Multicast Distribution System X-5

User's Guide

- Multicast Distribution Feature -

silex technology

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A. Appendix 57

1. Introduction

Thank you for purchasing the Multicast Distribution System X-5 (called "X-5" below).

1-1. This Manual

X-5 includes a Multicast Distribution feature for IP multicast transfer of video/audio from players (computers and DVD players) to displays (TVs and monitors) and a Store & Play feature for playing back video in storage devices using the receiver only.

This manual describes the setting and operating procedures when using the Multicast Distribution feature of X-5. For details on using the Store & Play feature, refer to the separate manual "User's Guide: Store & Play Feature".

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.

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- Ethernet is a trademark of Xerox Corporation.
- Other company names and product names contained in this manual are trademarks or registered trademarks of their respective companies.

1-2. User Registration and Services for X-5

User Registration

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

> User registration is performed from the URL below.
> USA: http://www.silexamerica.com/support/product-registration/
> Japan: http://www.silex.jp/register/

Note
- The product serial number is required for user registration.
  The serial number is provided on the rear panel of the product.

Services

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

USA: http://www.silexamerica.com/
Japan: http://www.silex.jp/

- Latest firmware available for download
- Latest software available for download
- Latest manuals available for 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		
	Phone	E-mail
USA	+1-801-748-1199	support@silexamerica.com
Japan	+81-(0)774-98-3981	support@silex.jp

Note
- Refer to the Silex Technology website (http://www.silexamerica.com/) for the latest FAQ and available product information.

2. X-5

MDS is an abbreviation for Multicast Distribution System and is a system for IP multicast transfer of the video/audio from players (computers and DVD players) to displays (TVs and monitors).

The devices connected to computers, DVD players, and other players are referred to as "transmitters", and the devices connected to projectors and displays are referred to as "receivers". The transmitter encodes the signals that are output from the player and distributes the encoded data in realtime to the receiver, where the data is then decoded and output.

2-1. Features and System Configuration

The features and system configuration of X-5 are shown below.

Features

[Video and Audio Control]
- Uses Silex Technology's proprietary "JPEG-XR" as video codec
- Uses 16-bit stereo+monaural PCM (sampling rate: 32KHz / 44.1KHz / 48KHz) as audio codec
- Multi-resolution support (640 x 480 to 1920 x 1080)
- Maximum frame rate of 30 fps
- Includes video and audio synchronizing function ("Lip-sync")
- Includes Store & Play feature for playing back video on a storage device using the receiver only.
  (*For details on using X-5 with the Store & Play feature, refer to the separate manual "User's Guide: Store & Play Feature".)

[Network Control]
- Multicast for enabling simultaneous batch sending to multiple receivers (During wired connection: Up to 1000 receivers, During wireless connection: Up to 32 receivers)
- Time correction with transmitter of receiver enables playback synchronization between receivers
- Support for both wired LANs (10Base-T/100Base-TX/1000Base-T) and wireless LANs (IEEE802.11a/g/n: Infrastructure mode)
- Network interface select function of transmitter enables distribution of data only to the network interfaces connected by a receiver (wired LAN or wireless LAN) for reducing traffic of networks where the receiver is not connected
- Support for remote management function based on SX Smart Manager (sold separately)

[Other Features]
- Internal web page for making various settings

System Configuration

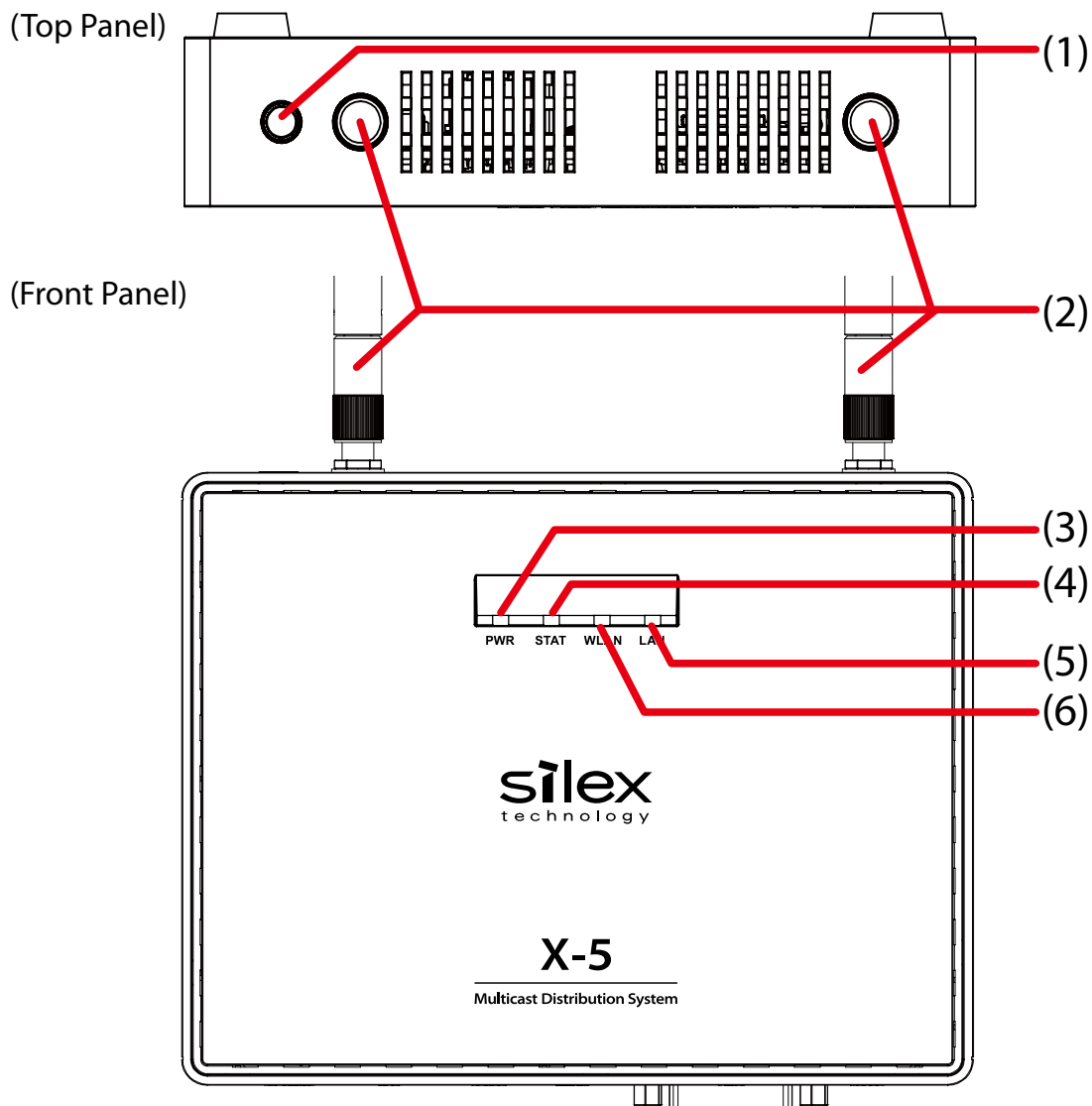An example of a network system configuration using X-5 is shown below.
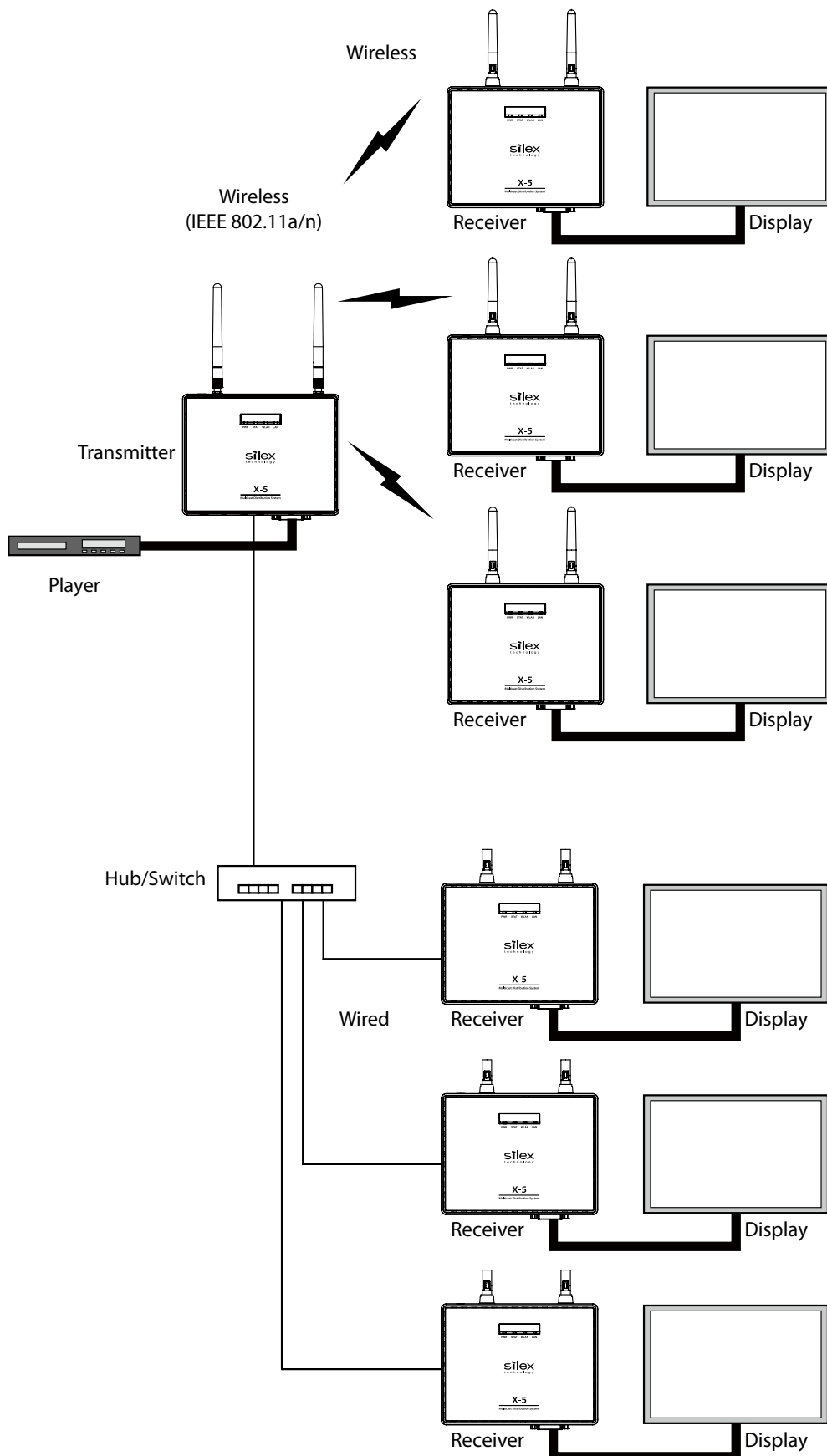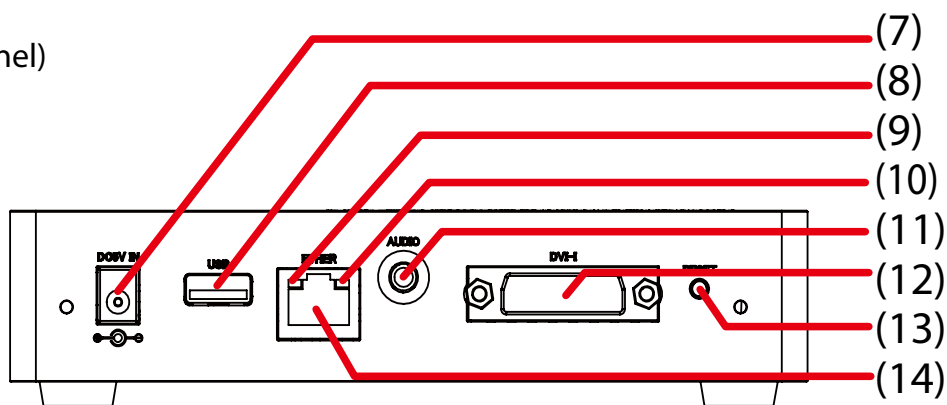
2-2. Parts and Functions

[X-5T / X-5R]

The names and functions of X-5T / X-5R are shown below.
(The transmitter (X-5T) and receiver (X-5R) have an identical appearance. They can be distinguished by the model name written on the label on the rear panel. When they are turned on, it is possible to distinguish the model by a color of PWR LED.)
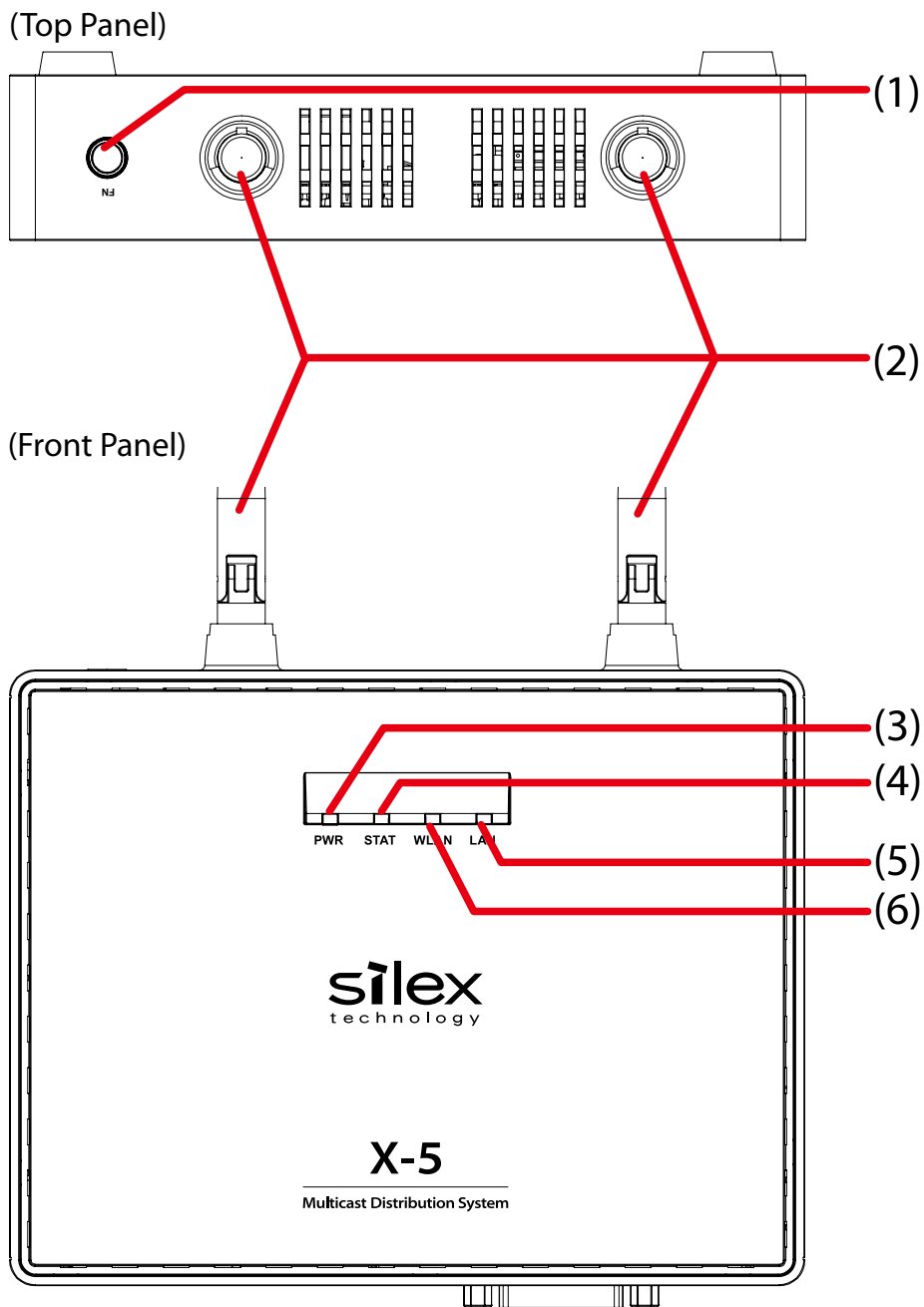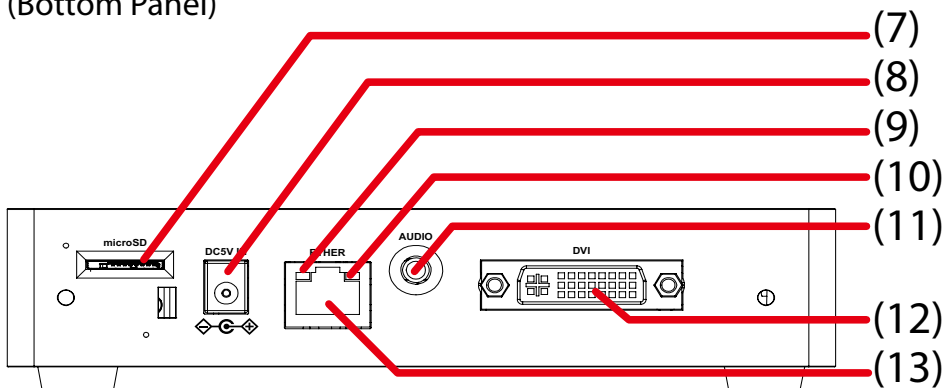
(Top Panel)

(Front Panel)

(1)

(2)

(3)
(4)
(5)
(6)

PWR   STAT   WLAN   LAN

sĭlex
t e c h n o l o g y

X-5

Multicast Distribution System

(Bottom Panel)

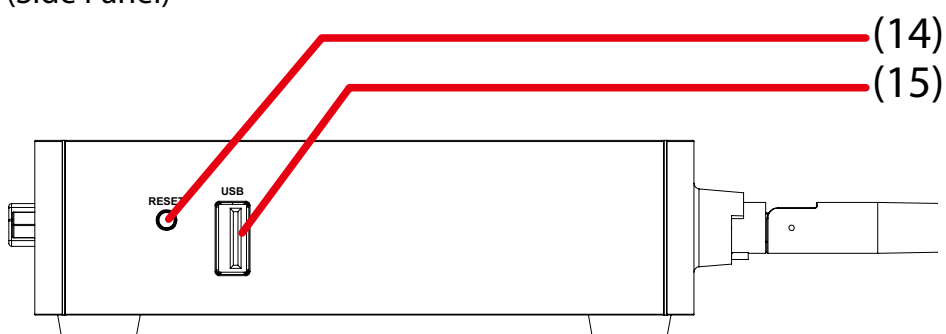|		Status	

(1)	Function switch	Transmitter:
		  (Function is not assigned.)
		  Receiver:
		If multiple transmitters are installed in the network when using the multicast distribution feature, the transmitter that distributes the video can be switched.	

(2)	Wireless LAN antenna	This is an antenna for performing wireless LAN communication.	
(3)	PWR LED (green/orange/red)	Solid green	Transmitter mode (X-5T)
		Solid orange	Receiver mode (X-5R)
		Flashing red	Uploading the firmware
(4)	STAT LED (green/orange/red)	Flashing green	Video conversion in progress (transmitter digital)
		Flashing orange	Video conversion in progress (transmitter analog, receiver digital/analog)
		Solid red	Resolution error, video conversion process error
(5)	LAN LED (green/orange)	Solid green	1000Base Link (connected to TX or RX)
		Flashing green	1000Base Link (not connected to TX or RX)
		Solid orange	10/100Base Link (connected to TX or RX)
		Flashing orange	10/100Base Link (not connected to TX or RX)
(6)	WLAN LED (green/orange/red)	Solid green	Host mode (connected to TX or RX by wireless LAN)
		Flashing green	Host mode (no wireless link/not connected to TX or RX)
		Solid orange	Client mode (connected to TX or RX by wireless LAN)
		Flashing orange	Client mode (no wireless link/not connected to TX or RX)
		Flashing red	Communication error in wireless LAN
(7)	Power connector	Connects the AC adapter.	

(8)	USB port	Connects a USB storage device.
		  Transmitter:
		  (Function is not assigned.)
		  Receiver:
		  Saves the content data.	

(9)	Status LED (yellow)	On	Receiving packets (turns on at 0.5-second intervals when receiving)
		Off	Not receiving packets
(10)	Link LED (green/orange)	Solid green	1000Base Link (communicating with TX or RX)
		Solid orange	10/100Base Link (communicating with TX or RX)
		Off	Link not established
(11)	Audio output jack	Connects the audio cable (audio output jack).	
(12)	DVI-I connector	Connects the DVI cable.	
(13)	RESET switch	Returns X-5 settings to the factory defaults. (For the detailed operating procedure, see "4-3 Initializing the Settings".)	
(14)	Network port	Connects the network cable.	

[X-5SR]

The names and functions of X-5SR are shown below.

(Top Panel)

(Front Panel)

(Bottom Panel)

(7)
(8)
(9)
(10)
(11)
(12)
(13)

(Side Panel)

(14)
(15)

		Status
(1)	Function switch	If multiple transmitters are installed in the network when using the multicast distribution feature, the transmitter that distributes the video can be switched.
(2)	Wireless LAN antenna	This is an antenna for performing wireless LAN communication.

(3)	PWR LED (green/orange/red)	Solid green	(Function is not assigned.)
		Flashing green	Copying data from USB thumb drive to microSD card.
		Solid orange	Receiver mode (X-5SR) Data copy from USB thumb drive to microSD card has successfully been completed. Now, it is safe to remove the USB thumb drive.
		Flashing orange	Data copy from USB thumb drive to microSD card has failed. The copy has failed but it is safe to remove the USB thumb drive.
		Solid red	Uploading the firmware
(4)	STAT LED (green/orange/red)	Flashing green	(Function is not assigned.)
		Flashing orange	Video conversion in progress (receiver digital)
		Solid red	Resolution error, video conversion process error
(5)	LAN LED (green/orange)	Solid green	1000Base Link (connected to TX)
		Flashing green	1000Base Link (not connected to TX)
		Solid orange	10/100Base Link (connected to TX)
		Flashing orange	10/100Base Link (not connected to TX)

(6)	WLAN LED (green/orange/red)	Solid green	Host mode (connected to TX by wireless LAN)
		Flashing green	Host mode (no wireless link/not connected to TX)
		Solid orange	Client mode (connected to TX by wireless LAN)
		Flashing orange	Client mode (no wireless link/not connected to TX)
		Flashing red	Communication error in wireless LAN
(7)	microSD slot	Insert a microSD card which will save the content data. * After a microSD card is inserted to the slot, fix it by screwing the cover that came with X-5.	
(8)	Power connector	Connects the AC adapter.	
(9)	Status LED (yellow)	On	Receiving packets (turns on at 0.5-second intervals when receiving)
		Off	Not receiving packets
(10)	Link LED (green/orange)	Solid green	1000Base Link (communicating with TX)
		Solid orange	10/100Base Link (communicating with TX)
		Off	Link not established
(11)	Audio output jack	Connects the audio cable (audio output jack).	
(12)	DVI-D connector	Connects the DVI-D cable.	
(13)	Network port	Connects the network cable.	
(14)	RESET switch	Returns X-5 settings to the factory defaults. (For the detailed operating procedure, see "4-3 Initializing the Settings".)	
(15)	USB port	Connects a USB storage device.	

TIP
- When the PWR LED blinks Green, data copy is in process from USB thumb drive to microSD card. When the data copy has successfully been completed, the PWR LED will turn Orange, and when it has failed, the PWR LED will blink Orange. In both cases, the USB thumb drive can safely be removed.
- If all of four LEDs blink Red at the front of X-5 , it is not safe to remove the USB thumb drive. In such a case, disconnect the AC plug from outlet before you remove the USB thumb drive.

Note
- If the PWR LED blinks Orange, data copy from USB thumb drive may have failed due to a lack of available disk space on the microSD card.
- The PWR LED will stop blinking Orange and start to constantly turn Orange after the USB thumb drive is removed.

2-3. Product Specifications

Basic Specifications

[X-5T / X-5R]

CPU		Marvell "88F6180" 800MHz (32-bit ARM)
RAM		128 MB DDR
ROM		16 MB
Interface	Video	DVI-I x 1 (Analog RGB input/output uses conversion cable.)
	Audio	3.5mm stereo mini-jack x 1
	Ethernet	10BASE-T/100BASE-TX / 1000BASE-T Auto-detect (RJ-45) x 1
	Wireless	IEEE802.11a/b/g/n mini PCIe module x 1 (SX-PCEAN)
Power supply		AC adapter (operating voltage: 5 V)
LED		Front panel: 4 LEDs "PWR" / "STAT" / "WLAN" / "LAN" Bottom panel: 2 LEDs RJ-45 "Link" / "Status"
Push switch		Top panel: Function switch Bottom panel: Setting reset switch
Video input/output support		Resolution auto-detect

Video input/output support — Resolution auto-detect:

Supported resolution	Digital (*1)	Analog (*1)(*2)
VGA (640x480)	○	○
480p (720x480)	○	○
SVGA (800x600)	○	○
XGA (1024x768)	○	○
720p (1280x720)	○	△ (*3)
WXGA (1280x768)	○	△ (*3)
WXGA (1360x768)	○	△ (*3)
SXGA (1280x1024)	○	△ (*3)
WSXGA (1600x1024)	○	△ (*3)
Full-HD (1920x1080)	○	△ (*3)

(*1) The supported digital and analog refresh rate is 60 Hz only.

(*2) An analog connection requires a D-sub 15-pin DVI-I conversion adapter or cable.

(*3) The transmitter is not supported, but Store & Play mode in the receiver is supported.

[X-5SR]

CPU		Marvel ARMADA370 800MHz (32bit ARM)
RAM		128 MB DDR
ROM		16 MB
Interface	Video	DVI-D x 1
	Audio	3.5mm stereo mini-jack x 1
	Ethernet	10BASE-T/100BASE-TX / 1000BASE-T Auto-detect (RJ-45) x 1
	Wireless	IEEE802.11a/b/g/n mini PCIe module x 1 (SX-PCEAN)
Power supply		AC adapter (operating voltage: 5 V)
LED		Front panel: 4 LEDs "PWR" / "STAT" / "WLAN" / "LAN" Bottom panel: 2 LEDs RJ-45 "Link" / "Status"
Push switch		Top panel: Function switch Side panel: Setting reset switch
Video output support		Resolution auto-detect

Supported resolution	Digital (*1)
VGA (640x480)	○
480p (720x480)	○
SVGA (800x600)	○
XGA (1024x768)	○
720p (1280x720)	○
WXGA (1280x768)	○
WXGA (1360x768)	○
SXGA (1280x1024)	○
WSXGA (1600x1024)	○
Full-HD (1920x1080)	○

(*1) The supported refresh rate is 60 Hz only.

FCC / IC Notice

Federal Communication Interference Statement (United States only)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is not allowed as it is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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 A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A 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 no contrôlé et respecte les règles les 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.

Communication Protocol Specifications

TCP/IP	Network layer	ARP, RARP, IPv4, ICMP IPv4 Organization Local Scope "239.192.0.0/14" is used for multicasting
	Transport layer	TCP, UDP
	Application layer	TELNET, BOOTP, DHCP, HTTP, JCP (proprietary #19541), RTP (proprietary #50001 to #65535), X-5 Announcement Protocol (proprietary #50000), SX-RPC (proprietary via HTTP/RTP), NTP, DNS
Other	FLDP	For firmware updating

Interface Specifications

Video

Interface	DVI-I (X-5T / X-5R), DVI-D (X-5SR)
Codec	JPEG-XR (proprietary)
Resolution	Auto-detect of VGA (640 x 480) to Full-HD (1920 x 1080)
Frame Rate	Maximum 30 fps
Setting	Image position adjustment

Audio

Interface	3.5mm stereo mini-jack
Codec	16-bit PCM
Sampling rate	32 KHz, 44.1 KHz, 48 KHz

USB

Standards	USB 2.0 Hi-Speed (USB 3.0 Super Speed is backward compatible)
Memory	Up to 32GB
File system	FAT, FAT32
Partition	1 partition only
Device insertion or removal while the unit is powered on	X-5T / X-5R: Insertion/removal of USB thumb drive is prohibited. X-5SR: Insertion of USB thumb drive is allowed any time when X-5SR is powered on. Removal of USB thumb drive is allowed when it is safe to remove it. (For when it is safe to remove USB thumb drive, refer to **2-2. Parts and Functions**.)

microSD

Supported media	micro SD, micro SDHC
Memory	micro SD: Up to 2GB, micro SDHC: Up to 32GB
File system	FAT, FAT32
Partition	1 partition only
Device insertion or removal while the unit is powered on	Insertion/removal of micro SD card is prohibited.

2-4. Usage Notes

Wireless Signals

Do not use X-5 near the equipment below.

- Industrial, scientific, and medical equipment such as microwave ovens and pacemakers
- Short-range wireless base stations (wireless base stations that require a license) for mobile identification used in factory manufacturing lines and other applications
- Low-power wireless base stations (wireless base station that do not require a license)

The above equipment uses the same signal frequency band as wireless LANs. Signal interference can occur if X-5 is used near the above equipment. This can result in a communication failure or slow communication speeds.

Avoid use of X-5 near cellular telephones, PHS, televisions, and radios as much as possible.

Cellular phones, PHS, televisions, radios, and other devices use a different frequency band than the wireless LAN. Therefore, use of these devices near X-5 will not affect communication by X-5 or by these devices. However, if these devices are brought near a wireless LAN product, noise may occur in the audio or video due to the electromagnetic waves generated by X-5 and other wireless LAN products.

Communication is not possible through reinforced steel, metal, or concrete barriers.

The signals used in X-5 will pass through wood, glass, and other barriers used in a typical home, and so communication is possible even in rooms with walls made from wood or glass.
However, the signals will not pass through barriers made of reinforced steel, metal, concrete, or similar materials.
Communication cannot be performed in rooms with walls made from these types of materials.
In the same way, communication cannot be performed through floors using reinforced steel, metal, concrete, or similar materials.

Wireless Equipment Using the 2.4 GHz and 5 GHz Bands

The operating frequency band of this equipment is used by microwave ovens, industrial, scientific, and medical equipment, and also by short-range wireless base stations (wireless base stations that require a license) and low-power wireless base stations (wireless base station that do not require a license) for mobile identification used in factory manufacturing lines and other applications.

- Before using this equipment, check that there are no short-range wireless base stations or low-power wireless base stations for mobile identification in the immediate area.
- If any cases of signal interference occur in short-range wireless base stations for mobile identification due to this equipment, either immediately change the operating frequency band, or stop the transmission of signals, and contact Silex Technology about possible corrective actions for preventing interference (such as installation of a partition).
- In addition, if any cases of signal interference occur in low-power wireless base stations for mobile identification due to this equipment, or if any other problems occur, contact Silex Technology.

*Meaning of the indicators written on the rear panel of the product

```
2.4      DS/OF      4
▭         ▭        ▭
```
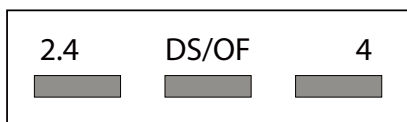
2.4	: Indicates wireless equipment using the 2.4 GHz frequency band.
DS/OF	: Indicates that DS-SS and OFDM are being used as the modulation scheme.
4	: Indicates that the estimated interference distance is "40 m maximum".
▭ ▭ ▭	Indicates that all bands are used and the band for mobile identification devices can be avoided.

Notes When Using 5 GHz Band

- Usage of the 5.2 GHz band (W52/W53) outdoors is prohibited under the Radio Law of Japan.
  For outdoor usage, use the W56 channel only, and do not use the W52/W53 channel.
- For details about environments where recommended antennas besides the standard supplied antenna can be used, please contact Silex Technology.

Copyrights for Video and Audio Content

Generally, the permission of the copyright holder is required whenever distributing content using X-5.

Unauthorized distribution of other people's copyrighted material (content) is prohibited by law.

3. X-5 Settings and Installation

This section describes the preparation procedures before setting and installation of X-5.

3-1. Required Items

Obtain the equipment and software below for building the system for X-5.

Transmitter (X-5T)	At least one transmitter is required.
Receiver (X-5R / X-5SR)	Obtain the required number of receivers for your installation environment. One display monitor can be connected to one receiver. Also, when using a wired connection, up to 1000 receivers can be connected to one transmitter, and when using a wireless connection, up to 32 receivers can be connected to one transmitter. Note: The receivers (X-5R / X-5SR) cannot be used as AP.
Media player	A media player (or computer) is required that includes a DVI-I (or DVI-D or Analog RGB) interface and is capable of video output at resolutions supported by X-5. Note: X-5 does not support HDCP. An HDCP-compliant media player cannot be used.
Display monitor	[X-5R] A monitor is required that includes a DVI-I (or DVI-D or Analog RGB) interface and is capable of display at resolutions supported by X-5 (The number of required monitors matches the number of receivers). [X-5SR] A monitor is required that includes a DVI-D interface and is capable of display at resolutions supported by X-5 (The number of required monitors matches the number of receivers).

Speakers	The number of required stereo speakers matches the number of receivers (Speakers are not required if the display monitor already has built-in speakers).
Display cable	[X-5R] A display cable is required with a DVI-I connector (male to male) and noise suppressor. The number of required display cables matches the number of transmitters and receivers. Also, if connecting to a media player or display monitor with an Analog RGB interface, a separate adapter (or conversion cable) is also required for converting between the respective interface and DVI-I. [X-5SR] A display cable is required with a DVI-D connector (male to male) and noise suppressor. The number of required display cables matches the number of transmitters and receivers.
Audio cable	An audio cable is required with a stereo mini-plug connector and noise suppressor. The number of required audio cables matches the number of transmitters and receivers.
Wireless antenna	A wireless antenna is required for both the transmitters (X-5T) and receivers (X-5R). Although X-5 is supplied with a non-directional antenna, a dedicated directional wireless antenna (sold separately) must be obtained if a high-performance sending and receiving environment is required. Obtain a suitable wireless antenna based on the distance to the receiver, installation location position, and other factors of the environment where X-5 is installed. (Only wireless antennas authorized for use by Silex Technology can be used. If a directional antenna is required, please contact Silex Technology.) Note: Mount the wireless antenna by turning the mounting base (screw section) while grasping the wireless antenna body. Do not turn the wireless antenna body during or after mounting. If the wireless antenna needs to be turned, remove the wireless antenna first before turning it. Note: The receiver (X-5SR) has a fixed antenna. Other antennas cannot be used.
Computer (for setting)	A computer with a wired LAN port is required for setting X-5.
Network cable (for setting)	When making the settings, a network cable (category 5e or higher) is required for connecting the transmitter or receiver with the computer. - Because X-5 supports Auto MDI/MDI-X, either a straight-through cable or crossover cable can be used. - The setting device and computer can be connected directly, or they can be connected through an Ethernet hub.
Setting software	The setting software "SX Smart Finder" is used for setting X-5. "SX Smart Finder" can be downloaded from the Silex Technology website at the URL below. http://www.silexamerica.com/

3-2. Building the Setting Environment

First, connect the cables to X-5 (both transmitter and receiver), and connect the player, monitor, speakers, and computer. The settings for X-5 are made from a computer by passing through a wired network.

1. **Connect the network cable**

Connect the network cable to X-5 (transmitter and receiver) and the computer.

2. **Turn on the power**

Turn on the power for X-5 (transmitter and receiver), computer, player, monitor, and speakers.

3. **Connect the display cables**

Use the display cables to connect the transmitter to the player and the receiver to the monitor.

4. **Connect the audio cables**

Use the audio cables to connect the transmitter to the player and the receiver to the monitor and speakers.

5. **Start video output for the player**

Perform video output from the player.

<Example of Connections During Setting Process>

An example of the connections during X-5 setting is shown below.

Monitor

Player

Display cable   Audio cable   Display cable   Audio cable

Transmitter   Receiver

Network cable
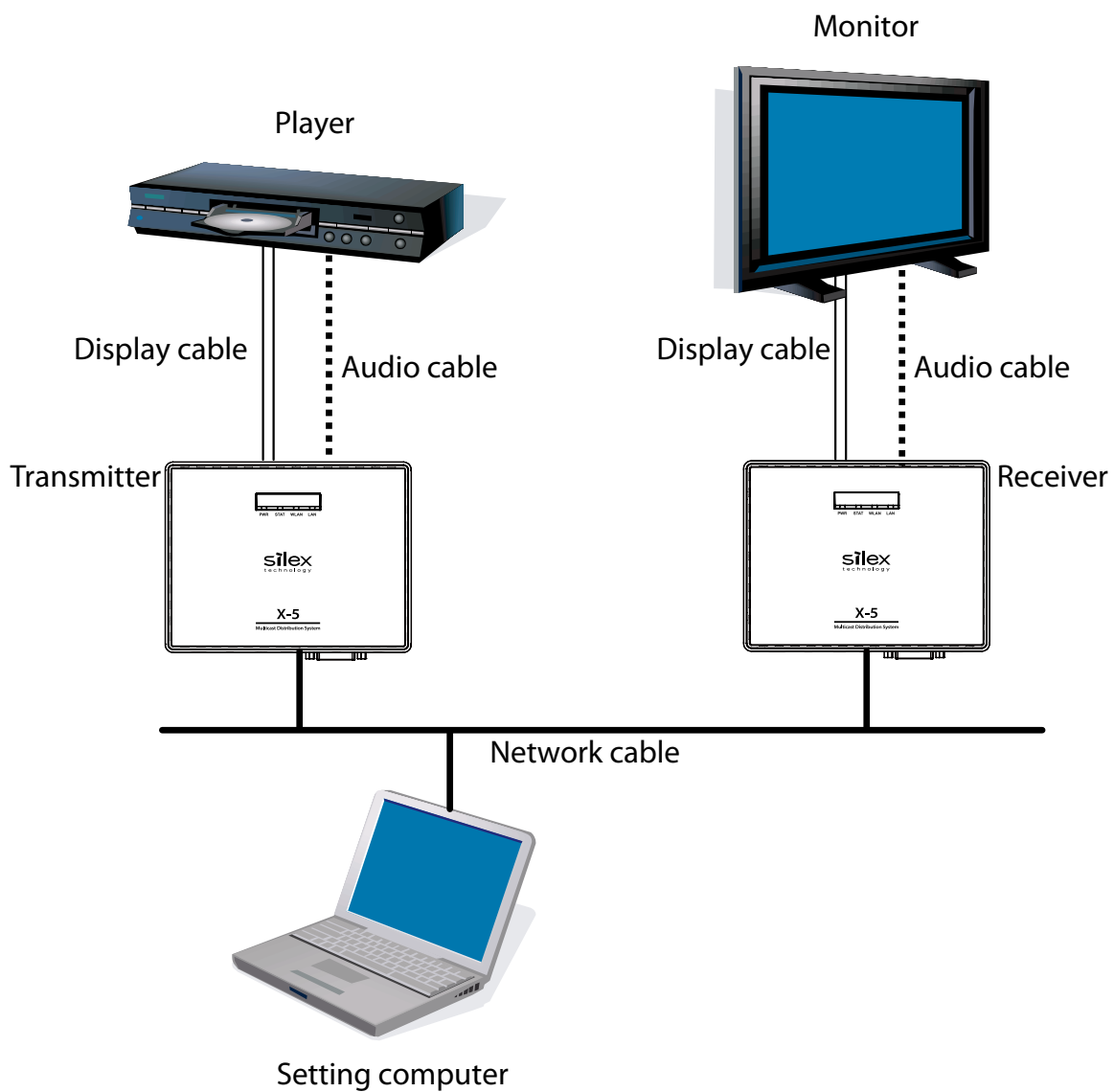
Setting computer

3-3. X-5 Settings

When the cable connections and power-on sequence are completed, make the network settings and screen adjustments for X-5 (transmitter and receiver). X-5 is set from the setting computer.

Assigning IP Addresses

To simplify the network setting process, X-5 includes an automatic IP address assignment function. In the factory defaults, the IP address is automatically assigned from the DHCP server on the network when the power is turned on. If there is no DHCP server on the network, IP addresses starting from "169.254.xxx.xxx" are automatically assigned so that there are no duplicate addresses among the devices (Pay careful attention when making the settings for environments where both wired and wireless networks are used because duplicate IP addresses may be assigned to devices).

> **Note**
> - The setting procedure below is unnecessary if using the automatic IP address assignment function of X-5. Skip to the next section.

If SX Smart Finder is used to manually assign IP addresses to X-5, perform the procedure shown below.

> **Note**
> - "SX Smart Finder" can be downloaded from the Silex Technology website at the URL below.
>   http://www.silexamerica.com/

1. Assign a fixed IP address to the computer that will be used to make the settings. (Example: 10.10.10.10)

2. When SX Smart Finder is started, the transmitter (X-5T) or receiver (X-5R / X-5SR) is displayed in the list screen of SX Smart Finder.

> **TIP**
>
> - If the Windows firewall is enabled, the screen below is displayed only when SX Smart Finder is started for the first time. In this screen, check both check boxes and click **Allow access** (click **Unblock** in Windows XP and Vista).
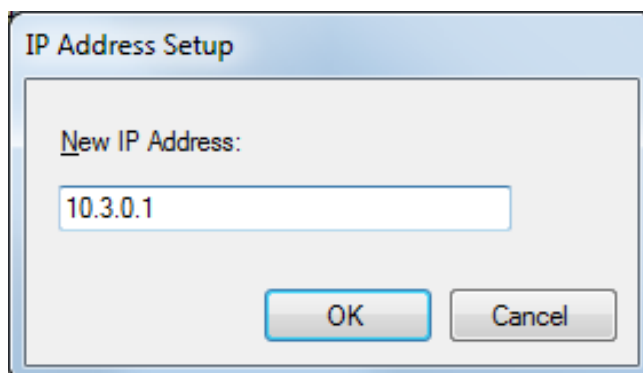>
> If using Windows Vista, after performing the above operation, the User Account Control window is displayed, and so click **Continue**.
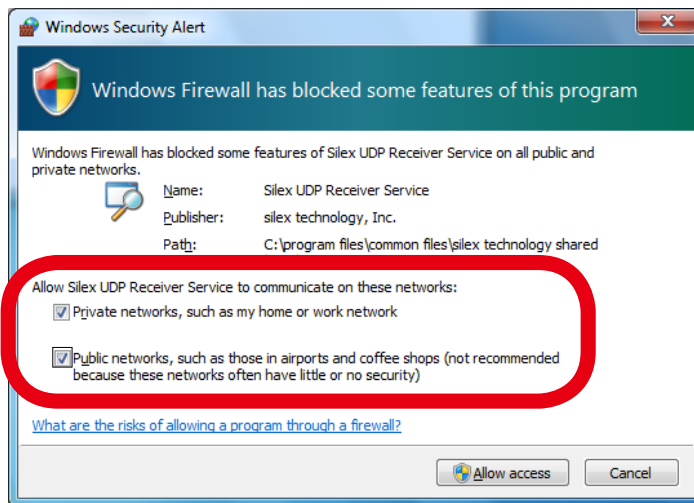
3. Select the transmitter or receiver that will be set. From the menu, click **Node** - **Set an IP address**.
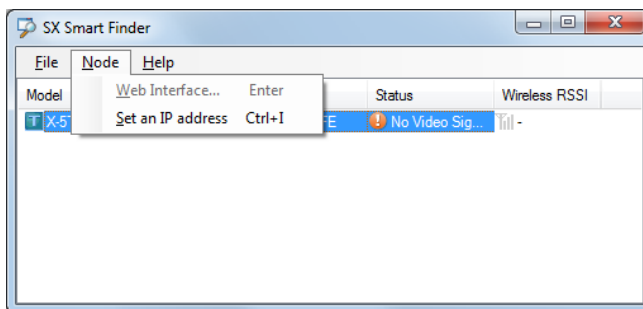
4. In the displayed screen, enter an IP address that is not being used by other network devices, and click **OK**.
(Example: 10.3.0.1)

5. Repeat the above procedure to assign IP addresses to all transmitters and receivers that do not duplicate the addresses of other network devices.

Parameter Settings

When assigning of the IP address to X-5 is complete, access the web page of X-5 from the computer, and set the network parameters. The web page of X-5 can be accessed using SX Smart Finder.

> ☝ **TIP**
> - The computer that is used for setting must be assigned an IP address that allows communication with X-5. If the computer cannot access X-5, confirm the IP address of the computer, and if necessary, change the IP address of the computer.
>   (Example: If the IP address of X-5 is "169.254.3.111", the computer used for setting must be set to "169.254.3.1", which is an IP address that is not used by other network devices.

[Accessing the Web Page]

1. Start SX Smart Finder, and select the product that will be set.

2. From the menu, click **Node** - **Web Interface**.
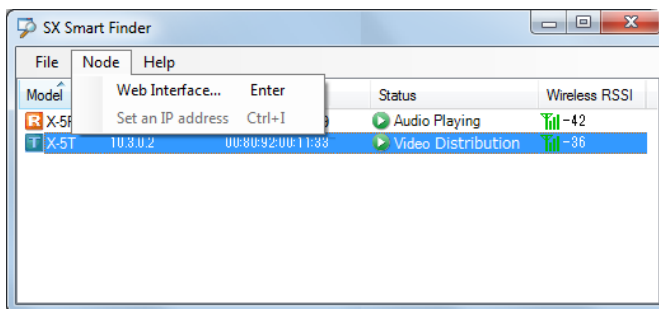
3. Start the web browser, and open the web page of X-5.

> ☝ **TIP**
> - If accessing the configuration page or management page in X-5 web page, a screen is displayed for entering the password. In the password entry screen, enter "root" for the user name, and enter the root password assigned to X-5 for the password (nothing is set in the factory defaults).

[Host Name and Password Settings]

In the factory defaults, the host name of X-5 is automatically set from the last six digits of the Ethernet address. The host name can be used unchanged from its initial value. If changing the host name, set a name that does not duplicate a name already used by other network devices.

> **TIP**
> - In the factory defaults, no password is set.
>   Be sure to always set a password if X-5 is used by connecting to a public network.

1. Click **Basic Configuration** - **Basic** from the left-side menu on the web page of X-5.

2. Set **Host Name** and **Password** in the displayed page.

[Video Parameter Settings]

The video parameter settings include **Video Interface** and **Video Mode**.

Set **Video Interface** to match the input signal from the player.

Video Mode is used to set the balance between video smoothness and image quality. Select the setting value by referring to the table below.

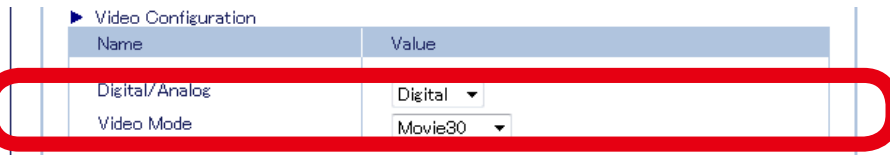| Selection option name	Setting description
Custom	Operation is performed based on the information set in the "Advanced Configuration" page.
Movie30 Movie20 Movie15	Movie mode is set when you want to give priority to smoothness of motion in the video. The number in the selection option name is the number of images that are updated per second. A larger number results in smoother rendering of the video, but a smaller number results in a higher image quality. The "Movie30" setting is optimal for distributing video containing scroll messages. Select either "Movie20" or "Movie15" to give priority to motion while also keeping a certain level of image quality.
Picture10 Picture5 Picture3 Picture2 Picture1	Picture mode is set when you want to give priority to image quality. The number in the selection option name is the number of seconds that an image is updated. A larger number results in higher image quality, and a smaller number results in a reduced communication load. In particular, the "Picture5" setting is optimal for providing a stable audio quality with a reduced communication load. To increase the number of updated images, select "Picture1".

Note
- To enable a certain degree of stable video distribution even in environments with weak signals when connected to a wireless LAN, select "Movie20" or "Picture1".

Use this setting at its initial setting unless it needs to be changed.

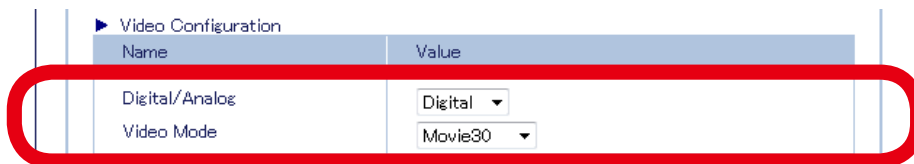**1.** Click **Basic Configuration** - **Basic** from the left-side menu on the web page of X-5.

2. Set **Digital/Analog** in the displayed page.

3. If necessary, set **Video Mode**.

[Wireless LAN Settings]

When using a wireless LAN, set **Wireless Mode** to **Host** or **Client**, and set the **Wireless Band**, **SSID**, **Network Authentication**, and other wireless LAN information to match the installed wireless LAN environment.

1. Click **Basic Configuration** - **Basic** from the left-side menu on the web page of X-5.

2. Set the items contained in the **Wireless LAN Configuration** group in the displayed page. Depending on the settings made in **Wireless LAN Configuration**, the displayed group will change to **WEP Configuration**, **WPA/WPA2 Configuration**, or other option, and so set the items contained in the respective group.

> **TIP**
> - Be sure to always set encryption if using X-5 by connecting to a wireless network.
> - In many cases, the communication bands in the IEEE 802.11b/g and IEEE 802.11n/b/g wireless bands are already being used due to the widespread use of supported devices, and so in certain cases, it may not be possible to obtain sufficient communication bandwidth for video transmission. The use of the IEEE 802.11n/a communication band is recommended for wireless LAN communication in X-5. The communication band is set in the **Channel** item of the transmitter.
> - If installing for outdoor use, be sure to install in accordance with the stipulated radio wave laws in the respective country.
>   Some countries have limitations on the communication bands (channels) that can be used outdoors, and so caution is needed.
> - If W53 (52/56/60/64ch) or W56 (100/104/108/112/116/120/124/128/132/136/140ch) is selected, the following restrictions apply due to laws and regulations.
>   - Radar wave detection is performed for one minute before communication is started for each channel. Communication cannot be performed during this detection period.
>   - If a radar wave is detected during communication, the channel is automatically detected, and communication is disconnected.

An example of the settings when using the transmitter in Host mode is shown below.

	Transmitter	Receiver
DHCP	Disable	Disable
IP address	Any value	Any value (any value where communication is possible with the transmitter)
Wireless mode	Host	Client
Wireless band	802.11n/a	802.11n/a
SSID	Any character string	Any character string (same as transmitter)
Channel bandwidth	40 MHz	40 MHz
Channel	Any value	-
Sending strength	100%	100%
Network authentication	WPA2	WPA2
Encryption system	AES	AES
Shared key	Any value	Any value (same as transmitter)

[Saving the Settings]

When entry of a settings group is completed, click the **Submit** button in the bottom section of the right side in the web page to save the settings.

Screen Adjustment

To show video from the player in the optimal state on the display, perform the procedure below to make screen adjustments.

> *Note*
> - This function is enabled during analog connections.
> - Execute this operation only when the display position of the image is shifted. This operation does not need to be performed if the image is already displayed at a suitable position in the installed state.

1. Output and pause the video from the player connected to the transmitter (output of a still image is also possible). The output of the video appears nearly completely white and in full screen.

2. Use the same operation as in "Parameter Settings" to access the web page of the transmitter.

3. Click **Management** - **Video/Audio** from the left-side menu on the web page.

4. Click **Start** in the **Video Auto Adjustment** box on the displayed page to execute the automatic adjustment function of the video signal.

When automatic adjustment is successful, the message below is displayed on the web page.
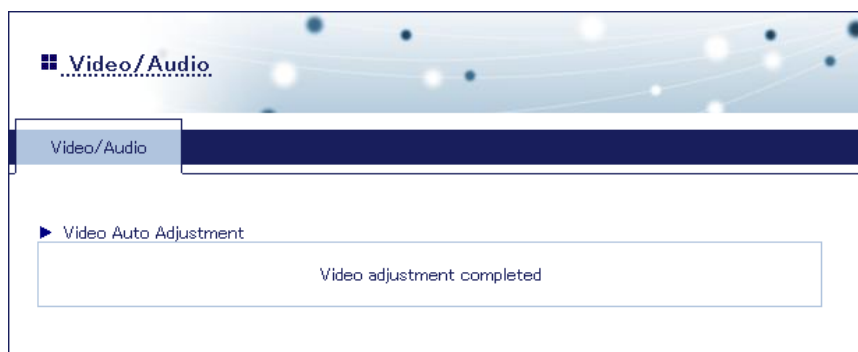
5. The video is distributed from the transmitter to the receiver, and the video that was output from the player is shown on the display connected to the receiver.

6. Execute the automatic adjustment function of the display (For details on the automatic adjustment function of the display, refer to the instruction manual for the display).

This completes the screen adjustment procedure.

If detailed adjustments are necessary, such as for the video contrast and brightness, use the display's or player's video adjustment function to make the detailed adjustments (For details on the video adjustment function of the display, refer to the instruction manual for the display).

Note
- If the video is still not displayed in the optimal state even after performing automatic video adjustment, use the procedure below to make the setting manually.
  1) Click **Advanced Configuration** - **Video/Audio** from the left-side menu on the web page.
  2) Enter the value for the setting item (such as the phase) of the resolution that will be used in **Analog Resolution Configuration**.
  3) When the settings are complete, click **Submit**.
 For the allowable setting ranges of each setting item, refer to "A-1. List of Setting Items".

3-4. X-5 Installation

When installing X-5, the network can be connected using either a wired LAN or wireless LAN. A network environment can also be built that combines both wired and wireless LANs.

[Device configuration when connecting by a wired LAN]
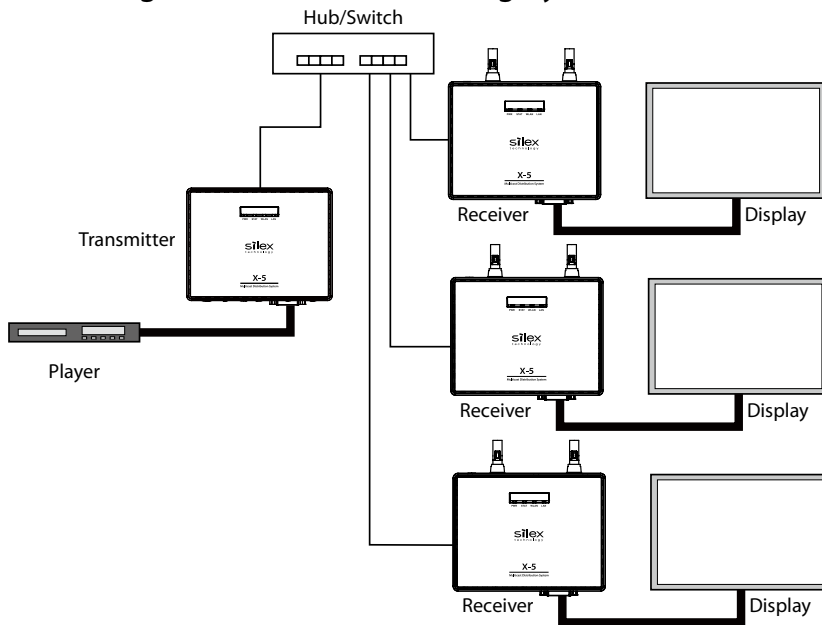
[Device configuration when connecting by a wireless LAN]
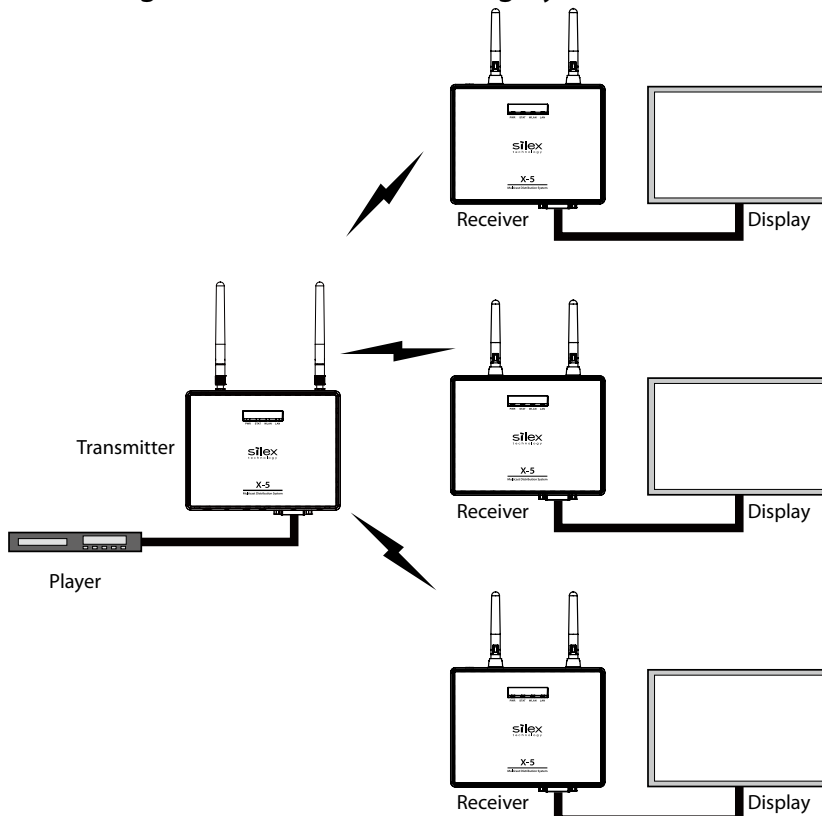
If a wireless LAN is used to build the network, you must understand the characteristics of the supplied antenna and install X-5 in a favorable signal environment.

> **TIP**
> - When installing for outdoor use, be sure to install in accordance with the stipulated radio wave laws in the respective country.
>   Some countries have limitations on the communication bands and communication methods that can be used outdoors, and so caution is needed.

Characteristics of Supplied Antenna

The antenna supplied with X-5 is a non-directional antenna (omni-directional antenna). The allowable distance that X-5 can be installed from the antenna for proper operation is a maximum of 15 meters if a suitable line of sight (described later) is obtained.

> **TIP**
> - The allowable distance from the antenna for proper operation varies depending on the signal strength at the installation location. Install at a distance that actually enables stable flow of video when X-5 is operated.

Obtaining Line of Sight

Problems may occur in communication using the IEEE 802.11a/n (5 GHz) communication band due to the effects of barriers and other objects due to the signal characteristics. To ensure a stable operating environment, obtain a suitable line of sight with the antenna.

[Horizontal line of sight]

Receiver

Receiver

Transmitter

[Vertical line of sight]

Transmitter   Transmitter

Receiver
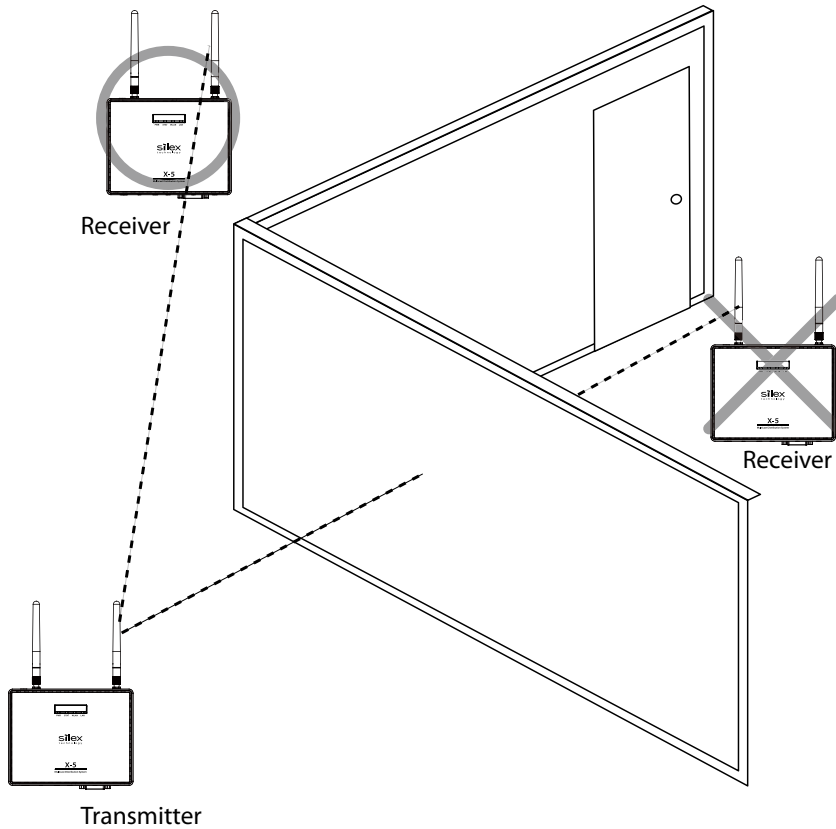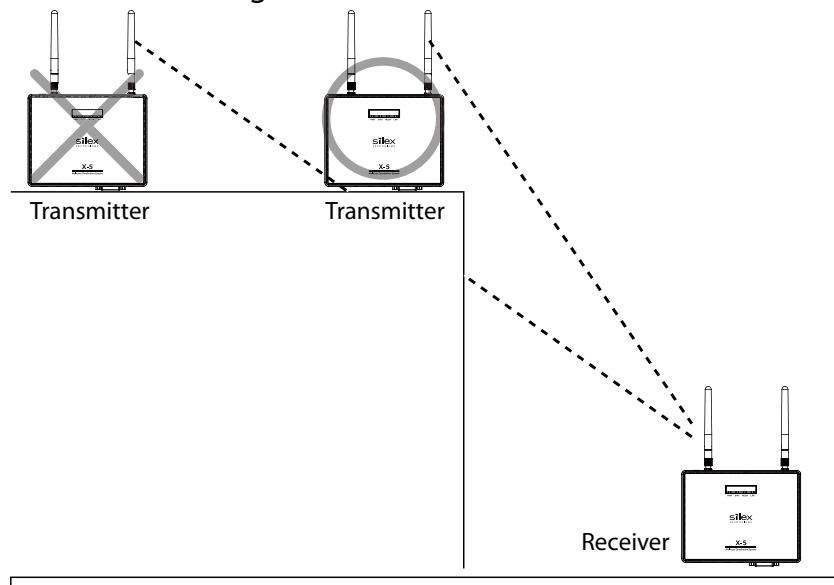
4. Video and Audio Distribution and Maintenance

This chapter describes X-5 operating procedures and maintenance functions provided with X-5.

4-1. Video and Audio Distribution

In video and audio distribution by X-5, the player connected to the transmitter of X-5 is used to perform playback only of content. If the setting and installation in the previous chapter was completed properly, content is played back on the display connected to the receiver.

If playback of content is stopped (video output to the transmitter is stopped), the standby screen of X-5 is automatically displayed, and the system waits until playback of content is started again.

Note
- Once the standby screen is displayed, after a certain amount of time elapses, the video signal is stopped, and the system switches to sleep mode.
  The time until the video signal is stopped can be adjusted in X-5 settings.

4-2. Maintenance Using the Web Interface

X-5 environment settings are made by accessing X-5 using a web browser. Access it from a computer connected to the network environment where X-5 is connected.

The recommended browser settings are shown below.

- Microsoft Internet Explorer 8.0 or later

Note
- The explanations below are based on screen examples when accessing using Internet Explorer 9.0 in Windows 7. The text displayed in the screens varies depending on the OS and browser version.
- The web page images in the explanations below are based on the web page images of the transmitter. The displayed information for the receiver may be different.

Accessing the Web Page of X-5

1. Start SX Smart Finder, and select the product that will be set.

2. From the menu, click **Node** - **Web Interface**.

3. Start the web browser, and open the web page of X-5.
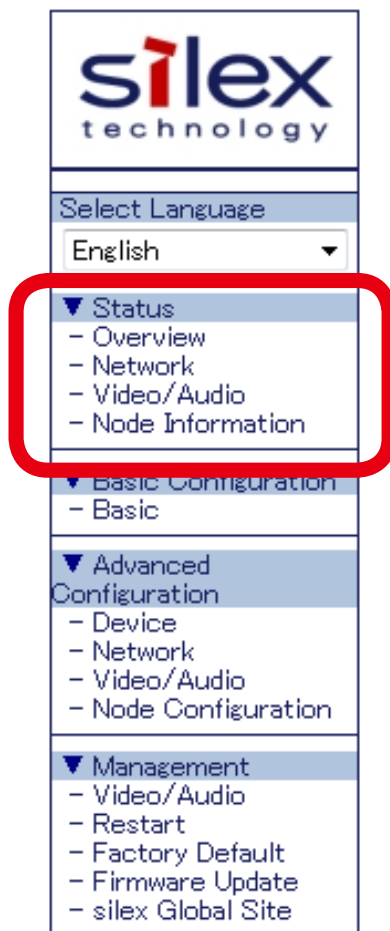

TIP
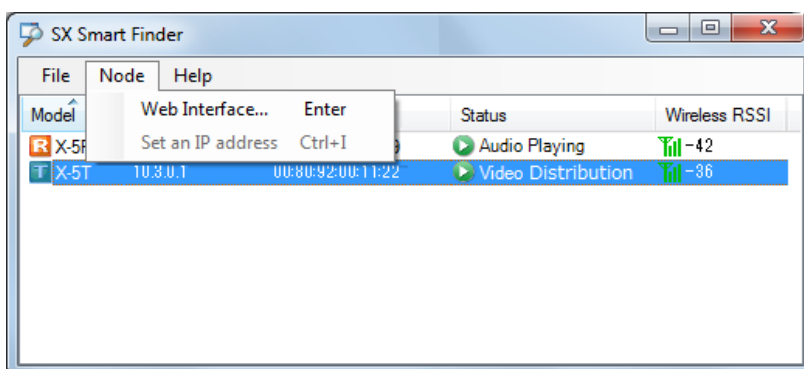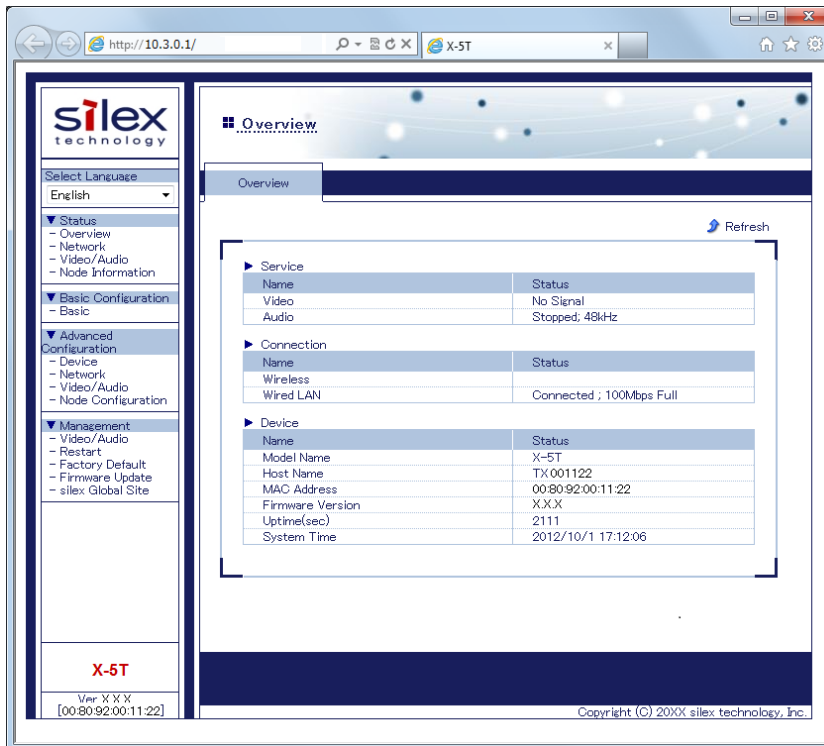
- If accessing the configuration page, management page, or maintenance page in X-5 web page, a screen is displayed for entering the password. In the password entry screen, enter "root" for the user name, and enter the root password assigned to X-5 for the password (nothing is set in the factory defaults).

Status Page

The Status page shows the operating status of X-5.

The various status information can be viewed by selecting the desired menu from the web page left side.

■ Overview
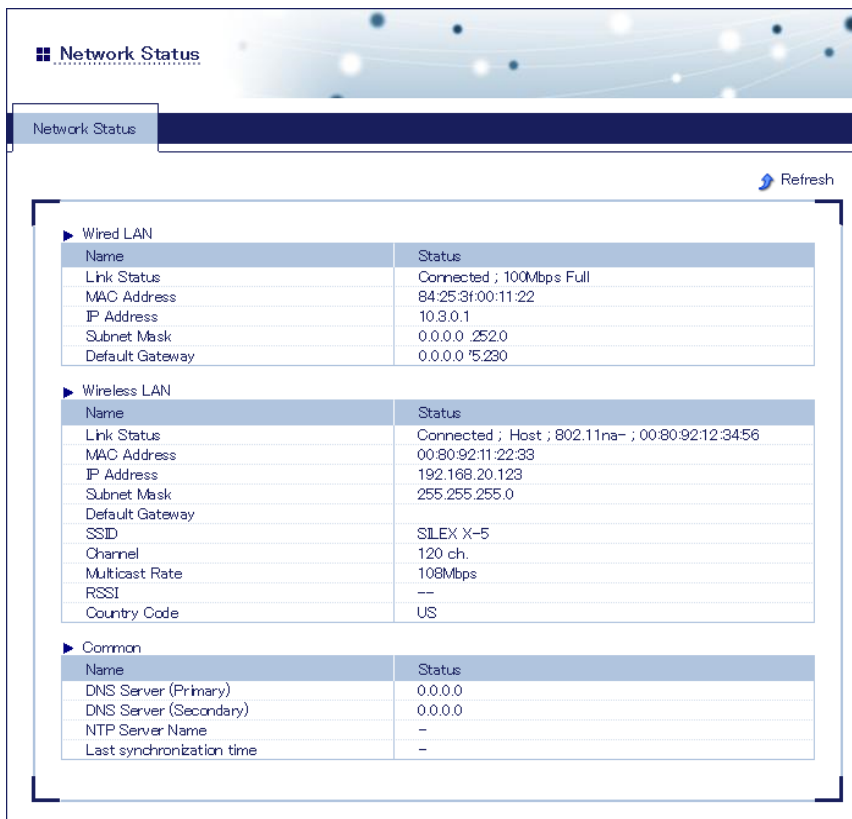
This page shows X-5 services, network operating status, and system information.

■ Network Status

This shows the operating status of the wired/wireless LAN of X-5.

■Video/Audio Status

This shows the video/audio distribution status of X-5.

■ Store & Play Status (Receiver Only)

This shows the status of Store & Play function.

■ Node Information

This displays a list of the nodes connected in the same network.

Configuration Page

The Configuration page is used to make X-5 environment settings.

The Configuration page is divided into **Basic Configuration** where the basic settings are made and **Advanced Configuration** where the advanced settings are made.
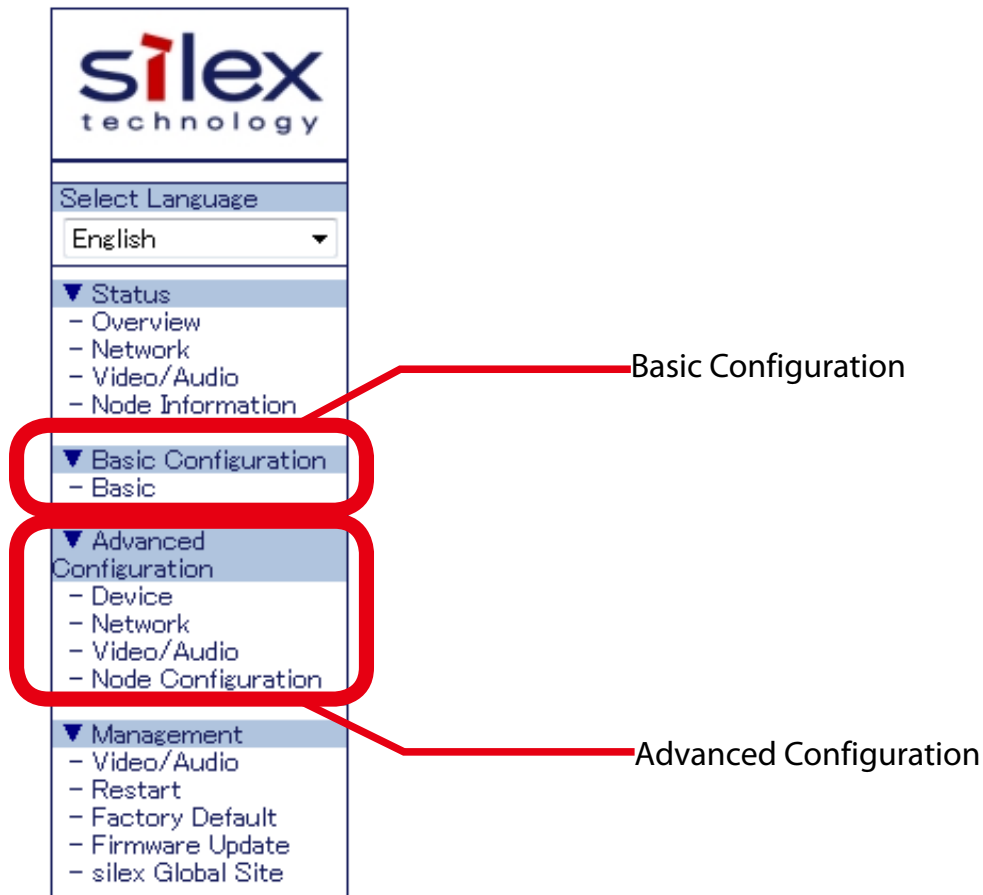
To change the settings in the Configuration page, enter the setting information in the respective page, and click **Submit**.

An overview of each configuration page is presented below.

For details on each setting item, refer to "Appendix - A-1. List of Setting Items".

> *Note*
> - The explanations below are based on the configuration pages for the transmitter. The number of setting items and setting items vary for the configuration pages for the receiver.

■ Basic Configuration

This sets the information required for operating X-5.

■ Advanced Configuration - Device Configuration

(Transmitter)

The settings below are available.
- Host name and password settings

- Video/audio distribution run/stop

- Retrieving a system time from NTP server

- Synchronizing a system time with the PC via Web browser

(Receiver)

The settings below are available.
- Host name and password settings
- Operation priority settings for the multicast distribution feature and Store & Play feature
- Time setting until stopping of video signal sent to the monitor after video playback is stopped and the standby screen is displayed
- Retrieving a system time from NTP server
- Synchronizing a system time with the PC via Web browser

■ Advanced Configuration - Network Configuration

This sets X-5 network settings.

■ Advanced Configuration - Video/Audio Configuration

This sets the detailed video and audio parameters for X-5.

■ Advanced Configuration - Node Configuration

(Transmitter)

For the nodes detected on the network by the transmitter, this sets the time until a communication failure is determined to have occurred in the disconnected node.

(Receiver)

This sets the method for connecting to transmitters by receivers.

Management Page

Control of remote operation is performed in the Management page.

The various tools can be displayed by selecting the desired menu from the web page left side.
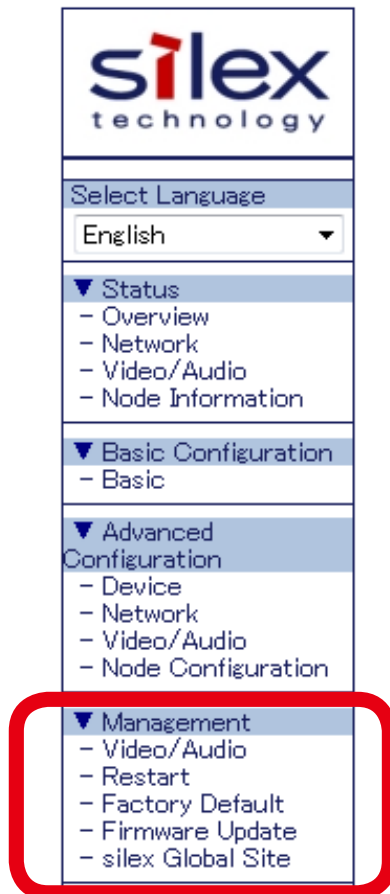
■Video/Audio

(Transmitter)
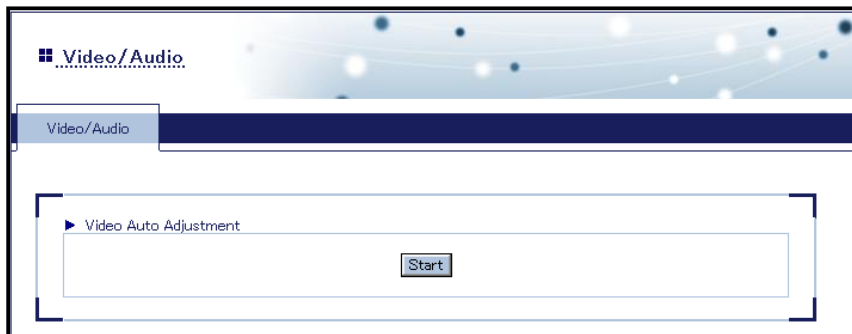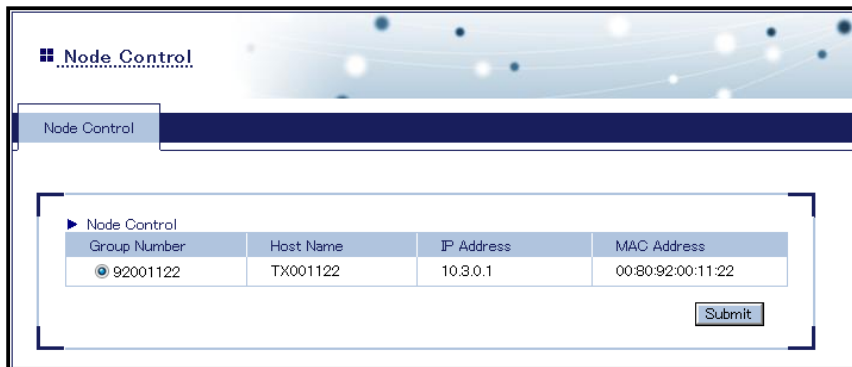
In the transmitter, the screen automatic adjustment function can be executed.

(Receiver)
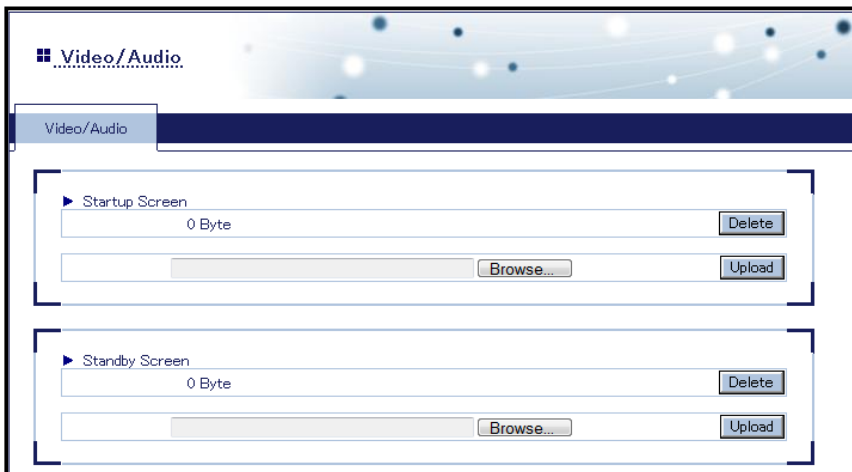
In the receiver, the image displayed at X-5 startup and the image displayed when video distribution is stopped can be set.

■ Node Control (Receiver Only)
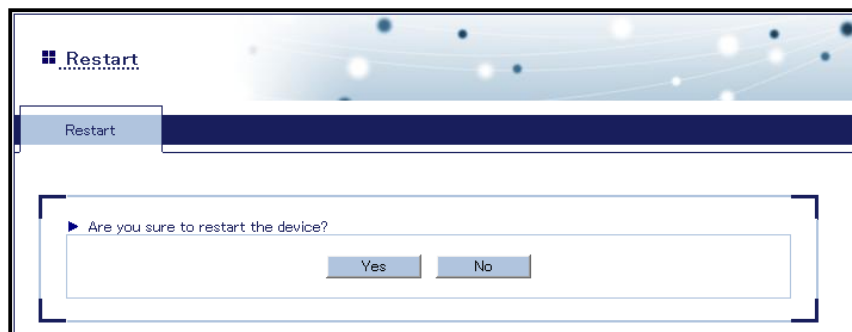
The transmitter receiving the video distribution can be changed.

■ Restart

Click **Yes** to restart X-5.

■ Factory Default
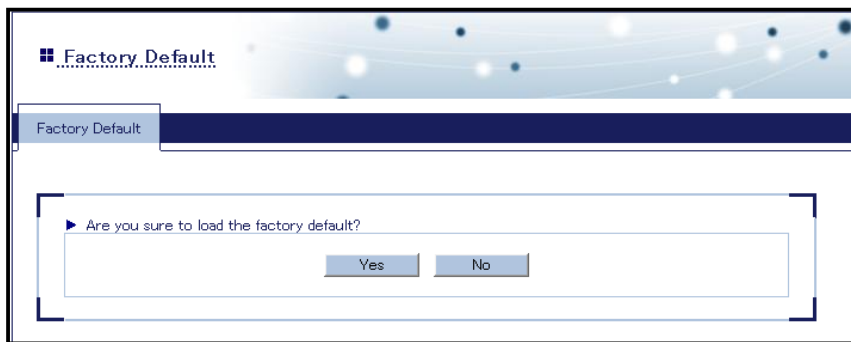
X-5 setting information can be returned to the factory defaults by clicking **Yes**.

■ Firmware Update
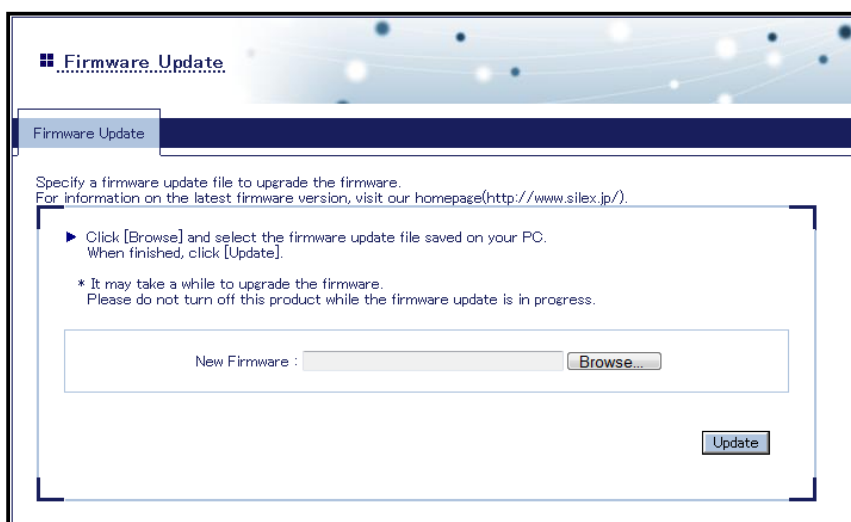
The firmware in X-5 can be updated to the latest firmware available on the Silex Technology website (You need to download the latest firmware from the Silex Technology website first).

Click **Browse** to select the firmware update file. Click **Update** to perform the firmware update process.

■ silex Global Site

Click **silex Global Site** on the web page left side to open the Silex Technology website.

4-3. Initialization of Settings

This describes how to initialize (reset) X-5 setting information and return to the factory defaults by using the push switch on X-5.

Initialize X-5 settings to change the settings for X-5 that were previously used on other networks.

[X-5T / X-5R]

1. Unplug X-5 from the outlet.

2. Insert the power plug into the outlet while holding down the push switch on X-5 bottom panel.

3. The network port Link LED (orange) and Status LED (yellow) turn on.
If you continue to hold down the push switch, the Link LED changes from orange to green, and the initialization process is started, and so please release your finger from the push switch.

4. The initialization process is complete when either the Link LED or Status LED turns off and then turns on or starts flashing again.

[X-5SR]

1. Unplug X-5 from the outlet.

2. Insert the power plug into the outlet while holding down the push switch on the X-5 side panel.

3. The network port Link LED (orange) and Status LED (yellow) turn on.
If you continue to hold down the push switch, the Link LED changes from orange to green, and the initialization process is started, and so please release your finger from the push switch.

4. The initialization process is complete when either the Link LED or Status LED turns off and then turns on or starts flashing again.

A. Appendix

A-1. List of Setting Items

Some of the setting items below may apply only to transmitters or receivers (In the tables, "TX" and "RX" are used to indicate whether the item applies to transmitters and receivers, respectively).

Device Configuration			

Host Name		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	Sets the host name.			
Allowable setting range	Any character string (up to15 characters)			
Default value	Prefix ("TX" for transmitter and "RX for receiver) + Last 6 digits of MAC address			

Password		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	Sets the password.			
Allowable setting range	Any character string (up to 7 alphanumeric characters or symbols)			
Default value	None			

Operation Mode		TX		-
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets whether the multicast distribution feature or the Store & Play feature has operation priority.			
Allowable setting range	Video Distribution priority / Store & Play priority / Video Distribution only / Store & Play only			
Default value	Video Distribution priority			
Remarks	Selecting **Store & Play only** will enable synchronization among the receivers. For details, refer to "**User's Guide - Store & Play Feature**". Only X-5SR supports the synchronization among the receivers.			

Monitor Sleep Timer (sec)		TX		-
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the time in seconds until the monitor switches to power-saving mode after video playback is stopped and the standby screen is displayed.			
Allowable setting range	0 (Monitor sleep off) to 1800 (sec)			
Default value	10			

Continuation of Device Configuration

Video/Audio		TX		*
		RX		-
		Web	Basic	-
			Advanced	*
Description	Sets the video/audio import operation mode.			
Allowable setting range	Video/Audio dependent / Video only / Video/Audio independent / Video/Audio disabled			
Default value	Video/Audio dependent			

NTP

NTP Time Synchronization		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Enables/Disables the time synchronization using the NTP feature.			
Allowable setting range	Enable / Disable			
Default value	Disable			

NTP Server Name		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the host name or IP address of the NTP server.			
Allowable setting range	Any string (up to 63 characters) or IP address (0.0.0.0 - 255.255.255.255)			
Default value	None			

Time			

Local Time Zone	TX		*
	RX		*
	Web	Basic	-
		Advanced	*

Description	Sets the time zone.
Allowable setting range	-12:00 to +12:00 (on an hourly basis)
Default value	0:00

System Time	TX		*
	RX		*
	Web	Basic	-
		Advanced	*

Description	Synchronizes the equipment system time with the sending time by the web browser
Allowable setting range	*A fixed value cannot be set. This only allows synchronizing with the sending time by the web browser.
Default value	Undetermined (For details, see the Remarks field.)
Remarks	The system time will stop if the main unit power remains off for a prolonged period of time and the internal battery for storing the system time runs out of power. If the battery runs out of power, the time that the battery ran out of power is stored as the system time until the main unit power is turned on again and the battery for storing the system time is charged.

Browser Time	TX		*
	RX		*
	Web	Basic	-
		Advanced	*

Description	Shows the system time of the PC which the Web browser is opened on.
Allowable setting range	*A fixed value cannot be set.
Default value	Undetermined

Wired LAN Settings

DHCP		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	Selects whether IP address setting by DHCP is used.			
Allowable setting range	Enable / Disable			
Default value	Enable			

IP Address		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	Sets the IP address.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	0.0.0.0			

Subnet Mask		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the subnet mask.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	0.0.0.0			

Default Gateway		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the default gateway address.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	0.0.0.0			

Wireless LAN Settings

DHCP		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	Selects whether IP address setting by DHCP is used.			
Allowable setting range	Enable / Disable			
Default value	Disable			

IP Address		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	Sets the IP address.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	10.x.x.x (Automatically generated from MAC address in wired LAN)			

Subnet Mask		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the subnet mask.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	0.0.0.0			

Default Gateway		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the default gateway address.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	0.0.0.0			

Wireless Mode		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	Sets whether the wireless LAN operates as an access point or client device.			
Allowable setting range	Disable (Wireless LAN is not used)/ Host (Access point)/ Client (Client device)			
Default value	Disable			

Wireless Band		TX		*
		RX		*
		Web	Basic	*
			Advanced	*
Description	The frequency band used in the wireless LAN is selected from the wireless LAN types.			
Allowable setting range	802.11b/g, 802.11a, 802.11n/b/g, 802.11n/a			
Default value	802.11n/a			

Continuation of Wireless LAN Settings

Channel Bandwidth		TX		*
		RX		*
		Web	Basic	-
			Advanced	*

Description	Selects the bandwidth used when operating at IEEE 802.11n.
Allowable setting range	20 MHz / 40 MHz
Default value	40 MHz
Remarks	This is enabled only when "802.11n/b/g" or "802.11n/a" is selected in the setting item "Wireless Band".

Channel		TX		*
		RX		*
		Web	Basic	*
			Advanced	*

Description	Selects the wireless channel.
Allowable setting range	The channels that can be set vary depending on the country. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 36, 40, 44, 48, 52, 56, 60, 64, 149, 153, 157, 161, 165
Default value	36

Transmit Power		TX		*
		RX		*
		Web	Basic	*
			Advanced	*

Description	Selects the transmission strength of the wireless LAN.
Allowable setting range	100% / 50% / 25% / 12%
Default value	100%
Remarks	Changes the setting when you want to reduce signal interference to other wireless networks.

SSID		TX		*
		RX		*
		Web	Basic	*
			Advanced	*

Description	Sets the SSID.
Allowable setting range	Any character string (maximum of 32 characters)
Default value	SILEX X-5

SSID Broadcast		TX		*
		RX		*
		Web	Basic	-
			Advanced	*

Description	Selects whether an SSID broadcast is performed.
Allowable setting range	OFF/ON
Default value	ON

Continuation of Wireless LAN Settings

a/g Multicast Rate	TX		*
	RX		*
	Web	Basic	-
		Advanced	*

Description	Sets the transmission rate when "802.11b/g" or "802.11a" is set for "Wireless Band".
Allowable setting range	6Mbps / 9Mbps / 12Mbps / 18Mbps / 24Mbps / 36Mbps / 48Mbps / 54Mbps
Default value	36Mbps
Remarks	This is enabled only when "802.11b/g" or "802.11a" is selected for the "Wireless Band" setting.

n 20MHz Multicast Rate	TX		*
	RX		*
	Web	Basic	-
		Advanced	*

Description	Sets the transmission rate when "Wireless Band" is set to "802.11n/b/g" or "802.11n/a" and "Channel Bandwidth" is set to "20MHz".
Allowable setting range	S 6.5Mbps / S 19.5Mbps / S 58.5Mbps / S 65Mbps / D 13Mbps / D 26Mbps /D 39Mbps / D 52Mbps / D 78Mbps / D 104Mbps / D 117Mbps / D 130Mbps
Default value	D 104Mbps
Remarks	This is enabled only when "802.11n/b/g" or "802.11n/a" is selected in the "Wireless Band" setting and "20MHz" is selected in the "Channel Bandwidth" setting.

n 40MHz Multicast Rate	TX		*
	RX		*
	Web	Basic	-
		Advanced	*

Description	Sets the transmission rate when "Wireless Band" is set to "802.11n/b/g" or "802.11n/a" and "Channel Bandwidth" is set to "40MHz".
Allowable setting range	S 13.5Mbps / S 40.5Mbps / S 121.5Mbps / S 135Mbps / D 27Mbps / D 54Mbps / D 81Mbps / D 108Mbps / D 162Mbps / D 216Mbps / D 243Mbps / D 270Mbps
Default value	D 108Mbps
Remarks	This is enabled only when "802.11n/b/g" or "802.11n/a" is selected in the "Wireless Band" setting and "40MHz" is selected in the "Channel Bandwidth" setting.

Network Authentication	TX		*
	RX		*
	Web	Basic	*
		Advanced	*

Description	Selects the authentication method.
Allowable setting range	Open / Shared / WPA / WPA2 / WPA MIX
Default value	WPA2

Wireless LAN Settings - WEP Configuration

WEP	TX		*
	RX		*
	Web	Basic	*
		Advanced	*

Description	Selects whether WEP is used.
Allowable setting range	OFF / ON
Default value	OFF

Key Index	TX		*
	RX		*
	Web	Basic	*
		Advanced	*

Description	Selects the WEP key index.
Allowable setting range	1 to 4
Default value	1

WEP Key1-4	TX		*
	RX		*
	Web	Basic	*
		Advanced	*

Description	Sets the WEP key.
Allowable setting range	A hex character string (hexadecimal notation) or ASCII character string can be set. For a 64-bit key, 10 hexadecimal digits or 5 ASCII characters can be used. For a 128-bit key, 26 hexadecimal digits or 13 ASCII characters can be used. The hexadecimal number and ASCII character string are distinguished based on the character string length.
Default value	None
Remarks	WEP Key1 only can be set in the Web Basic Configuration screen.

Wireless LAN Settings - WPA/WPA2 Configuration

WPA Encryption Mode	TX		*
	RX		*
	Web	Basic	*
		Advanced	*

Description	Selects the WPA encryption mode.
Allowable setting range	TKIP / AES / AUTO
Default value	AES

Pre-Shared Key	TX		*
	RX		*
	Web	Basic	*
		Advanced	*

Description	Sets the pre-shared key.
Allowable setting range	Any character string (8 to 63 characters. However, for hexadecimal numbers, the string can be from 8 to 64 characters.)
Default value	silex technology, Inc.

Common

DNS Server (Primary)		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the primary DNS server address.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	0.0.0.0			

DNS Server (Secondary)		TX		*
		RX		*
		Web	Basic	-
			Advanced	*
Description	Sets the secondary DNS server address.			
Allowable setting range	0.0.0.0 to 255.255.255.255			
Default value	0.0.0.0			

Video Configuration

Video Mode		TX		*
		RX		-
		Web	Basic	*
			Advanced	-

Description	Sets the balance between video smoothness and image quality.
Allowable setting range	Movie30 / Movie20 / Movie15 / Picture10 / Picture5 / Picture3 / Picture2 / Picture1 / Custom
Default value	Movie30
Remarks	If **Custom** is set for this setting in **Basic Configuration**, the video parameters must be set in **Advanced Configuration**.

Digital/Analog Mode		TX		*
		RX		-
		Web	Basic	*
			Advanced	*

Description	This is set to match the input signal from the player.
Allowable setting range	Digital / Analog
Default value	Digital

Analog Input		TX		*
		RX		-
		Web	Basic	-
			Advanced	*

Description	Selects the method for recognizing the analog video signal.
Allowable setting range	mode1 (PC mode)/mode2 (TV mode)
Default value	mode1
Remarks	Differences between methods for recognizing the analog video signal
	mode1 (PC mode)
	- Video at analog 640x480 and 720x480 are both run at 640x480.
	mode2 (TV mode)
	- Video at analog 640x480 and 720x480 are both run at 720x480.

Codec Size (KB)		TX		*
		RX		-
		Web	Basic	-
			Advanced	*

Description	Sets the image size (image quality) used per video frame.
Allowable setting range	32 to 1024 (KByte)
Default value	168

Frame Rate		TX		*
		RX		-
		Web	Basic	-
			Advanced	*

Description	Sets the frame rate of the video being distributed.
Allowable setting range	30fps / 20fps / 15fps / 10fps / 5fps / 3fps / 2fps / 1fps
Default value	30fps

Continuation of Video Configuration

Video/Audio Recovery Level		TX		*
		RX		-
		Web	Basic	-
			Advanced	*
Description	Sets the level for compensating for any network data loss in video/audio distribution. A larger value enables fewer breaks in video/audio distribution due to data loss. On the other hand, a smaller value reduces the video/audio delay time, but in a wireless environment, this can increase the likelihood that a break occurs in the distribution. Normally, use at the default value.			
Allowable setting range	0 to 3			
Default value	3			

Video Configuration - Analog Resolution Adjustment

H.Position		TX		*
		RX		-
		Web	Basic	-
			Advanced	*
Description	Sets the horizontal direction of the video capture position for each resolution. A smaller value moves the position to the left, and a larger value moves the position to the right.			
Allowable setting range	-100 to 100			
Default value	0			

V.Position		TX		*
		RX		-
		Web	Basic	-
			Advanced	*
Description	Sets the vertical direction of the video capture position for each resolution. A smaller value moves the position upward, and a larger value moves the position downward.			
Allowable setting range	-50 to 50			
Default value	0			

Clock		TX		*
		RX		-
		Web	Basic	-
			Advanced	*
Description	Sets the sampling frequency of the video signal.			
Allowable setting range	-128 to 127			
Default value	0			

Phase		TX		*
		RX		-
		Web	Basic	-
			Advanced	*
Description	Changes the phase of the clock that samples the video signal.			
Allowable setting range	0 to 31			
Default value	0			

Audio Configuration

Volume	TX		*
	RX		-
	Web	Basic	-
		Advanced	*
Description	Sets the audio volume (recording volume).		
Allowable setting range	0 (mute) to 45		
Default value	23		

Node Configuration

Node Expiration Time (sec)	TX		*
	RX		-
	Web	Basic	-
		Advanced	*
Description	Sets the expiration time of the node where communication was disconnected.		
Allowable setting range	AUTO / 60 / 300 / 1800 / 3600		
Default value	AUTO		

Node List Method	TX		-
	RX		*
	Web	Basic	-
		Advanced	*
Description	Selects the node detection method.		
Allowable setting range	Dynamic(Multicast) / Dynamic(Unicast) / Static		
Default value	Dynamic(Multicast)		
Remarks	If "Static" was selected, Static Node0 - 7 must also be set.		

Static Node 0-7	TX		-
	RX		*
	Web	Basic	-
		Advanced	*
Description	Sets the IP address when Static Node is selected.		
Allowable setting range	0.0.0.0 to 255.255.255.255		
Default value	0.0.0.0		