

User Manual

**Ethernet Coax Transmitter/Receiver,
Data & Power over Coax,
1 x RJ-45, 1 x BNC**

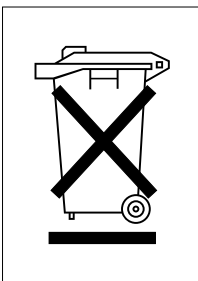
**IAM-6MC1001MTA
IAM-6MC1001MRA**

Safety instructions

- Before switching on and operating the system, first read this safety advice and the operating instructions.
- Keep the operating instructions in a safe place for later use.
- Installation, commissioning and maintenance of the system may only be carried out by authorised individuals and in accordance with the installation instructions - ensuring that all applicable standards and guidelines are followed.
- Protect the devices from water penetration and humidity, since these can cause lasting damage.
- Should moisture nevertheless enter the system, under no circumstance switch on the devices under these conditions, instead send them for examination to an authorised specialist workshop.
- The system must never be used outside of the technical specifications, since this can destroy it.
- The device must be protected from excesses of heat, dust, humidity and vibration.
- When separating the system from the voltage supply, only ever use the plug to pull out the cable. Never pull directly on the cable itself.
- Lay the connecting cables carefully and check that they are not mechanically stressed, kinked or damaged and that no humidity can penetrate into them.
- In the event of a malfunction, please inform your supplier.
- Maintenance and repairs may only be carried out by authorised specialist personnel.
- The system must be isolated from the power supply before opening the housing.
- The device may only be opened by qualified service personnel. Unauthorised access invalidates any warranty claim.
- Connection cables should always be exchanged through Videor E. Hartig GmbH.
- Use only original spare parts and accessories from Videor E. Hartig GmbH.
- The housing should only be cleaned using a mild domestic cleaning agent. Never use solvents or petrol as these can permanently damage the surface.
- During installation, it is essential to ensure that the seals provided are correctly installed and that they are not displaced during installation. Damaged seals must not be installed and will invalidate any warranty.
- The installer is responsible for the maintenance of the enclosure as per the technical data, e.g. by sealing the cable outlets with silicone.
- Wire end ferrules should be used when shortening the flexible connection cables.
- The devices may only be operated in the temperature range indicated in the data sheet and within the defined air humidity range.

WEEE (Waste Electrical & Electronic Equipment)

Correct Disposal of This Product (Applicable in the European Union and other European countries with separate collection systems).



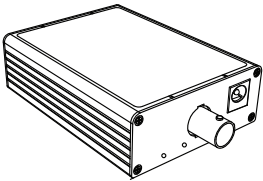
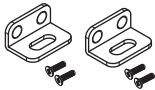

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

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1. Quick Installation Guide

1.1. Package Contents

EPoC Extender (Transmitter/Receiver)	Bracket & Screw	Installation Guide
		

1.2. Overview

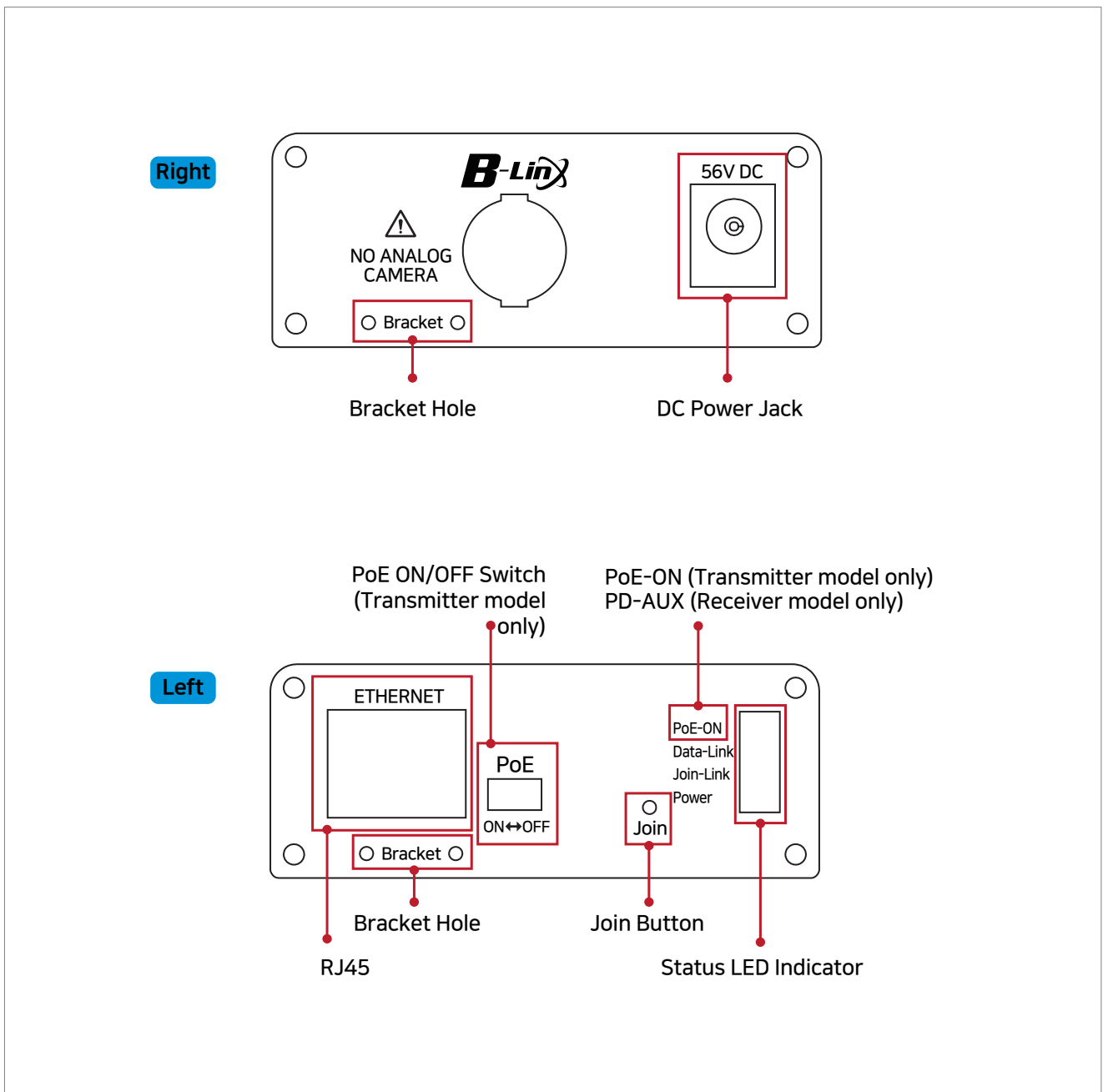
EPoC Extender is a High-Speed, long distance Ethernet & PoE extender that makes possible to transmit the Ethernet signal up to 2.4Km and PoE up to 1.2Km via Coax (or UTP, 2wire & Etc.) cables in different situations. It is cost-effective and time saving solution to migrate existing analog system to IP based system since **EPoC Extender** supports easy installation utilizing the existing cable.

With long distance transmission feature, the device makes to overcome 100 meters distance limitation easily and reduces the construction cost significantly compared with fiber optic configuration.

1.3. Features

- Ethernet over Coax communication following IEEE1901 Standard
- Data + Power over Coax cable (or UTP, 2-Wire)
- Data distance up to 2.4Km
- PoE distance up to 1.2Km
- Max. 95Mbps Bandwidth
- 10/100 Full Duplex
- 128bit AES network encryption
- Supports Multi-connection (Daisy chain, Star, etc.)
- Slim design
- PoE, PoE+, Extra PoE (Max. 60W output) - Transmitter model only
- Supports UTP, Telephone (2 Pairs), 2-Wire cable communication (Using IAM-4MU1001M0A)
- LED Indication (PoE, Data, Join, Power)
- Plug & Play
- Surge Protection
- Support PoE+ Input (25.5W) from PSE devices (PoE Switch or Injector) – Receiver model only

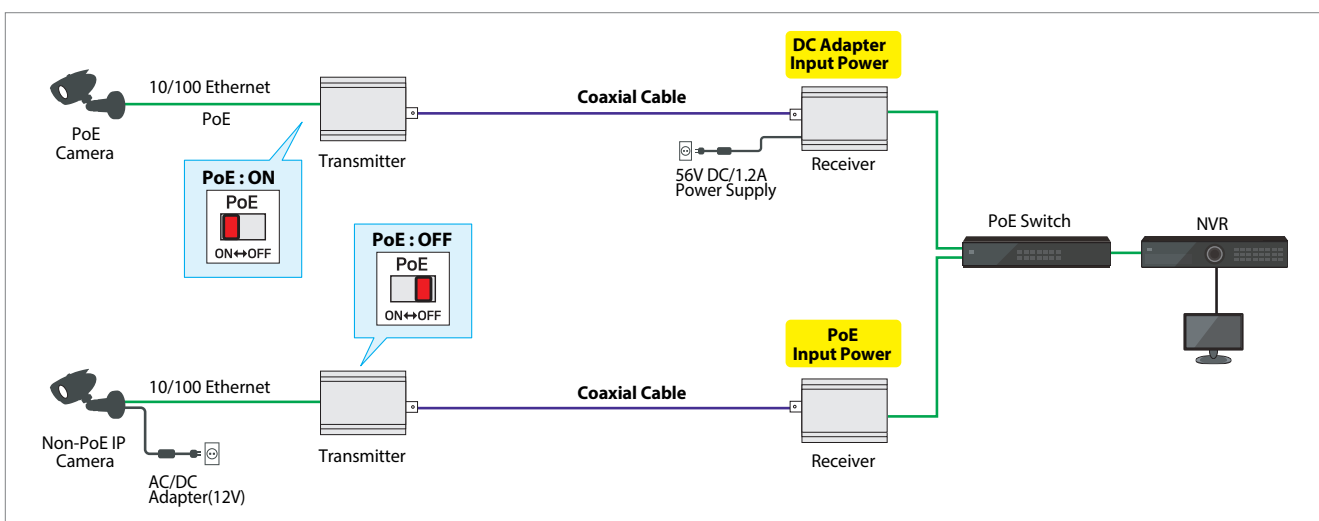
1.4. Hardware Overview



1.5. Product Installation Guide

1. Set the IP address on the camera following the instruction manual of the camera.
 - If the camera IP is automatically assigned (DHCP, etc.), there is no need to set the camera IP separately.
2. Connect BNC of the coaxial cable to each Transmitter/Receiver.
3. Connect 56V DC power to Transmitter/Receiver first and then to AC outlet.
recommended to use 56VDC Power supply on Receiver. When using both PoE switch Device and
 - Receiver can be powered by PoE Switch Device (PoE+ PD Supported) but for safe working, it power supply at the same time, power supply works preferentially.
 - In case of 7W camera, the device supports long distance PoE transmission up to 1,200m over RG6 coaxial cable.
PoE transmission distance can be varied depending on cable type and Camera's power consumption(W).
4. When they are connected without any problem, Power / Join Link LED are on.
5. Adhere the brackets in the package to Transmitter/Receiver and then fix up the products.
6. Connect the UTP(LAN) cable between Receiver and NVR first and then between Transmitter and camera.
7. Turn on the PoE switch on Transmitter for PoE IP camera and if the camera is powered by a separate power source (not powered by PoE output feature of the Transmitter), turn off the PoE switch on Transmitter.
 - Both Transmitter/Receiver send data and power together via BNC connector. Receiver does not have PoE support so that it can send data only via RJ45.
8. Ping test is recommended to confirm the whole network after installation.
9. Check the video signal on the monitor.

1.6. Product Application



NOTE:

- To avoid damage of products do not connect Transmitter RJ45 PoE Out to a PoE Switch!
- Joining function by hardware is only available between Transmitter/Receiver or Transeiver devices except camera.

1.7. Network Password Change

All EPoC products have the same network password on factory default to support plug & play between EPoC products. In case of multiple 1:1 connections, It is possible to avoid network interference by setting password of each group.

1. Basic connection

- Prepare a short coaxial cable for convenience.
- Connect EPoC products and power adapter.

2. Unjoin : removing the password

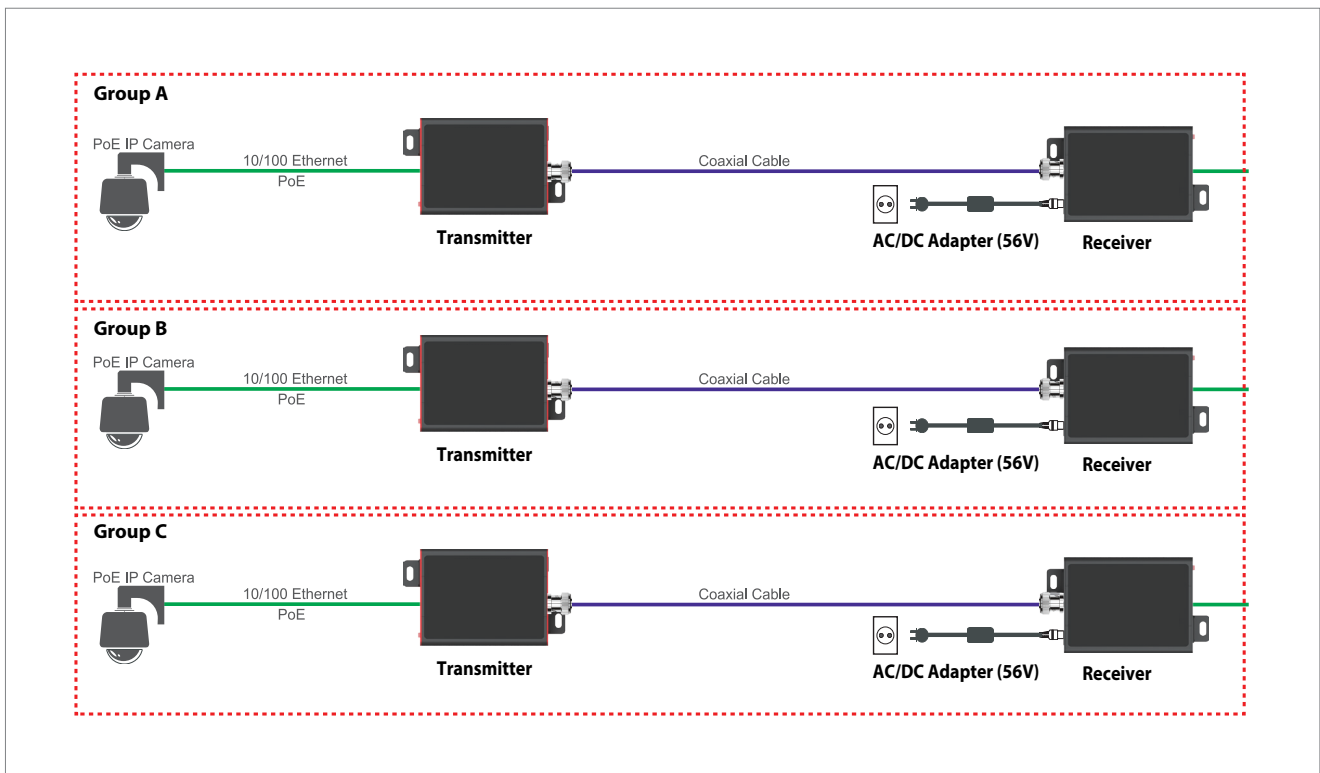
- Push the join button for 15 seconds. BNC Join LED turns off.
- Push the join button for 15 seconds on the other side.

3. Join : making new password

- After unjoining, push the join button for **1 or 2** seconds. PWR LED turns off and on, and then BNC Join LED turns on.
- Push the join button for 3 seconds on the other side.
- After PWR LED is on, BNC Join LED on both side are flickering and the network is working again.

4. Repeat above 1~3 for the other groups.






- New and random password is automatically assigned and it can not be restored to the factory default password.



NOTE:

- To avoid damage of products do not connect Transmitter RJ45 PoE Out to a PoE Switch!
- Joining function by hardware is only available between Transmitter/Receiver or Transeiver devices except camera.

1.8. LED Indicators

Indicator	Color	Function
PoE-ON		PoE Output Status (Transmitter model only)
PD-AUX		PoE Input Status (Receiver model only)
Data-Link		Blinks when transmitting Ethernet data
Join-Link		EPoC products connected
Power		56VDC or PoE Input connected

1.9. Specification

Model		Transmitter	Receiver
Interface	Coax	1 x 75Ω BNC (Female) - Ethernet over Coax (B-LinX)	
	Ethernet	1 x RJ45 - 10/100 Base-T with Auto-detect MDIX	
Transmission Rate		95Mbps Full Duplex	
Transmission Distance	Ethernet	up to 2.4Km(RG-6)	
	PoE (PoC)	up to 1.2Km (RG-6 / 7W camera)	
LED Indication	Ethernet	1 x Data-Link (Yellow)	
	EPoC	1 x Join-Link (Green)	
	Power	1 x Power On(Amber)	
	PoE	1 x PoE Out (Red)	
Encryption		128-bit AES	
Power	Input	B-Linx or DC12V~57V	PoE Switch or DC12V~57V
	PoE Output	Extra PoE up to 60W	PoE Not Supported PoC Only
Mechanical	Dimension	82.4(L) x 61.6(W) x 24(H)mm	
	Weight	77g	
Environment	Operating Temp	-20 ~ 60°C	
	Storage Temp	-30 ~ 80°C	
	Relative Humidity	10% ~ 90%	
Compliance	Certification	FCC, CE, KC, RoHS	
	Surge Protection	IEC 61000-4-5 4kV(1.2 / 50us), 2kA(8 / 20us)	
Optional Accessories		56VDC / 1.2A External Power Supply	

1.10. Caution

- Please install the device following the installation guide.
- Do not touch the device and cable with wet hands.
- Keep away from moisture and shock.
- Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus that produce heat.
- Indoor use only.
- Do not use for other purposes. (i. e. Connecting analog camera to BNC connector)
- Do not disassemble or modify this device.
- Do not put any sticker or paint on it.
- If this device is defective or malfunctioning, please unplug the power adapter immediately and contact dealer or service center.
- Use only rated 56V power adapter specified by the manufacturer. Connect DC power to EPoC Extender first and then to AC outlet.

1.11. Warranty

- This device has passed the quality control and product inspection.
- Please install and use according to the installation guide.
- The warranty period for this product is 24 months from the date of purchase.
- Any damages or breakage from user's abuse, accident, modification or natural disasters will not be covered manufacturer's warranty.

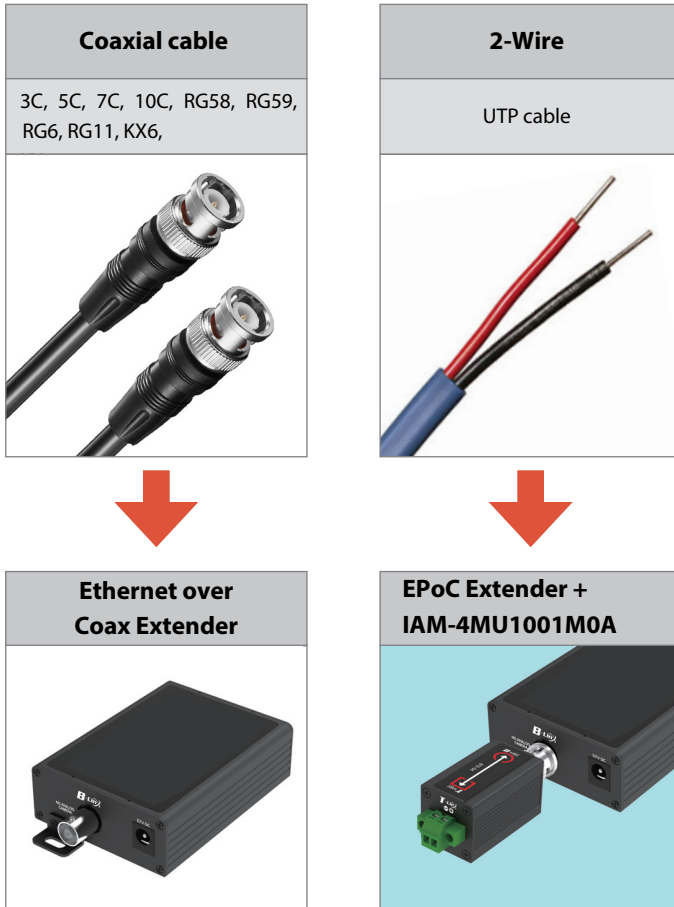


2. Pre-field verification

2.1. Check transmission line

2.1.1. Transmission line type

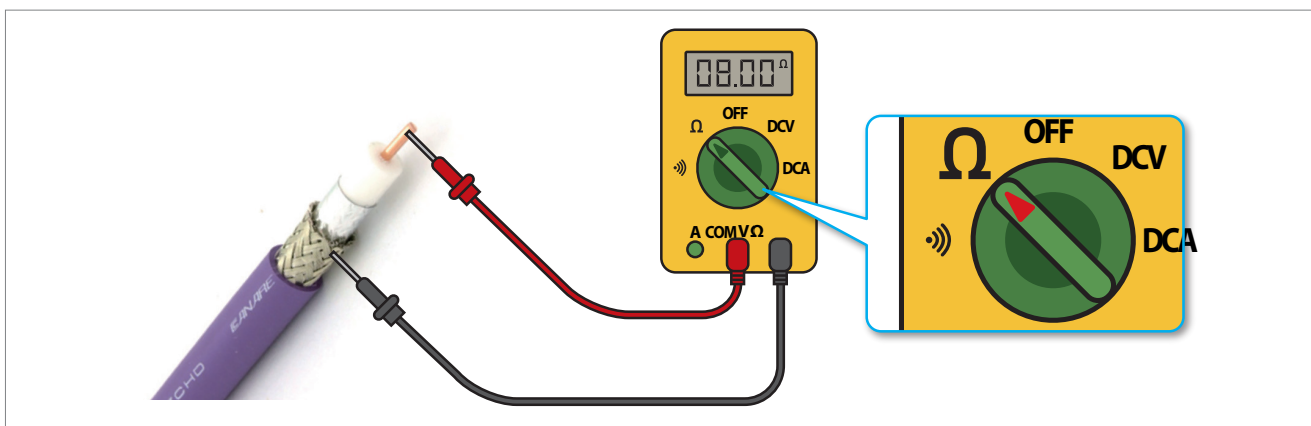
■ EPoC (Ethernet over Coax) Applicable



2.1.2. Check whether the cable is disconnected / shorted

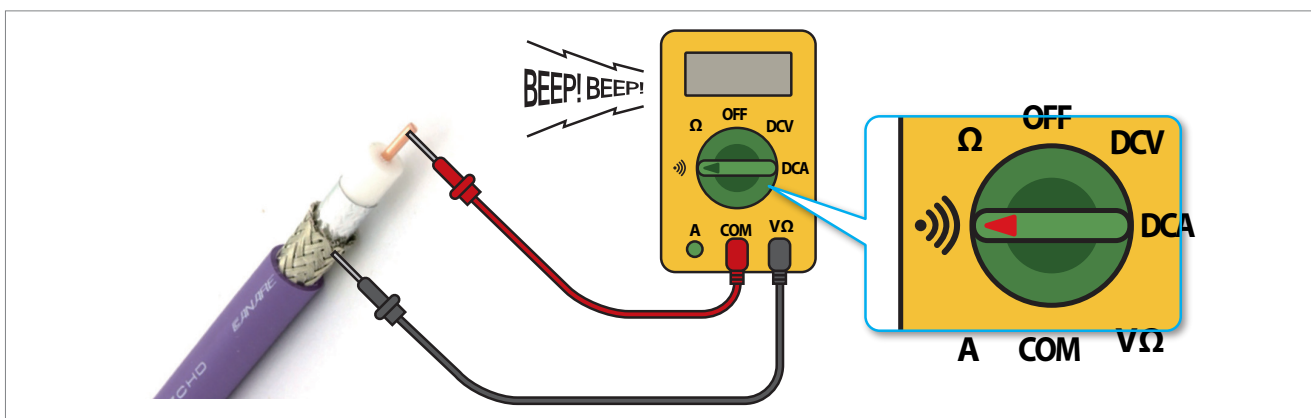
■ Test cable opens

1. Make a short the conductor and shield of the one side of the coax.
2. Take the testing probe and connect its cords to the specific ends of multimeter (red positive into the '+' marked jack and black negative into the 'COM' jack) and Set the measurement type dial of the multimeter to Ω .
3. Touch one of the leads to the outer metal part of the BNC and the second to the center pin on the another side and check the value.
4. If the value is significantly high such as Mega Ohm, it means the cable might be open.
5. If the value is lower than the expected loop resistance value, the cable might be shorted. (Normal loop resistance of the cable in case of RG59 is about 8~10 Ω / 100 meter)



■ Test for shorted or open

1. Make both ends of the coax free by disconnecting it from the device
2. Take the testing probe and connect its cords to the specific ends of multimeter (red positive into the '+' marked jack and black negative into the 'COM' jack) and Set the measurement type dial of the multimeter to continuity test.
3. Touch one of the leads to the outer metal part of the BNC and the second to the center pin. If you don't hear any sound, then it means the coax is not shorted.



■ Cable Connection Precautions

- Be sure to use dedicated connector when connecting cables.



- It is not recommended to mix different types of cables.
 - When 50Ω and 75Ω cable are used in combination or 50Ω BNC is applied to 75Ω cable, the impedance between the lines is unmatched and this could affect performance of the device.

2.1.3. Cable distance

Ethernet over Coax (EPoC) products have different Ethernet and PoE transmission distance depending on the product lineup.

Check the maximum transmission distance between the transmitter and receiver in advance.

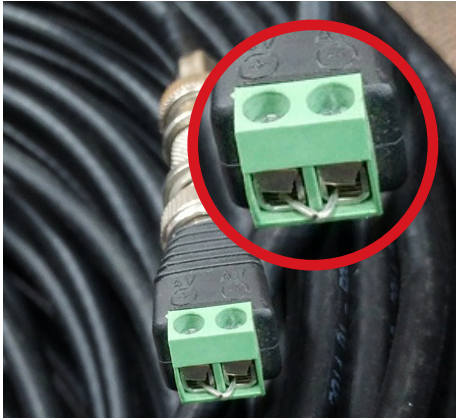
■ PoE distance by available wattage to end-device (e.g. Single port product)

Camera power consumption (Watt)	3C-2V / RG-59, meter (Bare Copper Cable)	5C-HFBT / RG-6, meter (Bare Copper Cable)
3	900m	1800m
7	750m	1200m
10	550m	900m
12	450m	750m
15	350m	600m
20	300m	500m
25	200m	350m
30	150m	250m
40	60m	100m
50	40m	80m
60	25m	50m

- The above distances are calculated value and the result may vary depending on the cable and connector quality.
- The above mentioned transmission distance is a condition when using single port device with DC 56V /1.2A power supply.
- Cable Loop Resistance is 18Ω / 200m with RG-59 and 10Ω / 200m with RG-6 condition.
- Above result is the value when using Bare Copper Cable and in case of the Copper covered steel cable, the distance can be reduced by about 40 ~ 50% compared with Bare Copper Cable.

2.1.4. Identify loop resistance

- By measuring the loop resistance of the cable, it is possible to check the condition and the quality of the cable used for power transmission function of the EPoC device in advance.



1. Make a short the conductor and shield on one side.



2. Measure the resistance (Ω) of the conductor and shield on the other side.

- In case of Copper-covered steel cable, the cable loop resistance can be significantly increased and It is strongly recommended to check the cable loop resistance before installation because it can greatly affect the distance performance of the devices
- The PoE transmission distance specified on the installation guide is the value when using RG-6 Coaxial cable with 10Ω or less / 200 meter.
- If accurate loop resistance is not measured, such as measuring $K\Omega$, $M\Omega$, etc. as result, check if the cable or BNC is shorted or if there's power leakage on cable.

2.2. Check grounding and potential difference

EPoC equipment is basically grounded through the power cord of the adapter, so there is no need to ground separately.

However, EPoC equipment supports PoC (Power Over Coax) function and the transmitter is powered by the power source connected to the receiver and the end-device is powered by the transmitter through the PoE output feature.

At this time, if there is a potential difference between the end-device and the transmitter, the transmitter may not recognize the PD (Powered Device) of the end-device correctly, and the PoE output function of the transmitter may not work properly.

Therefore, it is necessary to make sure that the end-device is normally grounded, and that there's the potential difference between the end-device and transmitter.

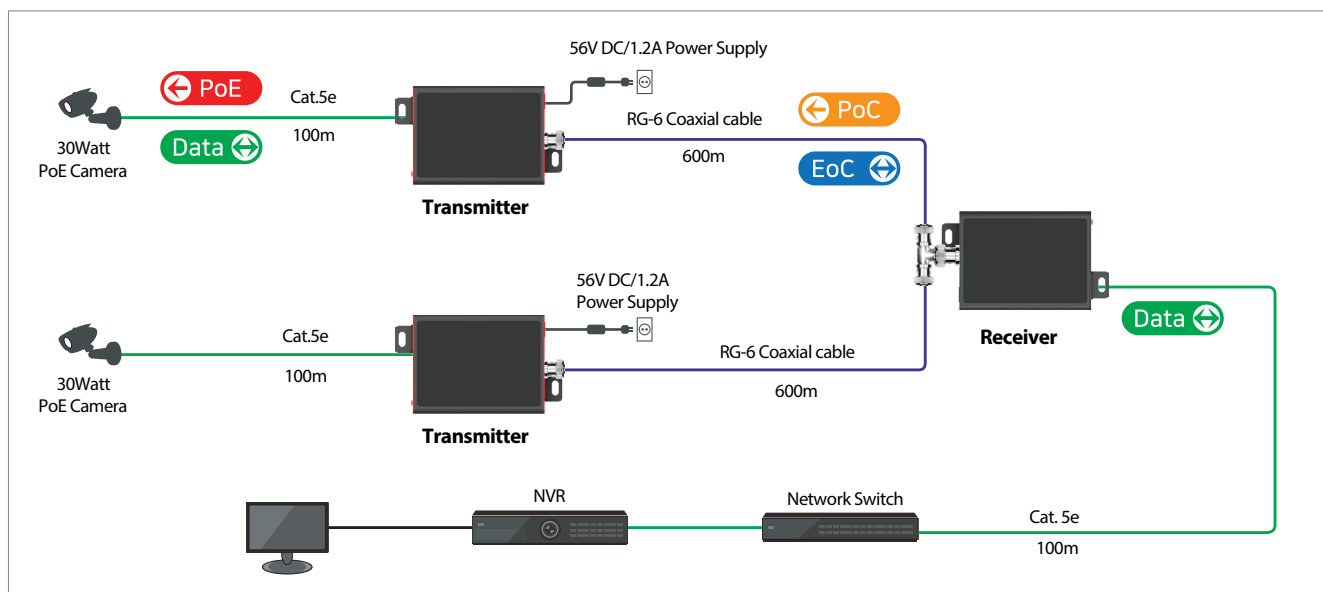
2.4. Power supply availability

EPoC equipment supports PoC (Power over Coax), so that the transmitter and the end-device (e.g. camera) are powered by receiver.

When installing multiple cameras over one cable with daisy chain configuration or PTZ camera with high power consumption, it is possible to configure by putting an additional power adapter (48 ~ 57VDC) on the transmitter.

■ Examples of using additional adapters

- When installing two cameras with high power consumption such as 30W by 2:1 Daisy chaining, two power adapters of 56VDC /1.2A can be applied on the transmitters and the maximum 120W power is supplied throughout the whole range.
- The power adapter can be applied to transmitter or receiver or both transmitter and receiver simultaneously.



NOTE:

- To avoid damage of products do not connect Transmitter RJ45 PoE Out to a PoE Switch!
- Joining function by hardware is only available between Transmitter/Receiver or Transeiver devices except camera.

2.5. Site environment review

- Check the environment in which EPoC device is installed.
- The cable between the EPoC devices must be installed apart from high-voltage power cable.
- In environments where cross-talking or signal interference occurs, separate settings may be required, such as network grouping (See how to set Joining).
- In environments where power noise occurs (e.g. Installation on elevator), it is necessary to use a model specifically designed to prevent noise.
- EPoC devices are for Indoor Use and must be installed in a separate watertight enclosure when installed outdoors.
- Check that the environment is suitable for the operating temperature and operating humidity of the equipment.

3. Equipment Installation Guide

3.1. Selection of installation equipment

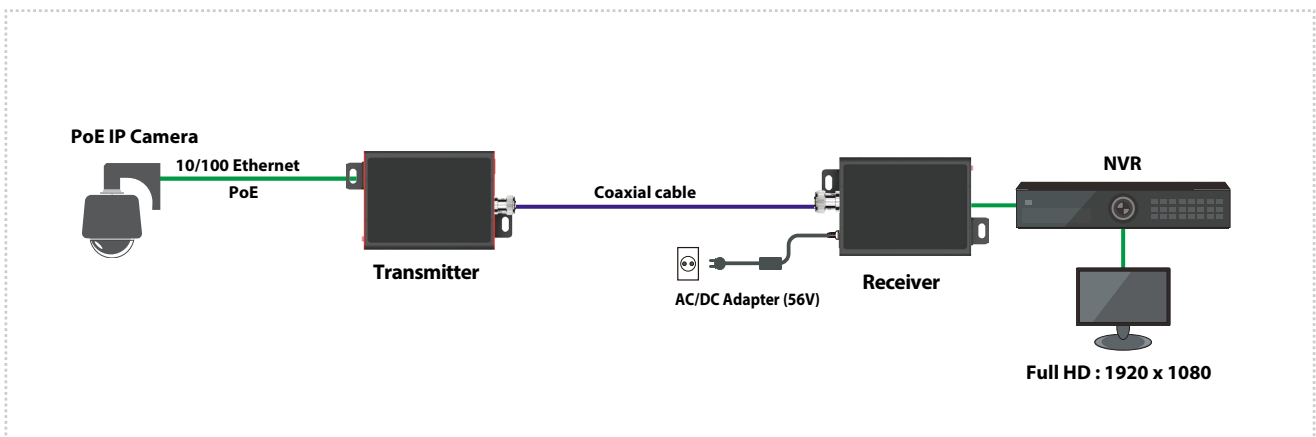
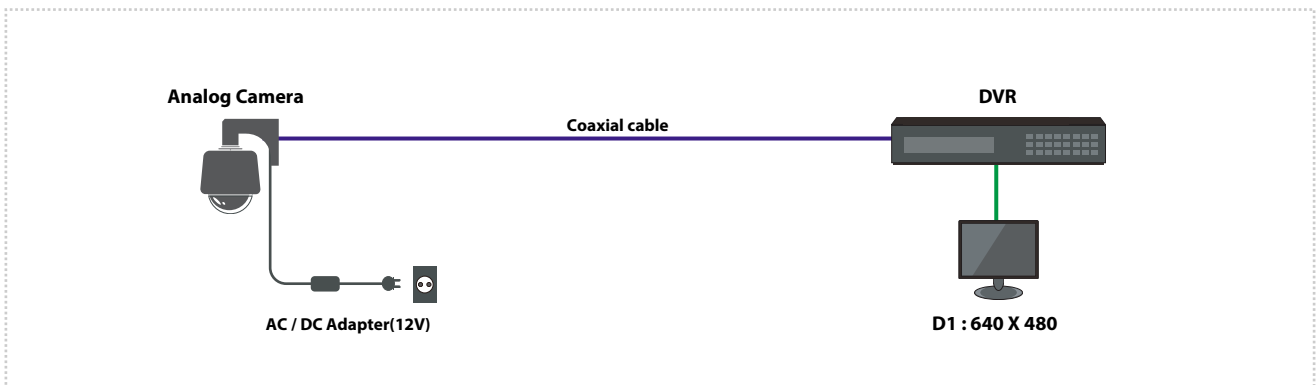
3.1.1. EPoC Solution Network Security

■ IP Video Surveillance

EPoC devices allow the coaxial cables from existing analogue CCTV system to be re-used for network camera connection.

Reusing existing coax for IP cameras can cut installation costs and save installation time significantly.

EPoC devices will even provide 60W power over existing cable and outputs PoE to cameras, it would be sufficient power for up to 4 cameras operation in DAISY CHAIN CONFIGURATION.



NOTE:

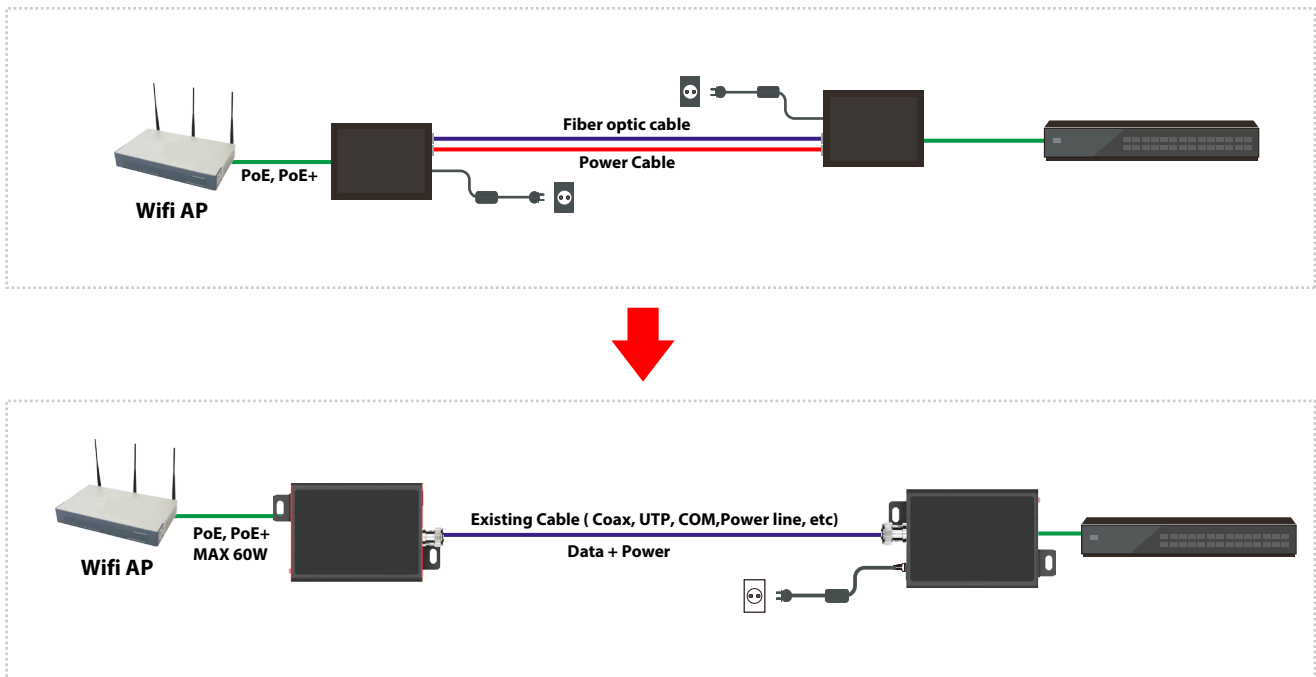
- To avoid damage of products do not connect Transmitter RJ45 PoE Out to a PoE Switch!
- Joining function by hardware is only available between Transmitter/Receiver or Transeiver devices except camera.

■ Network Extension

Extended distance with PoE

EPoC devices provides high speed & long distance Ethernet connectivity via various cables such as Coax, UTP 4 pair cable, even UTP 1 pair cable, etc. With long distance transmission feature, EPoC devices make to overcome 100 distance limitation of the general network configuration in a simple and easy way.

Also, EPoC devices will even provide PoC (Power over Cable) and PoE up to 60W to the end device, it is useful when installing PoE powered devices like PoE Wireless APs and cost saving solution without power wiring work for the network devices.



NOTE:

- To avoid damage of products do not connect Transmitter RJ45 PoE Out to a PoE Switch!
- Joining function by hardware is only available between Transmitter/Receiver or Transeiver devices except camera.

3.2. Transmission rate / PoE output

- Transmission rate(Mbps) by product configuration

Daisy Chain Distance	1:1	1:2	1:3	1:4	1:5	1:6	1:7	1:8
200m	95	47	31	23	18	15	12	10
600m	95	47	31	23	18	14	11	
1,200m	95	43	26	18	13	10		
1,800m	95	41	23	15	10			
2,400m	50	18						

- PoE output(W) by product configuration

Daisy Chain Distance	1:1	1:2	1:3	1:4	1:5	1:6	1:7	1:8
50m	40	19	12	8	6			
200m	35	16	10	7	5			
300m	27	12	7	5				
400m	22	10	6					
500m	17	7						
700m	11							

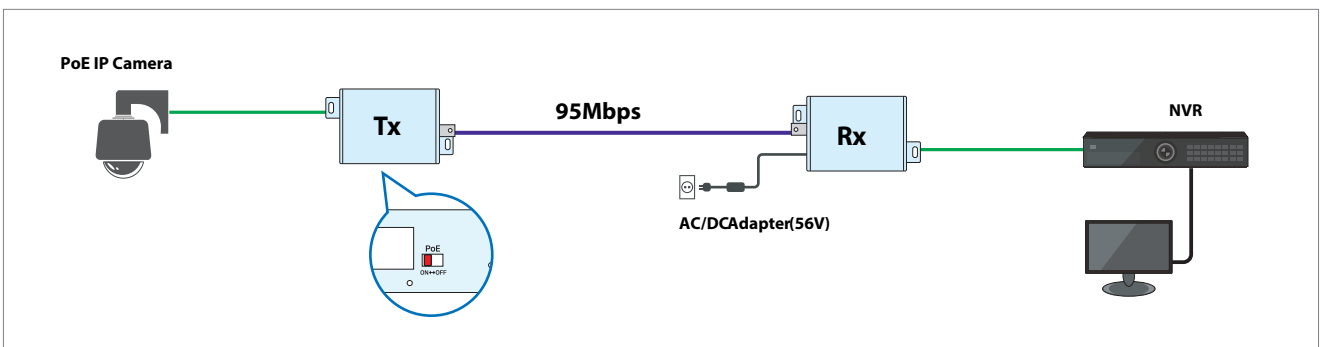
3.3. PoE On / Off Setting

EPOC transmitter has PoE On / Off switch. When connecting with non-PoE equipment, PoE The switch must be set to Off.

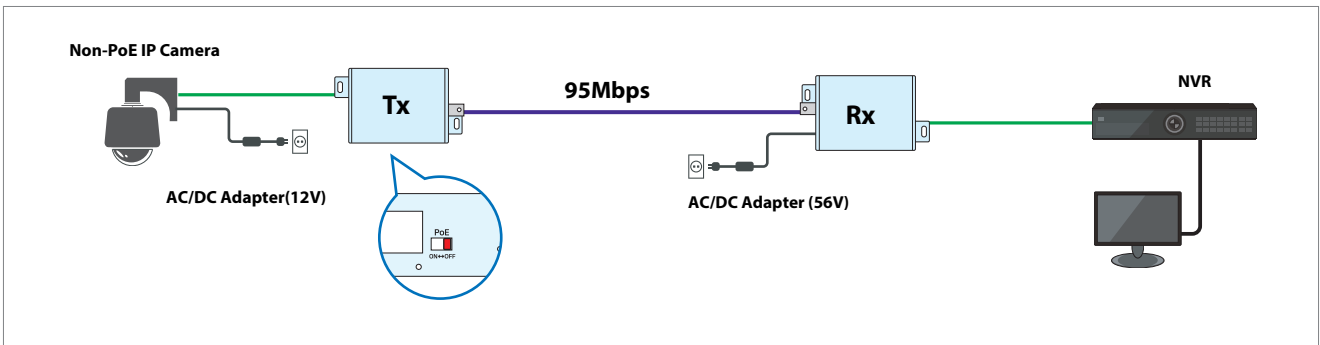
The factory default setting of the PoE On / Off switch is OFF. Therefore, when installing transmitter with PoE devices, the PoE switch must be set to On for power supply.

EPoC Extender is designed to be used as transceiver and when using these device as receiver with non-PoE equipment, the PoE switch must be set to OFF.

- **PoE Camera Application (PoE Switch On)**



- **Non-PoE camera application (adapter used, PoE switch off)**



NOTE:

- To avoid damage of products do not connect Transmitter RJ45 PoE Out to a PoE Switch!
- Joining function by hardware is only available between Transmitter/Receiver or Transeiver devices except camera.

3.4. Joining (Network Grouping Password Setting)

EPoC devices support Joining (Network Grouping Password Setting) function. When cross-talking issue occurs between devices, communication between products can be encrypted with joining function for reliable communication without interference problem.

All EPoC devices have the same network password on factory default to support plug & play between EPoC devices.

In case of multiple 1:1 connections, It is possible to avoid network interference by setting password of each group. In addition, the joining function enables secure network communication without threat of line-to-line signal hacking.

Joining function can be set up with Joining button on the product or can be set up using Joining software.

■ Join

- Joining can be physically set by Join button and the password is randomly generated. (To manage the joining password, joining software should be used.)
- The default password of all EPoC devices is HomePlugAV for plug & play operation.

■ Components

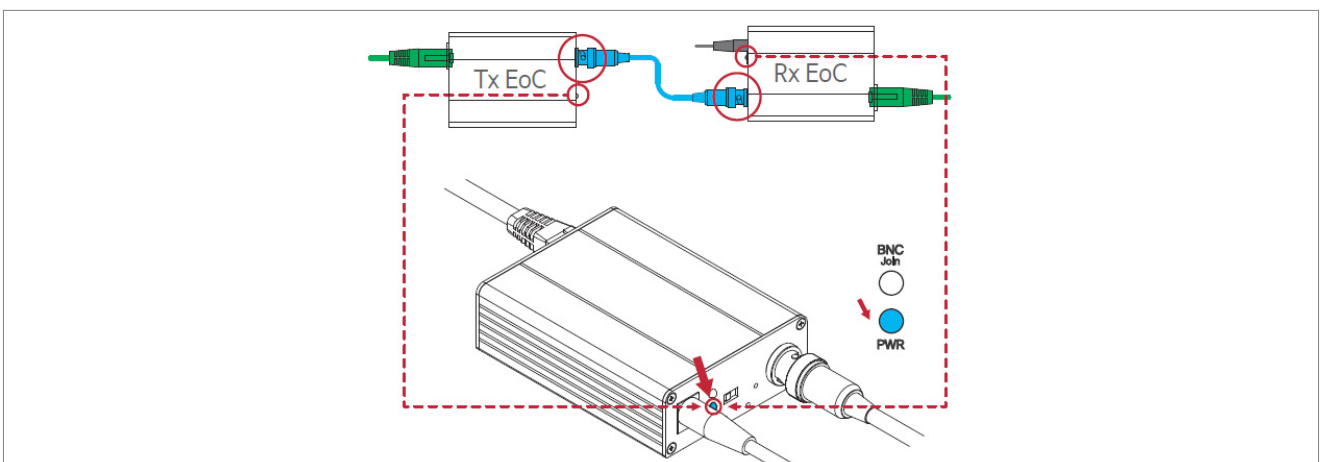
- EPoC Rx / Tx products
- 56V or 57V VDC Power Adapter (GM60-550120-F recommended)
- Coaxial cable (short cable)
- Paper clips (or everything else within 2mm diameter)

3.4.1. 1:1 Joining between EPoC products (password setting between products) ■

1:1 Joining

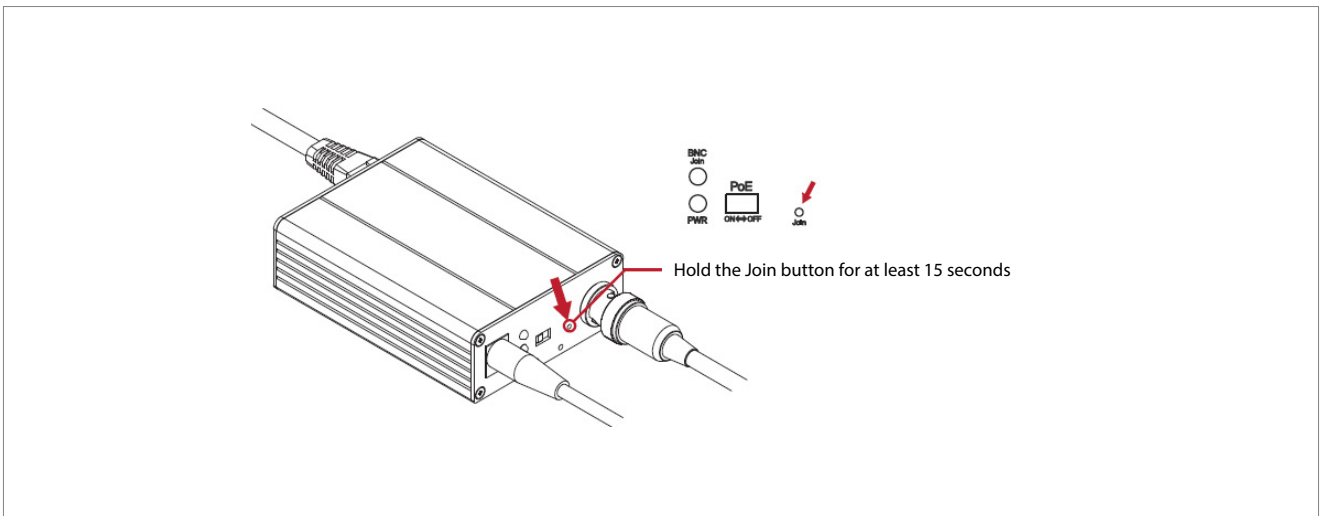
1. [Power on equipment]

Connect EPoC Rx and Tx with Coax (BNC) or UTP or 2-wire and power to the devices.
Check the Blue Power LED is lit.



2. [Clear password]

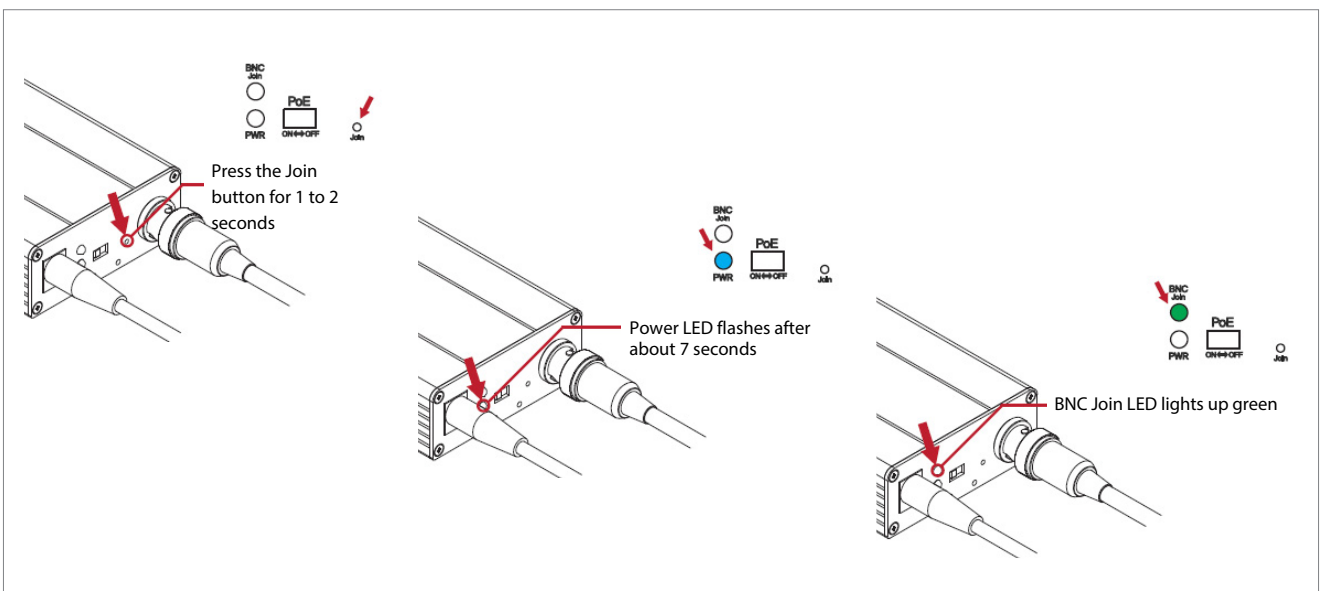
Press the Join button of EPoC Rx and Tx (one by one) for more than 15 seconds and Check that the blue power LED turns off and on again.



3. [Joining]

Press and hold each Join button of the EPoC Tx and Rx (one by one) for 1 ~ 2 seconds. After approx. 7 seconds, check that the blue power LED turns off and lights up.

Check that the green BNC (Join) LED is lit.

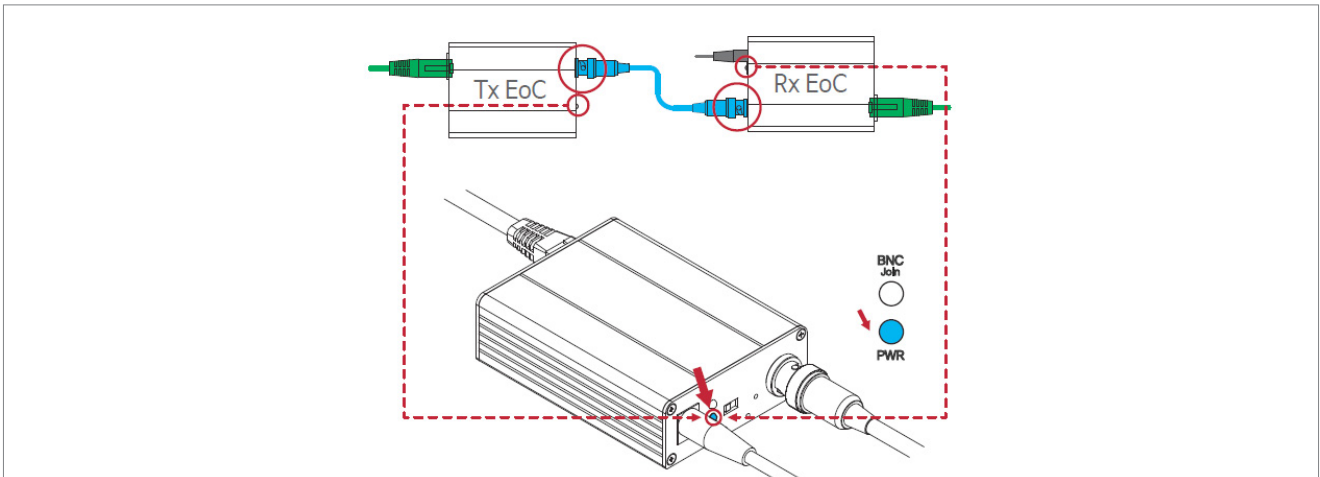


3.4.2. 1: N Join method between EPoC products (password setting between products)

■ 1: N Joining

1. [Power on equipment]

After connecting Coax (BNC) or UTP or 2-wire between EPoC Rx Tx, check that Power LED is blue.

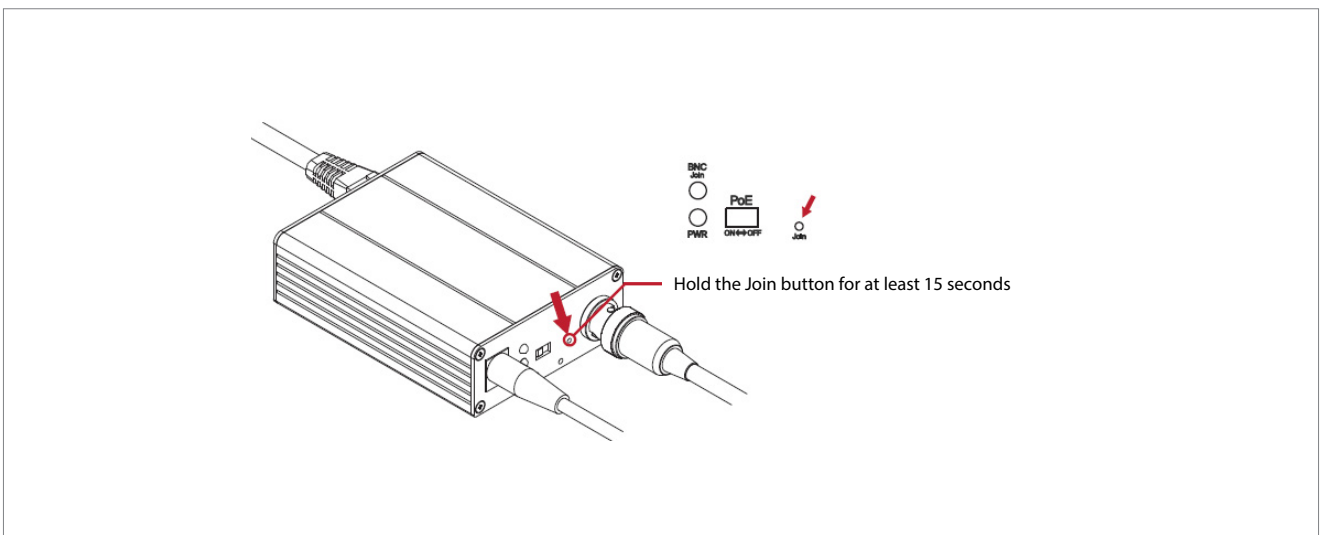


2. [Clear password]

2-1. Press the Join button of EPoC Rx and Tx (one by one) for more than 15 seconds and Check that the blue power LED turns off and on again.

2-2. Proceed to step 2-1 for other EPoC devices

(The recommended number of transmitter may vary depending on the product line up.)

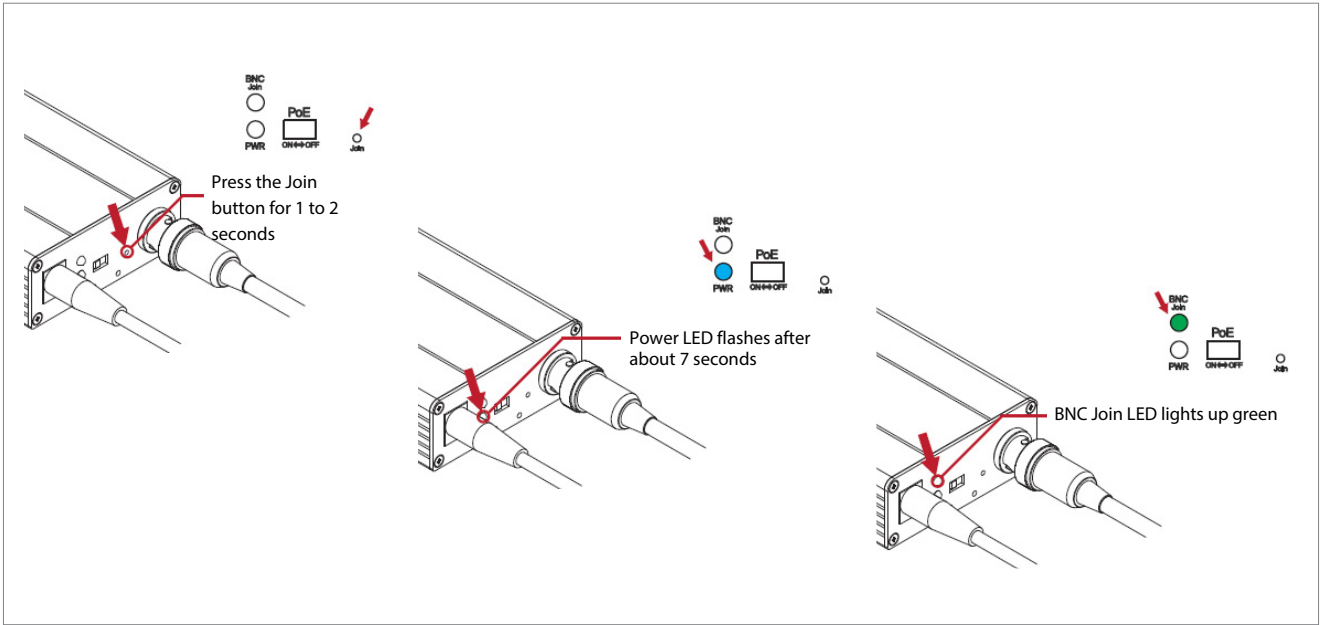


3. [Joining]

3-1. Press and hold each Join button of the Tx and Rx for 1 ~ 2 seconds and after approx. 7 seconds, Power LED turns off and lights up

Check the BNC (Join) LED lights up in green.

3-2. Repeat step 3-1 for newly added EPoC devices (Once the joining button of newly added device is pressed, the joining button of the device on existing group should also be pressed for joining)



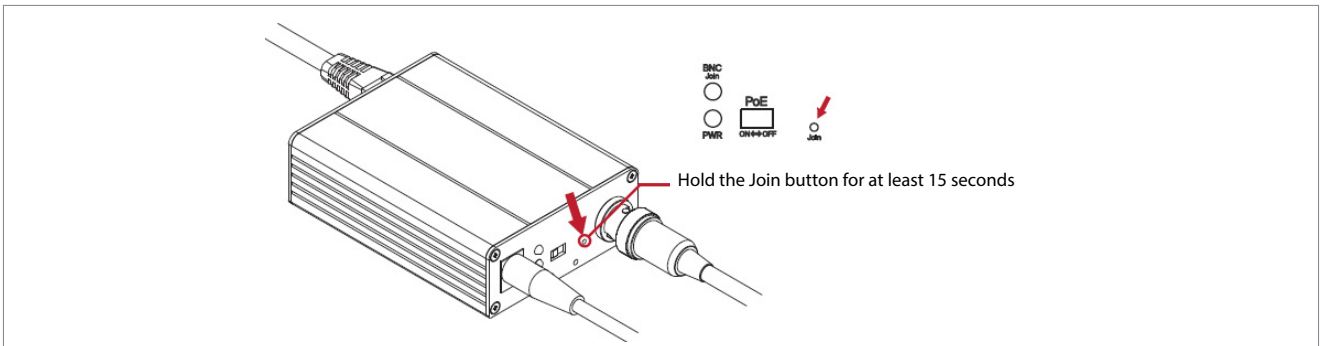
3.4.3. 1: N Join method between EPoC products (when setting password between products)

■ Components at Join

- EPoC Rx Tx products
- 56V or 57V VDC Power Adapter (GM60-550120-F recommended)
- Coaxial cable 1m
- File clips (everything else within 2mm diameter)

■ What to do if joining fails

1. Press the Join button again for about 15 seconds from Tx and Rx EPoC devices and check that the power LED turns on and off.

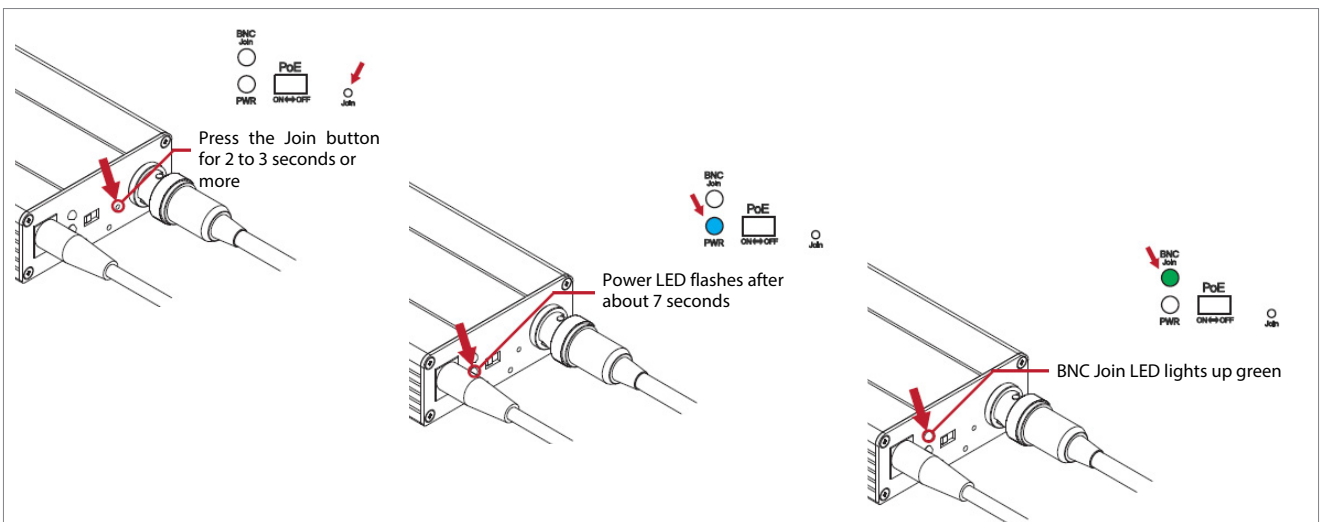


2. [Clear password]

Press the Join button of the failed EPoC device for about 15 seconds to clear the password and check if the power LED turns off and on.

3. Press join button of the failed device for 1~2 seconds and check if the green Join LED lights up.

4. If there is no connection from the first device, perform the 1: 1 Join process again.

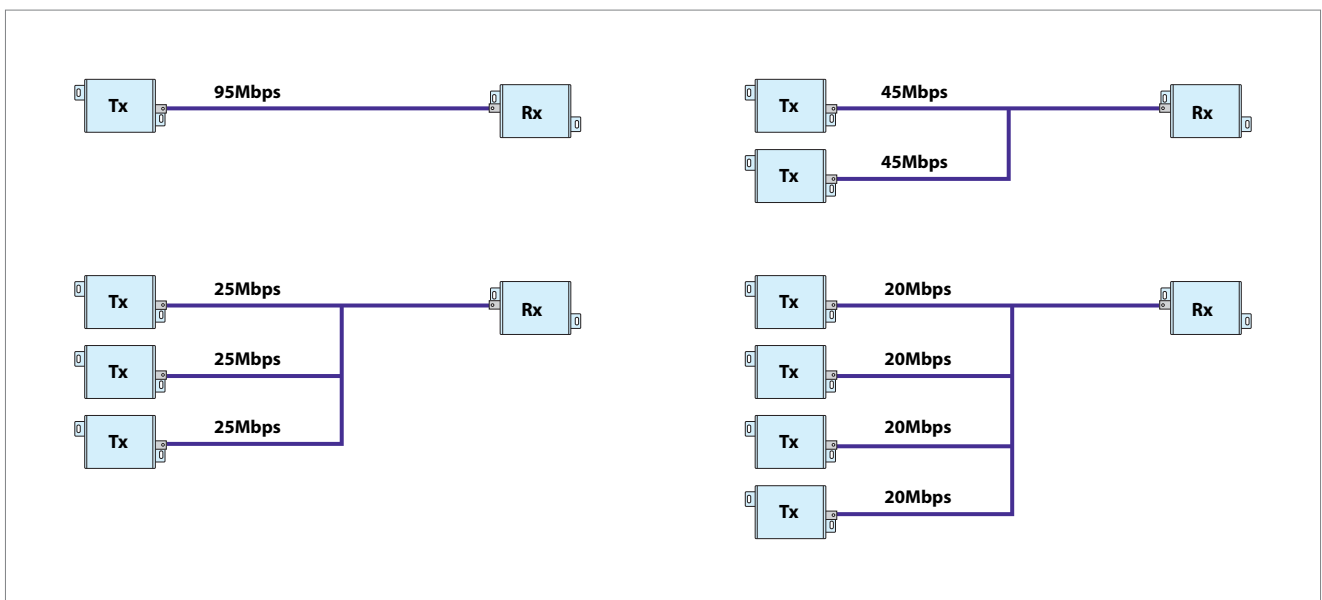


3.5. Daisy Chain Connection

- The EPoC product supports a 1: N Daisy Chain configuration with 1: 2 or 1: 4 BNC Splitter (T-type BNC connectors) and It is possible to connect multiple transmitters to one receiver over 1 line of the coax or UTP 4 pair or 2 wire.
- In a 1: N configuration, the transmission bandwidth between transmitter and receiver and the available PoE output will be reduced in proportion to the number of products connected to the same group. Therefore, it is necessary to check the transmission rate and power consumption of each network device which will be installed in advance.

3.5.1. Transmission rate of single port line up in daisy chain configuration

■ Daisy chain configuration

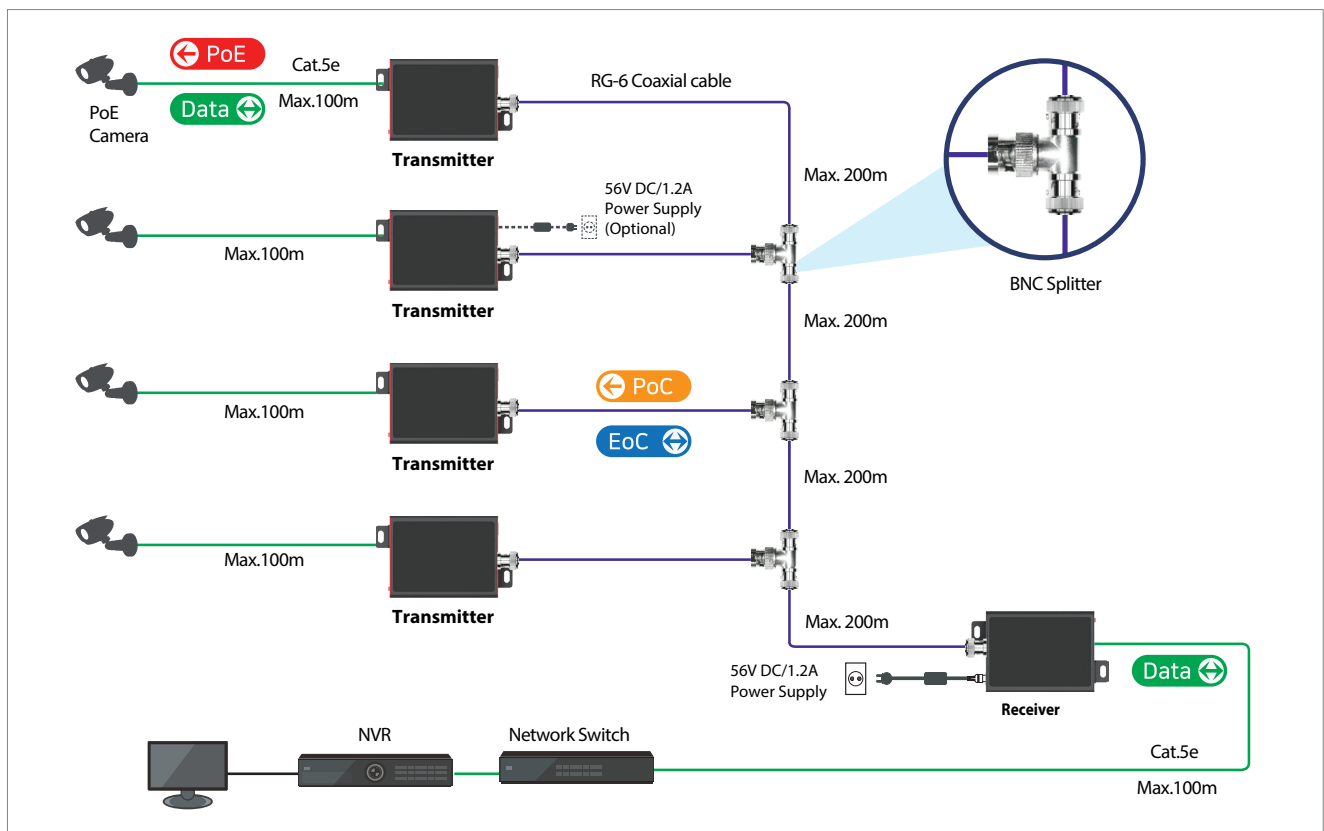


3.6. Product power supply (DC adapter / PoE)

- EPoC device supports 12 ~ 57VDC input or PoE + (IEEE802.3af / at) input for product operation and PoE output. (Power over Cable)
- EPoC Device supports PoC (Power over Cable) function, so that the transmitter and camera are powered by the power from DC power supply connected to the receiver.
 - Receiver requires PoE or 48VDC or more power input.
 - If power is not sufficient for transmitter or PoE device operation, it is possible to apply the additional power to transmitter so that the transmitter can supply power (PoE+) to the end device.
- When applying power adapter to the product line up which support PoE input, the PoE input function is stopped and the adapter power input is operated.
- EPoC device supports up to 60W PoE output with 57VDC power supply and when configured with PoE device with high power consumption, additional power can be applied to the transmitter for reliable configuration. (e.g. when installing devices with daisy chain configuration or PTZ camera with high power consumption)

• Examples of using additional adapters

When installing 4 network cameras with high power consumption with 4:1 Daisy chain configuration, one additional power supply (56VDC / 1.2A) can be applied on one of transmitters and max. 120W power is available for all sections.








NOTE:

- To avoid damage of products do not connect Transmitter RJ45 PoE Out to a PoE Switch!
- Joining function by hardware is only available between Transmitter/Receiver or Transceiver devices except camera.

3.7. LED operating status

3.7.1. LED status

Indicator	Color	Function
PoE-ON		PoE Output Status (Transmitter model only)
PD-AUX		PoE Input Status (Receiver model only)
Data-Link		Blinks when transmitting Ethernet data
Join-Link		EPoC products connected
Power		56VDC or PoE Input connected

3.7.2. Precautions for configuring a linear network

- If the Join LED is on or blinking quickly, the EPoC devices are connected properly and are communicating each other.
- If the Join LED is blinking occasionally or OFF, the devices are not correctly connected (Not joined) or there's no data communication.
- If the network configuration is completed but the ethernet Link LED of the EPoC Transmitter is not blinking, it is necessary to recheck the network settings of the end device.
- If the Power LED on the EPoC device is flashing at constant rate, check for cable short or over-current problems.
- If the Join LED of the EPoC product which is not connected is blinking rapidly, the signal from other device affect to the device due to the cross-talking problem. In this case, joining is recommended to secure the stable signal communication by creating the network group.

3.8. Grounding and Potential Difference

EPoC device is basically grounded through the AC power cord of the adapter, so there is no need to ground separately.

If there is a potential difference between the camera(specially metal housing camera) and ground (metal surface), PSE of the EPoC transmitter cannot detect camera's PD correctly and PoE output will not operate properly. In this case, it is necessary to check if there's potential difference between the camera body or metal surface and EPoC transmitter.

If there's potential difference on the camera and DC ground of the EPoC transmitter, it is necessary to isolate camera body from metal surface using insulated panel (Wood or Plastic) and insulated screw.

3.9. Apply Surge Protector

In case of general surge protector for analog video, the Maximum Continuous Operating Voltage is under DC5V and this surge protector is not compatible with EPoC devices which transfer 57VDC power via cable.

When it is necessary to install surge protector, make sure that the maximum continuous operating voltage of the surge protector should be over 57VDC.

4. Troubleshooting FAQ

4.1. EPoC transmission equipment

Problem	Action
What is EPoC?	<p>Looking at the features,</p> <p>First, when replacing analog cameras with high-resolution IP camera, you can use the existing Coaxial cable without any special construction.</p> <p>Second, you can supply PoE power or 12VDC to IP camera. As a result, there is no additional power wiring work when installing IP cameras.</p> <p>Third, it is possible to send signals over long distance by modulating and demodulating digital signals into RF signals.</p> <p>Fourth, you can apply transmission media that is suitable for your installation. There are various types of transmission media, such as Coaxial, 2-wire and an additional cable exchanger (BTE-04) is applicable.</p> <p>Fifth, while the existing analog camera has the installation distance limitation, EPoC is applied to IP camera and can be installed up to several hundred meters away. Please refer to the installation distance for each product and transmission medium.</p>
What is the basic configuration?	<p>NVR ↔ Rx EPoC(ADC) ↔ Tx EPoC (DAC) ↔ IP camera are configured as one set. Therefore you need two EoCs (Tx, Rx) and adapter per IP camera.</p>
What are the basic things to check during the initial installation?	<p>You need to check</p> <ul style="list-style-type: none"> - the transmission media (Coaxial, Twisted pair) - the installation distance, - the rate of 48~57 VDC power adapter, - the LED states of the device when applying power to the device. <p>You also need to check the operating environmental temperature/humidity and grounding.</p>
Does the initial installation require a device setup?	<p>Because of working Plug & Play method, any setting is not required, but it depends on the situation. In a suspected interference environment between lines, group joining of the device helps avoid cross-talking by changing passwords between groups.</p>
The connector of the 48-57 VDC Adaptor purchased is not connected to the DC IN terminal of the EPoC.	<p>EPoC DC IN connector is different from the connector size of 48VDC Adapter.</p> <p>Please note that the inner pin spec of DC IN connector is 2.18 mm.</p>
Tx, Rx EPoC 1 Set (2 ea) was purchased. Should 48-57 VDC Adaptor be installed on each Tx, Rx EPoC?	<p>EPoC DC IN connector is different from the connector size of 48VDC Adapter. Please note that the inner pin spec of DC IN connector is 2.18mm.</p>

Problem	Action
Tx, Rx EPoC 1 Set (2 ea) was purchased. Should 48-57 VDC Adaptor be installed on each Tx, Rx EPoC?	<p>Basically, only 1 power adaptor is used on the Rx EPoC (or Tx EPoC).</p> <p>When power is applied to Rx EPoC only with 48~57V adapter, Tx EPoC consumes some power from 48 ~ 57VDC transmitted by Rx EPoC through the cables and outputs remaining power by PoE or 12VDC.</p> <p>But it is necessary to check the power consumption of the whole system, especially, camera and cable specification to calculate the cable length.</p> <p>If there is a power source in the place where IP camera is installed, it is recommended to power to Tx EPoC and IP camera directly for stable operation.</p>
Can I use the 9 VDC, 12 VDC, and 24 VDC Adaptor?	<p>You can use it if the EPoC can supply more power than the maximum power consumption of the IP camera.</p> <p>However, since the power of IP camera is reset when it is below the reference value, please use 48~57VDC adapter.</p> <p>If PoE power supply is not required, the transmitter and receiver can only be used for data transmission using the 9, 12, 24VDC adapters on both Tx EPoC and Rx EPoC.</p>
Is it waterproof?	<p>Since waterproof is not available, install it inside the terminal box when installing it outdoors, so please do not let water get into the terminal box.</p>
What are the temperature and humidity in the operating environment?	<p>Temperature is -20 °C ~ 60 °C, humidity is 10% ~ 90%.</p>
I want to know what kind of transmission medium is used in the field.	<p>Mostly, the coaxial cable is RG-59 / 5C-HFBT (75Ω), the twisted pair cable is Cat.5e UTP.</p>
I want to know how to connect to a Coaxial cable.	<p>The coaxial cable must be connected using the BNC and BNC-BNC coupler. Connecting the conductor and the shield with a simple method can cause problems such as signal interference because the connection point serves as a single antenna.</p>
Is it necessary to have an Impedance Matching cable?	<p>Differences in impedance between cables can affect the signal quality, and it is recommended to connect using cables of the same impedance.</p>
Is it possible to use a twisted pair instead of a Coaxial between EPoC?	<p>Yes. Additional cable exchanger (BTE-04) can be added to EPoC. For reference, BTE-04 provides a physical interface between BNC and RJ-45.</p>
Is it possible to use a network switch or hub between Tx EPoC and Rx EPoC when using the twisted pair as transmission media?	<p>It is impossible because it is different from the pin map of the sending and receiving signal of the twisted pair used in the general LAN environment. At this time, since the data signal and the power of 48 ~ 57VDC are transmitted together with the twisted pair, please note that the corresponding port may be damaged when connecting network switch or hub.</p>

Problem	Action
In case of the EPoC devices which are not support PoE input feature. Is it possible to connect the Rx EPoC to NVRs via the PoE switch or hub in the middle rather than directly connecting them?	Yes. Theoretically, there is no problem, but it is recommended to connect with a general switch or hub rather than a PoE switch or hub.
No camera image is available.	If LED of the IP camera, Tx, Rx EPoC power LED are ON, please check if EoC's BNC (Join) LED is green. If it is OFF or not blinking, it is in a state where communication is not possible due to the difference between EPoC passwords so the additional join is required. For the Join method, please refer to Q&A below "LED Status Related > BNC (Join) LED is blinking"
IP camera video is blurred or mosaic occurs. And the image is slow or intermittently unavailable.	This occurs when the video signal is set to low resolution by IP camera. Please check if IP camera supports high resolution, encoding method, FPS, CBR / VBR, etc. EPoC does not affect video quality, only converting video and control signals (DAC, ADC) between NVR and IP camera.
Can EPoC devices be used with Analog cameras?	EPoC is designed to meet IP convergence requirements out of analog and cannot be directly connected with an analog camera. Please note that connecting to the BNC port of EPoC to the Video OUT terminal of the analog camera may cause fatal damage to the analog camera. If you look closely at the EPoC BNC terminal side, you will find the phrase No Analog camera.
Is there any way to connect with analog cameras?	Additional video encoder is available as follows. NVR ↔ Rx EPoC (ADC) ↔ Tx EPoC (DAC) ↔ Video Encoder ↔ Analog Camera For more information on video encoders, please check with other channels.
PTZ control is not enabled on the IP camera.	EPoC only converts the video and control signals sent and received between the NVR and the IP camera (DAC, ADC). EPoC recognizes only digital signals without distinction between video and control signals. If the video signals are clearly visible, please check if the NVR supports IP camera's PTZ control protocol.
The PTZ control for the analog camera is not enabled.	Analog cameras require a separate PTZ controller device that looks like a joystick. Also, RS-485 communication line must be connected between analog camera and video encoder (or DVR).Please note that PTZ controls on analog cameras are not related to EPoC at all.
The Power LED is blinking.	48 ~ 57VDC Power Adapter may be defective or damaged or please check whether the cable is shorted.
The Power Quality LED is Red.	Power supplies are measured at or below 40VDC.
The Link quality LED is red.	The data throughput of data transmitted and received via BNC (EPoC Signal) is not sufficient.

Problem	Action
The BNC (Join) LED is blinking.	<p>Tx, Rx EPoC network passwords are different from each other and communication is impossible, so a separate joining procedure is required.</p> <p>1. How to Join</p> <p>1) Connect BNC or RJ45(using BTE-04) between Tx and Rx EPoC, and when Power LED is blue</p> <p>2) Press and hold Join button of Tx, Rx EPoC for 2 seconds. After approx. 7 seconds, confirm that Power LED flashes and lights up, and confirm that BNC (Join) LED lights up green.</p> <p>2. What to do when you can not join</p> <p>1) Press the Join button for about 15 seconds only on one of Tx, Rx EPoC, and confirm that the Power LED turns off and lights up.</p> <p>2) Try to join again.</p>
Can I install multiple transmitters (camera side) using one line of cable?	<p>Our EPoC devices basically can be networked with Daisy Chain etc. By using T-type BNC connector, it is possible to connect multiple transmitter devices to one coaxial cable, which can greatly reduce the cost of installation.</p>
What are the points to consider when configuring Daisy Chain?	<p>In 1: N configuration, all products in the same group must be joined with the same password to communicate with each other. How to join the Daisy Chain is as follows.</p> <p>1. How to Join</p> <p>1) Connect BNC or 2-wire between Tx and Rx EPoC, and when Power LED is blue</p> <p>2) Press the Join button of Tx, Rx EPoC for 1 ~ 2 seconds and after about 7 seconds, confirm that Power LED blinks and turns on, and then confirm that BNC (Join) LED turns on green.</p> <p>3) After one set of Tx (1) and Rx (1) join is completed, connect the new Tx(2) to Rx (1) where the join operation is completed.</p> <p>4) Press the join button on Rx(1) for 1~2 seconds and then press the join button of new Tx(2) for 1~2 seconds while the green LED is blinking.</p> <p>5) Check that both power LEDs are blinking and on, and confirm that BNC(Join) LED is on.6) The added Tx joins in the same way to create the same group.</p>
Tx EPoC is not powered on.	<p>Check the power LED status of Rx EPoC.</p> <p>If the blue LED is not on, the 48 ~ 57VDC power adapter may be defective or the power input part may be damaged. If it is blue, check the status of CH LED connected to Tx EPoC.</p> <p>If it is not green, the power output part may be damaged.</p>

Problem	Action
PoE IP camera is out of power.	<p>Check the power LED status of Tx EPoC.</p> <p>If the blue LED is not turn on, it could be for transmission media and distance, or a faulty DC power input. If the blue is on, check the PoE switch status next.</p> <p>If the PoE switch is OFF, the PoE power cannot be outputted to the IP camera, so turn it ON, and then check the Power Quality LED status.</p> <p>If the red LED is on in the model that supports Quality LED, the 48~57VDC power source sent from Rx EPoC is measured to be less than 40VDC from the Tx EPoC due to the distance.</p> <p>Therefore, the IP camera cannot supply the PoE power required for operation can.</p> <p>If it is green, check the PoE LED status next.</p> <p>If the yellow light does not light, it may be a defect of the power output of PoE, so please request customer service.</p>
Non-PoE IP camera does not have power. (12VDC output model equivalent)	<p>Check the power LED status of Tx EPoC. If the blue LED is not turned on, it could be faulty transmission media or cause of cable length or power consumption of the end-device, or a faulty DC power input. If the blue is on, check the DC OUT switch is On and DC OUT LED status next.</p> <p>If the DC OUT switch is OFF and the DC OUT LED is blinking, check that the DC OUT switch is ON and the DC OUT LED is green, since the IP camera can not powered by 12VDC output.</p> <p>If red light on the power quality LED is on, 48~57VDC power from Rx EPoC is being measured by Tx EPoC to be less than 40VDC due to distance reasons, IP camera cannot be powered by 12VDC output feature.</p>



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