Industrial 1-Port BNC/RJ11 to 4-Port Gigabit

Ethernet Extender

IVC-4011-T-V2

User's Manual

Trademarks

Copyright © Antaira Technologies, LLC. 2023.

Contents are subject to revision without prior notice.

ANTAIRA is a registered trademark of Antaira Technologies, LLC. All other trademarks belong to their respective owners.

Disclaimer

ANTAIRA Technology does not warrant that the hardware will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose.

ANTAIRA has made every effort to ensure that this User's Manual is accurate; ANTAIRA disclaims liability for any inaccuracies or omissions that may have occurred.

Information in this User's Manual is subject to change without notice and does not represent a commitment on the part of ANTAIRA. ANTAIRA assumes no responsibility for any inaccuracies that may be contained in this User's Manual. ANTAIRA makes no commitment to update or keep current the information in this User's Manual, and reserves the right to make improvements to this User's Manual and/ or to the products described in this User's Manual, at any time without notice.

If you find information in this manual that is incorrect, misleading, or incomplete, we would appreciate your comments and suggestions.

FCC Warning

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.

CE Mark Warning

This device is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

Energy Saving Note of the Device

This power required device does not support Standby mode operation. For energy savings, please remove the power cable to disconnect the device from the power circuit. Without removing the power cable, the device will still consume power from the power source. In view of Saving the Energy and reducing the unnecessary power consumption, it is strongly suggested to remove the power cable from the device if this device is not intended to be active.

WEEE Warning

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment 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

ANTAIRA Industrial 1-Port BNC/RJ11 to 4-Port Gigabit Ethernet Extender User's Manual

For Models: IVC-4011-T-V2

Revision: 1.0 (JULY 2023)

Part No.: 2350-AC0530-470

Table of Contents

1. Package Contents

Thank you for purchasing ANTAIRA Industrial 1-Port BNC/RJ11 to 4-Port Gigabit Ethernet Extender, IVC-4011-T-V2. In the following sections, the term "Industrial Ethernet Extender" means the IVC-4011-T-V2.

Open the box of the Industrial Ethernet Extender and carefully unpack it. The box should contain the following items:

• IVC-4011-T-V2 x 1

• User's Manual x 1

• Wall-mount Kit x 1

• RJ11 / RJ45 Dust Caps x 5

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

2. Hardware Introduction

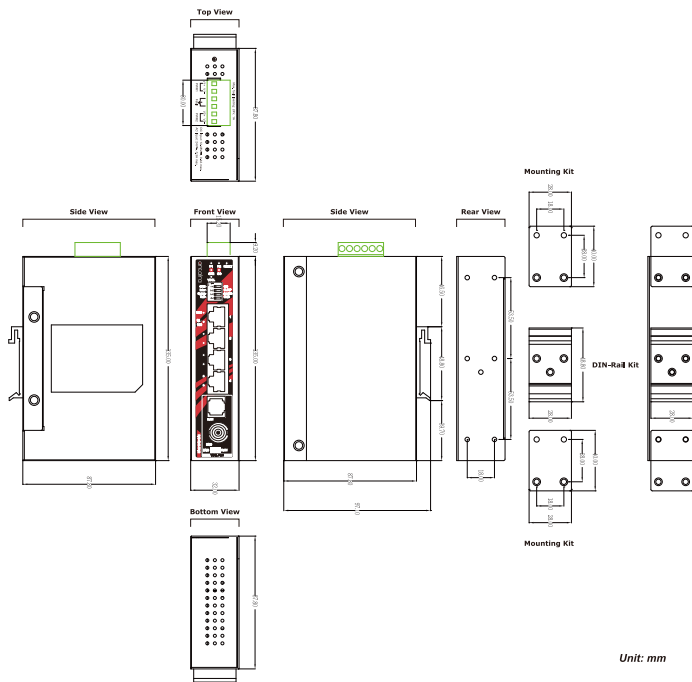## 2.1 Physical Dimensions

■ **Dimensions (W x D x H):** 32 x 135 x 87.8mm

Unit: mm

Figure 2-1: IVC-4011-T-V2 Three-View Diagram

2.2 Front View

■ **Front Panel**

Figure 2-2: IVC-4011-T-V2 Front Panel

The unit's front panel provides the following simple interfaces:

➢ LEDs for Power 1, Power 2 and VDSL2

➢ 4 10/100/1000BASE-T RJ45 ports

➢ BNC female/ RJ11 connector via DIP switch

➢ Selectable CO/CPE mode, Target Band Plan and Target SNR Margin via DIP switch

2.3 Top View

The upper panel of the Industrial Ethernet Extender consists of one terminal block connector within two DC power inputs
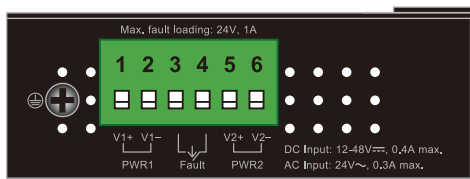

Figure 2-3: IVC-4011-T-V2 Top View

2.4 IVC-4011-T-V2 LED Indicators

The rich diagnostic LEDs on the front panel can provide the operating status of individual port and whole system.

■ **System**

LED	Color	Function
P1	Green	Lights to indicate DC power input 1 has power.
P2	Green	Lights to indicate DC power input 2 has power.
Fault	Red	Lights to indicate either power 1 or power 2 has no power.

■ **VDSL**

LED	Color		Function
VDSL	Green	**Lit**	Indicates that the VDSL connection is established.
		Fast Blink	Indicates that the VDSL connection is in training status (about 15 seconds).
		Slow Blink	Indicates that the VDSL connection is in idle status.
CO	Green	**Lit**	Indicates the Industrial Ethernet Extender is running in **CO** mode.
CPE	Green	**Lit**	Indicates the Industrial Ethernet Extender is running in **CPE** mode.

■ **100/1000BASE-T Port**

LED	Color		Function
1000	Green	**Lit**	Indicates that the port is operating at **1000Mbps**.
		Blink	Indicates that the Industrial Ethernet Extender is actively sending or receiving data over that port at 1000Mbps.
		Off	Indicates that the port is **link down** or **10/100Mbps**.
10/100	Green	**Lit**	Indicates that the port is operating at **100Mbps** or **10Mbps**.
		Blink	Indicates that the Industrial Ethernet Extender is actively sending or receiving data over that port at 100Mbps or 10Mbps.
		Off	Indicates that the port is **link down** or **1000Mbps**.

2.5 DIP Switch and Link Type

■ Link Type

The BNC mode allows Industrial Ethernet Extender to connect and transfer data by using BNC cable.

The RJ11 mode allows Industrial Ethernet Extender to connect and transfer data by using telephone wire.

■ DIP Switch

The Industrial Ethernet Extender provides a selectable 4-position DIP switch. Switch them on or off to obtain the best coaxial/RJ11 cable connection over a distance.

DIP	DIP-1	DIP-2	DIP-3	DIP-4
	Mode	Transmission	Band Profile	SNR Margin
OFF	CO	G.INP	Asymmetric	12dB
ON (default)	CPE	Interleave	Symmetric	8dB

Note	By default, the 4-position switches of the DIP switch, set at the **"ON"** position, are operated as **"CPE"**. For operating as **"CO"**, please turn DIP 1 switch to the **"OFF"** position. Then adjust other DIP switches accordingly to fulfill different network application demands.

■ DIP-1: Mode (CO/CPE)

CO (Central Office)	The Master device mode, usually the CO device, is located at the data center of ISP or enterprise to link to the backbone.
CPE (Customer Premises Equipment)	The Slave device mode, usually the CPE device, is located at branch office, home or remote side as the long reach data receiver. The CPE can be connected to the PC, IP camera or wireless access point, or other network devices.

■ DIP-2: Transmission (G. INP and Interleave mode)

G. INP	Method of protection against bursts from other devices or lines to impact your xDSL connection.
Interleave	Method of error correction used on xDSL connection. Interleave requires additional latency to improve resilience to burst of error.

■ DIP-3: Band Profile (Asymmetric/Symmetric)

Asymmetric	The asymmetric mode provides more bandwidth than the other side. This mode provides the highest bandwidth in short range.
Symmetric	With the G.997 band plan supported, the symmetric mode can provide almost the same rate of downstream and upstream.

■ DIP-4: SNR (Signal Noise Ratio) Margin

When the SNR margin is selected, the system provides 12dB/8dB SNR margin for all usable loop lengths. Better channel noise protection is made with the higher SNR margin.

3. Product Specifications

Product	IVC-4011-T-V2		
Hardware Specifications			
TP interface	4 10/100/1000BASE-T RJ45 auto-MDI/MDI-X ports		
VDSL	BNC	1 BNC female Ethernet over Coaxial	
		Cabling	Coaxial cable: 75 ohm RG-6/U cable, less than12Ω/1000 ft RG-59/U cable, less than 30Ω/1000 ft.
		Maximum Distance	Max. 1200m with data transmission (3,937ft.)
	RJ11	1 VDSL2 RJ11 female phone jack Twisted-pair telephone wires (AWG-24 or better) up to 1.2km (3,937ft.)	
Functionality		DIP-1	Select CO or CPE mode
		DIP-2	Select G.INP or Interleaved mode
		DIP-3	Select Band Profile (Asymmetric or Symmetric)
		DIP-4	Select SNR of 12dB or 8dB
Dimensions (W x D x H)	32 x 135 x 87.8mm		
Weight	185g		
Power Requirement	Dual 12~48V DC		
LED Indicators	Power 1/Power 2: Green FAULT: Red 1000BASE-T LNK/ACT: Green 10/100BASE-TX LNK/ACK: Green VDSL: Green CO: Green CPE: Green		
Housing	Metal		

System Specifications	
VDSL Compliance	■ **VDSL**-DMT ■ ITU-T G.993.1 VDSL ■ ITU-T G.997.1 ■ ITU-T G.993.2 VDSL2 (Profile 17a/30a Support) ■ ITU-T G.993.5 **G. Vectoring** ■ ITU-T G.998 ■ G.INP
Standards Conformance	
Standards Compliance	IEEE 802.3 Ethernet IEEE 802.3u Fast Ethernet IEEE 802.3ab Gigabit Ethernet ITU-T G.993.1 VDSL ITU-T G.997.1 ITU-T G.993.2 VDSL2 (Profile 17a/30a Support) ITU-T G.993.5 G.Vectoring and G.INP ITU-T G.998
Regulatory Compliance	FCC Part 15 Class A, CE
Environment	
Temperature	Operating: -40~75 degrees C Storage: -40~75 degrees C
Humidity	Operating: 5~95% (non-condensing) Storage: 5~95% (non-condensing)

4. Applications

The Industrial Ethernet Extender does not require any software configuration. Users can immediately use any feature of this product simply by attaching the cables and turning the power on. There are some key limitations on the Industrial Ethernet Extender. Please check the following items.

### 4.1 Point-to-Point Application -- LAN to LAN Connection

One set of the Industrial Ethernet Extender could be used to link two local area networks that are located in different places. Through the coaxial cable, it could set up a 200/100Mbps asymmetric backbone, but one Industrial Ethernet Extender must be **Master** (**CO** mode) and the other one is **Slave** (**CPE** mode).

Note	1. The following application is connected by Coaxial cable. You have to transfer the 2-Position DIP switch to the BNC mode. The other connection type must be transferred to RJ11 and connect by RJ11/telephone wire.
	2. Only one wire can be connected at a time, coaxial or RJ11.

## LAN to LAN Connection
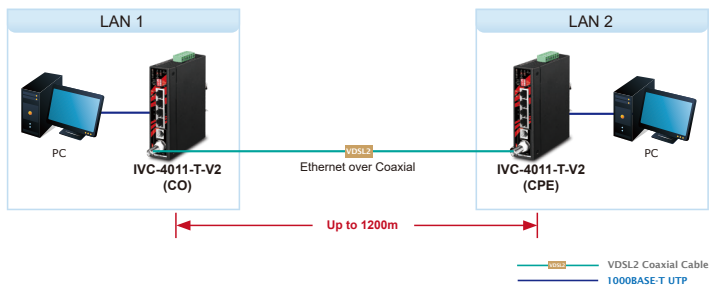
Connecting Standalone PC

Refer to the following procedures to set up the Industrial Ethernet Extender LAN to LAN connection.

1. **[LAN1]** Set the Industrial Ethernet Extender at LAN 1 in the **CO** mode from the DIP switch.

2. **[LAN2]** Set the Industrial Ethernet Extender at LAN 2 in the **CPE** mode from the DIP switch.

3. Power on the Industrial Ethernet Extender CO and CPE at both sides by connecting its power source.

4. Power, CO and CPE LEDs will illuminate correspondingly.

5. Connect coaxial cable from LAN1 IVC-4011-T-V2 to **VDSL BNC port** of the LAN2 IVC-4011-T-V2.

6. **VDSL LNK LED** will blink to illuminate at both Industrial Ethernet Extenders.

7. Connect the IVC-4011-T-V2 Ethernet **LAN port** to the other network device via regular Cat.5 UTP cable.

4.2 Point to Multi-point Application (IP surveillance)

Applications of IP Surveillance
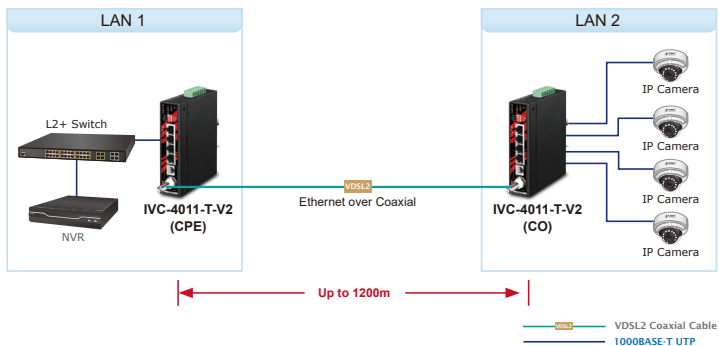
Building a IP surveillance system

Refer to the following procedure to set up many pairs of IVC-4011-T-V2 to IP surveillance system.

1. Set the IVC-4011-T-V2 to be the CO and CPE mode from the DIP switch on the front panel.

2. Power on the IVC-4011-T-V2 by connecting its power source.

3. Power LED will illuminate.

4. Connect coaxial cable from VDSL port of two IVC-4011-T-V2 units.

5. VDSL LED will blink to illuminate.

6. Connect Ethernet ports to IP cameras via regular Cat. 5, 5e or 6 cable.

7. Install the NVR and monitor and connect to one Ethernet switch

8. You can get data transmissions from all IP cameras.

# 5. Hardware Installations

5.1 Wiring the Power Inputs

The 6-contact terminal block connector on the top panel of Industrial Ethernet Extender is used for two DC redundant power inputs. Please follow the steps below to insert the power wire.
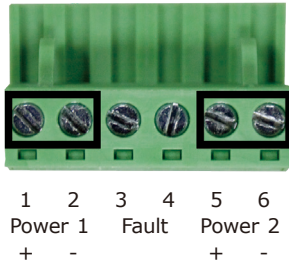
⚠ Caution	When performing any of the procedures like inserting the wires or tightening the wire-clamp screws, make sure the power is OFF to prevent from getting an electric shock.

1. Insert positive and negative DC power wires into Contacts 1 and 2 for Power 1, or 5 and 6 for Power 2.
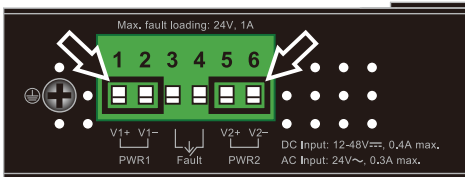
2. Tighten the wire-clamp screws for preventing the wires from loosening.

5.2 Wiring the Fault Alarm Contact

The fault alarm contacts are in the middle of the terminal block connector as the picture shows below. Inserting the wires, the Industrial Ethernet Extender will detect the fault status of the power failure and then forms an open circuit. The following illustration shows an application example for wiring the fault alarm contacts.

Fault Alarm Contacts

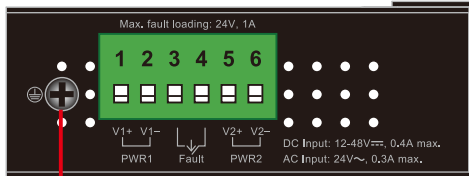**The Fault Alarm Contacts are energized (CLOSE) for normal operation and will OPEN when failure occurs**
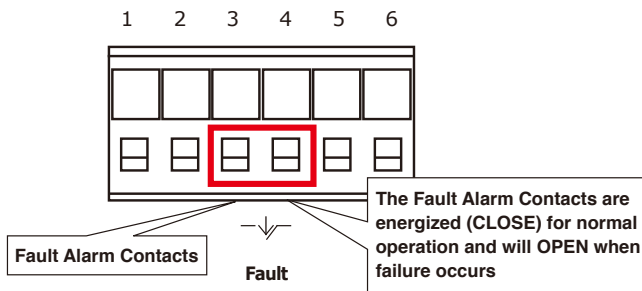
Fault

Insert the wires into the fault alarm contacts

5.3 Grounding the Device

Users **MUST** complete grounding wired with the device; otherwise, a sudden lightning could cause fatal damage to the device.
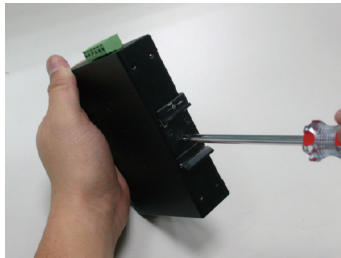

⏚ Earth Ground

|	
Note	EMD (Lightning) DAMAGE IS NOT CONVERED UNDER WARRANTY.

5.4 DIN-rail Mounting Installation

The DIN-rail bracket is screwed on the Industrial Ethernet Extender when out of factory. Please refer to the following steps for DIN-rail mounting:

Step 1: Screw the DIN-rail bracket on the Industrial Ethernet Extender.

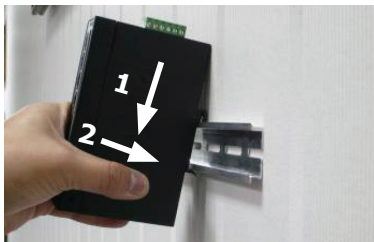**Step 2:** Lightly insert the bottom of the switch into the track.
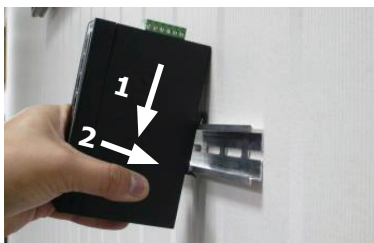
Step 3: Make sure the DIN rail is tightly secured on the track.

Step 4: Please refer to the following procedure to remove the Industrial Ethernet Extender from the track.

Step 5: Lightly pull out the bottom of DIN rail for removing it from the track.

5.5 Wall-mount Plate Mounting

To install the Industrial Ethernet Extender on the wall, please follow the instructions described below.

Step 1: Remove the DIN-rail bracket from the Industrial Ethernet Extender with a screwdriver.

Step 2: Place the wall-mount plate on the rear panel of the Industrial Ethernet Extender.
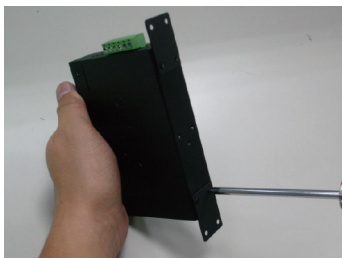
Step 3: Use the screws to screw the wall-mount plate on the Industrial Ethernet Extender.

Step 4: Use the hook holes at the corners of the wall-mount plate to hang the Industrial Ethernet Extender on the wall.

Step 5: To remove the wall-mount plate, reverse the steps above.

6. Performance Table

■ Industrial Ethernet Extender Upstream/Downstream Performance with RJ11 connection

CO DIP Switch Setting / Distance (meter)	Interleave (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	93/190	85/174	143/148	132/136
400	67/164	59/146	118/119	103/104
600	38/116	28/94	71/75	59/60
800	24/59	22/49	49/36	38/27
1000	9/45	7/40	21/25	15/24
1200	6/30	3/28	16/24	6/20
CO DIP Switch Setting / Distance (meter)	G.INP (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	92/190	85/174	143/148	129/136
400	68/165	57/144	116/115	99/96
600	37/112	28/94	71/69	61/55
800	27/56	22/49	49/32	39/24
1000	9/46	7/40	19/27	15/26
1200	5/31	3/28	16/23	12/20

■ Industrial Ethernet Extender Upstream/Downstream Performance with BNC connection

CO DIP Switch Setting / Distance (meter)	Interleave (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	84/184	75/169	131/144	125/128
400	49/148	54/128	93/118	89/99
600	36/100	26/80	77/66	64/53
800	21/50	17/39	44/30	37/26
1000	7/42	5/29	20/25	19/28
1200	5/27	3/28	13/27	15/20
CO DIP Switch Setting / Distance (meter)	G.INP (Upstream/Downstream)			
	Asymmetric		Symmetric	
	8dB	12dB	8dB	12dB
200	89/185	79/166	140/144	117/123
400	57/155	47/137	104/113	89/96
600	33/75	31/73	62/73	52/43
800	17/66	13/45	40/29	39/24
1000	13/59	6/38	20/27	15/26
1200	4/32	3/22	14/20	12/20

*1 BNC and RJ11 mode must switch to the same position for CO and CPE. Otherwise, it may cause instability.

*2 The actual data rate will vary on the quality of the copper wire and environmental factors.

7. Troubleshooting

SYMPTOM:

VDSL LNK LED does not light up after wire is connected to the VDSL port.

CHECKPOINT:

1. Verify the length of the coaxial cable (not more than 1.2km) connected between the two IVC-4011-T-V2 units. Please also try to adjust the DIP switch of the IVC-4011-T-V2 to the other SNR mode.

2. Please note you must use one IVC-4011-T-V2 in CO mode and the other IVC-4011-T-V2 in CPE mode to make connection to each other work.

SYMPTOM:

TP LED does not light up after cable is connected to the port.

CHECKPOINT:

1. Verify you are using the Cat.5e or better cable with RJ45 connector to connect to the port.

2. If your device (like LAN card) supports auto-negotiation, please try to manually set at a fixed speed of your device to solve this issue.

3. The IVC-4011-T-V2 and the connected device's power are on or not.

4. The port's cable is firmly seated in its connectors in the switch and in the associated device.

5. The connecting cable is good and with the correct type.

6. The connecting device, including any network adapter, is functional.

8. FAQs

Q1: What is VDSL2?

A1: VDSL2 (Very High-Bit-Rate Digital Subscriber Line 2), G.993.2 is the newest and most advanced standard of xDSL broadband wire line communications. Designed to support the wide deployment of Triple Play services such as voice, data, high definition television (HDTV) and interactive gaming, VDSL2 enables operators and carrier to gradually, flexibly, and cost efficiently upgrade the existing xDSL-infrastructure.

Q2: What is SNR and what's the effect?

A2: In analog and digital communications, Signal-to-Noise Ratio, often written as SNR, is a measure of signal strength relative to background noise. The ratio is usually measured in decibels (dB).

In digital communications, the SNR will probably cause a reduction in data speed because of frequent errors that require the source (transmitting) computer or terminal to resend some packets of data. SNR measures the quality of a transmission channel over a network channel. The greater the ratio, the easier it is to identify and subsequently isolate and eliminate the source of noise.

Generally speaking, the higher SNR value gets, the better the line quality gets, but performance is lower.

Q3: What is the best distance for IVC-4011-T-V2?

A3: In order to guarantee the stability and better quality of network, we suggest the distance should not exceed 1.2 kilometers.

9. Customer Support

Thank you for purchasing ANTAIRA products. If you need more product or support information, please contact ANTAIRA support team.

Antaira support team mail address:

- info@antaira.com
- support@antaira.com