4-Channel Video over Fiber Bundle Kit

VF-402-KIT

Manual

Copyright

Federal Communication Commission Interference Statement

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

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the device and receiver.
3. Connect the device into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio technician for help.

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 the device.

This device complies with Part 15 of the FCC Rules. Operation is subject to the Following two conditions: (1) This device may not cause harmful interference, and (2) this Device must accept any interference received, including interference that may cause undesired operation.

Federal Communication Commission (FCC) Radiation Exposure Statement

This device complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

Safety

This device is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical device. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the device.

CE CE Mark Warning

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

CE in which Countries where the product may be used freely:

Germany, UK, Italy, Spain, Belgium, Netherlands, Portugal, Greece, Ireland, Denmark, Luxembourg, Austria, Finland, Sweden, Norway and Iceland.

France: except the channel 10 through 13, law prohibits the use of other channels.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

National Restrictions

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

WEEE Regulation

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic device, end users of electrical and electronic device should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

User's Manual for 4-Channel Video over Fiber Bundle Kit (VF-402-T + VF-402-R)

Model: VF-402-KIT

Rev: 1.1 (January 2013)

Part No. EM-VF-402-KIT

Table of Contents

Chapter 1. Product Introduction

1.1 Package Contents

Check the contents of your package for following parts:

- VF-402-T – Video over Fiber Media Converter / Transmitter x 1
- VF-402-R – Video over Fiber Media Converter / Receiver x 1
- 5V / 2A Power Adapter x 2
- User's Manual x 1

Note	If any of these pieces are missing or damaged, please contact your dealer immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

1.2 Product Description

Long Distances Analog Surveillance Transmission System

The analog cameras and DVRs are still applied mostly in traditional surveillance systems while the main stream turns to IP-Based surveillance gradually. To help the analog camera deployment in long distances to provide high video transmission quality and reliable signal, PLANET develops the Video over Fiber media converter which successfully integrates the video signal and fiber optic transmission in a compact size mini box. The CCTV over Fiber media converter enables the videos to be delivered in high quality up to 20km long distance by the intelligent encoding / decoding technology. It is ideal for extending the distance and signal conversion by transmitting the Video and data over the fiber-optic cable.

Fiber Optic Communication for VIDEO and SERIAL DATA

This Video over Fiber Converter kit consists of a Video Transmitter and a Video Receiver:

- **VF-402-T:** 4-channel Video over Fiber **Transmitter**
- **VF-402-R:** 4-channel Video over Fiber **Receiver**

Fiber-optic transmission system

This Video over Fiber Converter kit consists of a Video Transmitter, VF-402-T, and a Video Receiver, VF-402-R (Figure 1).

It is a digital fiber-optic transmission system which brings customer a cost-effective solution for transmission of 4 channel uncompressed digital video and 1 reverse RS-485 async-data over one single fiber cable (Figure 2). It is an adjustment free device while providing high quality and real-time video transmission. Support 20 KM long distance data rate. The system can be widely used in Intelligent Transportation Systems (ITS), Traffic Surveillance, security monitoring, automation control, intelligent residential districts and so on.

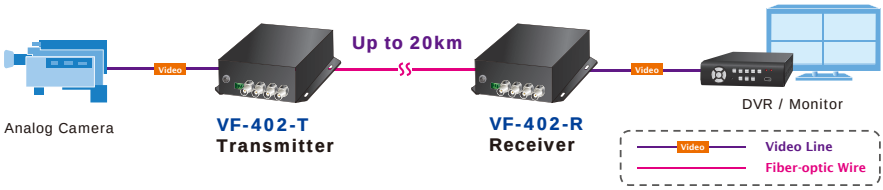


Figure 1 Standard Connection

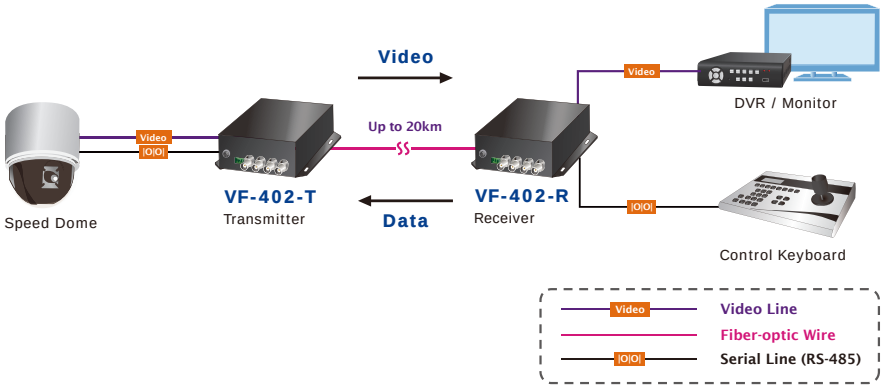
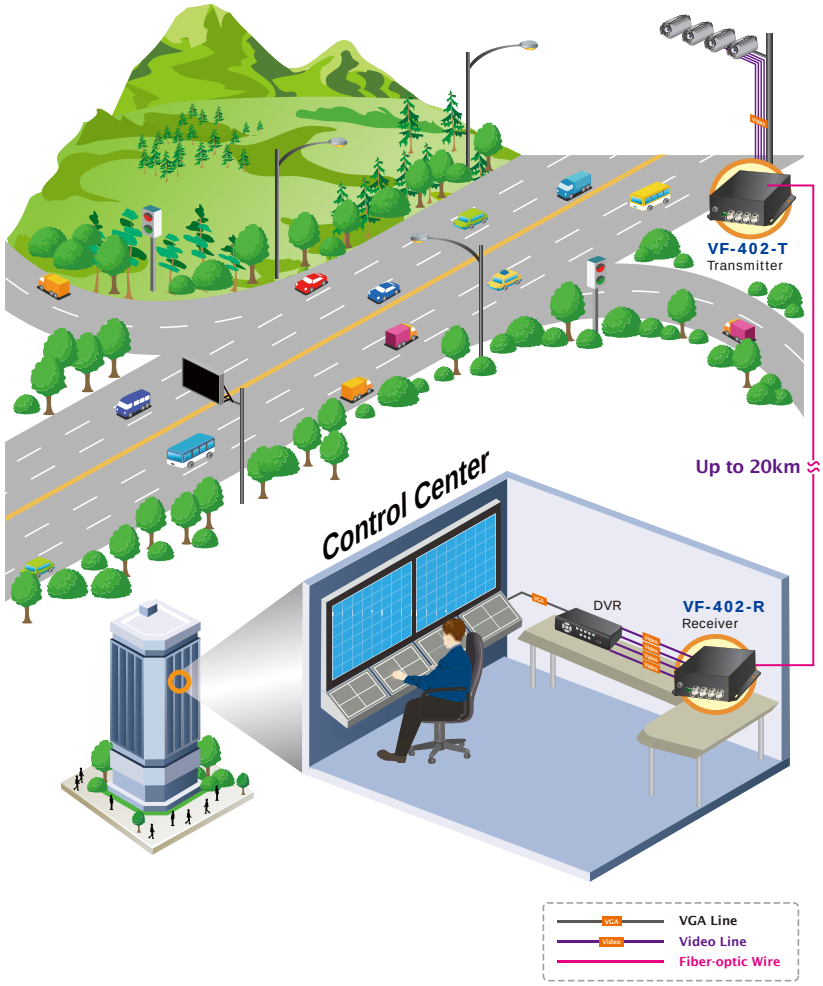


Figure 2 Data Control

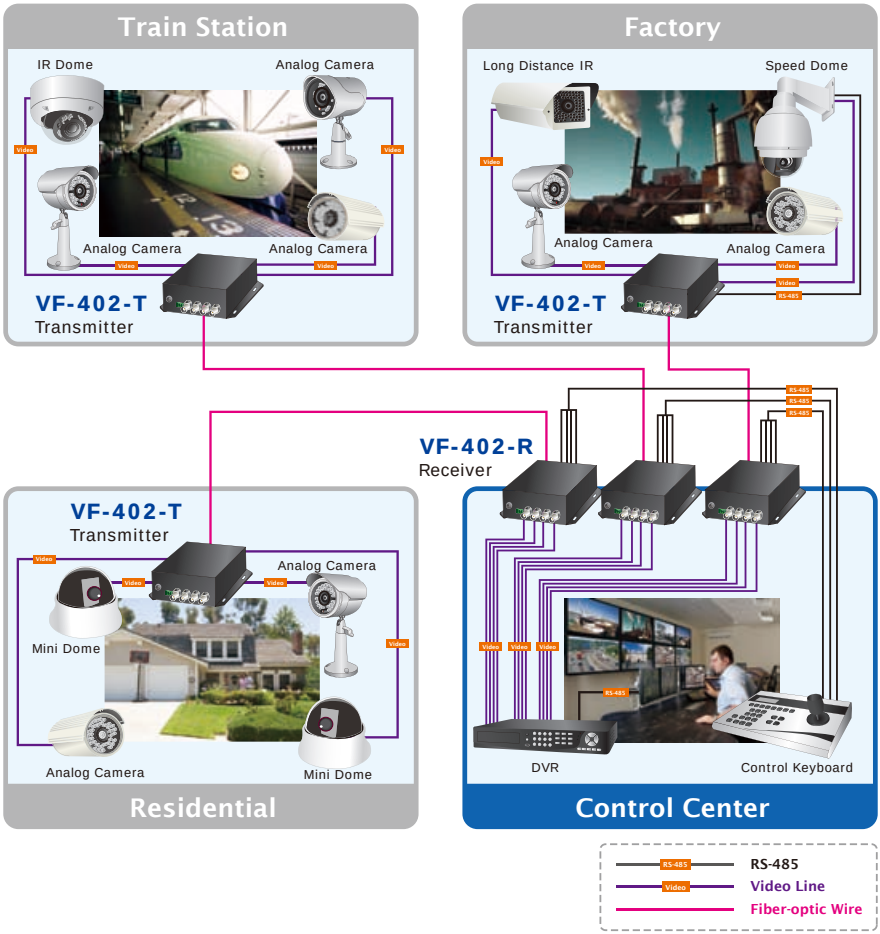
Industrial monitoring systems

Industrial level super wide temperature range -25 to 75 Degree C, applicable to lots kinds of environment, also support hot plug, VF-402-KIT, 4 channel video adopts advanced international no compression full digital error correction and gigabit fiber optical transmission technology to fulfill VF-402-KIT without distortion from long-distance in high quality through one fiber. This series of optical transceiver is of stable performance and clear graphics. This product is of high stability, can observe working condition visually with LED, support independent type and rack-mounted structure, simple to operate, no field adjustment need, applicable to different working environment.



1.3 Application

The VF-402-KIT consists of 4 channel video over fiber optical transceiver and receiver to transmit video and RS-485 signal through a reliable single mode / single fiber link. It is an ideal cost-effective solution for surveillance system that requires high display quality and high performance signal transmission over long distances. The VF-402-KIT can be installed easily and plug and play; that means the operator does not need to configure the pair of the video over fiber transmission in advance.



Typical Applications

- Intelligent Transportation Systems (ITS)
- Toll Collection
- Traffic Surveillance
- Air Traffic Management (ATM)
- Rail Signaling
- Perimeter Alarms and Area Monitors
- Telemedicine and Teleconference
- Industrial Surveillance
- Intelligent Building
- CCTV network

1.4 Product Features

- 20km long distance data transmission
- Fiber optic transmission of four video signals on one fiber with RS485 data signals which may be one way with the video or optionally duplex
- Status indication for power supply, optical signal and video
- High-Speed synchronous digital transmission technology
- No electromagnetic interference, radio frequency interference and ground current
- Safe transmission guaranteed under poor electromagnetic environment
- Maximum tolerable link loss for single mode single fiber is 18db
- Video bandwidth of 6.5 MHz, SNR>63dB
- Industrial level super wide temperature range -25 to 75 Degree C

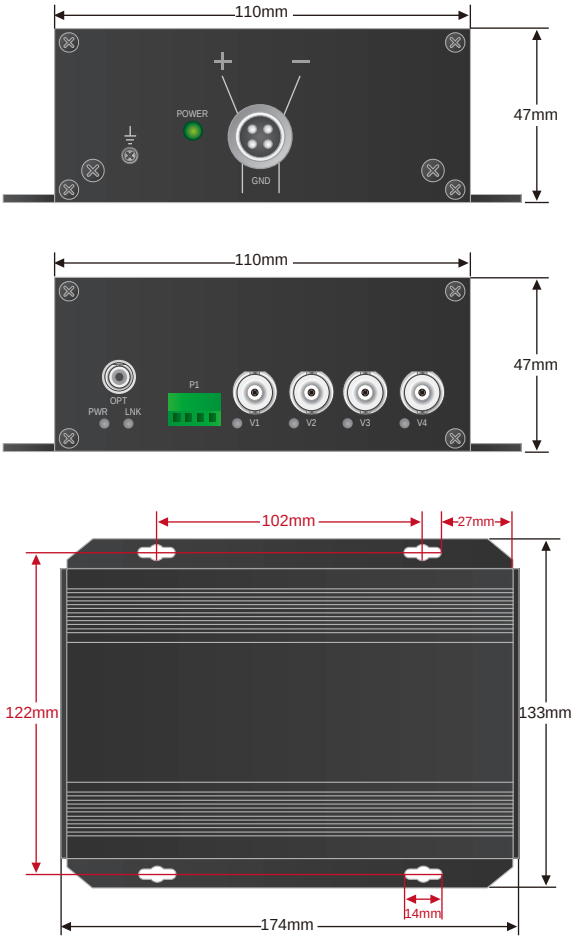
1.5 Product Specification

Model	VF-402-T	VF-402-R
Video Characteristic		
Video Channel	4 channel Bi-direction	
Video Connector	BNC	
Video Input/Output Impedance	75ohm / unbalanced interface	
Video Input/Output Voltage	1.0 Vpp / Typical peak-peak value	
Video Bandwidth	5Hz to 6.5MHz	

Video Digital Bit Width	8/10 bit	
Differential Gain (DG)	<1.3% (Typical Value)	
Differential Phase (DP)	<1.3° (Typical Value)	
SNR Weighted	>63dB (Typical Value)	
Data Interface		
Data Channel	4 channel	
Physical Protocol	RS-485	
Operation Mode	Simplex	
Data Connector	4 Pin terminal block with screw clamps	
Data Rate	DC-150Kbps	
Data Distance	RS-485: 0-20km	
BPS	0-115.2Kbps	
Bit Error Rate (BER)	$<10^{-9}$	
Optical Interface		
Optical Connector	FC	
Fiber Type	Single-mode, single fiber	
Distance	20km for single mode	
Optical Wavelength	TX: 1310nm RX: 1550nm	TX: 1550nm RX: 1310nm
Transmitter couple power	Max. : 4dBm Min. : -4dBm	
Receive Sensitivity	-26dBm	
Link budget	From 22dB to 30dB at 1310nm or 1550nm	
Cable	9/125μm single-mode cable	
Hardware Specification		
LED Indicators	• One Power • One for Video - Green, Link • One for Fiber Optic - Green, Link	
Dimension (W x D x H)	110 x 174 x 47 mm	
Weight	560g	
Power Requirement	DC 5V / 2A AC 90~264V, 50~60HZ	
Chassis Current Consumption	0.75Amp for 4 channel video and 1 channel data	
Mechanical	Metal	
Standards Conformance		
Regulation Compliance	FCC Part 15 Class A, CE	

Environment	
Operating	Temperature: -25 ~ 75 Degree C Relative Humidity: 0 ~ 95% (non-condensing)
Storage	Temperature: -40 ~ 85 Degree C Relative Humidity: 5 ~ 95% (non-condensing)

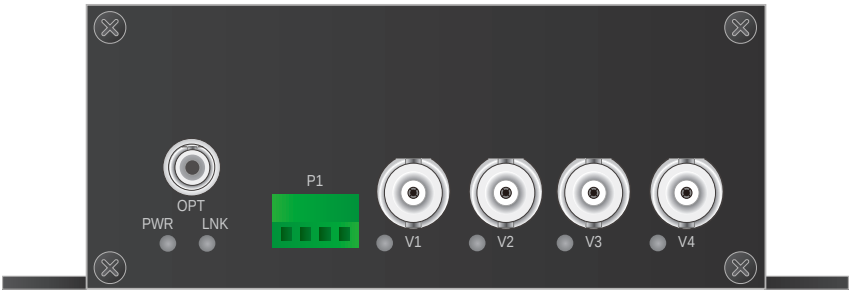
1.6 Dimension of Installing



Chapter 2. Hardware Description

2.1 Panel Overview

■ Front Panel:



■ Video interface

Item	Description
VIDEO/V1...V4	Video input interface

■ Fiber interface

Item	Description
FIBER/OPT	Fiber interface (Warning: In case of damage to eyesight, Do not look directly into interface on electrify state). For Optical transceiver B type, this interface is empty, wiring out from the rear panel.

■ LED definition

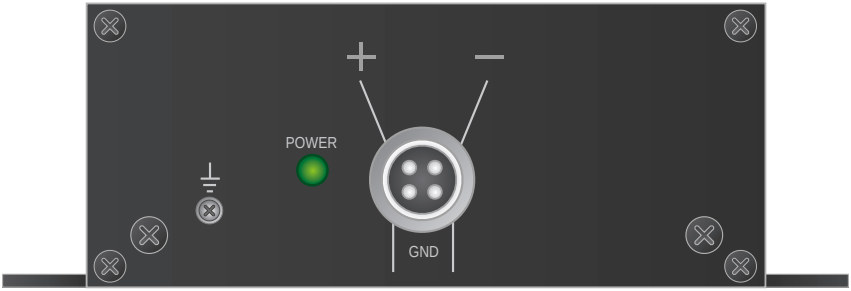
PWR: Power indicators. When power on, both PWR in “UP” and “DOWN” are ON.

LNK: Optical link Indicator(After connecting fiber, the indicator is green when optical signal is detected; Unplug fiber or no optical detected, light is out.)

V1~V4: Video indicator (the indicator is green when video signal is detected; light is out when there is no video signal).

■ Rear Panel:

There is a power interface and power indicator on the rear panel, both PWR is ON when power on. FIBER is fiber interface; the description of each is as follows:



■ Power Supply

Power supply...	
Input	AC 90~264V, 50~60HZ
Output	5V / 2A

Power Notice

1. The device is a power-required device, it means, it will not work till it is powered. If your networks should active all the time, please consider using UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime.
2. In some area, installing a surge suppression device may also help to protect your converter from being damaged by unregulated surge or current to the converter or the power adapter.

Chapter 3. Installation

This section describes how to install your VF-402-KIT Video over Fiber and make connections to the converter. Please read the following topics and perform the procedures in the order being presented. The hardware installation of PLANET VF-402-KIT Video over Fiber Converter do not need software configuration. To install your VF-402-KIT on a desktop or shelf, simply complete the following steps.

3.1 Limitation

The Video over Fiber Converter does not require any software configuration. Users can immediately use any feature of this product simply by attached the cables and plug power on. There is some key limitation on the video over fiber converter. Please check the following items:

The device is used for Point-to-Point connection only (transmitter to receiver) and allows video and data work on the same optical fiber patch cord.

The BNC connector and supports 75 ohm cable. The distance will change by the quality of coaxial cables.

3.2 Preparation before Installing

In order to ensure your normal use, please make sure that you are using the right optical path, right signal, power grounding is good, and the environment meets the requirement. We guarantee all of our products are subject to strict test and aging, and we simulate field environment operation tests. Please contact us if there is any problem.

(1) Please carefully read the user manual of the product before installing.

(2) Please carefully read the safety instructions.

(3) Optical transceiver equipment shall not be disassembled by anyone without authorization.

(4) Check the product model tag stuck outside the cabinet (T for transmitter, R for receiver) to prevent incorrect installation.

(5) Optical transmitter is the transmitting part, its function is converting the video, audio and data, switching value, Ethernet, etc into optical signals and then transmitting through fiber. Therefore, the device connect this type of optical transmitter can be cradle head with cameras.

(6) Optical receiver is the receiving part, its function is converting the video, audio and data, switching value, Ethernet, etc into electrical signals. Therefore, the device connect this type of optical receiver can be displayer or matrix.

(7) The relation of the video of optical transmitter and optical receiver is one-to-one, which means V1~V4 of optical transmitter is one-to-one to V1~V4 of optical receiver.

3.3 Order for installation

(1) Connect the interface of optical transmitter with camera or speed dome. Then connect the optical fiber and the power supply.

(2) Connect the interface of optical receiver with video interface, monitor, video matrix and displayer. Then connect the optical fiber and the power supply.

(3) Insert the power supply according to the configuration of device, correctly access peripheral attachment. Check optical fiber, data cable, video cable, and etc. on the basis of wiring diagram (accompanied with each set of optical transceiver) of optical transceiver.

(4) After all the connection and passing inspection, power on to see if device run normally.

(5) Please install the lightning protection facilities and make sure the ground connection is good when installing this device in the open air.

3.4 Stand-alone Installation

To install a VF-402-T / VF-402-R stand-alone, on a desktop or shelf, simply complete the following steps:

Step 1: Turn off the power of the analog camera / monitor to which the VF-402-T / VF-402-R will be attached.

Step 2: VF-402-T (Transmitter): Connect coaxial cable from analog camera to Video BNC port of the VF-402-T.

Step 3: Attach FC single mode fiber cable from the VF-402-T to VF-402-R in the remote side.

Step 4: VF-402-R (Receiver): Connect coaxial cable from monitor / DVR to Video BNC port of the VF-402-R.

Step 5: Connect the 5V DC power adapter to the VF-402-T / VF-402-R and verify that the Power LED lights up.

Step 6: Turn on the power of the analog camera / monitor; the VIDEO LED (Green) should light when all cables are attached.

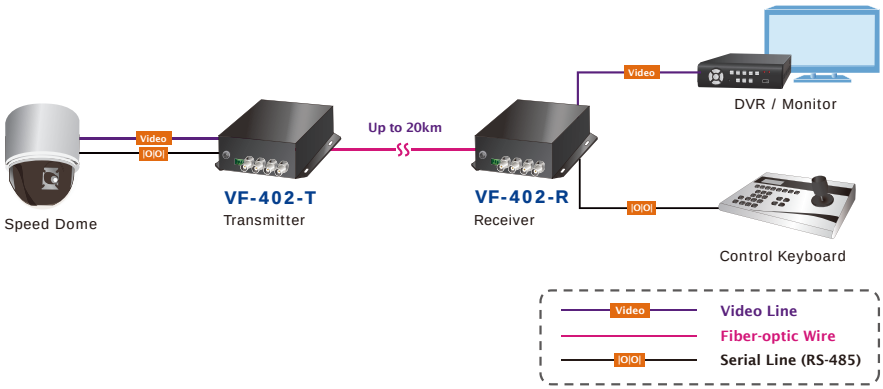
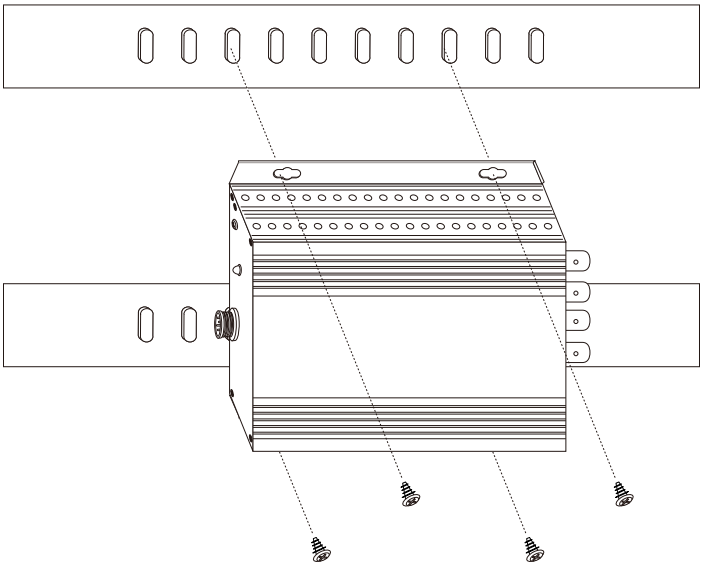


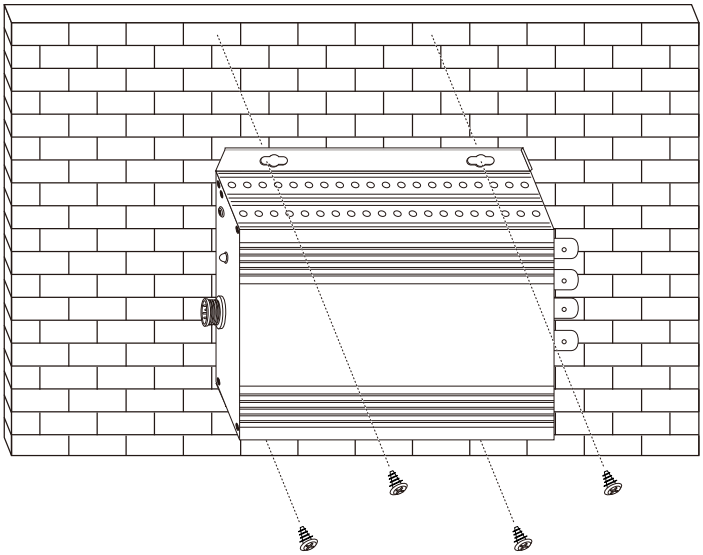
Figure 3-2 VF-402-T / VF-402-R stand alone installation

3.5 Rack Mounting and Wall mount

Rack Mount: Check device is tightly on the track



Wall Mount: Easier to put device on the wall with screws



Appendix A: Precautions

(1) Insert fiber rightly into the fiber interface; avoid breaking off fiber because of applying too much force. The rolling diameter shall not be too short (not less than 20CM).

(2) Fasten the retaining screw after connecting terminal blocks.

(3) Do not remove the dust cap before installation, in order to avoid dirt and other things getting into port, increasing the loss of optical signal and affecting the transmission quality.

(4) Notice optical transceiver matching when installing device to avoid cannot work because of different optical power, data interface and transmission distance. Pay attention to the differences of transmitter and receiver.

(5) Data interface is terminal block. To ensure good contact, it requires inserting interface after tinning. Please adopt stranded and shielded copper core of good quality, such as Belden, etc.

Appendix B: Troubleshooting

Question	Answer or Resolution
Power supply indicator is OFF	Check if the power plug is loose and the fuse wire of chassis.
Abnormal video data	Check if optical output power is normal and in the range of receiving sensitivity.
Irregular horizontal grain or beating video images	Incorrect video input synchronization, check if the grounding electrical level is equal, especially the grounding electrical level of the power of optical transceiver and input & output device; check the connection of video lines and if the input signal complies with standard.
All indicators are off	Check if the power adapter works normally, if modules completed, insert the right slots.
Video indicator of optical receiver flashes	Receiver not receiving the right optical signal; check if the link loss rate is normal. The rolling diameter is too short(less than 20CM); impurities on ceramic interface (gently clean it with alcoholic cotton).
Video indicator of optical transmitter OFF	Optical transceiver not receiving video signal, need to check the video input.
Snowflakes emerge in output video of receiver	Bit error in transmission; check if the link loss is too much, The rolling diameter shall not be too short (not less than 20CM), unstable transmission because of operating the temperature of environment is too high.
Abnormal data	Check is data protocol is right (if using 232 transmitting 485, etc.), if the transmitting direction is right (forward, backward or bidirectional), if connecting right (data is positive or negative, transmitting or receiving), if the data input is right.