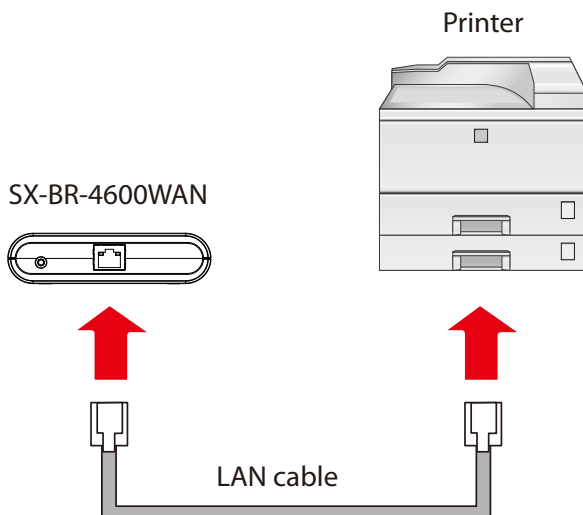
When the operating mode is **Single Client Mode**, you need to connect a non-wireless device to the SX-BR-4600WAN in order to start the configuration.

When the operating mode is **Multi-Client Mode**, you do not have to connect a non-wireless device. In such a case, start from **2** in this section.

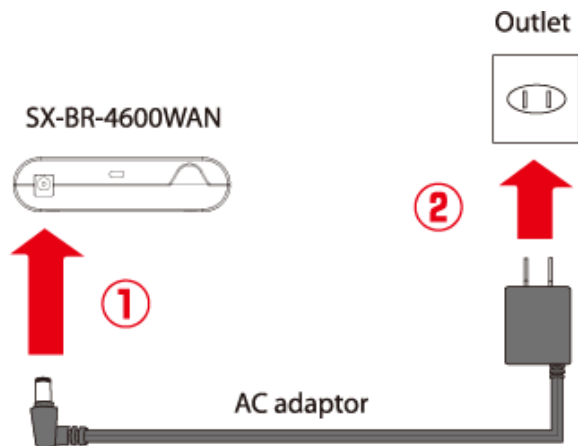
**Note**

- By defaults, the operating mode is set to **Single Client Mode**.
- To see which operating mode your SX-BR-4600WAN is running on, start the SX-BR-4600WAN in the Configuration Mode and access the Web page.

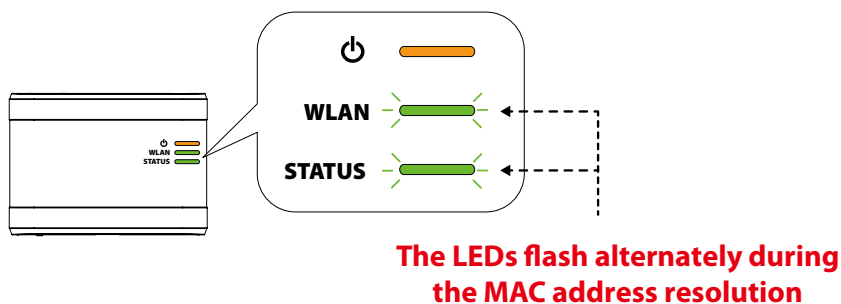
1. Turn off the non-wireless device that you wish to use wirelessly and connect the SX-BR-4600WAN to it using a network cable.



2. Connect the AC adaptor to the SX-BR-4600WAN and the AC plug to the outlet.



3. Turn on the non-wireless device connected to the SX-BR-4600WAN.
During the MAC address resolution, the WLAN LED and STATUS LED will flash alternately. When it is finished, the SX-BR-4600WAN will be ready for configuration using WPS.

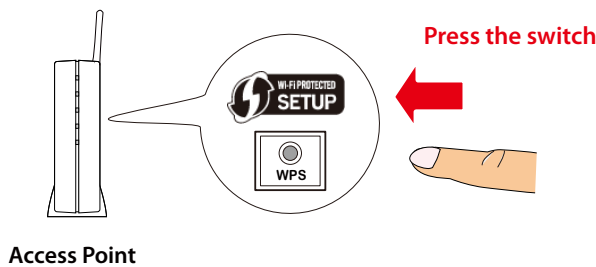


Note

- Depending on the non-wireless device you have connected, further network settings may need to be configured to that device. In such a case, please configure it according to the operating manual that came with your device.
- When you turn on the SX-BR-4600WAN and your non-wireless device, be sure to turn on the SX-BR-4600WAN first. Do not press the push switch then.

4. Press the WPS button on your Access Point.

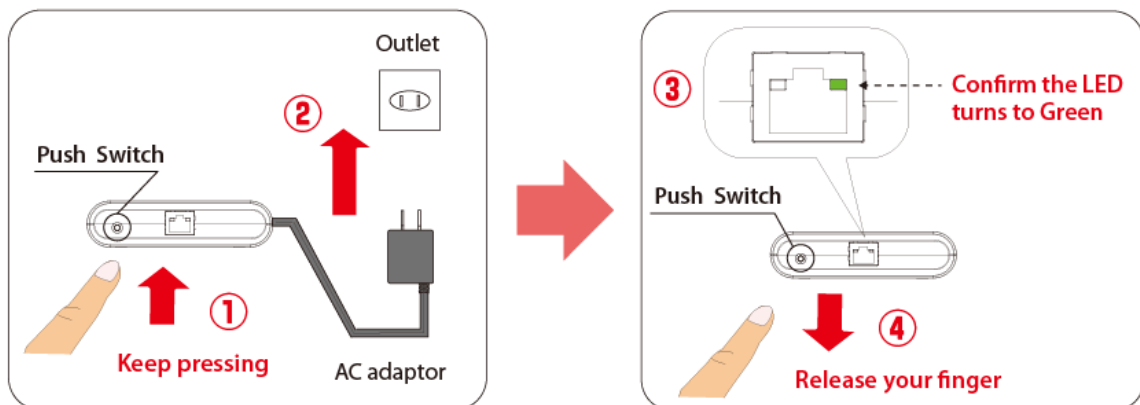
Confirm that your Access Point is ready for a wireless connection to be made.

**Note**

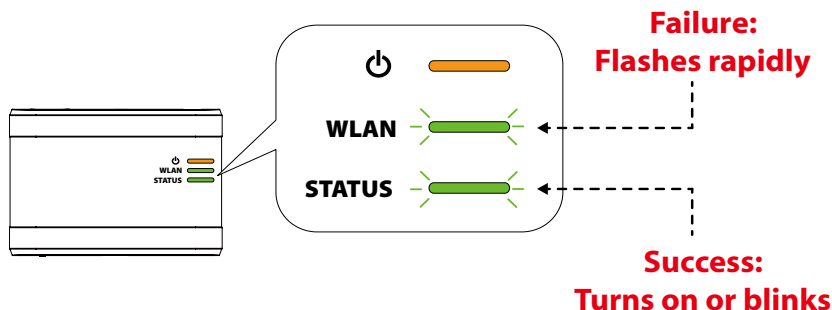
- The name, position and shape of the WPS button will differ depending on your Access Point. For details, refer to the operation manual that came with your Access Point.
- Please use only one Access Point. If two or more Access Points are waiting for wireless connections, SX-BR-4600WAN will not be able to connect properly.

5. Press and hold the push switch on the SX-BR-4600WAN. The WLAN LED and STATUS LED will start to blink together.

When the WLAN LED blinks while STATUS LED turns off, release the push switch (it may take 15 sec until the STATUS LED turns off after the WLAN and STATUS LEDs blink together).



6. The SX-BR-4600WAN and the Access Point will start to communicate each other. When the configuration finished successfully, the STATUS LED turns on or blinks.



Note

- It may take up to 2 min to finish the wireless configuration depending on your environment.
 - If the wireless configuration is finished in failure, the WLAN LED will flash rapidly for 10 sec.
- In such a case, read the instructions carefully and start from **4** again.

If you plan to use SX-BR-4600WAN in **Single Client Mode**, you can keep using the connected non-wireless device to use it wirelessly.

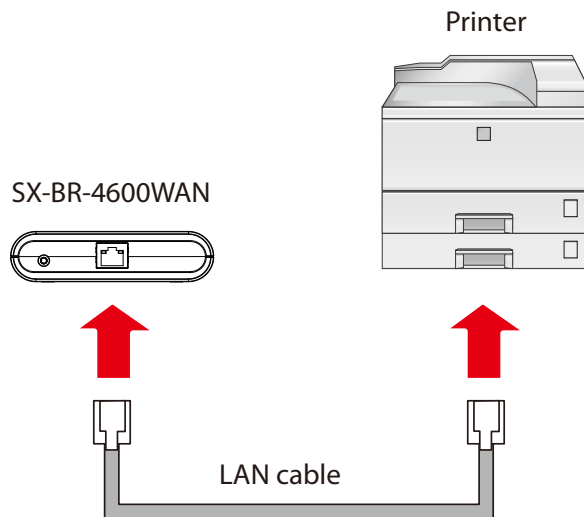
To replace it with the other non-wireless device, turn off the SX-BR-4600WAN and replace the connected non-wireless device to it. See **Connecting Non-wireless Devices** in the next page for how to connect the SX-BR-4600WAN and non-wireless device using a network cable.

To change the operating mode, start the SX-BR-4600WAN in configuration mode. For details, refer to **5-1. Configuration Mode**.

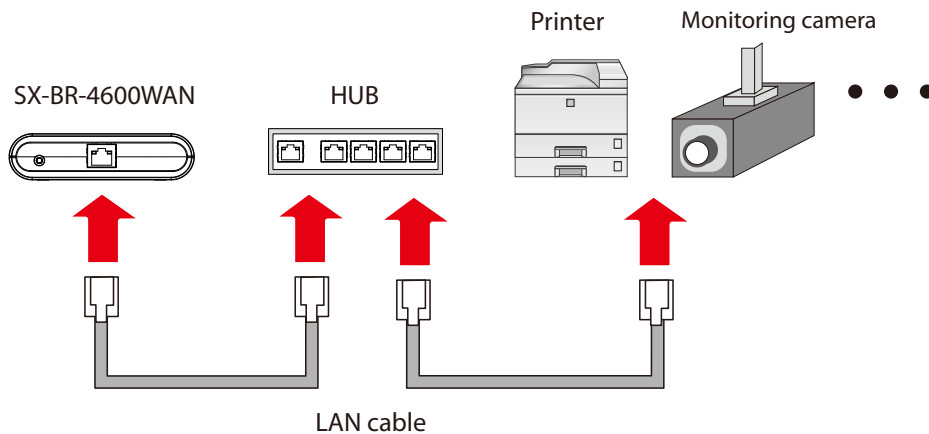
Connecting Non-wireless Devices

1. Turn off the non-wireless device that you wish to use wirelessly and connect the SX-BR-4600WAN to it using a network cable. The connection method will vary for each operating mode.

How to Connect in Single Client Mode



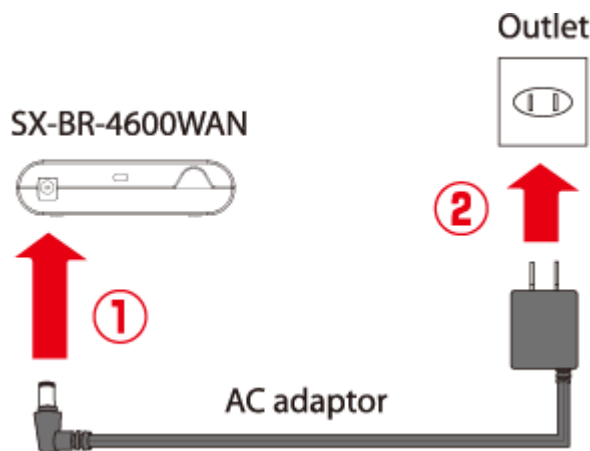
How to Connect in Multi-Client Mode



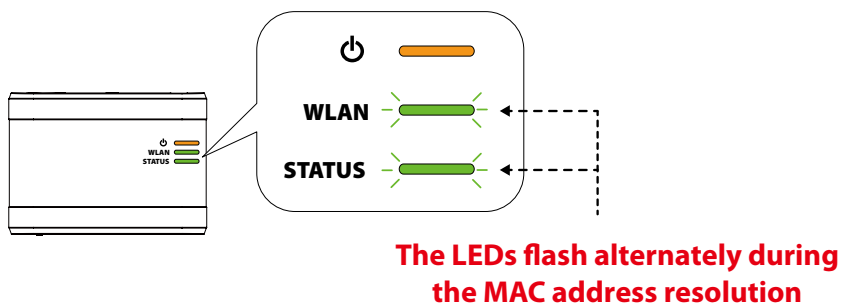
- For details on each operating mode, refer to **3.1 Operating Mode**.

Note

2. Connect the AC adaptor to the SX-BR-4600WAN and the AC plug to the outlet.



3. Turn on the non-wireless device connected to the SX-BR-4600WAN.
During the MAC address resolution, the WLAN LED and STATUS LED will flash alternately. When the LED status has changed from it, the SX-BR-4600WAN will be ready to use. You can use the non-wireless device over a wireless network.



Note

- Depending on the non-wireless device you have connected, further network settings may need to be configured to that device. In such a case, please configure it according to the operating manual that came with your device.
- When you turn on the SX-BR-4600WAN and your non-wireless device, be sure to turn on the SX-BR-4600WAN first. Do not press the push switch then.

4-3. Configuration Using WPS (Pin Code)

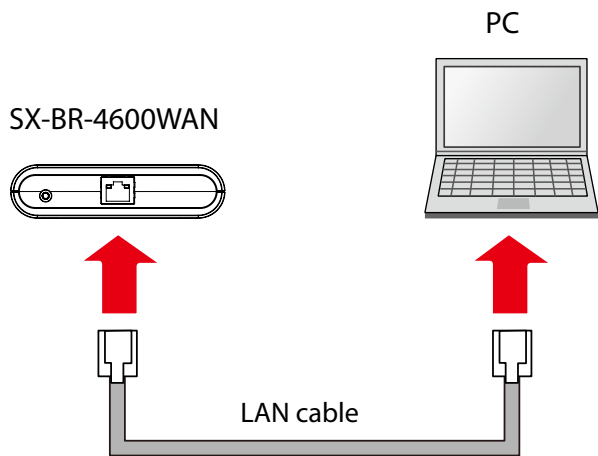
The wireless settings can be configured easily using the PIN code when your Access Point supports WPS(Wi-Fi Protected Setup). How to configure the wireless settings using the PIN code is explained below.



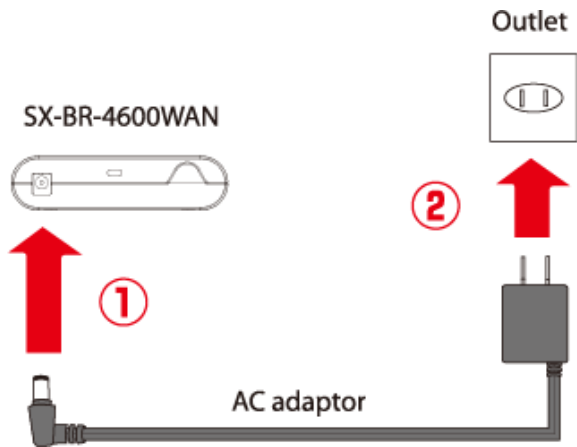
- Please check that the Access Point supporting WPS is installed on your network.
- This configuration method is not available if the Access Point is operating in a stealth mode.
- To ensure proper communication during this configuration, please temporarily move the SX-BR-4600WAN closer to the Access Point.
- The WPS feature may need to be enabled on your Access Point manually. For details, see the operating manual that came with your Access Point.
- If a security feature such as MAC address filtering is enabled on your Access Point, disable it temporarily.
- If the SSID filter is enabled on the SX-BR-4600WAN, this configuration method cannot be used. To disable the SSID filter, turn on the SX-BR-4600WAN in Configuration Mode and change the setting, or otherwise, initialize the SX-BR-4600WAN.
- To connect multiple devices using a HUB, use **Multi-Client Mode**. See **5-1. Configuration Mode** to change the operating mode.

Starting SX-BR-4600WAN in Configuration Mode

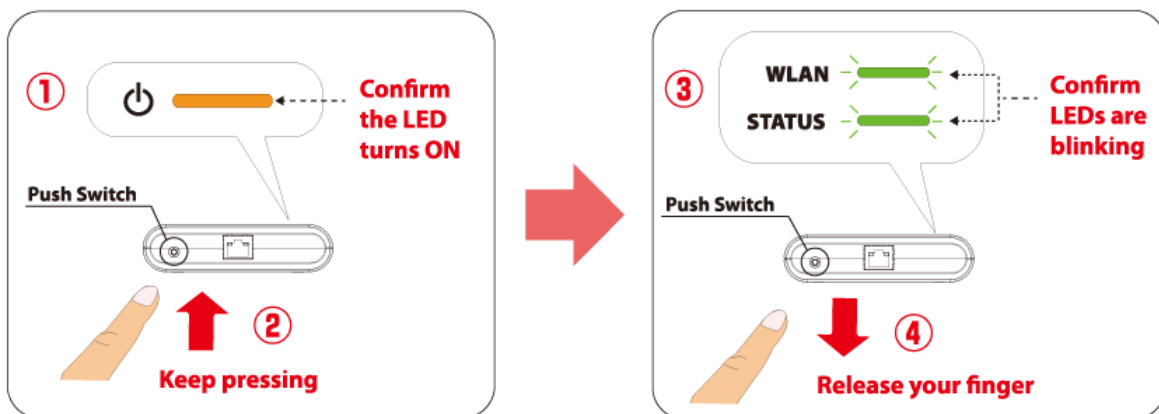
1. Connect SX-BR-4600WAN and the PC (to use for setup) using a network cable.



- 2.** Connect the AC adaptor to SX-BR-4600WAN, and the AC adaptor's plug to an electrical outlet.

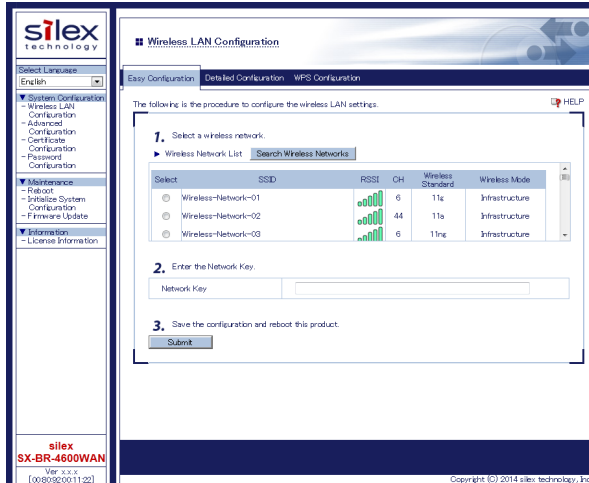


- 3.** When the POWER LED on top of SX-BR-4600WAN turns on, press and hold the push switch on the front. Release the push switch when the WLAN LED and STATUS LED start blinking together (it may take 20sec until blinking). SX-BR-4600WAN will start operating in the Configuration Mode and you will be ready to configure SX-BR-4600WAN from the PC.



Checking a PIN Code

1. Start a Web browser (Internet Explorer, Safari, etc) on the PC you are using for the setup. The Web page of SX-BR-4600WAN is displayed.



Note

- If the Web page is not displayed, enter "**http://silex**" in the address bar of the Web browser and press the Enter key.



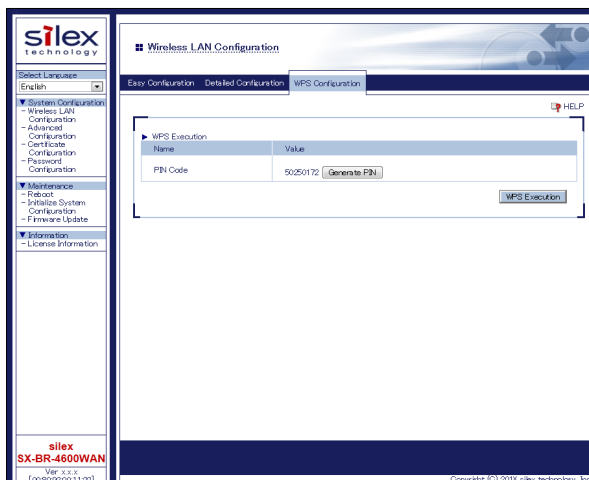
- If a password is set to SX-BR-4600WAN, a password entry screen is displayed. Enter the password and click **Login**.
- The password entry screen is not displayed at the initial setup. Go on to 2 then.



**TIP**

- To start the configuration, the PC and SX-BR-4600WAN need to communicate each other properly.
- Confirm that an IP Address is correctly configured to the PC.
- If a wireless LAN is enabled on your PC, please disable it.
- If a static IP address is set to the PC, the Web configuration interface cannot be displayed in the following cases:
 - An IP address of the different segment is entered to the address bar, when the default gateway address is not configured to the PC.
 - A URL ("www.silexamerica.com", etc.) is entered to the address bar when the name resolution is disabled (DNS server address is not registered or NetBIOS is disabled).

2. In the Web configuration interface, click **Wireless LAN Configuration - WPS Configuration** and check the PIN code. Keep this screen displayed as it will be used again at **Configuration** in the next page. Do not click the **WPS Execution** button yet.

**TIP**

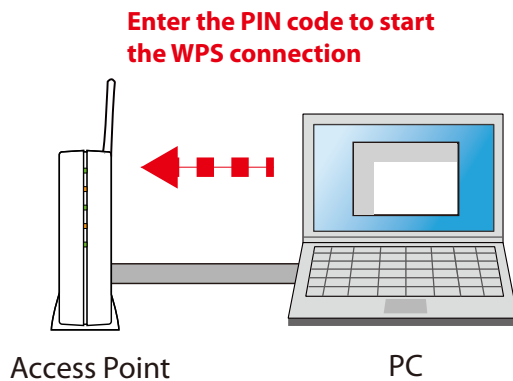
- Do not click the **WPS Execution** button yet. It will need to be clicked at **Configuration** in the next page.

**Note**

- To change the PIN code, click the **Generate PIN** button. A new PIN code will be generated automatically.

Configuration

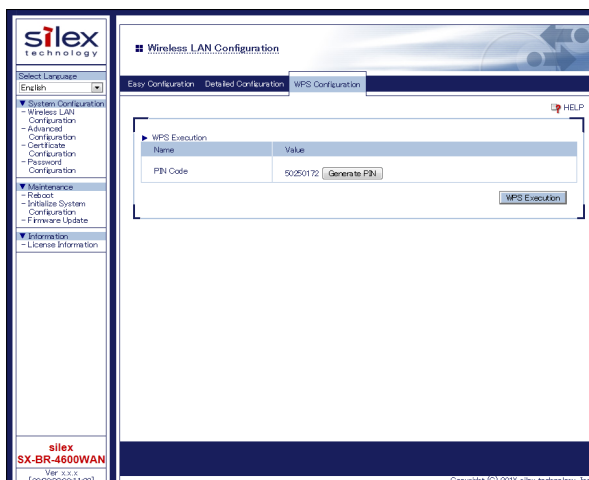
1. Access the Web configuration interface of the Access Point using a Web browser (Internet Explorer, Safari, etc) on your PC. Enter the PIN code and start the WPS connection from the Access Point.



Note

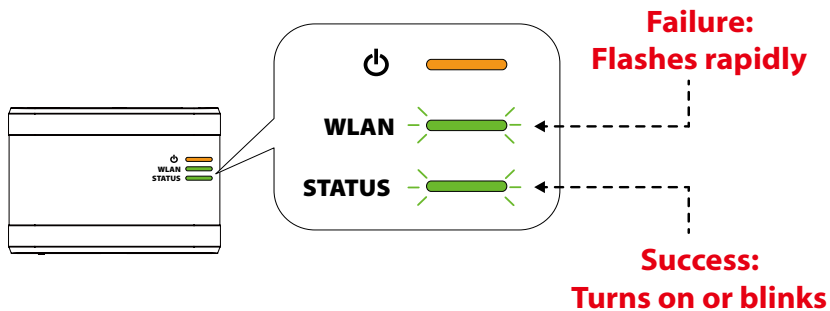
- The method to enter the PIN code on Access Point will differ depending on each Access Point. For details, refer to the operating manual that came with your Access Point.

2. Go back to the **WPS Configuration** page of the SX-BR-4600WAN and click the **WPS Execution** button.



- If WPS is started on the SX-BR-4600WAN earlier than the Access Point, the configuration may fail.

- 3.** The SX-BR-4600WAN and the Access Point will start to communicate each other. The wireless configuration is successfully completed when the STATUS LED turns on or blinks.



Note

- It may take up to 2 min to finish the wireless configuration depending on your environment.
- If the wireless configuration failed, the WLAN LED will flash rapidly for 10 sec.
In such a case, read the instructions carefully and start from **1** again.
- To change the PIN code, see **Checking a PIN Code**.

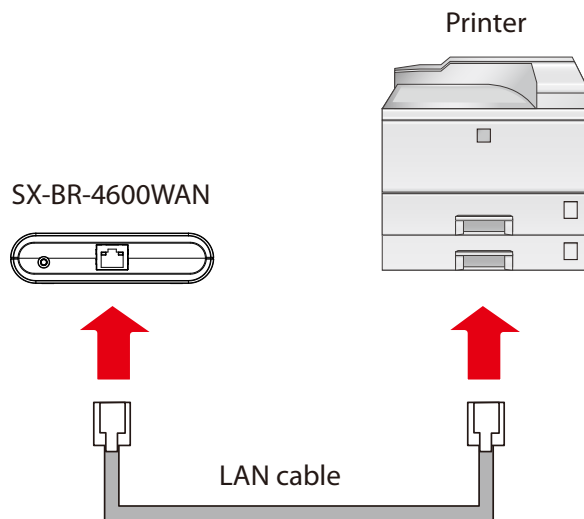
If you plan to use the PC wirelessly (the one you have been using for this configuration), restart the PC. To use the other non-wireless device wirelessly, turn off the SX-BR-4600WAN and the PC, and connect the SX-BR-4600WAN to the non-wireless device using a network cable.

For details, refer to **Connecting Non-wireless Devices** in the next page.

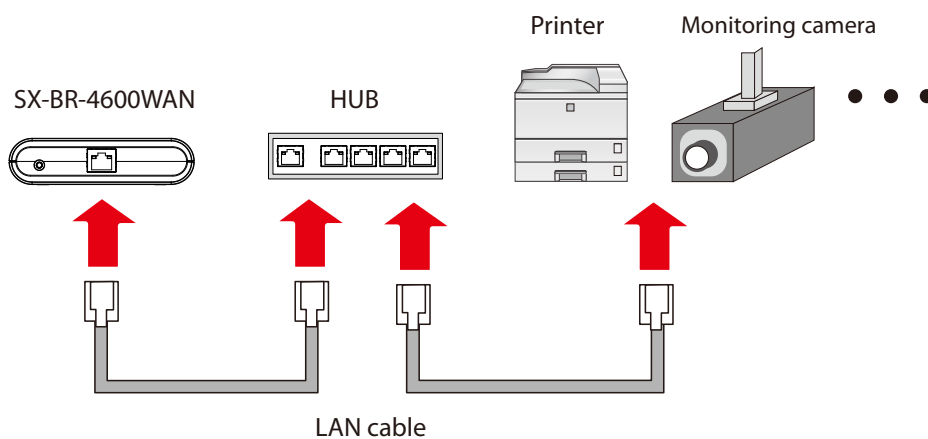
Connecting Non-wireless Devices

1. Turn off the non-wireless device that you wish to use wirelessly and connect the SX-BR-4600WAN to it using a network cable. The connection method will vary for each operating mode.

How to Connect in Single Client Mode



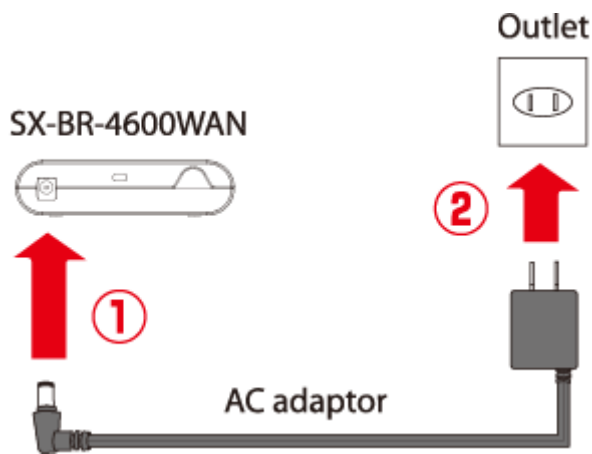
How to Connect in Multi-Client Mode



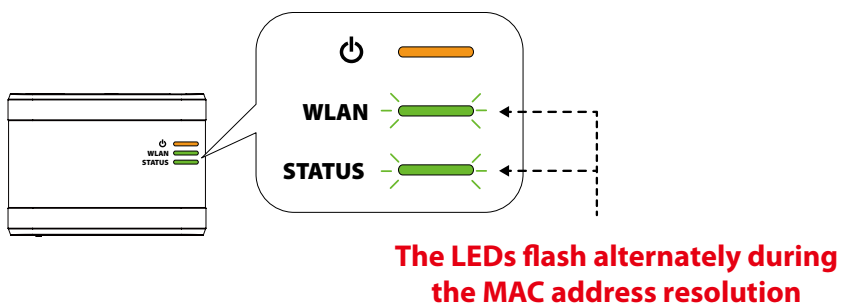
- For details on each operating mode, refer to **3.1 Operating Mode**.

Note

2. Connect the AC adaptor to the SX-BR-4600WAN and the AC plug to the outlet.



3. Turn on the non-wireless device connected to the SX-BR-4600WAN.
During the MAC address resolution, the WLAN LED and STATUS LED will flash alternately. When the LED status has changed from it, the SX-BR-4600WAN will be ready to use. You can use the non-wireless device over a wireless network.



Note

- Depending on the non-wireless device you have connected, further network settings may need to be configured to that device. In such a case, please configure it according to the operating manual that came with your device.
- When you turn on the SX-BR-4600WAN and your non-wireless device, be sure to turn on the SX-BR-4600WAN first. Do not press the push switch then.

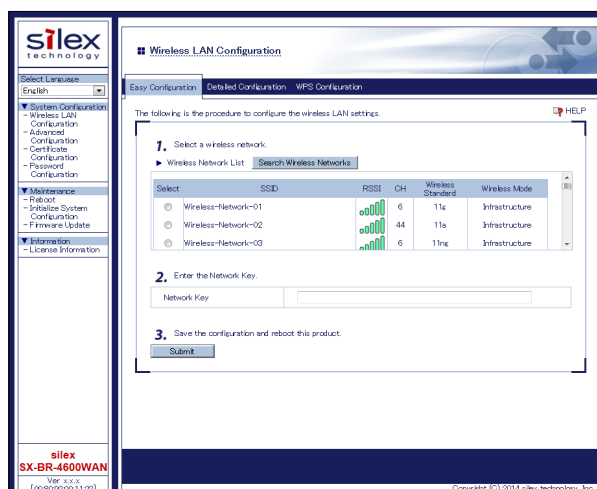
5. List of Functions

This chapter explains the SX-BR-4600WAN functions.

5-1. Configuration Mode

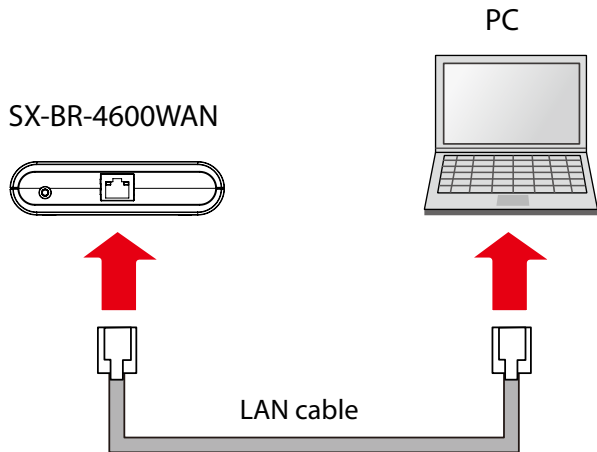
The Configuration Mode is used when you access the Web configuration interface of SX-BR-4600WAN. In the Web configuration interface, each setting can be configured.

How to start the SX-BR-4600WAN in Configuration Mode as well as access the Web configuration interface are explained.



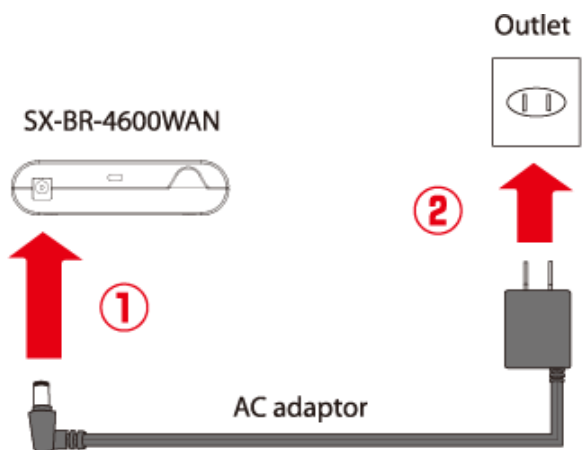
Starting SX-BR-4600WAN in Configuration Mode

1. Connect SX-BR-4600WAN and the PC (to use for setup) using a network cable.

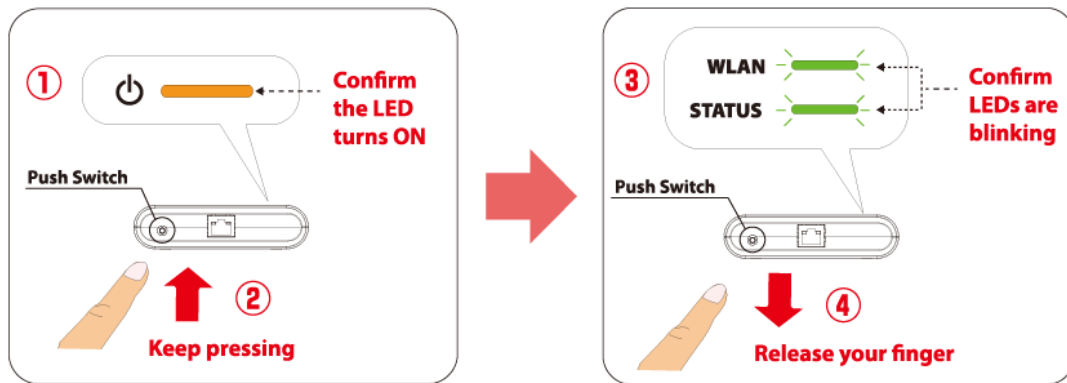


- To start the configuration, the PC and SX-BR-4600WAN need to communicate each other properly.
- Confirm that an IP Address is correctly configured to the PC.
- If a wireless LAN is enabled on your PC, please disable it.

2. Connect the AC adaptor to SX-BR-4600WAN, and the AC adaptor's plug to an electrical outlet.

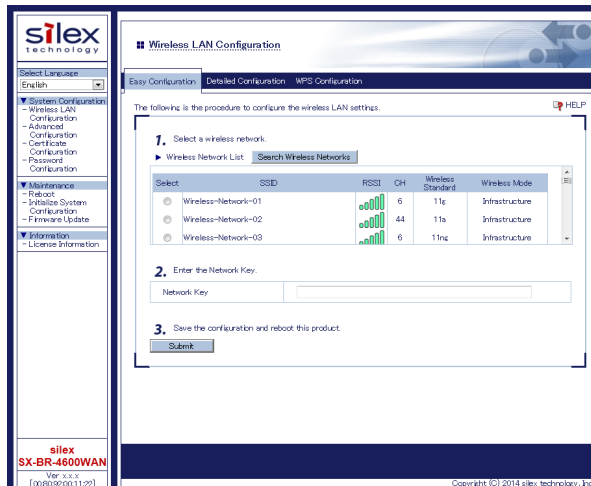


3. When the POWER LED on top of SX-BR-4600WAN turns on, press and hold the push switch on the front. Release the push switch when the WLAN LED and STATUS LED start blinking together (it may take 20sec until blinking). SX-BR-4600WAN will start operating in the Configuration Mode and you will be ready to configure SX-BR-4600WAN from the PC.



Configuration via Web Configuration Interface

Start a Web browser (Internet Explorer, Safari, etc) on the PC you are using for the setup. The Web configuration interface of SX-BR-4600WAN is displayed. In the Web configuration interface, the operating mode, wireless setting, etc. can be changed.

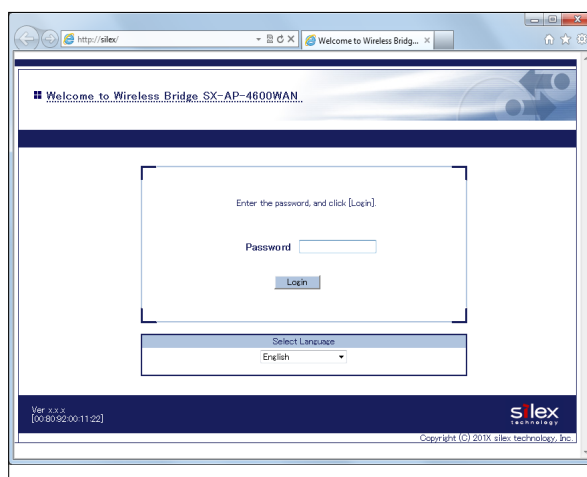


Note

- If the Web page is not displayed, enter "**http://silex**" in the address bar of the Web browser and press the Enter key.



- If a password is set to SX-BR-4600WAN, the password entry screen is displayed. Enter the password and click **Login**. By defaults, the password entry screen is not displayed.



- SX-BR-4600WAN needs to be restarted for changes to take effect.

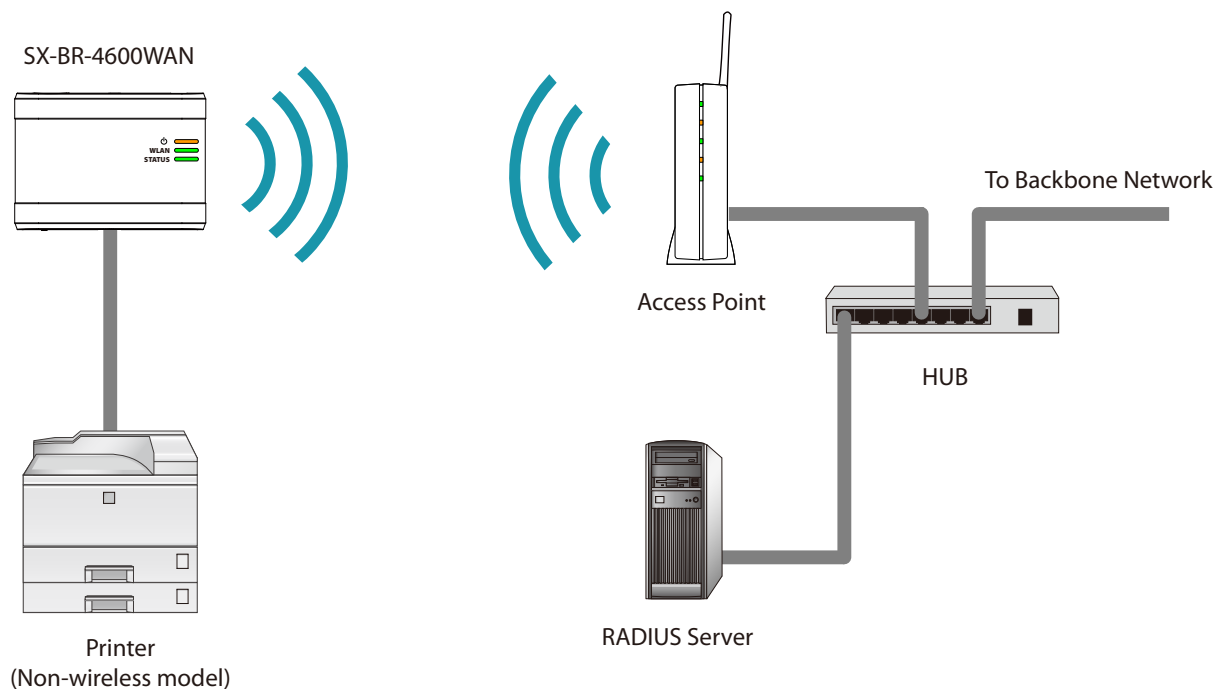
5-2. IEEE802.1X Authentication

SX-BR-4600WAN supports the IEEE802.1X authentication.

To use the IEEE802.1X authentication, a RADIUS server is needed.

Network Configuration

Connect the SX-BR-4600WAN to a network as below when you use the IEEE802.1X authentication. The RADIUS server identifies the reliability of SX-BR-4600WAN as an authentication host, while SX-BR-4600WAN identifies the reliability of RADIUS server as an authentication client to identify the reliability of the network to connect to.



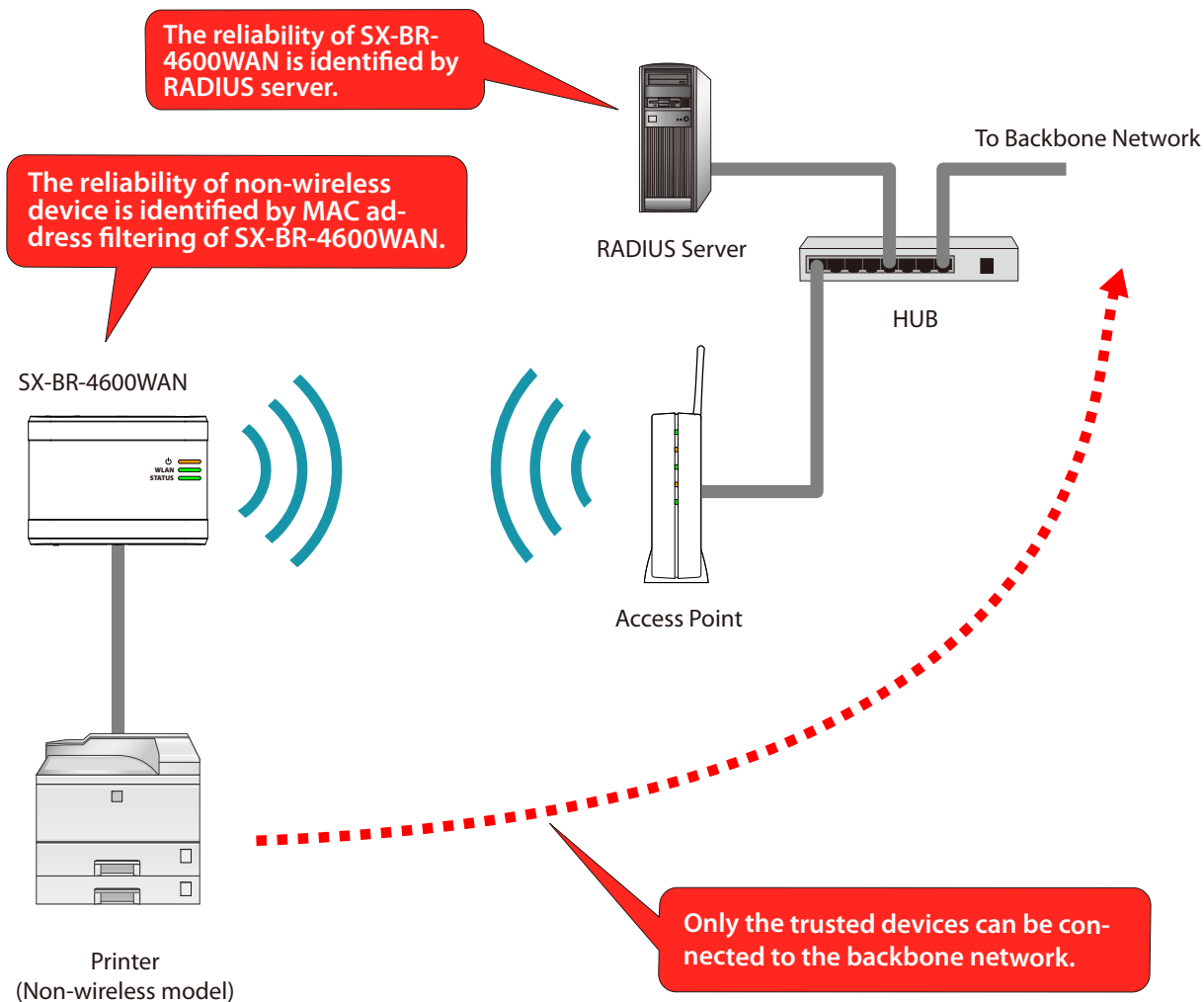
When using the authentication method that requires a certificate, get the necessary certificate issued by the certificate authority and import it to the SX-BR-4600WAN.

To use this function, register the MAC address of non-wireless device with SX-BR-4600WAN. The reliability of non-wireless devices connected to SX-BR-4600WAN is identified using the MAC address filtering.



- IEEE802.1X authentication is supported only for wireless network.

TIP



IEEE802.1X Authentication

SX-BR-4600WAN supports the following IEEE802.1X authentication methods.

In the Web configuration interface of SX-BR-4600WAN, select **ON** at **IEEE802.1X Authentication** and select the authentication mode at **IEEE802.1X Authentication Type**.

IEEE802.1X Authentication mode
EAP-TLS
EAP-TTLS
PEAP
EAP-FAST
LEAP

Settings on each authentication mode

The compatible settings on each authentication mode are as follows.

For details, refer to **Appendix A-1. List of All Settings**.

Name	IEEE802.1X Authentication Mode				
	EAP-TLS	EAP-TTLS	PEAP	EAP-FAST	LEAP
IEEE802.1X User Name	Necessary	Necessary	Necessary	Necessary	Necessary
Password	-	Necessary	Necessary	Necessary	Necessary
Inner Authentication Method	-	Necessary	Necessary	-	-
Server Certificate Verification	-	Optional	Optional	-	-
CA Certificate	Necessary	Optional	Optional	-	-
PAC Auto-distribution	-	-	-	Optional	-
PAC File	-	-	-	Optional	-
Client Certificate	Necessary	-	-	-	-
Password	Necessary	-	-	-	-

Name	Details
IEEE802.1X User Name	This is an ID and password for the RADIUS server to identify the client.
Password	
Inner Authentication Method	Specify the authentication protocol to use. For PEAP, MSCHAPv2 is used.
Server Certificate Verification	Enable/Disable the reliability check of the RADIUS server. When ON is selected, CA certificate is required to verify the server certificate.
CA Certificate	This is a CA certificate to authenticate the RADIUS server.
PAC Auto-distribution	Enable/Disable the automatic PAC distribution. When OFF is selected, the PAC file generated by the RADIUS server is required.
PAC File	This is the file used for manual provisioning. This file is generated by the RADIUS server.
Client Certificate	Use this to check the client reliability. To read out the secret key from the client certificate, a password is required.
Password	

Certificate Standard

When using the authentication mode which uses a certificate, get the necessary certificate issued from the certificate authority and import it to the SX-BR-4600WAN.

The SX-BR-4600WAN supports the following certificates:

Certificate Standard

The certificate supports the standards as follows:

Certificate	Item	Compatible standards
Client certificate	X509 certificate version	v3
	Public key algorithm	RSA
	Public key size	512bit, 1024bit, 2048bit
	Signature algorithm	SHA1/SHA2(SHA-224,SHA-256,SHA-384,SHA-512) withRSA MD5withRSA
	X509v3 extended key usage	Client authentication (1.3.6.1.5.5.7.3.2)
CA certificate	Public key algorithm	RSA
	Public key size	512bit, 1024bit, 2048bit
	Signature algorithm	SHA1/SHA2(SHA-224,SHA-256,SHA-384,SHA-512) withRSA MD5withRSA

Certificate Saving Format

The following saving formats are supported:

Certificate	Compatible standards
Client certificate	PKCS#12, pfx * This is the format which includes a secret key of the certificate.
CA certificate for server authentication	DER (Binary encoded X509) PEM (A text form. DER is BASE64 encoded.)

MAC Address Filtering

When the IEEE802.1X authentication is used, access to the SX-BR-4600WAN from non-wireless devices needs to be restricted so that access from unauthorized devices can be blocked. Check the MAC address of the non-wireless device you want to allow an access from and register it with the SX-BR-4600WAN at **Network Device Address** of **IEEE802.1X Network Device Configuration** in the Web configuration interface.

Before Using the IEEE802.1X Authentication

In order to use the IEEE802.1X authentication on SX-BR-4600WAN, the information below will be required.

(1) User name and password to access the RADIUS server

To access the RADIUS server, the user name and password are required. Also, when using the authentication method that requires a certificate, the certificate file will be needed.

(2) MAC address of the non-wireless device

SX-BR-4600WAN allows bridging only for those with the registered MAC address. The MAC address information is required to allow them to be bridged using SX-BR-4600WAN.

IEEE802.1X Authentication Settings

How to configure the IEEE802.1X authentication setting is explained.

To use the authentication method that requires a certificate, import the certificate file.

1. In the Web configuration interface of the SX-BR-4600WAN, click **Wireless LAN Configuration - Detailed Configuration**.

In the **Detailed Configuration** page, enter the settings for the IEEE802.1X authentication and the MAC address of the non-wireless device you want to use wirelessly, and click **Submit**.

* Settings will vary depending on the IEEE802.1X authentication mode you select.



TIP

- When the IEEE802.1X authentication is used, access to the SX-BR-4600WAN from non-wireless devices needs to be restricted so that access from unauthorized devices can be blocked.
- The SX-BR-4600WAN bridges only the devices whose MAC address is registered to **Network Device Address**. Check the MAC address of the non-wireless device to bridge and register it to **Network Device Address**.

Name	Value
Network Device Address	008092112233

- Please configure this even when you connect only one non-wireless device in a **Single Client Mode**.
- In **Multi-Client Mode**, register the MAC addresses of all non-wireless devices connected to the SX-BR-4600WAN (up to 16 addresses).



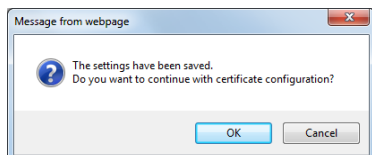
Note

- When the MAC address is registered to **Network Device Address** of **Advanced Configuration** page, such setting will automatically take effect on this setting.
- The following MAC addresses cannot be used for this setting:
 - Broadcast address
 - Multicast address
 - The address composed of 12 zeros
 - Duplicated address (when operating in Multi-Client Mode)

2. The message below is displayed after the setting is updated.

When a certificate will be used for the selected authentication mode, click **OK**.

When not, click **Cancel** and go on to 5.



- If **Cancel** is clicked, the SX-BR-4600WAN will be restarted.

Note

3. In the certificate configuration page, click **Browse** to specify the certificate file to use. After the certificate file is specified, click **Submit**.

* The certificate will differ depending on the IEEE802.1X authentication mode you select.

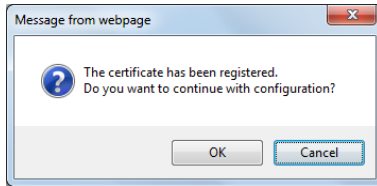
Certificate to use	IEEE802.1X Authentication Method				
	EAP-TLS	EAP-TTLS	PEAP	EAP-FAST	LEAP
Client Certificate	Necessary	-	-	-	-
CA Certificate	Necessary	- (*1)	- (*1)	-	-
PAC File	-	-	-	- (*2)	-

Note

(*1) Necessary when the server certificate verification is ON.

(*2) Necessary when the PAC file auto-distribution is OFF.

4. After the certificate is registered, the message below is displayed. Click **Cancel**.



Note

- To continue the configuration, click **OK**. If **OK** is clicked, the SX-BR-4600WAN will not be restarted.

5. The SX-BR-4600WAN will be restarted and the IEEE802.1X authentication will take effect.

The certificate registration is complete.

► Please wait while the server is restarting.
After rebooting, this product will run in "Normal Mode".

Turn off the SX-BR-4600WAN and connect it to the non-wireless device using a LAN cable. Refer to **Connecting Non-wireless Devices** for details.

5-3. Wi-Fi Direct

The SX-BR-4600WAN supports the Wi-Fi Direct feature.

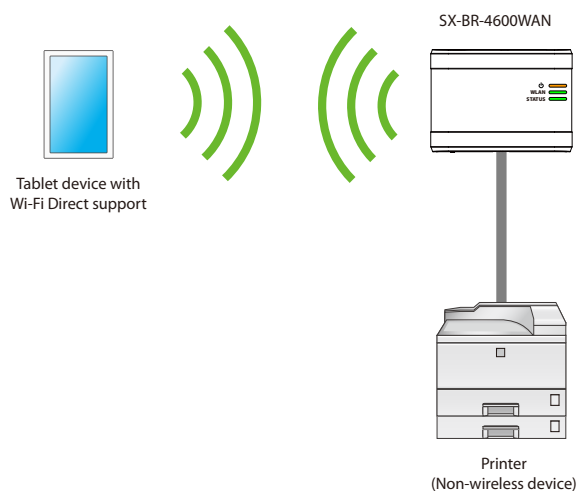
Using the Wi-Fi Direct will allow making a connection to wireless devices easily without using Access Point or Internet.

Network Configuration

To use the Wi-Fi Direct, connect the SX-BR-4600WAN to a network as shown below.

You do not have to prepare an Access Point as well as configure the security settings such as authentication, encryption, etc.

Up to 4 devices can be connected if the Wi-Fi Direct is used.



TIP

- The Wi-Fi Direct feature provides a wireless connection only. You may need a separate utility to use and control the connected device.
- To use Wi-Fi Direct, set the client mode to **Single Client Mode**. This feature cannot be used in **Multi-Client Mode**.

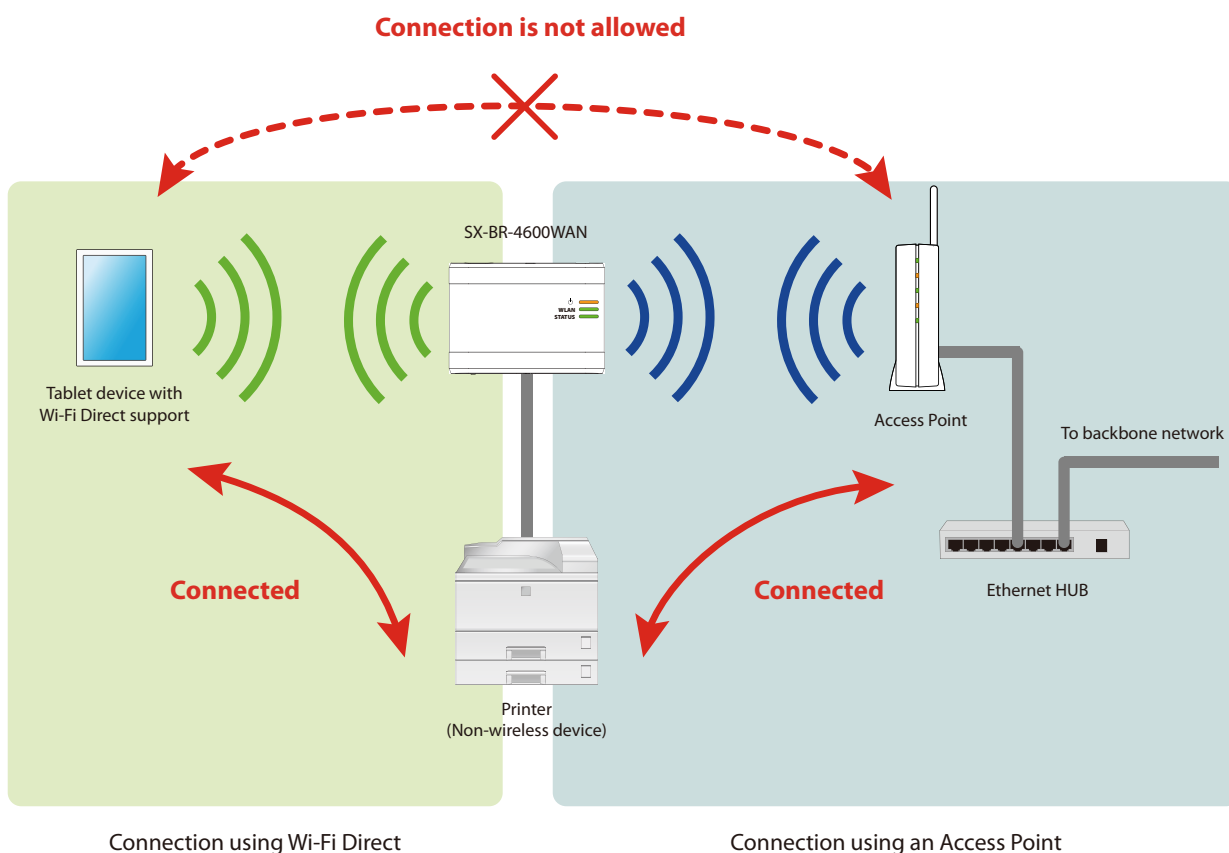


Note

- For details on Wi-Fi Direct, refer to **A-3. What is the Wi-Fi Direct?**

Concurrent Mode

In **Concurrent Mode**, the wireless connection is available both from Wi-Fi Direct connection and Access Point. If Wi-Fi Direct is used in a network as shown below, you can access the non-wireless device connected to SX-BR-4600WAN without using the Access Point. As users are not allowed to fully access your network and it is impossible for the users to connect to the Access Point via SX-BR-4600WAN, you can establish a secured network.



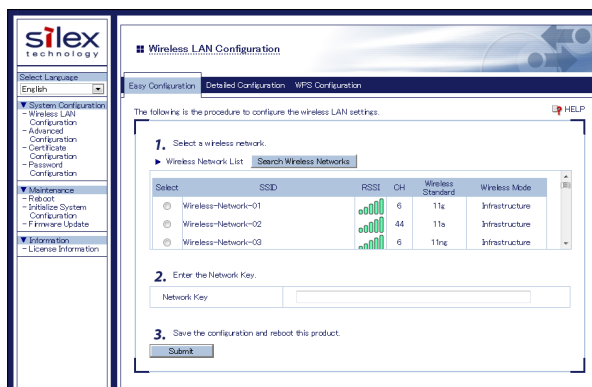
The Wi-Fi Direct cannot be used in Concurrent Mode in the following cases:

- A wireless connection is not established on the Access Point.
- 802.11b is used by the Access Point.
- W53 or W56 channels are used by the Access Point.
- Ad hoc is used as a wireless mode on the SX-BR-4600WAN.

Turning on Wi-Fi Direct

How to turn on the Wi-Fi Direct is explained. The Wi-Fi Direct setting can be configured from the Web configuration interface of SX-BR-4600WAN.

1. Start the SX-BR-4600WAN in Configuration Mode and login to the Web configuration interface using your Web browser.

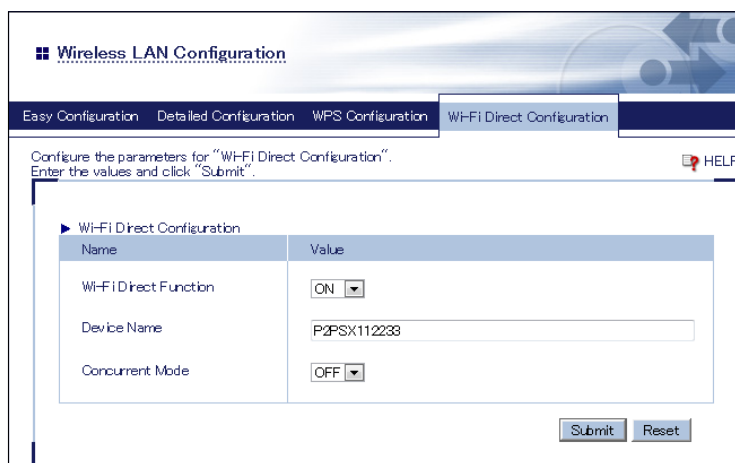


Note

- If you are planning to use SX-BR-4600WAN in **Concurrent Mode**, you can use WPS to configure wireless setting for an Access Point.

2. From the left menu on the Web configuration interface, click **Wireless LAN Configuration - Wi-Fi Direct Configuration**.

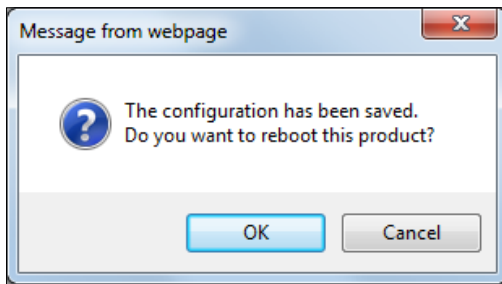
In the page displayed, configure each setting and click **Submit**.



Note

- If you are using the SX-BR-4600WAN in **Multi-Client Mode**, Wi-Fi Direct cannot be used. Select **Single Client Mode** for **Client Mode** at **Advanced Configuration** page.
- The **Device Name** is a name to be displayed on the device which waits for the Wi-Fi Direct connection.

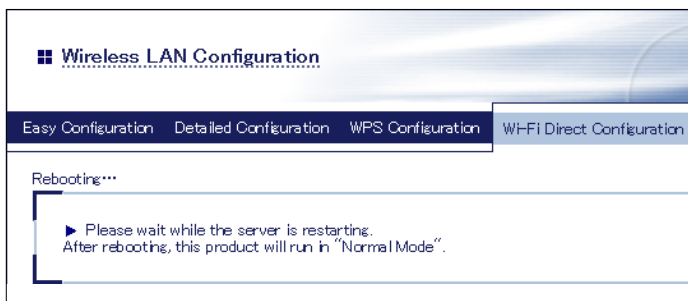
3. Click **OK** to the message below.



Note

- To continue the configuration, click **Cancel**.
If **Cancel** is clicked, the SX-BR-4600WAN will not restart.

4. After SX-BR-4600WAN is restarted, the Wi-Fi Direct feature will turn on.



The Wi-Fi Direct setting has been completed.

Turn off SX-BR-4600WAN and connect a non-wireless device to it using a network cable.
For details, refer to **Connecting Non-wireless Devices**.

Using Wi-Fi Direct

How to connect the SX-BR-4600WAN using Wi-Fi Direct is explained.

In order to connect the SX-BR-4600WAN using Wi-Fi Direct, a device that supports Wi-Fi Direct is required (e.g. tablet device).

Follow the instructions below to connect to the SX-BR-4600WAN using Wi-Fi Direct.

1. Search for the SX-BR-4600WAN from a device you want to connect using Wi-Fi Direct.
2. Send a connection request from the device to SX-BR-4600WAN.
3. Allow the connection request on SX-BR-4600WAN.
4. Check the result on the device.

**TIP**

- Move closer to SX-BR-4600WAN as you will be required to use the push switch on it.
- The Wi-Fi Direct feature of SX-BR-4600WAN allows connecting only the device who has sent a connection request. It is not possible to search or specify the wireless device from the SX-BR-4600WAN side.
- SX-BR-4600WAN is not able to connect a device if it is already connected using Wi-Fi Direct. Make sure that the device you want to connect is not currently connected by Wi-Fi Direct.

**Note**

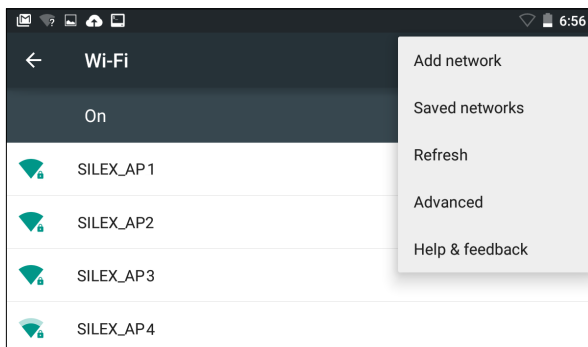
- For details on Wi-Fi Direct, refer to **A-3. What is the Wi-Fi Direct?**.
- Up to 4 devices can be connected using Wi-Fi Direct.

How to connect using Wi-Fi Direct is explained.

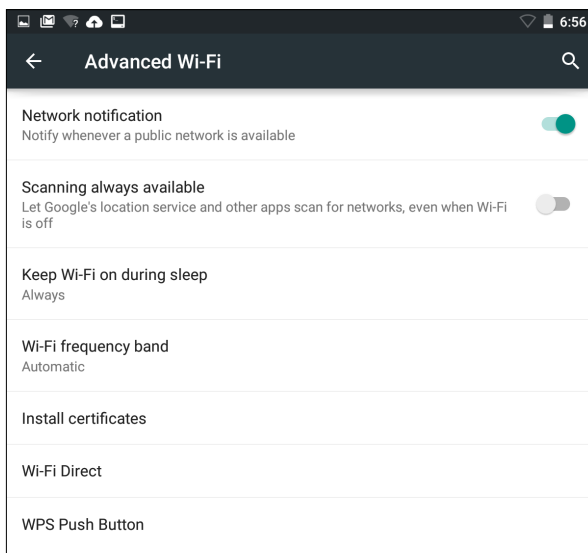
The following instructions will use a tablet device (with Android 5.0.2) which supports Wi-Fi Direct as an example.

1. On a tablet device, tap **Settings - Wi-Fi**.

In the Wi-Fi setting screen, tap **Advanced** from the menu on top right.

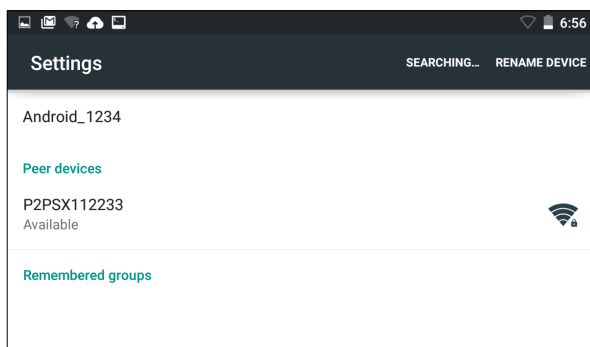


2. In the advanced setting screen, tap **Wi-Fi Direct**.



3. The search result for Wi-Fi Direct is displayed.

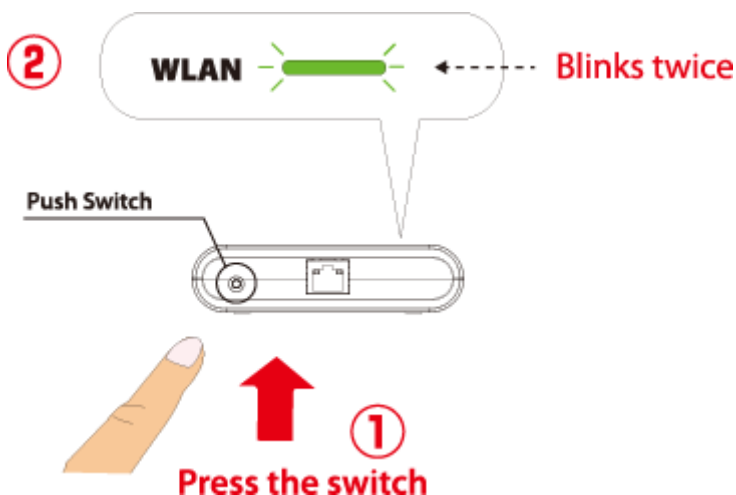
SX-BR-4600WAN is displayed by its device name and is marked with "Available" when it is ready to connect. Tap the SX-BR-4600WAN to send a connection request to. After the connection request is sent, the status will change to "Invited".



Note

- SX-BR-4600WAN is displayed by its device name configured at the Wi-Fi Direct setting.
- If SX-BR-4600WAN is not found, check the SX-BR-4600WAN settings or check that the SX-BR-4600WAN has not already been connected using Wi-Fi Direct.

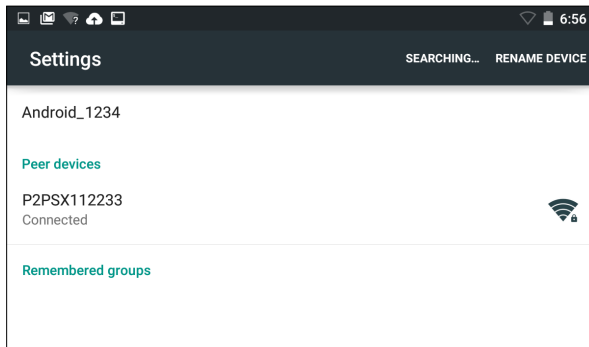
4. Press the push switch on the SX-BR-4600WAN to connect using Wi-Fi Direct. The WLAN LED blinks twice after the push switch is pressed when the connection request is present.



Note

- If the WLAN LED does not blink, the SX-BR-4600WAN may not have received the connection request. Go back to 2 to check that you have selected the SX-BR-4600WAN correctly.
- Release the push switch shortly after you pressed it. If the push switch is pressed for 5 sec or more, the wireless configuration using WPS will turn on.

- 5.** When "Connected" is displayed under the device name of SX-BR-4600WAN on the tablet device, the Wi-Fi Direct connection is successfully established.
- In case the connection failed, the device name of the SX-BR-4600WAN will disappear from the list. In such a case, tap **SEARCH FOR DEVICES** to discover SX-BR-4600WAN again and start from **2**.

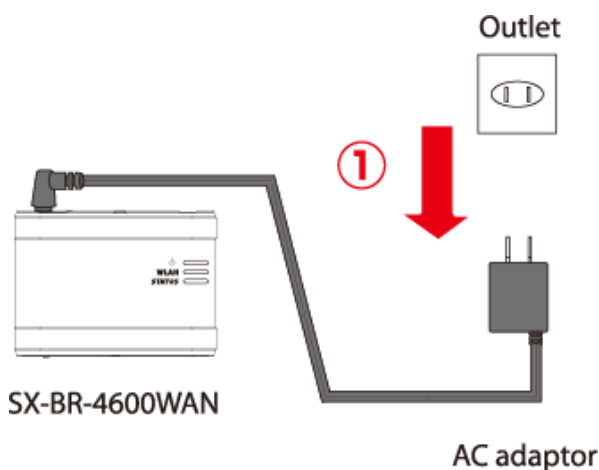


5-4. Maintenance

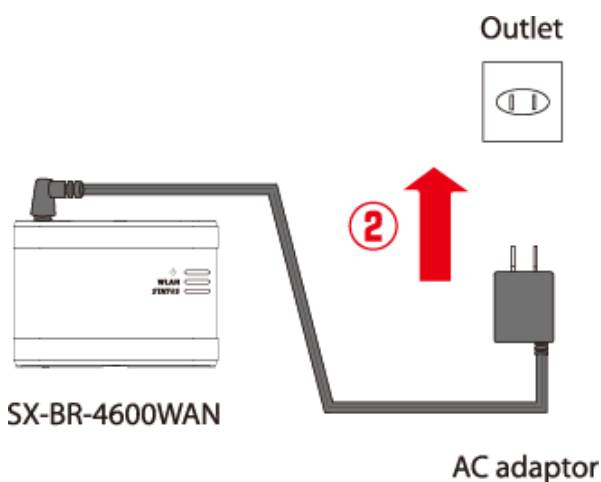
Restarting

How to restart SX-BR-4600WAN by unplugging the AC adaptor:

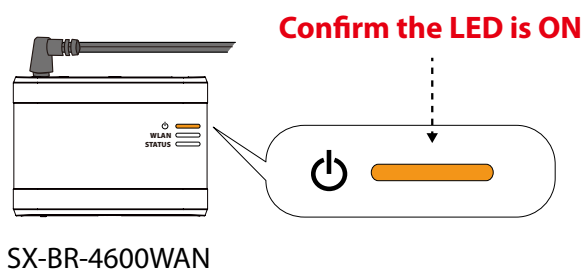
1. Unplug the AC adaptor of SX-BR-4600WAN from the outlet.



2. Plug the AC adaptor back into the outlet.

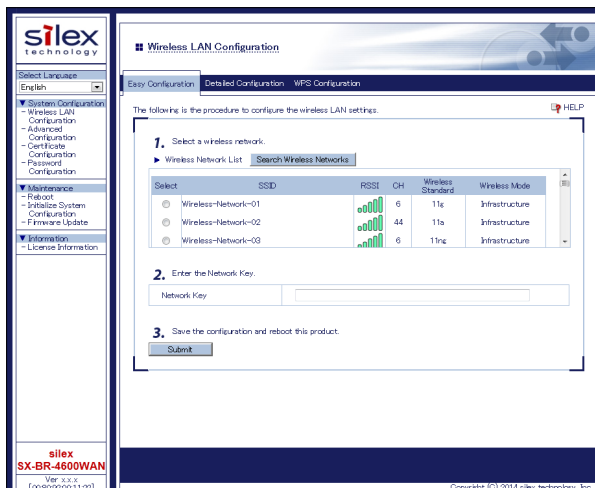


3. When the POWER LED turns to Orange, the restart is completed.
After the restart, the SX-BR-4600WAN will start in a normal mode.

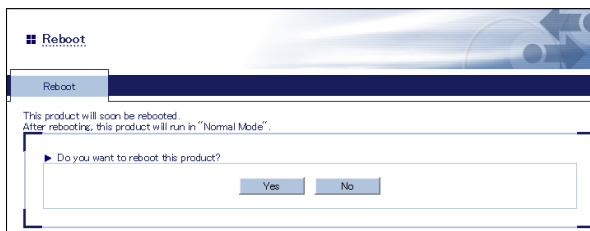


How to restart SX-BR-4600WAN using the Web configuration interface:

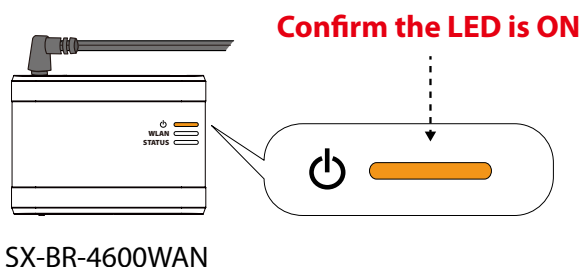
1. Start the SX-BR-4600WAN in **Configuration Mode** and login to the Web configuration interface using your Web browser.



2. From the left menu on the Web configuration interface, click **Maintenance - Restart**. In the page displayed, click **Yes**.



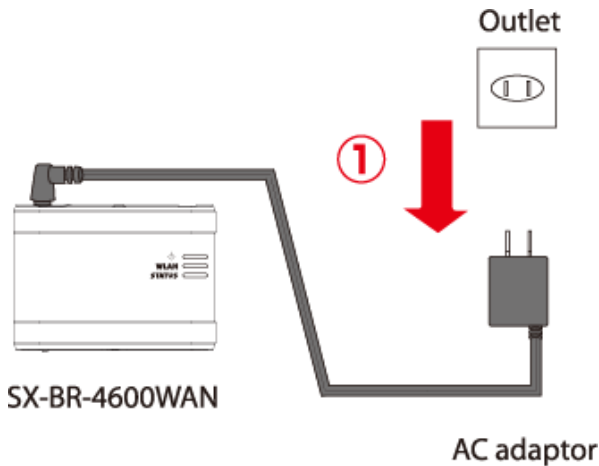
3. When the POWER LED turns to Orange after all LEDs turn off, the restart is completed. After the restart, the SX-BR-4600WAN will start in a normal mode.



Factory Default Configuration

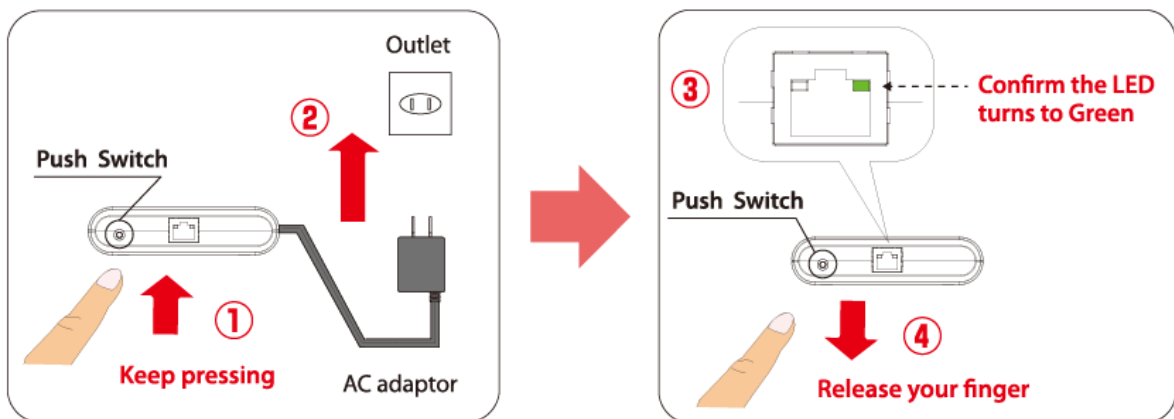
How to reset SX-BR-4600WAN to factory defaults using the Push Switch:

1. Unplug the AC adaptor of SX-BR-4600WAN from the outlet.



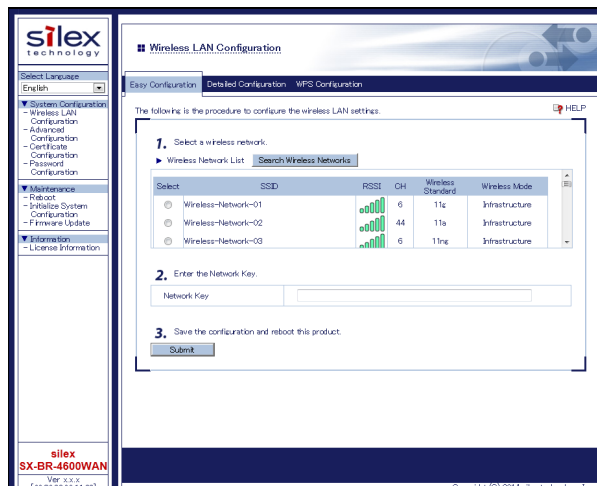
2. Press and hold the push switch on the front while inserting the AC adaptor back into the electrical outlet.

When the Link LED on the LAN port turns to Green, the factory default configuration is completed. Release the push switch then.

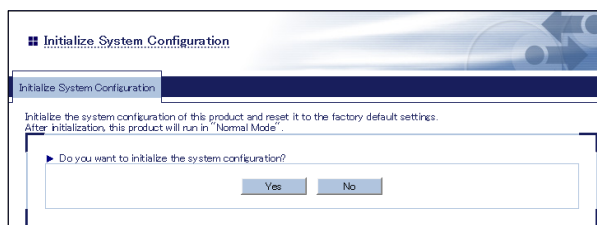


How to reset SX-BR-4600WAN to factory defaults using the Web configuration interface:

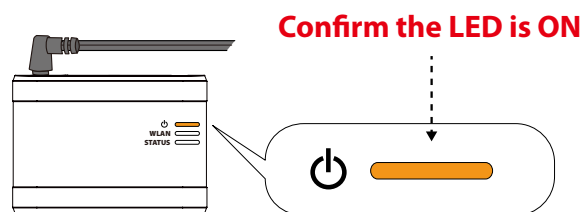
1. Start the SX-BR-4600WAN in **Configuration Mode** and login to the Web configuration interface using your Web browser.



2. From the left menu on the Web page, click **Maintenance - Initialize System Configuration**. In the page displayed, click **Yes**.



3. After the factory default configuration is completed, the SX-BR-4600WAN will automatically restart.



SX-BR-4600WAN

Firmware Update

The latest firmware file can be downloaded from our website.

See the instructions below to download the firmware file. For how to upload the firmware file to SX-BR-4600WAN, refer to the firmware update procedure sheet file contained in the firmware file you download.

**Note**

- The current firmware version can be identified at the bottom left of the Web configuration interface.

How to download the firmware file:

1. Access our website below.

URL	
USA	http://www.silexamerica.com/
Europe	http://www.silexeurope.com/

2. Go to the support section and download the firmware file.

A. Appendix

A-1. List of All Settings

The SX-BR-4600WAN has the following configuration items:

Wireless Configuration - Easy Configuration	
Select a wireless network.	
Details	Select the SSID of the Access Point (or other wireless devices) to connect from Wireless Network List .
Range	Access Point of the wireless network to connect
Default Value	(None)
Enter the Network Key.	
Details	Enter the WEP Key or Pre-Shared Key of the wireless network for Network Key .
Range	WEP Key or Pre-Shared key
Default Value	(None)

Wireless LAN Configuration - Wireless LAN Basic Configuration

Operating Mode

Details	Select the method to connect to the wireless network (AdHoc / Infra.).
Range	Infra. / AdHoc
Default Value	Infra.
Note	When using the SX-BR-4600WAN in AdHoc mode, only Open or Shared can be used for the network authentication mode.

SSID

Details	Set the SSID to connect to the wireless network (up to 32 characters).
Range	Up to 32 characters
Default Value	SXxxxxxx (xxxxxx is the last 6 digits on MAC address of the SX-BR-4600WAN.)
Note	The SSID is an ID that distinguishes a wireless LAN network from others. For wireless devices to communicate with each other on a wireless network, they must share the same SSID.

SSID Filter

Details	Enable/Disable the SSID filter.
Range	ON / OFF
Default Value	OFF
Note	If there are too many SSIDs on the wireless network and you fails to connect to the target Access Point, select ON . When ON is selected, only the registered SSIDs will be shown on Wireless Network List . The WPS feature will become unavailable then.

Channel

Details	Set the wireless channel.
Range	11-13
Default Value	11
Note	If the network device, whose SSID is registered to the SX-BR-4600WAN, uses a channel different from the SX-BR-4600WAN, the SX-BR-4600WAN will switch the channel of itself and apply the same channel as that device.

Network Authentication

Details	Select the network authentication mode.
Range	Open / Shared / WPA2 / WPA/WPA2 Mixed Mode
Default Value	Open

IEEE802.1X Authentication

Details	Enable/Disable the IEEE802.1X authentication (ON/OFF).
Range	OFF / ON
Default Value	OFF
Note	This function can be used only when WPA2 or WPA/WPA2 Mixed Mode is selected as network authentication mode.

Wireless LAN Configuration - WEP Configuration

WEP

Details	Enable/Disable the WEP encryption. If WEP encryption is used, wireless communication will be encrypted using the settings for " WEP Key 1-4 " and " Key Index ".
Range	ON/OFF
Default Value	OFF
Note	If encryption is not enabled, data is not encrypted and is sent as is. To ensure higher security, enabling encryption is recommended.

Key Index

Details	Select the number of the WEP key to use for encryption (1-4). This setting must be the same as that of your wireless device.
Range	1 - 4
Default Value	1

WEP Key1-4

Details	Set the WEP key for WEP encryption. Up to 4 WEP keys can be set. This setting must be the same as that of your wireless devices. A WEP key must be entered using hexadecimal or alphanumeric characters.
Range	5 or 13 characters 10 or 26 digit hexadecimal value
Default Value	(None)
Note	In most cases, alphanumeric characters are used. Enter 5 characters if the key size is 64bit or 13 characters if the key size is 128bit. For Hexadecimal, a value consists of numbers (0-9) and English letters (A-F). Enter a 10-digit value if the key size is 64bit or a 26-digit value if the key size is 128bit.

Wireless LAN Configuration - WPA/WPA2 Configuration

Encryption Mode

Details	Select the encryption mode to use for WPA2 or WPA/WPA2 Mixed Mode authentication.
Range	AES/AUTO
Default Value	AES
Note	When the network authentication mode is WPA2 , AUTO cannot be used.

Pre-Shared Key

Details	Set the Pre-Shared Key to use for encryption. The Pre-Shared Key is a keyword used to create the encryption key. It is also referred to as 'network key' or 'password'.
Range	8-63 alphanumeric characters 64 hexadecimal value
Default Value	silex technology, Inc.
Note	In most case, alphanumeric characters are used (8-63 characters). For Hexadecimal, a value consists of numbers (0-9) and English letters (A-F). * This setting must be the same as that of your wireless devices.

Wireless LAN Configuration - IEEE802.1X Authentication Configuration

IEEE802.1X Authentication Type

Details	Select the EAP authentication mode (Extensible Authentication Protocol) for IEEE802.1X authentication.
Range	EAP-TLS / EAP-TTLS / PEAP / EAP-FAST / LEAP
Default Value	EAP-TLS
Note	<p>EAP-TLS Provides two-way authentication between the client and RADIUS server using a certificate.</p> <p>EAP-TTLS, PEAP This is the authentication method using EAP-TLS, providing the client authentication using a user name / password.</p> <p>EAP-FAST In this authentication, the authentication process is tunneled by the PAC (Protected Access Credential) which is issued from the RADIUS server.</p> <p>LEAP One kind of EAP protocols used for PPP authentication. The authentication performs using a user name / password between the RADIUS server and client.</p>

Wireless LAN Configuration - Inner Authentication Method Configuration

Inner Authentication

Details	Select the authentication protocol to use for EAP-TTLS. In case of PEAP, only MSCHAPv2 can be used.
Range	PAP / CHAP / MSCHAP / MSCHAPv2
Default Value	PAP

Wireless LAN Configuration - Server Certificate Verification Configuration

Server Certificate Verification

Details	Set whether to verify that the server certificate is issued from a trusted root certification authority when EAP-TTLS or PEAP authentication mode is used (ON/OFF).
Range	OFF / ON
Default Value	OFF
Note	When ON is selected, the CA certificate needs to be registered.

Wireless LAN Configuration - IEEE802.1X User Configuration

User Name in IEEE802.1X

Details	Set the user name for IEEE802.1X authentication. The user name is used by the RADIUS server to identify a client.
Range	Up to 64 characters
Default Value	(None)

Password

Details	Set the password for IEEE802.1X authentication. The password is used by the RADIUS server to identify a client.
Range	Up to 32 characters
Default Value	(None)

Wireless LAN Configuration - EAP-FAST Configuration

PAC Auto-distribution

Details	Enable/Disable the automatic distribution of the PAC (Protected Access Credential) in EAP-FAST authentication.
Range	OFF / ON
Default Value	OFF
Note	When OFF is selected, the PAC file generated by the server will need to be registered.

Wireless LAN Configuration - IEEE802.1X Network Device Configuration

Device Filter

Details	Enable/Disable filtering for the devices registered to the network device address.
Range	OFF / ON
Default Value	ON
Note	If the device filter is disabled, communication will be bridged even for devices not registered to the network device address. The device authentication (one security feature of IEEE802.1X authentication) will not be assured then.

Network Device Address

Details	Register the MAC address of devices to be connected to LAN port of the SX-BR-4600WAN when the IEEE802.1X authentication is used.
Range	MAC address (in Multi-Client Mode , up to 16 addresses can be registered)
Default Value	(None)
Note	One Ethernet Address can be registered for Single Client Mode while 16 Ethernet Addresses can be registered for Multi-Client Mode .

Wireless LAN Configuration - WPS Configuration

PIN Code

Details	The PIN code of SX-BR-4600WAN is displayed.
Range	The value is automatically generated by clicking the button.
Default Value	Automatically generated

WPS Execution

Details	Execute the wireless configuration by WPS PIN.
Range	(WPS Execution button)
Default Value	-

Wireless LAN Configuration - Wi-Fi Direct Configuration	
Wi-Fi Direct Function	
Details	Enable/Disable the Wi-Fi Direct feature.
Range	ON/OFF
Default Value	OFF
Note	To use the Wi-Fi Direct feature, the client mode needs to be set to Single Client Mode . It cannot be used in Multi-Client Mode .
Device Name	
Details	Set a device name which will be used to identify the SX-BR-4600WAN in the Wi-Fi Direct environment.
Range	Up to 32 characters
Default Value	P2PSXxxxxxx ("xxxxxx" is a last 6-digits of the SX-BR-4600WAN's MAC Address.)
Note	-
Concurrent Mode	
Details	Enable/Disable the concurrent mode for Wi-Fi Direct. If this setting is enabled, you can use both wireless connections simultaneously; the one established by Wi-Fi Direct and the other by Access Point.
Range	ON/OFF
Default Value	OFF
Note	-

Advanced Configuration

LAN Interface

Details	Configure the physical network type. Usually, " AUTO " is used.
Range	AUTO / 10BASE-T-Half / 10BASE-T-Full / 100BASE-TX-Half / 100BASE-TX-Full / 1000BASE-T-Full
Default Value	AUTO
Note	If a LINK LED on the connected device does not light on when SX-BR-4600WAN is powered on, change the network type to that of the connected device.

Network Device Address

Details	Set the Ethernet Address of the network device to be connected to a LAN port of the SX-BR-4600WAN.
Range	MAC address
Default Value	(None)
Note	In most cases, it is recommended to leave this field blank, as the SX-BR-4600WAN automatically detects the Ethernet Address from the network packets sent from the connected device.

Client Mode

Details	Set the operating mode.
Range	Single Client Mode / Multi-Client Mode
Default Value	Single Client Mode
Note	Select Single Client Mode to bridge only one device connected to a LAN port of the SX-BR-4600WAN. In Single Client Mode , not only TCP/IP but various communication protocols can be used. Select Multi-Client Mode to bridge several devices using a HUB on the LAN port of SX-BR-4600WAN. In Multi-Client Mode , only TCP/IP(IPv4, IPv6) protocol can be used.

IEEE 802.11g Ad hoc Mode

Details	Allows high speed communication between the IEEE802.11g Ad hoc compatible devices, when Ad hoc mode is used.
Range	ON/OFF
Default Value	ON
Note	If a device incompatible with the IEEE802.11g Ad hoc is included to your network, the communication may become unstable. In such a case, disable this function.

TCP/IP Configuration

DHCP

Details	Enable/Disable the DHCP protocol. To assign an IP address using DHCP, the DHCP server must be running in your subnetwork.
Range	ENABLE/DISABLE
Default Value	DISABLE

IP Address

Details	Set the IP address. If the DHCP is enabled on your network, the IP Address obtained from it will be applied.
Range	0.0.0.0 - 255.255.255.255
Default Value	0.0.0.0

Subnet Mask

Details	Set the subnet mask. If the DHCP is enabled on your network, the Subnet Mask obtained from it will be applied.
Range	0.0.0.0 - 255.255.255.255
Default Value	0.0.0.0
Note	When set to "0.0.0.0", a subnet mask appropriate for the IP address is automatically assigned.

Default Gateway

Details	Set the gateway address. If "0.0.0.0" is set, this setting is disabled. When the DHCP is enabled on your network, the Default Gateway obtained from it will be applied.
Range	0.0.0.0 - 255.255.255.255
Default Value	0.0.0.0

Push Switch Configuration

Time before turning into Configuration Mode

Details	Specify the period of time until the SX-BR-4600WAN turns into the Configuration Mode. If the Push Switch is pressed for the period of time specified here, the SX-BR-4600WAN will turn into the Configuration Mode.
Range	5-60 (sec)
Default Value	5
Note	* Please keep 5 sec or more interval than the value you specify at Time before starting WPS .

Time before starting WPS

Details	Specify the period of time until WPS is started. If the Push Switch is pressed for the period of time specified here, WPS will start.
Range	5-60 (sec)
Default Value	10
Note	* Please keep 5 sec or more interval than the value you specify at Time before turning into Configuration Mode .

Certificate Configuration - Client Certificate

Certificate File

Details	Register the certificate used to authenticate the SX-BR-4600WAN by IEEE802.1X authentication.
Range	A certificate file to authenticate the SX-BR-4600WAN by IEEE802.1X authentication.
Default Value	The certificate file must support the followings: <ul style="list-style-type: none"> - File format PKCS#12 format (*.p12, *.pfx) - Certificate version V3 - Public key algorithm RSA - Public key size 512bit, 1024bit, 2048bit - Signature algorithm SHA1/SHA2(SHA-224,SHA-256,SHA-384,SHA-512)withRSA, MD5withRSA - Extended key usage "Client authentication(1.3.6.1.5.5.7.3.2)" is included.

Password

Details	This is the password to read a secret key from the client certificate.
Range	1 - 32 characters
Default Value	(None)

Certificate Configuration - CA Certificate

Certificate File

Details	This is the CA certificate file to authenticate the certificate sent from the RADIUS server when the IEEE802.1X authentication is used.
Range	CA certificate file to authenticate the certificate sent from the RADIUS server when the IEEE802.1X authentication is used.
Default Value	<p>The certificate file must support the followings:</p> <ul style="list-style-type: none"> - File format DER format(*.der), PEM format(*.pem) - Public key algorithm RSA - Public key size 512bit, 1024bit, 2048bit - Signature algorithm SHA1/SHA2(SHA-224,SHA-256,SHA-384,SHA-512)withRSA, MD5withRSA

Certificate Configuration - PAC File

PAC File

Details	When the PAC (Protected Access Credential) is manually distributed in EAP-FAST authentication method, register the PAC file generated from the server.
Range	A PAC file generated from the server

Password Configuration

Password

Details	<p>Configure the password to manage the SX-BR-4600WAN.</p> <p>This password is used for authentication to login to the Web configuration interface of SX-BR-4600WAN.</p>
Range	Up to 15 characters
Default Value	(None)

A-2. Troubleshooting

This section provides the solutions for possible troubles you may experience when you are configuring or using the SX-BR-4600WAN.

My Access Point is not displayed in the Wireless Network List of the Web configuration interface.

The Access Point may not be active.

Solution	Please check that the Access Point is operating correctly.
----------	--

The Access Point may be operating in a stealth mode.

Solution	Configure the detailed settings of the wireless network at Detailed Configuration of the Web configuration interface to connect to the Access Point. Remember that Access Points operating in a stealth mode will not be displayed in the list.
----------	--

Too many wireless devices may be operating, exceeding the maximum number of devices the SX-BR-4600WAN can show on (up to 32 devices).

Solution	Up to 32 wireless devices can be displayed at Wireless Network List . To show your Access Point in the list, use SSID Filter so that only the specified networks are displayed there. Even when the Access Point is not displayed in the list, it can be connected by configuring the wireless settings at Detailed Configuration of the Web configuration interface.
----------	--

I failed to connect to a wireless network using WPS.

The WPS feature may be disabled on the Access Point.

Solution	Check that the Access Point supports the WPS feature. Depending on the Access Point, you may need to manually enable the WPS feature. For details, see the operating manual that came with your Access Point.
----------	--

The SSID Filter may be enabled on the SX-BR-4600WAN.

Solution	Disable the SSID Filter at Detailed Configuration of the Web configuration interface. If the SSID Filter is enabled, configuration using WPS does not work.
----------	--

A LAN port error has occurred (POWER LED: Blinks rapidly, WLAN LED: OFF, STATUS LED: ON).

The bridge feature may be aborted as the non-wireless device is unplugged and changed to the other device on the LAN port.

Solution	<p>Restart the SX-BR-4600WAN.</p> <p>In Single Client Mode, if the non-wireless device is unplugged and changed to the other device, SX-BR-4600WAN will abort bridging of that device, taking such occurrence as an error.</p> <p>Also, when the MAC address filtering is used to restrict the devices to bridge, you will need to change the setting registered to Network Device Address.</p> <p>This error does not occur in Multi-Client Mode. The restart is not required then.</p>
----------	---

Several devices may have been connected to the SX-BR-4600WAN using a HUB, though it is operating in **Single Client Mode**.

Solution	<p>In Single Client Mode, connect only one device to the LAN port of SX-BR-4600WAN. To use several devices, use Multi-Client Mode.</p>
----------	--

I cannot access the non-wireless device connected to a LAN port of the SX-BR-4600WAN.

The SX-BR-4600WAN or non-wireless device may not be operating correctly.

Solution	<p>Please check the LED status on SX-BR-4600WAN. Please also check that the non-wireless device is properly powered on.</p>
----------	---

The connection may be restricted by the MAC address filtering on SX-BR-4600WAN.

Solution	<p>See the setting at Network Device Address to check that access of the connected device is not restricted by the MAC address filtering.</p>
----------	--

The connection to the non-wireless device is lost.

The connection may be timed out.

Solution	<p>If the connected non-wireless device is idle and no communication occurs from it for 5 mins, SX-BR-4600WAN automatically cuts a link with it. To recover the communication, try to do anything that can cause communication packets on the non-wireless device. For the connection not to be timed out again, it is recommended to disable the sleep mode on the non-wireless device.</p> <p>(Example) If the connected non-wireless device is a printer and the printer has turned into a sleep mode, printing will become unavailable as SX-BR-4600WAN will disconnect a link with the printer.</p> <p>To get printing ready again, wake up the printer from a sleep mode using the control panel on it to make a communication from the printer to SX-BR-4600WAN.</p>
----------	---

The imported IEEE802.1X certificate cannot be deleted.

It is impossible to delete the imported certificate only.	
Solution	<p>To delete the imported certificate, initialize the SX-BR-4600WAN.</p> <p>NOTE:</p> <p>The imported certificate is validated only when it is used.</p> <p>Even if you keep the certificate, it has no impact on the authentication process since the imported certificate is used only with the compatible authentication method.</p>

The Wi-Fi Direct connection fails.

You may have reached the maximum number of devices that can be connected using Wi-Fi Direct.	
Solution	<p>Up to 4 devices can be connected to SX-BR-4600WAN using Wi-Fi Direct.</p> <p>When finished using the non-wireless device over the Wi-Fi Direct connection, please cut off that connection. Check if the Wi-Fi Direct connection is available to SX-BR-4600WAN using any applications that you can see the Wi-Fi Direct connection status with.</p>

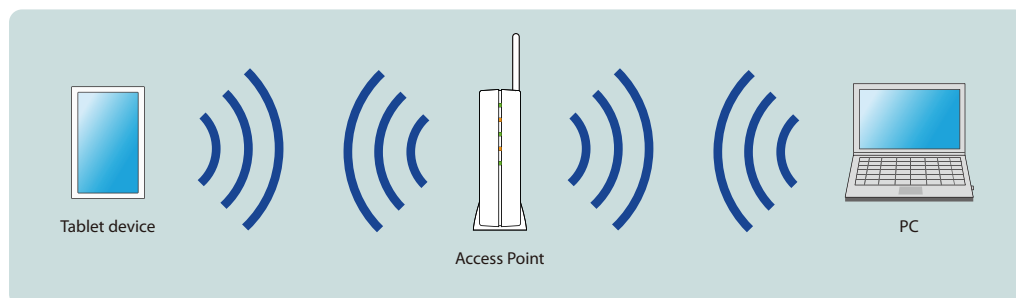
The Wi-Fi Direct connection is lost.

The Wi-Fi Direct connection may have been cut off as a result that the other device has connected to SX-BR-4600WAN using Wi-Fi Direct.	
Solution	<p>Try reconnecting to SX-BR-4600WAN using Wi-Fi Direct.</p> <p>In a certain environment, the Wi-Fi Direct connection could be cut off when other device is trying to connect to SX-BR-4600WAN using Wi-Fi Direct.</p>

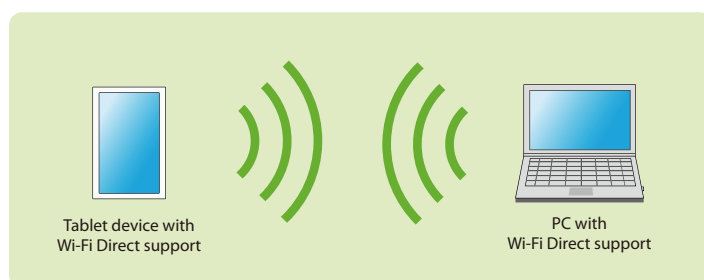
A-3. What is the Wi-Fi Direct?

Wi-Fi Direct is one of the wireless LAN standards which allows a direct access to the wireless device without using an Access Point or Internet.

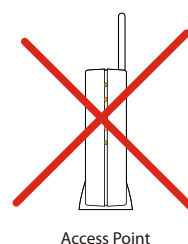
Wireless LAN connection using Access Point



Wireless LAN connection using Wi-Fi Direct



Access Point is not required



Wi-Fi Direct Features

- Provides a wireless connection even when an Access Point is not installed to network.
- As WPS is used for wireless configuration, the security settings such as authentication, encryption, etc. are not necessary.



- The Wi-Fi Direct feature provides a wireless connection only. You may need a separate utility to use or control the connected device.



Note

- In Windows 7 or newer, a separate utility is required to connect using Wi-Fi Direct.
- Android 4.0 or newer supports the wireless connection using Wi-Fi Direct.
- For Wi-Fi Direct, WPA2 authentication and encryption can be configured easier than the Ad hoc mode setting.

