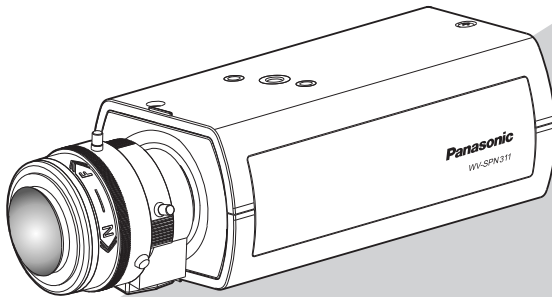


# Panasonic®

## Important Information

### Network Camera

Model No. **WV-SPN311/WV-SPN310**



WV-SPN311

Please purchase the recommended lens separately.



Before attempting to connect or operate this product, please read these instructions carefully and save this manual for future use.

The model number is abbreviated in some descriptions in this manual.

**WARNING:**

- To prevent injury, this apparatus must be securely attached to the wall/ceiling in accordance with the installation instructions.
- To prevent fire or electric shock hazard, do not expose this apparatus to rain or moisture.
- The apparatus should not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, should be placed on the apparatus.
- All work related to the installation of this product should be made by qualified service personnel or system installers.
- The installation shall be carried out in accordance with all applicable installation rules.
- The connections should comply with local electrical code.

**CAUTION:**

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- The network camera is only intended for a connection to an ethernet or PoE network without routing to the outside plant.
- Batteries (battery pack or batteries installed) shall not be exposed to excessive heat such as sunlight, fire or the like.

For Canada

CAN ICES-3(A)/NMB-3(A)

For U.S.A.

NOTE: 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 likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Caution: To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

For U.S.A.

The model number and serial number of this product may be found on the surface of the unit.

You should note the model number and serial number of this unit in the space provided and retain this book as a permanent record of your purchase to aid identification in the event of theft.

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

For Europe

We declare under our sole responsibility that the product to which this declaration relates is in conformity with the standard or other normative document following the provisions of Directive 2004/108/EC.

Wir erklären in alleiniger Verantwortung, daß das Produkt, auf das sich diese Erklärung bezieht, mit der folgenden Norm oder normativen Dokument übereinstimmt. Gemäß den Bestimmungen der Richtlinie 2004/108/EC.

Nous déclarons sous notre propre responsabilité que le produit auquel se réfère la présente déclaration est conforme à la norme spécifiée ou à tout autre document normatif conformément aux dispositions de la directive 2004/108/CE.

Nosotros declaramos bajo nuestra única responsabilidad que el producto a que hace referencia esta declaración está conforme con la norma u otro documento normativo siguiendo las estipulaciones de la directiva 2004/108/CE.

Noi dichiariamo sotto nostra esclusiva responsabilità che il prodotto a cui si riferisce la presente dichiarazione risulta conforme al seguente standard o altro documento normativo conforme alle disposizioni della direttiva 2004/108/CE.

Wij verklaren als enige aansprakelijke, dat het product waarop deze verklaring betrekking heeft, voldoet aan de volgende norm of ander normatief document, overeenkomstig de bepalingen van Richtlijn 2004/108/EC.

Vi erklærer os eneansvarlige for, at dette produkt, som denne deklaration omhandler, er i overensstemmelse med standard eller andre normative dokumenter i følge bestemmelserne i direktiv 2004/108/EC.

Vi deklarerar härmed vårt fulla ansvar för att den produkt till vilken denna deklaration hänvisar är i överensstämmelse med standarddokument eller annat normativt dokument som framställs i direktiv 2004/108/EC.

Ilmoitamme yksinomisella vastuullamme, että tuote, jota tämä ilmoitus koskee, noudattaa seuraavaa standardia tai muuta ohjeellista asiakirjaa, jotka noudattavat direktiivin 2004/108/EC sääöksiä.

Vi erklærer oss alene ansvarlige for at produktet som denne erklæringen gjelder for, er i overensstemmelse med følgende norm eller andre normgivende dokumenter som følger bestemmelsene i direktiv 2004/108/EC.

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\* For information about the installation tasks, refer to the provided Installation Guide.

## Important safety instructions

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



- 10) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 11) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

## Limitation of liability

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- (3) ALL MALFUNCTIONS OR TROUBLES FROM UNAUTHORIZED DISASSEMBLE, REPAIR OR MODIFICATION OF THE PRODUCT BY THE USER, REGARDLESS OF THE CAUSE OF THE MALFUNCTION OR TROUBLE;
- (4) INCONVENIENCE OR ANY LOSS ARISING WHEN IMAGES ARE NOT DISPLAYED, DUE TO ANY REASON OR CAUSE INCLUDING ANY FAILURE OR PROBLEM OF THE PRODUCT;
- (5) ANY PROBLEM, CONSEQUENTIAL INCONVENIENCE, OR LOSS OR DAMAGE, ARISING OUT OF THE SYSTEM COMBINED BY THE DEVICES OF THIRD PARTY;
- (6) ANY CLAIM OR ACTION FOR DAMAGES, BROUGHT BY ANY PERSON OR ORGANIZATION BEING A PHOTOGENIC SUBJECT, DUE TO VIOLATION OF PRIVACY WITH THE RESULT OF THAT SURVEILLANCE-CAMERA'S PICTURE, INCLUDING SAVED DATA, FOR SOME REASON, BECOMES PUBLIC OR IS USED FOR ANY PURPOSE;
- (7) LOSS OF REGISTERED DATA CAUSED BY ANY FAILURE.

# Preface

The network cameras WV-SPN311/WV-SPN310 are designed to operate using a PC on a network (10BASE-T/100BASE-TX).  
By connecting to a network (LAN) or the Internet, images and audio from the camera can be monitored on a PC via a network.

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**Note:**

- It is necessary to configure the network settings of the PC and its network environment to monitor images from the camera on the PC. It is also necessary to install a web browser on the PC.
- 

## About notations

The following notations are used when describing the functions limited for specified models. The functions without the notations are supported by all models.

- SPN311** The functions with this notation are available when using the model WV-SPN311.
- SPN310** The functions with this notation are available when using the model WV-SPN310.

# Main functions

## Equipped with a new codec engine

The redesigned codec engine can output up to 60 frames per second in HD quality.

## The equipped enhanced Super Dynamic function makes it possible to achieve 133 dB dynamic range.

By combining images taken at different shutter speeds and using pixel level brightness correction, more natural looking pictures can be taken even when objects have large differences in illumination. (When 60 fps is selected, the Super Dynamic function is automatically set to off.)

## Equipped with a high-sensitivity MOS sensor and noise reduction function (MNR)

The high-sensitivity sensor and new method of noise reduction (MNR: Multi-process Noise Reduction)<sup>\*1</sup> make it possible to take easy-to-view images even under low illumination conditions.

\*1 With the multi-process noise reduction that prioritizes noise reduction for central areas and resolution for edge areas where noise is prominent, MNR is able to produce clear images while limiting noise across the entire image.

## Auto back focus (ABF) function **SPN311**

Auto back focus (ABF) ensures easy installation and stable focus in both color and black & white modes.

## Equipped with 1 SD memory card<sup>\*2</sup> slot and enhanced image recording

- By using SD memory card, images can be recorded over long periods of time.

\*2 SDXC/SDHC/SD memory card is described as SD memory card.

## Extension Software support

Installing Extension Software<sup>\*3</sup> makes it possible to add functions that use image data.

\*3 For further information about Extension Software refer to our website (<http://security.panasonic.com/pss/security/support/info.html>).

## About the user manuals

There are 3 sets of operating instructions for the WV-SPN311/WV-SPN310 as follows.

- Important Information (this document): Provides information about the cautions required for safely using and installing this camera.
- Installation Guide\*: Explains how to connect devices.
- Operating Instructions (included in the CD-ROM): Explains how to perform the settings and how to operate this camera.

Adobe® Reader® is required to read these operating instructions on the provided CD-ROM.

When the Adobe Reader is not installed on the PC, download the latest Adobe Reader from the Adobe web site and install it.

\* English screens are used in these operating instructions and leaflets.

## System requirements for a PC

CPU:	Intel® Core™ 2 Duo 2.4 GHz or faster recommended
Memory:	A minimum of 1 GB or more (for 32-bit OSs), 2 GB or more (for 64-bit OSs) memory is required when using Microsoft® Windows® 8.1, Microsoft® Windows® 8, Microsoft® Windows® 7. A minimum of 1 GB or more memory is required when using Microsoft® Windows Vista®.
Network interface:	10BASE-T/100BASE-TX 1 port
Audio interface:	Sound card (when using the audio function)
Monitor:	Image capture size: 1024 x 768 pixels or more Color: 24-bit True color or better
OS:	Microsoft® Windows® 8.1 Microsoft® Windows® 8 Microsoft® Windows® 7 Microsoft® Windows Vista®
Web browser:	Windows® Internet Explorer® 11 (32-bit) Windows® Internet Explorer® 10 (32-bit) Windows® Internet Explorer® 9 (32-bit) Windows® Internet Explorer® 8 (32-bit) Windows® Internet Explorer® 7 (32-bit)
Others:	CD-ROM drive (It is necessary to read the operating instructions and use the software on the provided CD-ROM.) Adobe® Reader® (It is necessary to view the PDF file on the provided CD-ROM.)



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**IMPORTANT:**

- When using a PC that does not meet these requirements, displaying of images may become slower or the web browser may become inoperable.
  - Audio may not be heard if a sound card is not installed on a PC. Audio may be interrupted depending on the network environment.
  - Microsoft Windows RT, Microsoft Windows 7 Starter and Microsoft Windows Vista Starter are not supported.
  - When using Microsoft Windows 8.1 or Microsoft Windows 8, use it in the desktop. The software cannot be used in the Modern UI design.
- 

**Note:**

- For further information about PC system requirements and precautions for when using Microsoft Windows 8.1, Microsoft Windows 8, Microsoft Windows 7, Microsoft Windows Vista or Windows Internet Explorer, click “Manual” - “Open” from the supplied CD-ROM and refer to “Notes on Windows® / Internet Explorer® versions”.
  - For information on the operation verification of the supported operating systems and web browsers, refer to our website at <http://security.panasonic.com/pss/security/support/index.html>.
- 

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## Copyright

Distributing, copying, disassembling, reverse compiling and reverse engineering of the software provided with this product are all expressly prohibited. In addition, exporting any software provided with this product violating export laws is prohibited.

# Network security

As you will use this unit connected to a network, your attention is called to the following security risks.

- ① Leakage or theft of information through this unit
- ② Use of this unit for illegal operations by persons with malicious intent
- ③ Interference with or stoppage of this unit by persons with malicious intent

It is your responsibility to take precautions such as those described below to protect yourself against the above network security risks.

- Use this unit in a network secured by a firewall, etc.
- If this unit is connected to a network that includes PCs, make sure that the system is not infected by computer viruses or other malicious entities (using a regularly updated anti-virus program, anti-spyware program, etc.).
- Protect your network against unauthorized access by restricting users to those who log in with an authorized user name and password.
- Apply measures such as user authentication to protect your network against leakage or theft of information, including image data, authentication information (user names and passwords), alarm mail information, FTP server information and DDNS server information.
- After the unit is accessed by the administrator, make sure to close the browser.
- Change the administrator password periodically.
- Do not install the camera in locations where the camera or the cables can be destroyed or damaged by persons with malicious intent.

# Precautions

## **Refer installation work to the dealer.**

Installation work requires technique and experience. Failure to observe this may cause fire, electric shock, injury, or damage to the product. Be sure to consult the dealer.

## **Stop the operation immediately when something is wrong with this product.**

When smoke goes up from the product, the smell of smoke comes from the product, or the exterior of the product has deteriorated, continued use will cause a fire or fall of the product resulting in injury, or damage to the product. In this case, turn the power off immediately and contact qualified service personnel for service.

## **Do not attempt to disassemble or modify this product.**

Failure to observe this may cause fire or electric shock. Consult the dealer for the repair or inspections.

## **Do not insert any foreign objects.**

Fire or electrical shock may be caused if water or any foreign objects, such as metal objects, enter inside the unit. Turn the power off immediately and contact qualified service personnel for service.

## **Select an installation area that can support the total weight.**

Selecting an inappropriate installation surface may cause this product to fall down or topple over, resulting in injury or accidents. Installation work shall be started after sufficient reinforcement.

## **Periodic inspections shall be conducted.**

Rust on the metal parts or screws may cause a fall of the product resulting in injury or accidents. Consult the dealer for the inspections.

## **Do not use this product in an inflammable atmosphere.**

Failure to observe this may cause an explosion resulting in injury.

## **Avoid installing this product in the locations where salt damage occurs or corrosive gas is produced.**

Otherwise, the mounting portions will deteriorate and accidents such as a fall of the product may occur.

## **The screws and bolts must be tightened to the specified torque.**

Failure to observe this may cause a drop resulting in injury or accidents.

## **Do not install this product in locations subject to vibration.**

Loosening of mounting screws or bolts may cause a fall of the product resulting in injury or accidents.

## **Do not strike or give a strong shock to this product.**

Failure to observe this may cause fire or injury.

## **Turn the power off when do wiring of this product.**

Failure to observe this may cause electric shock. In addition, short circuit or wrong wiring may cause fire.

## **Keep SDXC/SDHC/SD memory cards away from infants and children.**

Otherwise, they may swallow the cards by mistake.

In this case, consult a doctor immediately.

## **Do not install or clean the camera, or touch this product, the power cable or the connected cables during thunder storms.**

Failure to observe this may cause electric shock.

**Install this product in a location high enough to avoid people and objects from bumping the product.**

Failure to observe this may cause injury.

**Do not hang down from this product or use this product as a pedestal.**

Failure to observe this may cause a drop resulting in accidents.

**Do not damage the power cable.**

Do not damage, fabricate, twist, stretch, bundle, or forcibly bend the power cable. Do not place heavy objects on it, and keep it away from heat sources.

Use of a damaged power cable may cause electric shock, short circuit, or fire. Consult the dealer for repair.

**Correctly perform all wiring**

Short circuits in the wiring or incorrect wiring may cause fire or electrical shock.

**The measures of protection against a fall of this product shall be taken.**

Failure to observe this may cause a drop resulting in injury or accidents. Be sure to install the safety wire.

**Turn the power off when cleaning this product.**

Failure to observe this may cause injury.

**Do not rub the edges of metal parts with your hand.**

Failure to observe this may cause injury.

### **[Precautions for use]**

**To keep on using with stable performance**

Do not use this product in hot and humid conditions for a long time. Failure to observe this causes component degradation resulting in life shortening of this product. Do not expose this product to direct heat sources such as a heater.

**This product is designed to be used indoors. This product is not operable outdoors.**

**Make sure that the product does not become wet.**

Keep this camera away from water and moisture.

**This product has no power switch.**

When turning off the power, disconnect the power supply from the 12 V DC power supply or the PoE device.

Before turning off the camera power switch, make sure that the SD MOUNT indicator (green) is turned off. If you turn off the camera power switch while the SD MOUNT indicator (green) is lit or flashing, the recorded data may be corrupted or damaged.

**Direct current symbol (  )**

The product is suitable for direct current only.

**Handle this product with care.**

Do not drop this product, nor apply shock or vibration to the product. Failure to observe this may cause trouble.

**About the battery**

A battery is installed inside the camera. Do not leave the battery exposed in environments of excessive heat as a result of sunlight or fire.

**Do not touch the lens surface with your bare hands.**

A dirty lens surface causes deterioration of picture quality.

**About the PC monitor**

When displaying the same image on the monitor for a long time, the monitor may be damaged. It is recommended to use a screen-saver.

**When an error is detected, this product will restart automatically.**

This product will be inoperable for around 2 minutes after the restart just as when the power is turned on.

### **About the automatic status detection function**

When this product malfunctions due to exogenous noise, etc. for 30 seconds or more, the product will automatically reset and will return to normal state. When the product is reset, initialization will be carried out as when the power of the product is turned on. When the product repeatedly resets, exogenous noise level around the product may be high and that may cause malfunction. Contact your dealer for instructions.

### **Transmission interval**

Image transmission interval may become slow depending on the network environment, PC performance, shooting subject, access number, etc.

### **Periodically images on the screen appear to be distorted**

When the camera is installed in a location where it is subject to small vibrations (for example, when it is installed near devices that vibrate), images may appear distorted and stretched lengthways. This phenomenon is a characteristic of image pickup devices that use CMOS sensors and is caused by the relationship between the periodic movements of the camera and the timing that the image sensor reads images. This is not a problem with the camera. To reduce the possibility of this phenomenon occurring, install the camera in a secure location.

### **About SD memory card**

- To remove the SD memory card, hold down the SD ON/OFF button for about 2 seconds. When the flashing SD MOUNT lamp goes out, you can remove the SD memory card.
- When using an SD memory card, format it using this product. Recorded data on the SD memory card will be deleted when formatted. If an unformatted SD memory card or an SD memory card formatted with other devices is used, this product may not work properly or performance deterioration may be caused. Refer to the

Operating Instructions on the provided CD-ROM for how to format an SD memory card.

- When some SD memory cards are used with this product, the product may not work properly or performance deterioration may be caused. Use the SD memory cards recommended in page 23.
- When using an SD memory card supporting Class 10 of the speed class, use a UHS-I (Ultra High Speed-I) compliant card.

### **About the MOS image sensor**

- When continuously shooting a bright light source such as a spotlight, the color filter of the MOS image sensor may become deteriorated and this may cause discoloration. Even when changing the fixed shooting direction after continuously shooting a spotlight for a certain period, the discoloration may remain.
- When shooting fast-moving subjects or objects crossing the shooting area may look to be bending askew.

### **Cleaning this product body**

Be sure to turn off the power before cleaning. Failure to observe this may cause injury. Do not use benzine, thinner, alcohol, or any other types of solvents or detergents. Otherwise, it may cause discoloration. When using a chemical cloth for cleaning, read the caution provided with the chemical cloth product.

### **Cleaning the lens**

Use a lens cleaning paper (used to clean camera lenses or lenses of spectacles). When using solvent, use an alcohol solvent and do not use a thinner or a glass cleaner.

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SEE [HTTP://WWW.MPEGLA.COM](http://www.mpegla.com)

### **Code label**

The code labels (accessory) are required at inquiry for trouble. Use caution not to lose these labels. It is recommended to paste one of the labels onto the CD-ROM case.

### **Equipment classification and power source indication label**

Refer to the indication label on the bottom side of this unit for the equipment classification, power source, and other information.

### **Product disposal/transfer**

Data saved on this product or a storage device used with this product may lead to personal information leakage. When it is necessary to dispose or give this product to someone, even when for repair, make sure that there is no data on this product.

# Precautions for installation

**Panasonic assumes no responsibility for injuries or property damage resulting from failures arising out of improper installation or operation inconsistent with this documentation.**

**For information about the installation tasks, refer to the provided Installation Guide.**

## Power supply

This product has no power switch.

When turning off the power, turn off a Power Supply or remove a power cable. When the power cable of the product is connected to the power supply device, the power will be supplied to the product.

Before cleaning the product, make sure that the power cable is not connected to the main power supply.

## Installation area for this product

Select an appropriate place for the installation area (such as a strong wall or ceiling) in your particular environment.

- Make sure that the installation area is strong enough to hold this product, such as a concrete ceiling.
- Install the camera in the foundation area of the architecture or where sufficient strength is assured.
- Do not mount the product on a plaster board or a wooden section because they are too weak. If the product is unavoidably mounted on such a section, the section shall be sufficiently reinforced.

## This camera is designed to be used indoors.

This product is not operable outdoors.

Do not expose this camera to direct sunlight for hours and do not install the product near a heater or an air conditioner. Otherwise, it may cause deformation, discoloration and malfunction. Keep this camera away from water and moisture.

## Do not place this product in the following places:

- Locations where a chemical agent is used such as a swimming pool
- Locations subject to moisture or oil smoke such as a kitchen
- Locations that have a specific environment that is subject to an inflammable atmosphere or solvents
- Locations where a radiation, an X-ray, a strong radio wave or a strong magnetic field is generated
- Locations where corrosive gas is produced, locations where it may be damaged by briny air such as seashores
- Locations where the temperature is not within the specified range (☞ page 20)
- Locations subject to vibrations, such as on vehicles, marine vessels, or above product lines (This product is not designed for on-vehicle use.)
- Locations where it may get wet from rain or water splash (including under the eaves, etc.)
- Locations subject to moisture or dust
- Locations subject to condensation as the result of severe changes in temperature

## Check before installation

Compatibility of devices is restricted. Before installation, check the ratings and dimensions of the devices to be used.

Contact your dealer for details.

## Before installation

- When mounting the camera to a ceiling or wall, a ceiling or wall mount bracket must be separately procured. The size of the bracket mounting hole is 1/4-20UNC camera tripod mounting hole (depth 9 mm {11/32 inches}).
- Anchor bolts and screws used to mount the camera on the ceiling or wall are not supplied. Prepare bolts and screws that match the structure and materials of the installation location and satisfy the performance and reliability specifications shown below.

### <When mounting on a ceiling>

Recommended screw or anchor bolt M6 or M8 x 4 pcs.

Minimum pull-out strength (per 1 pc.)  
562 N {126 lbf} (mount bracket: approx. 260 g {0.57 lbs}), camera: 400 g {0.88 lbs}, lens: 40 g {0.09 lbs})

### <When mounting on a wall>

Recommended screw or anchor bolt M6 or M8 x 4 pcs.

Minimum pull-out strength (per 1 pc.)  
724 N {163 lbf} (mount bracket: approx. 420 g {0.93 lbs}), camera: 400 g {0.88 lbs}, lens: 40 g {0.09 lbs})

\*When mounting on either a ceiling or wall, one M4 screw with minimum pull-out strength (per 1 pc.) of 24.5 N {5.5 lbf} is required for the attachment of the safety wire.

## Screw tightening

- The screws and bolts must be tightened with an appropriate tightening torque according to the material and strength of the installation area.
- Do not use an impact driver. Use of an impact driver may damage the screws or cause tightening excessively.
- When a screw is tightened, make the screw at a right angle to the surface. After tightening the screws or bolts, perform checks to ensure that the tightening is sufficient enough so that there is no movement or looseness.

## Protection from lightning

When connecting to a network using the network cable of this product, observe the following.

- When wiring for the network, design and engineer not to be affected by lightning.

## Radio disturbance

When this product is used near TV/radio antenna, strong electric field or magnetic field (near a motor, a transformer or a power line), images may be distorted and noise may be produced.

## PoE (Power over Ethernet)

Use a PoE hub/device that is compliant with IEEE802.3af standard.

## Router

When connecting this product to the Internet, use a broadband router with the port forwarding function (NAT, IP masquerade). Refer to the Operating Instructions on the provided CD-ROM for further information about the port forwarding function.

## Time & date setting

It is necessary to set the time & date before putting this product into operation. Refer to the Operating Instructions on the provided CD-ROM for descriptions of how to perform the settings.

**Make sure to remove this product if it will no longer be used.**



# Troubleshooting

**Before asking for repairs, check the symptoms with the following table.**

Contact your dealer if a problem cannot be solved even after checking and trying the solution in the table or a problem is not described below.

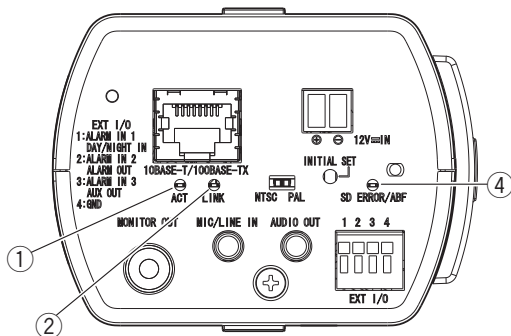
Symptom	Cause/solution	Reference pages
<b>Power is not turned on.</b>	<p><b>When using a PoE device for power supply</b></p> <ul style="list-style-type: none"> <li>• Are the PoE device and the network connector connected using a LAN cable (category 5 or better)? Check whether the connection is appropriately established.</li> <li>• Depending on the PoE device, the power supply will stop when the demanded power exceeds its total power limit for all PoE ports. Refer to the operating instructions of the PoE device in use.</li> <li>• When connecting both of the 12 V DC power supply and the PoE device for power supply, the network connection may not be established. Turn down the power supply from the PoE device.</li> </ul>	Installation Guide
	<p><b>When using DC power supply</b></p> <ul style="list-style-type: none"> <li>• Is the 12 V DC power cable plug (accessory) firmly inserted into the 12 V DC power terminals of the camera? Confirm the power plug is firmly connected.</li> <li>• Is the AC adaptor in use compliant with the Specifications? Check the Specifications regarding AC adaptor.</li> </ul>	
<b>The LINK indicator does not light in orange even when the network cable is connected to the camera.</b>	<ul style="list-style-type: none"> <li>• Is the LAN cable connected appropriately? Connect the LAN cable appropriately.</li> <li>• Is the hub or router connected to the camera operating appropriately? Check if the hub or router in use is operating appropriately.</li> <li>• Isn't the LAN cable connected to the camera broken? Replace the cable with another one.</li> </ul>	Installation Guide
<p><b>SD ERROR/ABF indicator lights red or blinks red</b> (SPN311)</p> <p><b>SD ERROR/F.A. indicator lights red or blinks red</b> (SPN310)</p>	<ul style="list-style-type: none"> <li>• Isn't the write protect switch of the inserted SD memory card set to "LOCK"? Unlock the write protect switch of the SD memory card.</li> <li>• Hasn't the inserted SD memory card been formatted on a PC? Use an SD memory card formatted on the camera. Or install the software to format the SD memory card on the PC. Refer to our website (<a href="http://security.panasonic.com/pss/security/support/info.html">http://security.panasonic.com/pss/security/support/info.html</a>) for further information about the supported software.</li> <li>• Isn't the inserted SD memory card faulty? Replace the card with a normal one.</li> </ul>	Operating Instructions (included in the CD-ROM)

Symptom	Cause/solution	Reference pages
<p><b>Audio input contains noise.</b></p>	<ul style="list-style-type: none"> <li>• Check the following.               <ul style="list-style-type: none"> <li>• Grounding of the camera, a switching hub or peripheral devices are not done.</li> <li>• The camera is used near an electrical power line.</li> <li>• The camera is used near a device which produces strong magnetic field or radio waves (such as near a TV/radio antenna, a motor of an air conditioning system, a transformer, etc.)</li> </ul> </li> </ul> <p>When audio input still contains noise even after checking the above possibilities, use a powered microphone or connect audio output with low output impedance.</p>	<p>16</p>

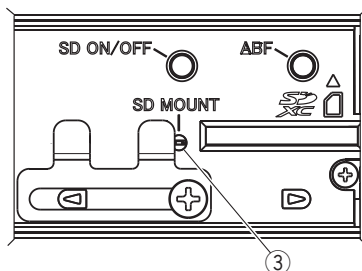
## About the indicator

The indicator will light or blink as follows depending on the camera status.

Indicator type and operation state	Change of indicator indication
① <b>ACT indicator</b>	
When data is being sent via the network camera	Blinks green (accessing)
② <b>LINK indicator</b>	
When the camera is able to communicate with the connected device	Lights orange
③ <b>SD MOUNT indicator</b>	
• When an SD memory card is inserted and could be recognized	Lights off → Blinks green → Lights off
• When data can be saved after the SD memory card is inserted and the SD ON/OFF button is pressed	Lights off → Lights green
• When data can be saved to the SD memory card	Lights green
• When the SD memory card is removed after holding down the SD ON/OFF button for about 2 seconds	Lights green → Blinks green → Lights off
• When data cannot be saved to the SD memory card because an abnormality was detected or the SD memory card is configured not to be used	Lights off
④ <b>SD ERROR/ABF indicator</b> (SPN311) <b>SD ERROR/F.A. indicator</b> (SPN310)	
• When ABF (Auto Back Focus) operation is being executed (SPN311)	Blinks red (Interval of 1 time/ second)
• When the focus assist function is activated (SPN310)	Blinks red (1 time)
• When the focus ring is positioned near the best focus position (SPN310)	Blinks red (1 time)
• When the set is being started	Lights red
• When an SD memory card is recognized normally	Lights red → Lights off
• When an abnormality is detected in SD memory card after the camera has started	Lights red



<Rear view>



<Side slide cover interior>

<Example of WV-SPN311>

# Specifications

## • Basic

Power source *1:	DC 12 V, PoE (IEEE802.3af compliant)
Power consumption *1:	<p><b>SPN311</b></p> <p>DC 12 V : 350 mA/Approx. 4.2 W PoE DC 48 V : 140 mA/Approx. 6.8 W (Class 2 device)</p> <p><b>SPN310</b></p> <p>DC 12 V : 310 mA/Approx. 3.8 W PoE DC 48 V : 120 mA/Approx. 5.8 W (Class 2 device)</p>
Operating environment	
Ambient operating temperature:	-10 °C to +50 °C {14 °F to 122 °F} (Power On range: -10 °C to +50 °C {14 °F to 122 °F})
Ambient operating humidity:	10 % to 90 % (no condensation)
Storage environment	
Storage temperature:	-30 °C to +60 °C {-22 °F to 140 °F}
Storage humidity:	10 % to 95 % (no condensation)
Monitor output (for adjustment):	VBS: 1.0 V [p-p]/75 Ω, composite, RCA jack An NTSC or PAL signal can be outputted from camera (use the selector switch or software to select either NTSC or PAL signal).
External I/O terminals:	ALARM IN 1 (DAY/NIGHT IN) (x1) <b>SPN311</b> ALARM IN 1 (x1) <b>SPN310</b> ALARM IN 2 (ALARM OUT) (x1) ALARM IN 3 (AUX OUT) (x1)
Microphone/line input:	ø3.5 mm monaural mini jack Input impedance: Approx. 2 kΩ (unbalanced)
<b>SPN311</b> For microphone input:	Recommended applicable microphone: Plug-in power type (option) Supply voltage: 2.5 V ±0.5 V Recommended sensitivity of microphone: -48 dB±3 dB (0 dB=1 V/Pa, 1 kHz)
For line input:	Input level: Approx. -10 dBV
Built-in microphone:	Electret condenser microphone
<b>SPN310</b>	
Audio output:	ø3.5 mm stereo mini jack (monaural output)
<b>SPN311</b>	Output impedance: Approx. 600 Ω (unbalanced) Output level: -20 dBV
Dimensions:	75.0 mm (W) x 57.0 mm (H) x 143.5 mm (D) {2-15/16 inches (W) x 2-1/4 inches (H) x 5-21/32 inches (D)} (excluding lens/ power cord plug)
Mass:	<b>SPN311</b> Approx. 400 g {0.88 lbs}
	<b>SPN310</b> Approx. 370 g {0.82 lbs}
Finish:	PC/ABS resin (Sail white)

\*1 Refer to our website (<http://security.panasonic.com/pss/security/support/info.html>) for further information about Power source and Power consumption information.

• **Camera**

Image sensor:	1/3 type MOS image sensor Built-in primary color filter
Effective pixels:	1296 (H) x 1041 (V), Approx. 1.35 mega pixels
Scanning area:	5.38 mm (H) x 3.02 mm (V) {7/32 inches (H) x 1/8 inches (V)}
Scanning system:	Progressive
Minimum illumination:	<p><b>SPN311</b></p> <p>Color: 0.01 lx {0.00093 footcandle} (F1.4, Maximum shutter: Off (1/30 s), AGC: High) 0.0007 lx {0.00007 footcandle} (F1.4, Maximum shutter: max. 16/30 s, AGC: High)*</p> <p>BW : 0.003 lx {0.00028 footcandle} (F1.4, Maximum shutter: Off (1/30 s), AGC: High) 0.0002 lx {0.00002 footcandle} (F1.4, Maximum shutter: max. 16/30 s, AGC: High)*</p> <p><b>SPN310</b></p> <p>Color: 0.01 lx {0.00093 footcandle} (F1.4, Maximum shutter: Off (1/30 s), AGC: High) 0.0007 lx {0.00007 footcandle} (F1.4, Maximum shutter: max. 16/30 s, AGC: High)*</p> <p>BW : 0.008 lx {0.0007 footcandle} (F1.4, Maximum shutter: Off (1/30 s), AGC: High) 0.0005 lx {0.00005 footcandle} (F1.4, Maximum shutter: max. 16/30 s, AGC: High)*</p> <p>* Converted value</p>
Super Dynamic:	On (High)/ On (Normal)/ Off When 60 fps is selected, the Super Dynamic function is automatically set to off.
Dynamic range:	133 dB typ. (Super Dynamic: On)
Face SD (Super Dynamic):	On/ Off (only when Super Dynamic: On)
Gain (AGC):	On (Low)/ On (Mid)/ On (High)/ Off
Adaptive black stretch:	On/ Off (only when Super Dynamic: Off)
Back light compensation (BLC):	On/ Off (only when Super Dynamic: Off)
Fog compensation:	On/ Off (only when Super Dynamic/ Adaptive black stretch: Off)
High light compensation (HLC):	On/ Off (only when Super Dynamic/ Back light compensation: Off)
Light control mode setting:	Outdoor scene/ Indoor scene (50 Hz)/ Indoor scene (60 Hz)/ ELC/ Fix shutter
Shutter speed:	1.3 mega pixel [16:9] (60 fps mode) OFF (1/60), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 Other than 1.3 mega pixel [16:9] (60 fps mode) OFF (1/30), 3/100, 3/120, 2/100, 2/120, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
Maximum shutter:	max. 1/1000 s, max. 1/500 s, max. 1/250 s, max. 1/120 s, max. 2/120 s, max. 1/100 s, max. 2/100 s, max. 1/60 s, max. 1/30 s, max. 2/30 s, max. 4/30 s, max. 6/30 s, max. 10/30 s, max. 16/30 s

Color/BW:	<p><b>SPN311</b></p> <p>Off/ On/ Auto1 (Normal)/ Auto2 (IR Light)/ Auto3 (SCC)</p> <p><b>SPN310</b></p> <p>Off/ Auto</p>
White balance:	ATW1/ ATW2/ AWC
Digital noise reduction:	High/ Low
Privacy zone:	On/ Off (up to 8 zones available)
Camera title on screen:	On/ Off Up to 20 characters (alphanumeric characters, marks)
Video Motion Detection (VMD):	On/ Off, 4 areas available
Back focus:	Auto back focus/ Focus/ Adjusting method
<b>SPN311</b>	
Lens drive:	DC drive
Lens mount:	CS-mount

### • Network

Network:	10BASE-T/100BASE-TX, RJ45 connector
Resolution:	1.3 mega pixel [16:9] (30 fps mode)/1.3 mega pixel [16:9] (60 fps mode)
H.264	
JPEG (MJPEG)	1280x720, 640x360, 320x180, 160x90 1.3 mega pixel [4:3] (30 fps mode) 1280x960, 800x600, VGA, 400x300, QVGA, 160x120
Image compression method:	<p>H.264*<sup>1</sup></p> <p>Image quality (Constant bit rate/Best effort): Low (Motion priority)/ Normal/ Fine (Image quality priority) (VBR): 0 Super fine/ 1 Fine/ 2/ 3/ 4/ 5 Normal/ 6/ 7/ 8/ 9 Low Transmission type: Unicast/Multicast Max bit rate (per client)*: (Constant bit rate/ VBR/ Frame rate/ Best effort/ Advanced VBR) 64 kbps/ 128 kbps*/ 256 kbps*/ 384 kbps*/ 512 kbps*/ 768 kbps*/ 1024 kbps*/ 1536 kbps*/ 2048 kbps*/ 3072 kbps*/ 4096 kbps*/ 6144 kbps*/ 8192 kbps*/ 10240 kbps*/ 12288 kbps*/ 14336 kbps*/ 16384 kbps*/ 20480 kbps*/ 24576 kbps*/ 30720 kbps*/ 40960 kbps*</p> <p>* The available range of the H.264 bit rate varies depending on the setting selected for "Image capture size", etc. Frame rate*: (Frame rate) 1 fps/ 3 fps/ 5 fps*/ 7.5 fps*/ 10 fps*/ 12 fps*/ 15 fps*/ 20 fps*/ 30 fps*/ 60 fps*</p> <p>* "Frame rate*" is limited to "Max bit rate (per client)*". When a value with an asterisk (*) on the right of it is selected, the actual frame rate may be lower than the value selected.</p> <hr/> <p>JPEG (MJPEG)</p> <p>Image quality: 0 SUPER FINE/ 1 FINE/ 2/ 3/ 4/ 5 NORMAL/ 6/ 7/ 8/ 9 LOW (10 steps: 0-9) Transmission type: Pull/ Push Refresh interval: 0.1 fps - 30 fps (JPEG frame rate will be restricted when displaying both JPEG and H.264 images.)</p>

Cropping function:	<ul style="list-style-type: none"> <li>• Off/ JPEG(1)/ JPEG(2)/ JPEG(3)/ H.264(1)/ H.264(2)/ H.264(3)/ H.264(4)/ H.264(all)</li> <li>• Alarm action On/ Off</li> </ul>
Audio compression method:	G.726 (ADPCM) 32 kbps/ 16 kbps, G.711 64 kbps, AAC-LC*2
Bandwidth control:	Unlimited/ 64 kbps/ 128 kbps/ 256 kbps/ 384 kbps/ 512 kbps/ 768 kbps/ 1024 kbps/ 2048 kbps/ 4096 kbps/ 8192 kbps
Protocol:	<p>IPv6: TCP/IP, UDP/IP, HTTP, HTTPS, FTP, SMTP, DNS, NTP, SNMP, DHCPv6, RTP, MLD, ICMP, ARP</p> <p>IPv4: TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, SMTP, DHCP, DNS, DDNS, NTP, SNMP, UPnP, IGMP, ICMP, ARP</p>
OS*3:	<p>Microsoft Windows 8.1</p> <p>Microsoft Windows 8</p> <p>Microsoft Windows 7</p> <p>Microsoft Windows Vista</p>
Browser*3:	<p>Windows Internet Explorer 11 (32-bit)</p> <p>Windows Internet Explorer 10 (32-bit)</p> <p>Windows Internet Explorer 9 (32-bit)</p> <p>Windows Internet Explorer 8 (32-bit)</p> <p>Windows Internet Explorer 7 (32-bit)</p>
Maximum concurrent access number:	<p>14 (Number of sessions that can connect to cameras at the same time)</p> <p>* Depends on network conditions</p>
FTP client:	Alarm image transmission, FTP periodic transmission (When the FTP transmission is failed, backup on an optional SD memory card is available.)
Multi-screen:	<p>Up to 16 camera images can be displayed simultaneously on a multi-screen.</p> <p>(Including the camera itself)</p>
Compatible SDXC/SDHC/SD memory card*4:	<p>Manufactured by Panasonic (SD speed class 4 or higher)</p> <p>SDXC memory card : 64 GB</p> <p>SDHC memory card : 4 GB, 8 GB, 16 GB, 32 GB</p> <p>SD memory card : 2 GB (except miniSD memory card and microSD memory card)</p>
Cellular phone compatibility:	<p>JPEG image,</p> <p>AUX control (by access level)</p>
Mobile terminal compatibility: (As of July, 2014)*5	<p>iPad, iPhone, iPod touch (iOS 4.2.1 or later)</p> <p>Android™ mobile terminals</p>

\*1 Transmission for 4 streams can be individually set.

\*2 AAC-LC (Advanced Audio Coding - Low Complexity) is only used when recording audio on an SD memory card.

\*3 For further information about PC system requirements and precautions for when using Microsoft Windows 8.1, Microsoft Windows 8, Microsoft Windows 7, Microsoft Windows Vista, or Windows Internet Explorer, click "Manual" - "Open" from the supplied CD-ROM and refer to "Notes on Windows® / Internet Explorer® versions".

\*4 When using an SD memory card supporting Class 10 of the speed class, use a UHS-I (Ultra High Speed-I) compliant card.

\*5 For further information about compatible devices, refer to our website (<http://security.panasonic.com/pss/security/support/info.html>).

## Standard accessories

Important Information (this document) .....	1 pc.
Installation Guide .....	1 set
Warranty card .....	1 set
CD-ROM*1 .....	1 pc.
Code label*2 .....	1 pc.

The following parts are used during installation procedures.

Tripod mount base .....	1 pc.
Power cord plug .....	1 pc.
Safety wire lug .....	1 pc.
Wire lug fixing screws (M2.5 x 8 mm {5/16 inches}).....	2 pcs. (of them, 1 for spare)
Safety wire.....	1 pc.
Washer .....	1 pc.
Spring washer .....	1 pc.

\*1 The CD-ROM contains the operating instructions and different kinds of tool software programs.

\*2 This label may be required for network management. The network administrator shall retain the code label.

## Optional accessories

User License Accessory (For H.264):	BB-HCA8A BB-HCA8CE
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## Information for Users on Collection and Disposal of Old Equipment and used Batteries



These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should not be mixed with general household waste.

For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC and 2006/66/EC.

By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.



### For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

### [Information on Disposal in other Countries outside the European Union]

These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.



**Cd**

### Note for the battery symbol (bottom two symbol examples):

This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

### For U.S. and Canada:

#### Panasonic System Communications Company of North America, Unit of Panasonic Corporation of North America

[www.panasonic.com/business/](http://www.panasonic.com/business/)

For customer support, call 1.800.528.6747

Two Riverfront Plaza, Newark, NJ 07102-5490

#### Panasonic Canada Inc.

5770 Ambler Drive, Mississauga,  
Ontario, L4W 2T3 Canada

(905)624-5010

[www.panasonic.ca](http://www.panasonic.ca)

### For Europe and other countries:

#### Panasonic Corporation

<http://panasonic.net>

Panasonic System Networks Co., Ltd.  
Fukuoka, Japan

Authorised Representative in EU:



Panasonic Testing Centre

Panasonic Marketing Europe GmbH

Winsbergring 15, 22525 Hamburg, Germany