Panasonic®

Important Information

Network Camera

Model No. WV-SFV481/WV-SFN480

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.

PGQX1661YA Cs1114-1045 Printed in China

WARNING:

- To prevent injury, this apparatus must be securely attached to the wall/ceiling in accordance with the installation guide.
- To prevent fire or electric shock hazard, do not expose this apparatus to rain or moisture. (WV-SFN480)
- The apparatus should not be exposed to dripping or splashing and no objects filled with liquids, such as vases, should be placed on the apparatus. (WV-SFN480)
- 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.
- Batteries (battery pack or batteries installed) shall not be exposed to excessive heat such as sunlight, fire or the like.

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.

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 á 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 dokument, 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.

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

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. (WV-SFN480)

6) Clean only with dry cloth. (WV-SFN480)

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) Only use attachments/accessories specified by the manufacturer.

10) 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.

11) Unplug this apparatus during lightning storms or when unused for long periods of time.

12) 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. (WV-SFN480)

Limitation of liability

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(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-SFV481/WV-SFN480 are designed to be operated using a PC on a network (10BASE-T/100BASE-TX).
By connecting the camera to a network (LAN) or the Internet, images and audio from the camera can be monitored on a PC via a network.

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.

<Outdoor Vandal resistant & waterproof model>

SFV481 : The functions with this notation are available when using the model WV-SFV481.

<Indoor model>

SFN480 : The functions with this notation are available when using the model WV-SFN480.

Main functions

Twice the resolution and sensitivity of conventional sensors*1 thanks to a high-sensitivity 12M MOS sensor

The camera allows 9 megapixel (1:1), high-resolution fisheye image output, and with the BW function, high-sensitivity recording is also possible at night.
The camera also allows 9 megapixel H.264 15 fps streaming and 4 megapixel H.264 30 fps streaming output.
*1 Compared to Panasonic models WV-SF438 and WV-SW458

360° monitoring with a wide variety of transmission modes

With the high-performance fisheye lens, clear 360° image capture of the surroundings is possible with a single camera. The 360° camera includes a wide variety of image capture modes that perform distortion correction: Wall Panorama, Double Panorama, Quad PTZ, Single PTZ, and Quad streams (H.264). It also supports modes that can transmit fisheye images and corrected images at the same time.

SD memory card*2 slot equipped

It is possible to save H.264 videos and JPEG images on the SD memory card manually at an alarm occurrence, during the period of the schedule, or on a web browser. (Download is possible.) It is also possible to save JPEG images at a network failure occurrence.
*2 SDXC/SDHC/SD memory card is described as SD memory card.

SFV481

The camera conforms to the IP66*3 and Type 4X (UL50)*4, is compliant with NEMA 4X*5 ratings, and provides high dust resistance and waterproof performance.

Waterproofing treatment is not required for the camera body (waterproofing treatment is required for cable connections).
*3 IP66 rating: The applicable product has “Dust tight (6)” protection against foreign solids and has “Powerful water jets (6)” protection against water (IEC60529).
*4 UL50 is a waterproofing standard regulated by UL, and Type 4X indicates the waterproofing class.
*5 NEMA: Dust resistance and waterproof performance standards set by National Electrical Manufacturers Association (United States).

Achieves high-level shock resistance with 50 J*6 (IEC 60068-2-75/JIS C60068-2-75) / IK10*7 (IEC 62262) compliance.

The camera has a strong shock resistance body which is needed in outdoor installations.
*6 J: the shock resistance measured in units of joules
*7 IK10: is a standard in regards to shock resistance that represents the level of impact protection, and is regulated by the International Electrotechnical Commission (IEC).

Creating system structures is made possible with the Panasonic WV-ASM200 software package

It is now possible for the camera to take in 9 megapixel high-resolution fisheye images, and correct the parts of live images and played images that you wish to view into Single PTZ/Quad PTZ images.

Install with Panasonic network microphone for 360° image and audio recording

By installing the camera with a network microphone (WV-SMR10), you can simultaneously record audio and images from any direction.

About the user manuals

There are 3 sets of operating instructions for the WV-SFV481/WV-SFN480 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.
The external appearance and other parts shown in this manual may differ from the actual product within the scope that will not interfere with normal use due to improvement of the product.

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

System requirements for a PC

CPU:	Intel® Core™ i5-2400 or faster, or Intel® Core™ i7-860 or faster recommended
Memory:	3 GB or more
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 High image capture size monitoring: 3840 x 2160 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.)

IMPORTANT:

- When using a PC that does not meet the above 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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- Android is a trademark of Google Inc.
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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 the product to fall 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 the product to fall, 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 this product falling, may occur.

The exclusively designed mount bracket shall be used.
Failure to observe this may cause the product to fall resulting in injury or accidents.
Use the exclusively designed mount bracket for installation.

The screws and bolts must be tightened to the specified torque.
Failure to observe this may cause the product to fall resulting in injury or accidents.

Do not install this product in locations subject to vibration. SFN480
Loosening of mounting screws or bolts may cause the product to fall 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.

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.

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.

Turn the power off when do wiring of this product.
Failure to observe this may cause electric shock. In addition, a short circuit or wrong wiring may cause fire.

Install this product in a location high enough to avoid people and objects from bumping the product.
Failure to observe this may cause injury.

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 damage the power cable.
Do not damage, fabricate, twist, stretch, bundle, or forcibly bend the power cable. Do not place heavy objects on it. 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. SFN480
Failure to observe this may cause a drop resulting in injury or accidents.
Be sure to install the safety wire.

Do not install in locations with strong winds SFV481
Installing in locations with strong winds of 60 m/s or more may cause the camera to fall, resulting in injury or an accident.

Implement snow protection measures SFV481
The weight of piled-up snow may cause the camera to fall, resulting in injury or an accident. Use a visor, etc. for snow protection.

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.

Do not touch the metal part of the product. SFN480
The metal part may become hot while the product is in use. Direct skin contact with high-temperature parts of the product may cause burns.

[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.

SFN480

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.

SFV481

If a strong shock or vibration is applied to the enclosure, it may cause damage or allow water to enter this product.

SFN480

If a strong shock or vibration is applied to the lens, it may cause damage.

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 dome cover SFV481 or lens SFN480 with your bare hands.

Dirty surfaces cause 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 MOS 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 SD MOUNT indicator 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 26.
- For SD memory cards that support Speed Class 10, use cards that support UHS-I (Ultra High Speed-I).

SFV481

About the dehumidifying device

- This product has dehumidifying device to keep the inside at low moisture level, preventing condensation and quickly dissipating dew if produced.
- Dew may be produced depending on the conditions of temperature, humidity, winds, and rain, and it may take time to dehumidify.

- The dehumidifier element is mounted inside the sub cover. In order to maintain normal operation of the dehumidifier function, do not caulk (fill the clearance with sealants or other materials) the clearance between the enclosure and the ceiling or wall.

SFV481

What to do if "WARMING UP-PLEASE WAIT" appears on the display.

This message indicates that the temperature inside the camera has become extremely low. In such a case, wait until the internal temperature of the camera rises (for around 2 hours or more in low temperatures below -20 ºC {-4 °F}), and turn on the power again.

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.

SFV481

Cleaning the dome cover

In case of adhesion any dirt or other unwanted substances, please wipe it with a lens cleaning paper and so on.

SFN480

Cleaning the lens

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

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Code label

The code label (accessory) is 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.

SFV481

This product is designed to be installed under eaves.

- Install the product in areas that do not receive direct sunlight.

SFN480

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, or locations subject to briny air such as seashores.
- Locations where the temperature is not within the specified range (☞ page 21)

SFV481

- Locations subject to vibrations that exceed the railroad standard (EN50155)

SFN480

- 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 (In case of installing the camera in such locations, the lens may become foggy or condensation may be caused on the cover.)
- Locations subject to vibrations, such as on vehicles, marine vessels, or above product lines (This product is not designed for on-vehicle use.)

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

- Use the attachment plate (accessory), base bracket (accessory) SFV481, or an optional mount bracket to install the camera on the ceiling or wall.
- 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.

  Required screws: M4 (4 pcs.)
  Minimum pull-out strength: 196 N {44 lbf} (per 1 pc.) (when the camera is installed on the ceiling or a wall using the attachment plate (accessory) or the base bracket (accessory) SFV481)

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.

Do not remove or loosen the screws on the bottom of this product.

If the screws (7 pcs. SFV481, 6 pcs. SFN480) are loosened, water exposure may cause damage SFV481 or malfunction of the product, or dropping may result in injury.

<Bottom side of WV-SFV481> <Bottom side of WV-SFN480>

Installing in low temperature environments SFV481

The camera can be used even outdoors in low-temperature environments as low as -40 °C {-40 °F}, but in an extremely low-temperature environment below -10 °C {14 °F}, snow and frost may not be defrosted from the dome cover. When this product is installed and operated in low temperatures below -20 °C {-4 °F}, normal images may not be obtained immediately after startup. In such a case, wait for about 2 hours with the power connected, and then disconnect and reconnect the power again.

Protection from lightning

SFV481

When cables are used outdoors, there is a chance that they may be affected by lightning. In this case, install a lightning arrester just before where the cables connect to the camera.

SFN480

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

- Do the wiring so that the network is not 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.

LAN cable

Shielded (STP) LAN cables must be used with this unit to ensure compliance with CE standards.

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.

Effects on images and image quality

Under the following conditions, image quality may deteriorate or images may become difficult to see.

SFV481

- Effects of rainfall
  During rainfall, it may be difficult to see images when there are raindrops on the dome cover due to wind.

- Effects of snowfall
  During snowfall, there may be snow on the dome cover due to wind, which makes surveillance images difficult to see (varies depending on the amount and quality of snowfall).

- Effects of dust in the air or gas emission from vehicles
  Depending on the installation environment, the image quality may deteriorate when the dome cover is dirty from dust in the air, gas emission from vehicles, etc.

- Effects of strong light
  When the camera is facing toward a spot light or other bright lights and light reflecting objects, ghost images (a phenomenon where objects that do not actually exist appear in images) may appear. In particular, ghost images may be more noticeable when the camera is facing toward an LED light.

SFN480

- Dust in the air, etc.
  Depending on the installation environment, the image quality may deteriorate when the lens is dirty.

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
Power is not turned on.	**When using a PoE device for the power supply** • Are the PoE device (IEEE802.3af compliant) and the network connector connected using a LAN cable (category 5: STP)? Check whether the connection is appropriately established. • 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. • 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 off the power supply from the PoE device.	Installation Guide
	When using DC power supply • 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. • Is the AC adaptor in use compliant with the Specifications? Check the specifications regarding the AC adaptor.	
The LINK indicator does not light in orange even when the network cable is connected to the camera.	• Is the LAN cable connected appropriately? Connect the LAN cable appropriately. • Is the hub or router connected to the camera operating appropriately? Check if the hub or router in use is operating appropriately. • Is the LAN cable connected to the camera broken? Replace the cable with another one.	Installation Guide

Symptom	Cause/solution	Reference pages
SD ERROR/ABF indicator lights red	• Is the write protect switch of the inserted SD memory card set to “LOCK”? Unlock the write protect switch of the SD memory card. • Was the inserted SD memory card 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 (http://security.panasonic.com/pss/security/support/info.html) for further information about the supported software. • Is the inserted SD memory card faulty? Replace the card with a normal one.	Operating Instructions (included in the CD-ROM)

Audio input contains noise.	• Check the following.
	  • Grounding of the camera, a switching hub or peripheral devices are not done.
	  • The camera is used near an electrical power line.
	  • 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.)
	When audio input still contains noise even after checking the above possibilities, use a powered microphone or connect audio output with low output impedance.
		Installation Guide

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
ACT indicator	
When data is being sent via the network camera	Blinks green (accessing)
LINK indicator	
When the camera is able to communicate with the connected device	Lights orange
SD ERROR/ABF indicator	
• When ABF (Auto Back Focus) operation is being executed	Blinks red (Interval of 1 time/ second)
• When the set is being started	Lights red
• When an SD memory card is recognized normally	Lights red → Lights off
• When the SD memory card slot is not used or an abnormality is detected in SD memory card after the camera has started	Lights red → Stays red
SD MOUNT indicator	
• 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 (recording) Lights green → Lights off (waiting for recording)
• 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

WV-SFV481:
Inside view of the SD memory card slot cover

WV-SFN480:
Inside view of the SD memory card slot cover

Specifications

• **Basic**

	WV-SFV481	WV-SFN480
Power source:	12 V DC, PoE (IEEE802.3af compliant)	
Power consumption*1:	DC12 V : 910 mA/ Approx. 10.9 W PoE DC 48 V : 200 mA/ Approx. 9.6 W (Class 0 device)	
Operating environment Ambient operating temperature:	-40 °C to +50 °C {-40 °F to 122 °F} (Power On range: -20 °C to +50 °C {-4 °F to 122 °F})	**Ceiling/ Wall/ Camera mount bracket** -10 °C to +50 °C {14 °F to 122 °F} (Power On range: -10 °C to +50 °C {14 °F to 122 °F}) **Desktop/ Tripod** -10 °C to +40 °C {14 °F to 104 °F} (Power On range: -10 °C to +40 °C {14 °F to 104 °F})
Ambient operating humidity:	10 % to 90 % (no condensation)	10 % to 90 % (no condensation)
Storage environment Storage temperature:	-40 °C to +65 °C {-40 °F to 149 °F}	-20 °C to +65 °C {-4 °F to 149 °F}
Storage humidity:	10 % to 95 % (no condensation)	10 % to 95 % (no condensation)
Monitor output*2:	VBS: 1.0 V [p-p]/75 Ω, composite, ø3.5 mm mini jack (monaural) An NTSC or PAL monitor can be connected to the camera (the monitor type can be changed by the software). Audio out or monitor out can be selected for the audio/monitor output plug	
External I/O terminals:	ALARM IN 1 (DAY/NIGHT IN) (x1)/ ALARM IN 2 (ALARM OUT) (x1)/ ALARM IN 3 (AUX OUT) (x1)	ALARM IN 1 (x1)/ ALARM IN 2 (ALARM OUT) (x1)/ ALARM IN 3 (AUX OUT) (x1)
Microphone/line input:	**ø3.5 mm stereo mini jack** **Input impedance:** Approx. 2 kΩ (unbalanced)	**Built-in microphone** **or ø3.5 mm stereo mini jack** **Input impedance:** Approx. 2 kΩ (unbalanced)
For microphone input:	**Recommended applicable microphone:** Plug-in power type **Supply voltage:** 2.5 V ±0.5 V **Recommended sensitivity of microphone:** -48 dB±3 dB (0 dB=1 V/Pa, 1 kHz)	**Recommended applicable microphone:** Plug-in power type **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	**Input level:** Approx. -10 dBV
Audio output*3:	ø3.5 mm stereo mini jack **Output impedance:** Approx. 600 Ω (unbalanced) **Output level:** -20 dBV	
Waterproof*4:	Main body: IP66 (IEC60529), Type 4X (UL50), NEMA 4X compliant	Not supported
Shock resistance:	Compliant with 50 J (IEC 60068-2-75)/ IK10 (IEC 62262)	Not supported

	WV-SFV481	WV-SFN480
On-vehicle support:	EN50155 (railroad standard) compliant	Not supported
Dimensions:	**When using the attachment plate:** ø154 mm x 60.5 mm (H) {ø6-1/16 inches x 2-3/8 inches (H)} Dome radius 35 mm {1-3/8 inches} **When using the base bracket:** ø164 mm x 96.5 mm (H) {ø6-15/32 inches x 3-13/16 inches (H)} Dome radius 35 mm {1-3/8 inches}	**When using the attachment plate:** ø150 mm x 52.1 mm (H) {ø5-29/32 inches x 2-1/16 inches (H)} **When using the desktop cover:** ø150 mm x 63.0 mm (H) {ø5-29/32 inches x 2-15/32 inches (H)}
Mass:	**When using the attachment plate:** Approx. 860 g {1.90 lbs} **When using the base bracket:** Approx. 1.3 kg {2.87 lbs}	**When using the attachment plate:** Approx. 480 g {1.06 lbs} **When using the desktop cover:** Approx. 440 g {0.97 lbs}
Finish:	**Main body:** Aluminum die cast (Light gray) **Dome cover:** Clear polycarbonate resin	**Main body:** ABS resin (Sail white)
Others:	Tamper-resistant enclosure	

*1 Refer to our website (http://security.panasonic.com/pss/security/support/info.html) for further information about Power source and Power consumption information.
*2 In order to be able to switch the monitor output, “9M Fisheye” or “4M Fisheye” must be selected for “Image capture mode”. For information about usage limitations, refer to “10.1 Configure the basic settings [Basic]” of the Operating Instructions.
*3 Cannot be used when the output is switched to monitor output.
*4 Only when installation work is properly performed according to the instructions in this book and appropriate waterproof treatment is performed.

• Camera

	WV-SFV481	WV-SFN480
Image sensor:	1/2 type MOS sensor Built-in primary color filter	
Effective pixels:	12.4 mega pixels	
Scanning area:	5.54 mm (H) x 5.54 mm (V) {7/32 inches (H) x 7/32 inches (V)}	
Scanning system:	Progressive	

	WV-SFV481	WV-SFN480
Minimum illumination:	Color: 0.3 lx {0.02787 footcandle} (F1.9, Maximum shutter: Off (1/30 s), AGC: High) 0.02 lx {0.00186 footcandle} (F1.9, Maximum shutter: max. 16/30 s, AGC: High)*	
	BW: 0.04 lx {0.00372 footcandle} (F1.9, Maximum shutter: Off (1/30 s), AGC: High) 0.003 lx {0.00028 footcandle} (F1.9, Maximum shutter: max. 16/30 s, AGC: High)*	BW: 0.2 lx {0.01858 footcandle} (F1.9, Maximum shutter: Off (1/30 s), AGC: High) 0.01 lx {0.00093 footcandle} (F1.9, Maximum shutter: max. 16/30 s, AGC: High)*
	* Converted value	
Wide Dynamic range:	On/ Off	
Gain (AGC):	On (High)/ On (Mid)/ On (Low)/ Off	
Adaptive black stretch:	On/ Off (only when Wide Dynamic range: Off)	
Back light compensation (BLC):	On/ Off (only when Wide Dynamic range: Off)	
Light control mode setting:	Indoor scene (50 Hz)/ Indoor scene (60 Hz)/ ELC	
Maximum shutter:	max. 1/10000 s, max. 1/4000 s, max. 1/2000 s, max. 1/1000 s, max. 1/500 s, max. 1/250 s, max. 1/120 s, max. 1/100 s, max. 2/120 s, max. 2/100 s, max. 3/120 s, max. 3/100 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:	Off/ On/ Auto1 (Normal)/ Auto2 (IR Light)/ Auto3 (SCC)	Day & Night (electrical)
White balance:	ATW1/ ATW2/ AWC	
Digital noise reduction:	High/ Low	
Number of the preset positions:	16 Preset can only be used when the image type is Quad PTZ or Single PTZ.	
Auto mode:	Auto pan/ Preset sequence Auto mode can only be used when the image type is Quad PTZ or Single PTZ.	
Self return:	10 s/ 20 s/ 30 s/ 1 min/ 2 min/ 3 min/ 5 min/ 10 min/ 20 min/ 30 min/ 60 min Self return can only be used when the image type is Quad PTZ or Single PTZ.	
Privacy zone:	On/ Off (up to 8 zones available)	
VIQS	On/Off (up to 8 areas available) * The VIQS function is supported only when “Fisheye” is selected for the image type.	
Camera title on screen:	On/ Off Up to 20 characters (alphanumeric characters, marks) * You can specify characters to be displayed on each of the four screens when “Quad streams” is selected.	
Video Motion Detection (VMD):	On/ Off, 4 areas available	
Back focus:	Auto back focus/ Focus/ Adjusting method (Auto/ Preset/ Fix)	

• **Lens**

Focal length:	1.38 mm {1/16 inches}
Maximum aperture ratio:	1:1.9
Angular field of view:	Horizontal: 180°　Vertical: 180°
Adjusting angle:	±45°

• **Network**

Network:	10BASE-T/100BASE-TX, RJ45 connector
Resolution: H.264 JPEG (MJPEG)	**<Ceiling><Wall>** **9M Fisheye mode** max. 15 fps 2992x2992/ 1280x1280/ 640x640/ 320x320 **4M Fisheye mode** max. 30 fps 2048x2048/ 1280x1280/ 640x640/ 320x320
	<Ceiling> **Double Panorama mode** max. 15 fps 2560x1440/ 1920x1080/ 1280x720/ 640x360/ 320x180 **Quad PTZ/ Single PTZ mode** max. 15 fps 2560x1920/ 2048x1536/ 1600x1200/ 1280x960/ 800x600/ 640x480/ 320×240 **8M Fisheye + Double Panorama mode** max. 7.5 fps (Fisheye) 2816x2816/ 1280x1280/ 640x640/ 320x320 (Double Panorama) 1280x720/ 640x360 **4M Fisheye + Double Panorama mode** max. 15 fps (Fisheye) 2048x2048/ 1280x1280/ 640x640/ 320x320 (Double Panorama) 1280x720/ 640x360 **8M Fisheye + Quad PTZ mode** max. 7.5 fps (Fisheye) 2816x2816/ 1280x1280/ 640x640/ 320x320 (Quad PTZ) 1280x960/ 800x600/ 640x480 **4M Fisheye + Quad PTZ mode** max. 15 fps (Fisheye) 2816x2816/ 1280x1280/ 640x640/ 320x320 (Quad PTZ) 1280x960/ 800x600/ 640x480 **Quad streams mode** * Only for H.264 images. (Ch1 - Ch4) 1280x960/ 800x600/ 640x480/ 320x240 max. 15 fps (Quad PTZ) 2560x1920/ 2048x1536/ 1280x960/ 800x600/ 640x480/ 320x240 max. 5 fps
	<Wall> **Panorama mode** max. 15 fps 2560x1440/ 1920x1080/ 1280x720/ 640x360/ 320x180 **Quad PTZ/Single PTZ mode** max. 15 fps 2560x1920/ 2048x1536/ 1600x1200/ 1280x960/ 800x600/ 640x480/ 320x240 **8M Fisheye + Panorama mode** max. 7.5 fps (Fisheye) 2816x2816/ 1280x1280/ 640x640/ 320x320 (Panorama) 1280x720/ 640x360 **4M Fisheye + Panorama mode** max. 15 fps (Fisheye) 2048x2048/ 1280x1280/ 640x640/ 320x320 (Panorama) 1280x720/ 640x360

Image compression method: H.264*1	**Transmission mode:** (Constant bit rate/ VBR/ Frame rate/ Best effort/ Advanced VBR) **Frame rate:** <When VBR/ Frame rate/ Advanced VBR is selected> 1 fps/ 3 fps/ 5 fps*/ 7.5 fps*/ 10 fps*/ 12 fps*/ 15 fps*/ 20 fps*/ 30 fps* * "Frame rate*" is limited to "Bit rate". When a value with an asterisk (*) on the right of it is selected, the actual frame rate may be lower that the value selected. **Max bit rate (per client):** 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* * The available range of the H.264 bit rate varies depending on the setting selected for "Image capture size". **Image quality:** <When Constant bit rate/ Best effort is selected> Low/ Normal/ Fine <When VBR is selected> 0 SUPER FINE/ 1 FINE/ 2/ 3/ 4/ 5 NORMAL/ 6/ 7/ 8/ 9LOW **Transmission type:** Unicast/ Multicast
JPEG (MJPEG)	**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 **Transmission interval:** 0.1 fps - 30 fps (JPEG frame rate will be restricted when displaying both JPEG and H.264 images.)
Audio compression method:	G.726 (ADPCM) 32 kbps/ 16 kbps, G.711 64 kbps, AAC-LC*2 64 kbps/ 96 kbps/ 128 kbps
Bandwidth control:	Unlimited/ 64 kbps/ 128 kbps/ 256 kbps/ 384 kbps/ 512 kbps/ 768 kbps/ 1024 kbps/ 2048 kbps/ 4096 kbps/ 8192 kbps
Protocol:	IPv6: TCP/IP, UDP/IP, HTTP, HTTPS, RTP, FTP, SMTP, DNS, NTP, SNMP, DHCPv6, MLD, ICMP, ARP IPv4: TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP, FTP, SMTP, DHCP, DNS, DDNS, NTP, SNMP, UPnP, IGMP, ICMP, ARP
OS*3:	Microsoft Windows 8.1 Microsoft Windows 8 Microsoft Windows 7 Microsoft Windows Vista
Browser*3:	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)
Maximum concurrent access number:	14 (Number of sessions that can connect to cameras at the same time) * Depends on network conditions
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:	Up to 16 camera images can be displayed simultaneously on a multi-screen. (Including the camera itself)
Compatible SDXC/SDHC/ SD memory card*4*5:	Manufactured by Panasonic (SD speed class 4 or higher) SDXC memory card: 64 GB SDHC memory card: 4 GB, 8 GB, 16 GB, 32 GB SD memory card: 2 GB (except miniSD card and microSD card)
Cellular phone compatibility:	JPEG image, AUX control (by access level)
Mobile terminal compatibility: (As of October, 2014)*6	iPad, iPhone, iPod touch (iOS 4.2.1 or later) Android™ mobile terminals

*1 Transmission for 2 streams can be individually set.
*2 When recording audio on an SD memory card, only AAC-LC (Advanced Audio Coding - Low Complexity) can be used.
*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 repeatedly recording images on an SD memory card using the auto overwrite function, make sure to use an SD memory card with high reliability and durability.
*5 For SD memory cards that support Speed Class 10, use cards that support UHS-I (Ultra High Speed-I).
*6 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.

SFV481

Base bracket ..... 1 pc.
Attachment plate ..... 1 pc.
Fixing screws for attachment plate
(M4 x 8 mm {5/16 inches}).....5 pcs. (incl. 1 spare)
Template A (for the attachment plate) ..... 1 sheet.
Template B (for the base bracket) ..... 1 sheet.
Waterproof tape..... 1 pc.
Bit (Hex wrench, screw size
6.35 mm {1/4 inches} T10) ..... 1 pc.
4P alarm cable ..... 1 pc.
2P power cable ..... 1 pc.
LAN cable cover ..... 1 pc.

SFN480

Attachment plate ..... 1 pc.
Bit (Hex wrench, screw size
6.35 mm {1/4 inches} T10) ..... 1 pc.
Template A ..... 1 pc.
Power cord plug*3 ..... 1 pc.
External I/O terminal plug*3 ..... 1 pc.
Audio cable ..... 1 pc.
Cable tie .....2 pcs. (incl. 1 spare)
Safety wire lug ..... 1 pc.
Wire lug fixing screws
(M2.5 x 8 mm {5/16 inches}).....2 pcs. (incl. 1 spare)
Desktop cover ..... 1 pc.
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.
*3 The external I/O terminal plug and power cord plug are attached to the camera.

Optional accessories

User License Accessory (For H.264):	BB-HCA8A BB-HCA8CE
Ceiling Mount Bracket: (Use when installing the WV-SFN480 on weak ceiling boards, etc.)	WV-Q105A SFN480
Ceiling hanging mount bracket: (Use with the WV-Q124 (suspension mount bracket) to be able to install on a ceiling.)	WV-Q121B SFV481
Wall mount bracket: (Use with the WV-Q124 (suspension mount bracket) to be able to install on a wall.)	WV-Q122A SFV481
Mount bracket: (Use when installing the WV-SFV481 using the WV-Q122A.)	WV-Q124 SFV481
Mount bracket: (Use when installing the WV-SFV481 using the WV-Q121B or WV-Q122A.)	WV-Q124 SFV481

Related products

Network Microphone:	WV-SMR10

* The Panasonic WV-SMR10 network microphone has shock resistance and is compliant with 20 J (IEC60068-2-75)/IK10 (IEC 62262). WV-SMR10 can be used in combination with WV-SF438, WV-SW458, WV-SFV481, and WV-SFN480. For more information about the network microphone, such as installation and adjustment methods, please refer to its Operating Instructions.

Disposal of Old Equipment and Batteries
Only for European Union and countries with recycling systems

These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste.
For proper treatment, recovery and recycling of old products and batteries, please take them to applicable collection points in accordance with your national legislation.
By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment.
For more information about collection and recycling, please contact your local municipality.
Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

Note for the battery symbol (bottom symbol)
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/
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

For Europe and other countries:

Panasonic Corporation
http://www.panasonic.com

Panasonic System Networks Co., Ltd.
Fukuoka, Japan

Authorised Representative in EU:

Panasonic Testing Centre
Panasonic Marketing Europe GmbH
Winsbergring 15, 22525 Hamburg, Germany

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