S105 Unmanaged Industrial Switch

User Manual

Version: 1.2

Revision History

No.	Description	Date
V1.0	First release	Nov. 21, 2022
V1.1	Updated the definition of LED indicators	Apr. 18, 2023
V1.2	Updated the setup instructions	Jun. 12, 2023

Table of Contents

Foreword

Thank you for purchasing Vantron S105 Industrial Switch ("the Switch" or "the Product"). This manual intends to provide guidance and assistance necessary on setting up, operating and maintaining the Product. Please read this manual and make sure you understand the structure and functionality of the Product before putting it into use.

Intended Users

This manual is intended for:

- Network administrators
- Technical support engineers
- Other users

Copyright

Disclaimer

While all information contained herein has been carefully checked to assure its accuracy in technical details and typography, Vantron does not assume any responsibility resulting from any error or features of this manual, nor from improper uses of this manual or the software.

It is our practice to change part numbers when published ratings or features are changed, or when significant structure changes are made. However, some specifications of the Product may be changed without notice.

Technical Support and Assistance

Should you have any question about the Product that is not covered in this manual, contact your sales representative for solution. Please include the following information in your question:

- Product name and PO number;
- Complete description of the problem;
- Error message you received, if any.

Vantron Technology, Inc.

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Tel: (650) 422-3128
Email: sales@vantrontech.com

Regulatory Information

The Product is designed to comply with:

- Part 15 of the FCC Rules
- China Compulsory Certification

Please refer to **Appendix** for Regulatory Compliance Statement.

Symbology

This manual uses the following signs to prompt users to pay special attention to relevant information.

⚠	Caution for latent damage to system or human injury
i	Attention to important information or regulations

General Safety Instructions

The Product is supposed be installed by knowledgeable, skilled persons familiar with local and/or international electrical codes and regulations. For your safety and prevention of damage to the Product and other equipment connected to it, please read and observe carefully the following safety instructions prior to installation and operation. Keep this manual well for future reference.

- Do not disassemble or otherwise modify the Product. Such action may cause heat generation, ignition, electronic shock, or other damages including human injury, and may void your warranty.
- Keep the Product away from heat source, such as heater, heat dissipater, or engine casing.
- Do not insert foreign materials into any opening of the Product as it may cause the Product to malfunction or burn out.
- To ensure proper functioning and prevent overheating of the Product, do not cover or block the ventilation holes of the Product.
- Follow the installation instructions with the installation tools provided or recommended.
- The use or placement of the operation tools shall comply with the code of practice of such tools to avoid short circuit of the Product.
- Cut off the power before inspection of the Product to avoid human injury or product damage.

Precautions for Power Cables and Accessories

⚠ Use proper power source only. The Product supports 5V-36V power supply. Make sure the supply voltage falls within the specified range.

⚠ Place the cables properly at places without extrusion hazards.

⚠ Use only approved antenna(s). Non-approved antenna(s) may produce spurious or excessive RF transmitting power which may violate FCC limits.

⚠ Cleaning instructions:

- Power off the Product before cleaning
- Do not use spray detergent
- Clean with a damp cloth
- Do not try to clean exposed electronic components unless with a dust collector

⚠ Power off and contact Vantron technical support engineer in case of the following faults:

- The Product is damaged
- The temperature is excessively high
- Fault is still not solved after troubleshooting according to this manual

⚠ Do not use in combustible and explosive environment:

- Keep away from combustible and explosive environment
- Keep away from all energized circuits
- Unauthorized removal of the enclosure from the Product is not allowed
- Do not change components unless the power cable is unplugged
- In some cases, the Product may still have residual voltage even if the power cable is unplugged. Therefore, it is a must to remove and fully discharge the Product before replacement of the components.

CHAPTER 1 INTRODUCTION

1.1 Product Overview

The S105 unmanaged industrial switch enriches Vantron's hardware solutions for industrial automation. It features 5 Megabit Ethernet jacks, providing an efficient and reliable solution for industrial networking needs.

The S105 is a Plug-and-Play solution that minimizes users' educational inputs. Its compact and space-saving design makes it a preference for users who value networking efficiency. It supports a 12V~48V wide input voltage and operates at an industrial-grade extended temperature range (-20℃ ~ +75℃), ensuring excellent performance even under demanding conditions. It offers PSE options to provide up to 30W power output to client devices. It also offers an option for the PD feature to receive power supply from a PSE. A DIN rail bracket is attached to the back of the enclosure for flexible installation of the device.

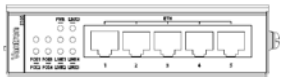
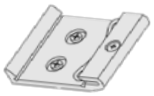
Switches are usually used in harsh environments that require stable operation and involve data interaction between a range of devices, and the S105 is particularly designed for rail transit, smart city, intelligent mining, etc.

1.2 Features

S105
Plug and play
Adaptive full/half duplex Ethernet jacks
PoE supported
Alarm relay
Prolonged longevity
Efficient fanless heat dissipation
Wide input voltage & temperature range
Compact size, easy to deploy

1.3 Unpacking

The Product has been carefully packed with special attention to quality. However, should you find anything damaged or missing, please contact your sales representative in due time.

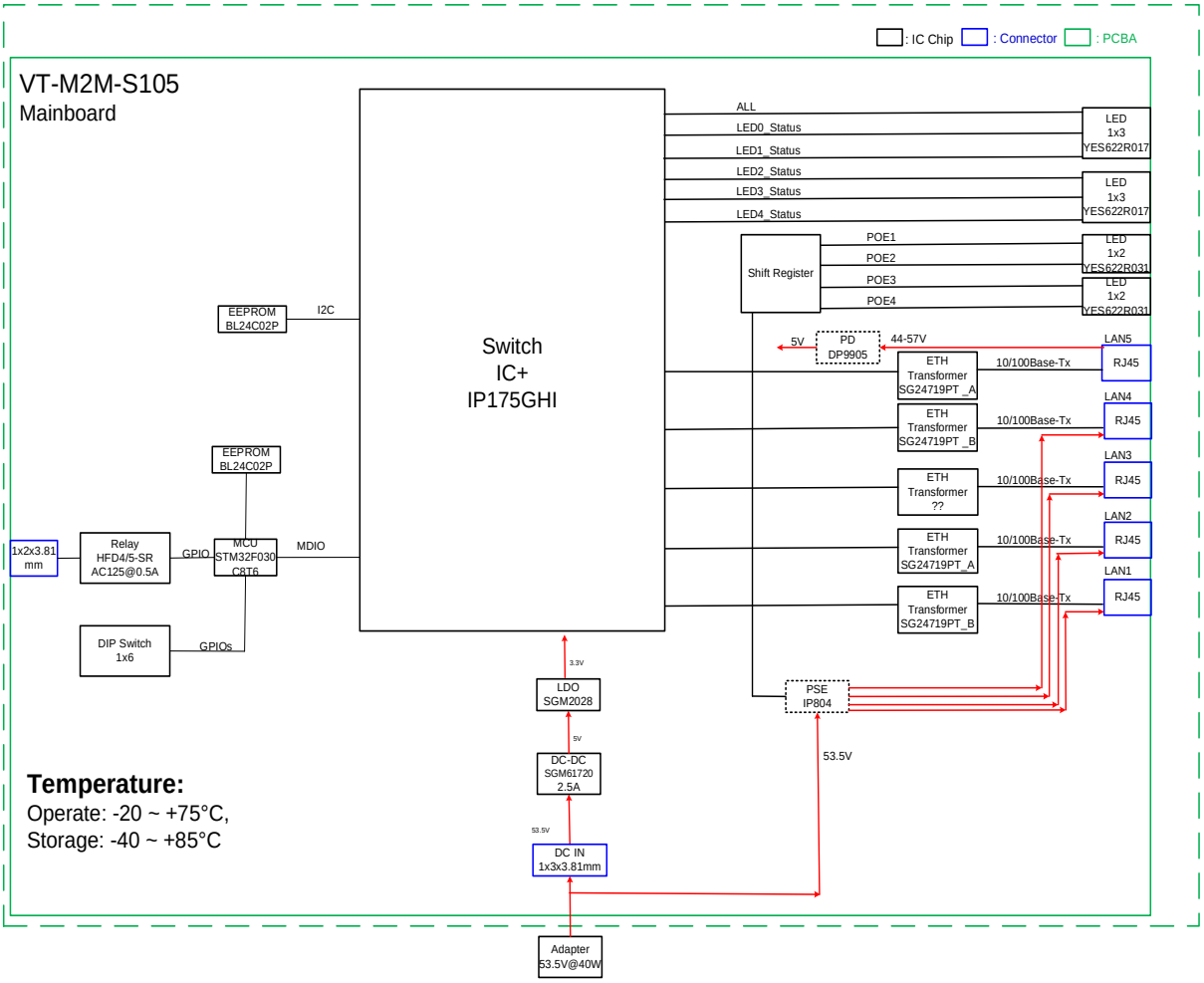
Standard accessories		Optional accessories	
	1 x S105 switch		1 x 12V DC Power adapter & power cord
	1 x DIN rail mounting bracket (attached)		1 x DC power connector

Actual accessories might vary slightly from the list above as the customer order might differ from the standard configuration options.

1.4 Specifications

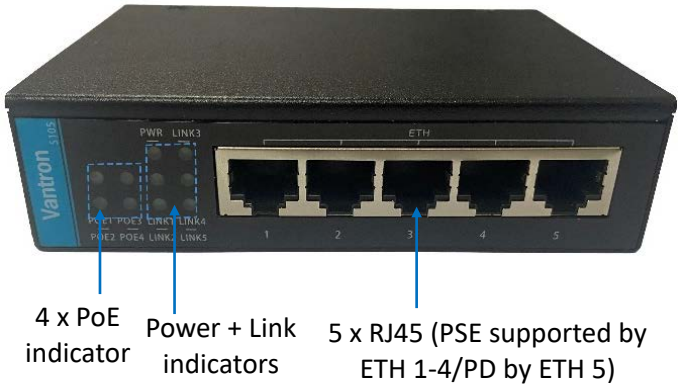
S105		
Ethernet	Interface	5 x RJ45, 10/100M Base-T (X), automatic flow control, adaptive full/half duplex
	Standard	IEEE802.3 IEEE802.3u IEEE802.3x (flow control)
	PSE (optional)	IEEE 802.3af, IEEE 802.3at ETH 1~ ETH 4 (Max. 30W power output in total)
	PD (optional)	Eth 5
Data transfer	Forwarding mode	Store-and-forward
	MAC address table	1K
	Switching capability	1Gbps
	Packet forwarding rate	0.75Mpp
	Packet buffer	1Mb
System control	Alarm relay	1 x 2-pin x 3.81mm
	LED indicator	1 x Power indicator (solid green after power on) 4 x PoE indicator (corresponding to ETH 1~ ETH 4) 5 x Network indicator (slow blinking for link; fast blinking for data transfer)
	DIP switch	1 x DIP switch (multi-/single-jack connection check)
Mechanical	Dimensions	115mm x 87mm x 30mm
	Installation	DIN rail mounting
	MTBF	≥30,000 H
	IP rating	IP40
Power	Input	12V~48V DC (48V-53.2V DC for PSE feature), 1 x 3 x 3.81mm terminal block (Over-current protection, reverse polarity protection)
	Consumption	< 32.1W (with four S105 connected)
Environment condition	Temperature	Operating: -20℃ ~ +75℃ Storage: -40℃ ~ +85℃
	Humidity	Operating: RH 5-95% (Non-condensing)
	EMC level	> EMC Level 3
	Certification	CCC, FCC, RoHS
Test standard	Industrial standard	IEC61000-4-2 (ESD): ±6kV (contact), ±8kV (air) IEC61000-4-4 (EFT): Power: ±2kV, Signal: ±1kV IEC61000-4-5 (Surge): Power: ±1kV (differential), ±2kV (common), Signal: ±1kV (differential), ±2kV (common) IEC60068-2-6 (Vibration) IEC60068-2-27 (Shock) IEC60068-2-32 (Free fall)

1.5 Block Diagram

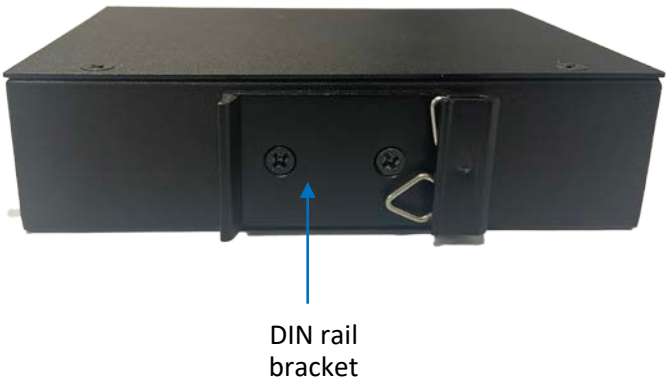


1.6 Product Layout

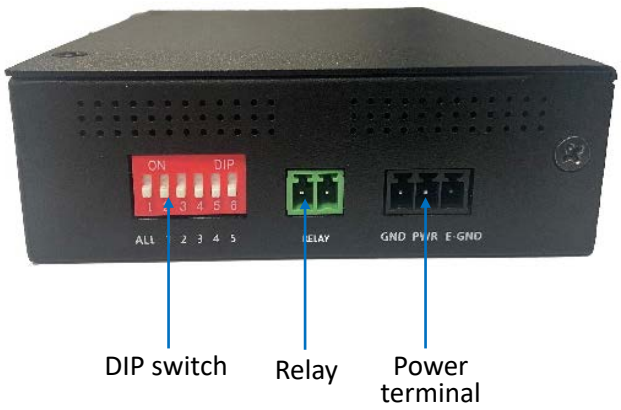
1.6.1 Front View



1.6.2 Back View



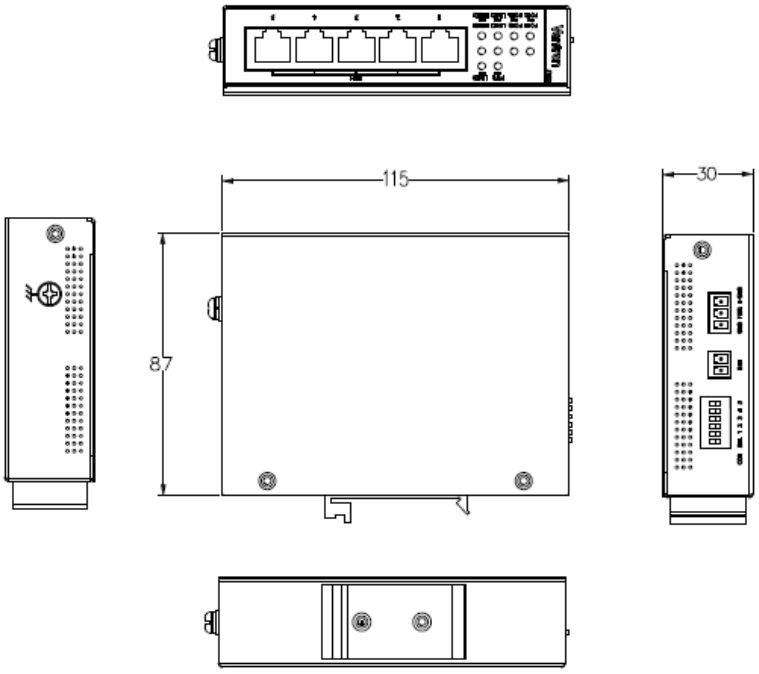
1.6.3 Left side view



1.6.4 Right side view

1.7 Mechanical Dimensions

- 115mm x 87mm x 30mm



1.8 Power Supply and Consumption

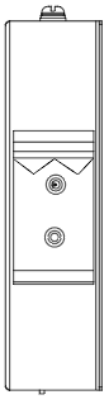
The S105 industrial switch work with 12V-48V DC power input supplied via the power terminal that is reinforced over-current protection, reverse polarity protection to ensure the safe operation of the device. The switch is designed to connect a 48V-53.2V DC when working in PSE mode. Its power consumption is less than 32.1W when four S105 switches are connected.

CHAPTER 2 GETTING STARTED

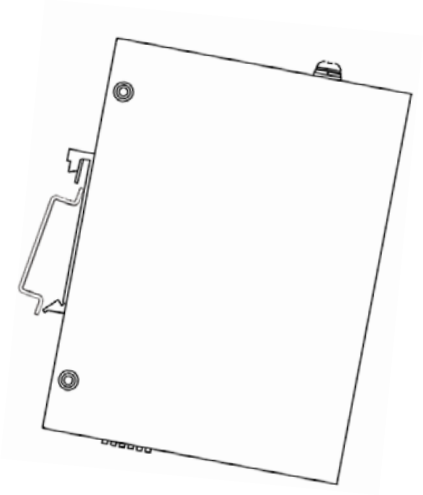
2.1 Device Setup

Before using the switch, please follow the steps below to finish the device installation.

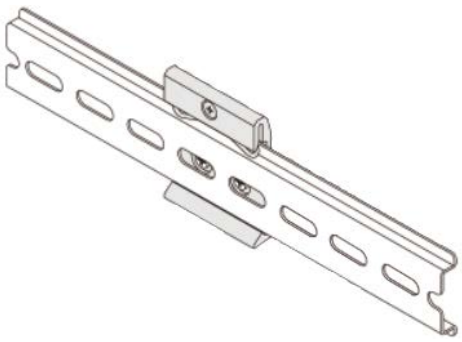
1. Hold the switch uprightly;



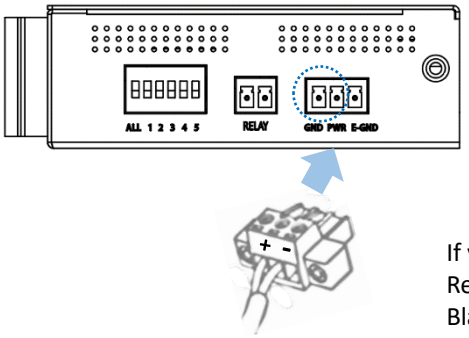
2. Place the switch on the DIN rail at an angle with the clip at the top of the DIN rail bracket fit into one side of the DIN rail;

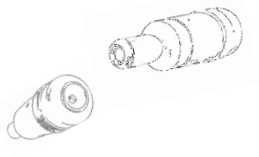


3. Push the switch down to compress the spring of the bracket;
4. Release the switch when there is enough space for the downside of the DIN rail bracket to fit the other side of the DIN rail;



5. Gently swing the switch to make sure the switch is fastened on the DIN rail;
6. Insert one end of an Ethernet cable into any RJ45 port of the switch and the other end into a switch or server to connect the switch to the network;
7. Use another Ethernet cable to connect a client device to another RJ45 port of the switch when necessary;
8. Insert the terminal end of the DC power connector into the power terminal of the switch and the other end into the power cord;





If you are using the power connector supplied by Vantron:
Red wire: PWR
Black wire: GND

9. Plug the power adapter into a power outlet that meets the supply voltage requirement (12V to 48V DC) to turn on the device.

If you are using the switch as a PSE to supply power to devices over Ethernet, please connect the switch to an outlet that supplies 48V-53.2V DC.

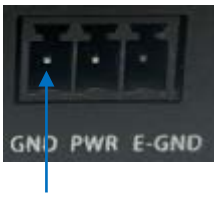
2.2 Starting the Device

The S105 unmanaged industrial switch offers a plug-and-play solution, and users need only to connect the switch to a power source to start using the device. There is no requirement for additional configurations.

2.3 I/Os

2.3.1 Power connector

The S105 implements a 3-pin power terminal (3.81mm) that accepts 12V-48V DC input with over-current protection and reverse polarity protection to ensure reliable operation of the device in a long term. However, for stable operation with the PSE feature, the device requires 48V-53.2V power input.



Pin 1

Pinout description:

Pin	Signal	Description
1	GND	Grounding
2	PWR	Power supply
3	E-GND	Enclosure grounding

2.3.2 Relay

The S105 offers a relay connector that can be used to connect an alarm to notify the user when the device connected to a specific Ethernet jack is disconnected.

The relay is designed to be used in combination with the DIP switch to monitor the connectivity of a specific Ethernet jack. The relay contacts are normally open. However, if a device connected to an Ethernet jack of the switch is disconnected, the contacts will close, completing the circuit and allowing electricity to flow through the relay. This triggers the alarm or other notification device that is connected to the relay connector, alerting the user to the disconnection.

2.3.3 DIP switch

The DIP switch is designed to be used in combination with the relay connector to monitor the devices connected to the Ethernet jacks. To monitor an Ethernet jack, place the corresponding switch to the ON position (up).

Switch 1 is for monitoring the connectivity of all the Ethernet jacks. If it is ON, the relay contacts will close when any of the connected devices is disconnected. The remaining switches (2-6) are for monitoring the specific Ethernet jack with the number marked on the enclosure (1-5).

2.3.4 Grounding screw

With the grounding screw, users can properly ground the switch using a grounding wire to protect the switch and other network devices from electrical hazards.

2.3.5 Ethernet jacks

The switch offers five RJ45 Ethernet jacks, supporting 10/100M Base-T data rate. Ethernet jacks 1-4 offers an option for the PSE feature while Ethernet jack 5 offers an option for the PD feature. These Ethernet jacks can be controlled by DIP switches 2-6, respectively and DIP switch 1 controls all the jacks.

Ethernet jacks 1-4 (Optional feature: PSE)

Ethernet jack 5 (Optional feature: PD）

2.4 Definition of LED Indicators

The switch provides three sets of LED indicators, including power indicator, PoE indicators and link indicators. The definition of the LED indicators is shown below.

LED Indicator	Description
PWR	Lights up when power is on
PoE (1-4)	Correspond to Ethernet jacks 1-4 from left to right and light up when a PD is connected (Please use 48V-53.2V power supply, otherwise all indicators might be on)
Link (1-5)	Correspond to Ethernet jacks 1-5 from left to right (Slow blinking: a device is connected to the corresponding Ethernet jack; fast blinking: data transfer is ongoing)

Variants not supporting PSE feature (such as standard S105 or S105-PD (with PD feature)) are not provided with PoE indicators.

CHAPTER 3 DEVICE CONNECTION

3.1 Usage of S105 Unmanaged Industrial Switch

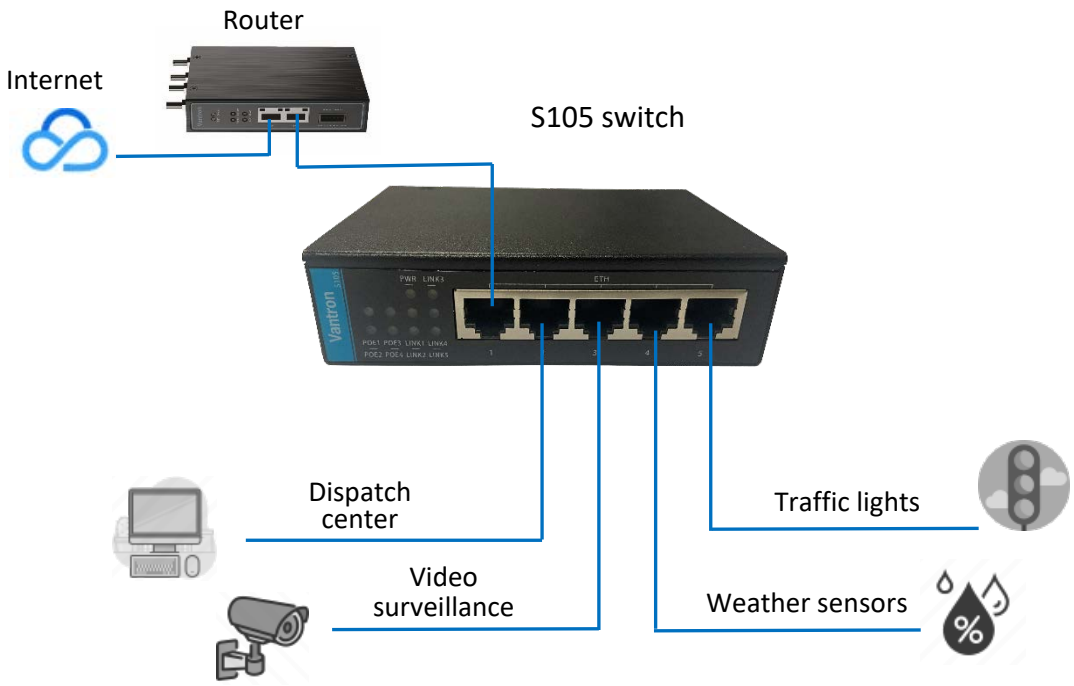
The S105 unmanaged industrial switch is a plug-and-play device that requires no complex setup. Such switches are typically used in smaller networks or to connect certain workgroups to a higher-level network without remote configuration, management, or monitoring options.

The S105 is suitable for any business network that wants to simplify the installation of wireless access points and IP-based surveillance cameras.

Switches are usually used in harsh environments that require stable operation and involve data interaction between a range of devices. Vantron S105 is particularly designed for rail transit, smart city, intelligent mining, etc.

3.2 Typical Connection

The following is a simple connection topology of S105-FR in the application of traffic surveillance.



CHAPTER 4 DISPOSAL AND WARRANTY

4.1 Disposal

When the device comes to end of life, you are suggested to properly dispose of the device for the sake of the environment and safety.

Before you dispose of the device, please back up your data and erase it from the device.

It is recommended that the device is disassembled prior to disposal in conformity with local regulations. Please ensure that the abandoned batteries are disposed of according to local regulations on waste disposal. Do not throw batteries into fire or put in common waste canister as they are explosive. Products or product packages labeled with the sign of “explosive” should not be disposed of like household waste but delivered to specialized electrical & electronic waste recycling/disposal center.

Proper disposal of this sort of waste helps avoid harm and adverse effect upon surroundings and people’s health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

4.2 Warranty

Product warranty

VANTRON warrants to its CUSTOMER that the Product manufactured by VANTRON, or its subcontractors will conform strictly to the mutually agreed specifications and be free from defects in workmanship and materials (except that which is furnished by the CUSTOMER) upon shipment from VANTRON. VANTRON's obligation under this warranty is limited to replacing or repairing, at its option, of the Product which shall, within **24 months** after shipment, effective from invoice date, be returned to VANTRON's factory with transportation fee paid by the CUSTOMER and which shall, after examination, be disclosed to VANTRON's reasonable satisfaction to be thus defective. VANTRON shall bear the transportation fee for the shipment of the Product to the CUSTOMER.

Out-of-Warranty Repair

VANTRON will furnish the repair services for the Product which are out-of-warranty at VANTRON's then-prevailing rates for such services. At customer's request, VANTRON will provide components to the CUSTOMER for non-warranty repair. VANTRON will provide this service as long as the components are available in the market; and the CUSTOMER is requested to place a purchase order up front. Parts repaired will have an extended warranty of 3 months.

Returned Products

Any Product found to be defective and covered under warranty pursuant to Clause above, shall be returned to VANTRON only upon the CUSTOMER's receipt of and with reference to a VANTRON supplied Returned Materials Authorization (RMA) number. VANTRON shall supply an RMA, when required within three (3) working days of request by the CUSTOMER. VANTRON shall submit a new invoice to the CUSTOMER upon shipping of the returned products to the CUSTOMER. Prior to the return of any products by the CUSTOMER due to rejection or warranty defect, the CUSTOMER shall afford VANTRON the opportunity to inspect such products at the CUSTOMER's location and no Product so inspected shall be returned to VANTRON unless the cause for the rejection or defect is determined to be the responsibility of VANTRON. VANTRON shall in turn provide the CUSTOMER turnaround shipment on defective Product within **fourteen (14) working days** upon its receipt at VANTRON. If such turnaround cannot be provided by VANTRON due to causes beyond the control of VANTRON, VANTRON shall document such instances and notify the CUSTOMER immediately.

Appendix Regulatory Compliance Statement

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

This device complies with Part 15 of 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.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate this equipment.