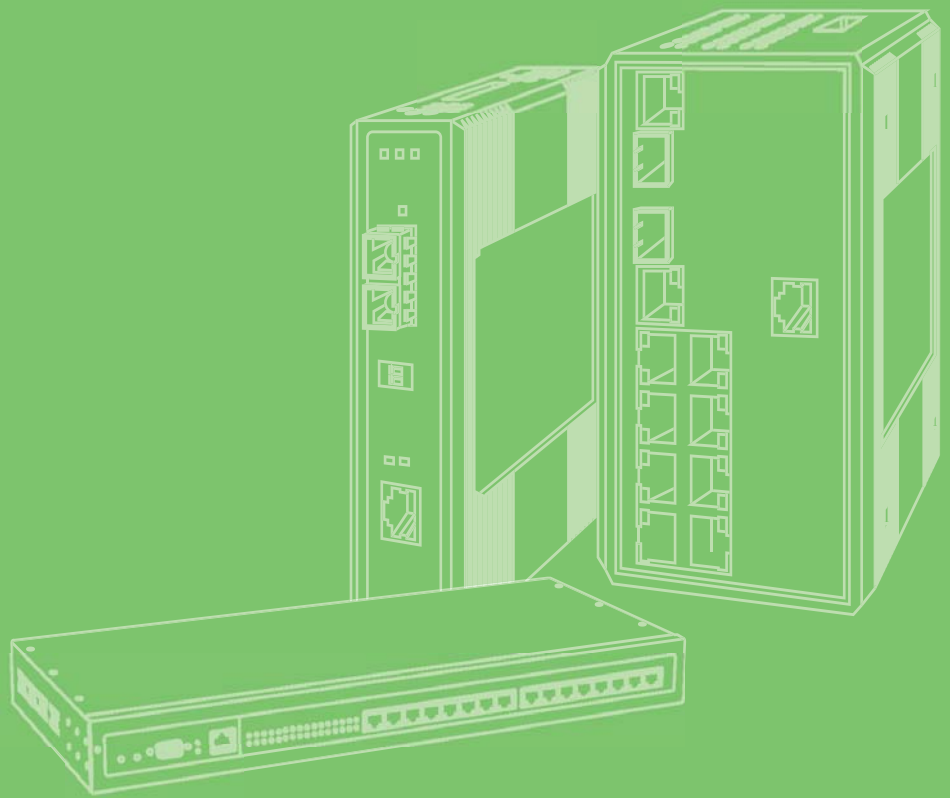


User Manual



EKI-1751PI Series

Long Reach PoE Extenders

ADVANTECH

Enabling an Intelligent Planet

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Product Warranty (5 years)

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for five years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Part No. XXXXXXXXXXX

Printed in Taiwan

Edition 1

February 2018

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! Warnings indicate conditions, which if not observed, can cause personal injury!



Caution! Cautions are included to help you avoid damaging hardware or losing data. e.g.



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! Notes provide optional additional information.



Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing to: support@advantech.com

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- 1 x Long Reach PoE Extenders
- 1 x DIN-Rail mounting Bracket and Screws
- 1 x Wall-mounting Bracket

Safety Instructions

- Read these safety instructions carefully.
- Keep this User Manual for later reference.
- Disconnect this equipment from any DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
- For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
- Keep this equipment away from humidity.
- Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
- The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
- Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
- Position the power cord so that people cannot step on it. Do not place anything over the power cord.
- All cautions and warnings on the equipment should be noted.
- If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- Never pour any liquid into an opening. This may cause fire or electrical shock.
- Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
- **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO -40°C (-40°F) ~ 85°C (185°F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.**
- The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Wichtige Sicherheitshinweise

- Bitte lesen sie Sich diese Hinweise sorgfältig durch.
- Heben Sie diese Anleitung für den späteren Gebrauch auf.
- Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie Keine Flüssig-oder Aerosolreiniger. Am besten dient ein angefeuchtetes Tuch zur Reinigung.
- Die NetzanschlusBsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
- Das Gerät ist vor Feuchtigkeit zu schützen.
- Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Verletzungen hervorrufen.
- Die Belüftungsöffnungen dienen zur Luftzirkulation die das Gerät vor überhitzung schützt. Sorgen Sie dafür, daB diese Öffnungen nicht abgedeckt werden.
- Beachten Sie beim. AnschluB an das Stromnetz die AnschluBwerte.
- Verlegen Sie die NetzanschlusBleitung so, daB niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
- Alle Hinweise und Warnungen die sich am Geräten befinden sind zu beachten.
- Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
- Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
- Öffnen Sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
- Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
 - Netzkabel oder Netzstecker sind beschädigt.
 - Flüssigkeit ist in das Gerät eingedrungen.
 - Das Gerät war Feuchtigkeit ausgesetzt.
 - Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
 - Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
- Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weiger.

Haftungsausschluss: Die Bedienungsanleitungen wurden entsprechend der IEC-704-1 erstellt. Advantech lehnt jegliche Verantwortung für die Richtigkeit der in diesem Zusammenhang getätigten Aussagen ab.

Safety Precaution - Static Electricity

Static electricity can cause bodily harm or damage electronic devices. To avoid damage, keep static-sensitive devices in the static-protective packaging until the installation period. The following guidelines are also recommended:

- Wear a grounded wrist or ankle strap and use gloves to prevent direct contact to the device before servicing the device. Avoid nylon gloves or work clothes, which tend to build up a charge.
- Always disconnect the power from the device before servicing it.
- Before plugging a cable into any port, discharge the voltage stored on the cable by touching the electrical contacts to the ground surface.

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Chapter 1

Product Introduction

1.1 Description

EKI-1751PI Series Long Reach PoE Extenders are designed to extend the reach of Ethernet Data and IEEE 802.3at Power over Ethernet beyond its natural limitations of 100 meters for the network infrastructure. The solution works in pairs for point to point connectivity. It features EKI-1751PI-M-AE Long Reach PoE Extender that the master unit is at the central site and on the receiving end is EKI-1751PI-R-AE Long Reach PoE Extender with 4 PoE (PSE) ports. Under Remote Power Mode, each EKI-1751PI-R-AE is equipped with four 10/100Base-TX IEEE 802.3at PoE Ports for a total power budget of 30W; Support any remote IEEE 802.3at/af powered device (PD) like Wi-Fi Access Point, IP phone, and IP Camera. It enables centralized management of power supply from a single location for easy, efficient and cost-effective installation. When enabling Local Power Mode by dip switch, EKI-1751PI-R-AE can supply power budget of 30W to each of the four PoE ports. Proscend EKI-1751PI Series Long Reach PoE Extenders is an ideal PoE extension solution for service providers to deploy networking applications in public areas that requires Wireless AP, IP Phones and IP Cameras.

1.2 Features

- Complies to IEEE 802.3at PoE
- Industrial-Grade Extenders for applications in harsh environment
- Simultaneous transmission of Ethernet data and PoE Power over UTP wire or coaxial cable
- Centralized management of power supply
- Eliminated the need for local power supply at remote sites
- Easy cabling for quick installation
- Long transmission distance up to 1,000 m
- Quick deployment and easy maintenance.
- Flexible and efficient power management
- Dip Switch to enable local power supply and provide full 30W to each of the four PoE ports.

1.3 Specifications

Specifications	Description
Hardware Interfaces	<ul style="list-style-type: none">■ Terminal Block for Copper Port■ BNC Female for Coaxial Port■ 4 x RJ-45 10/100Base-TX IEEE 802.3at PoE Port
3 Position Dip Switch	<ul style="list-style-type: none">■ Selectable target band plan (Asymmetric or Symmetric)■ Selectable target SNR margin (6dB or 9dB)■ Selectable Remote Power (ON) or Local Power (OFF)
LED Indicators	<ul style="list-style-type: none">■ Active: System Status■ LPWR/RPWR: Local Power/Remote Power■ PoE: PoE Port Status■ Available PoE Output (Watts): 5/15/30■ Line Speed (Mbps): Link/20/40/60/80/100

Specifications	Description
Power Supply	<ul style="list-style-type: none"> ■ Terminal blocks for redundant DC power inputs ■ Input Voltage: 48 to 57 V_{DC} ■ Power Consumption: <ul style="list-style-type: none"> – EKI-1751PI-M-AE: 65 Watts maximum – EKI-1751PI-R-AE: 125 Watts maximum ■ Over current protection ■ Automatic short protection
Protocol Support	Transparent bridging to higher layer protocols
Operating Environment	<ul style="list-style-type: none"> ■ Operating Temperature: -40°C ~ 75°C (-40°F ~ 167°F) ■ Storage Temperature: -40°C ~ 85°C (-40°F ~ 185°F) ■ Humidity: 10% - 95% (non-condensing)
Physical	<ul style="list-style-type: none"> ■ Hardened aluminum case, IP30 ■ Dimensions: 62 x 135 x 106.5 mm (2.44" x 5.31" x 4.19") ■ Installation: DIN-Rail, Panel Rack Mounting
Regulatory Compliance	<ul style="list-style-type: none"> ■ CE ■ FCC Part 15 Class A ■ EN60950

1.4 Applications

The solution works in pairs for point to point connectivity. It features EKI-1751PI-M-AE Long Reach PoE Extender that the master unit is at the central site and on the receiving end is EKI-1751PI-R-AE Long Reach PoE Extender with 4 PoE (PSE) ports. Without the need for local power supply, each EKI-1751PI-R-AE is equipped with four 10/100Base-TX IEEE 802.3at PoE Ports for a total power budget of 30W that can support any remote IEEE 802.3at/af powered device (PD) like Wi-Fi Access Point, IP Phone, and IP Camera.

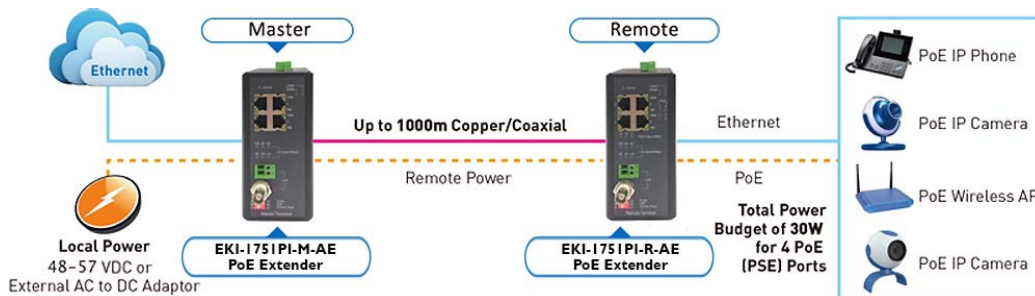


Figure 1.1 Remote Power Enable

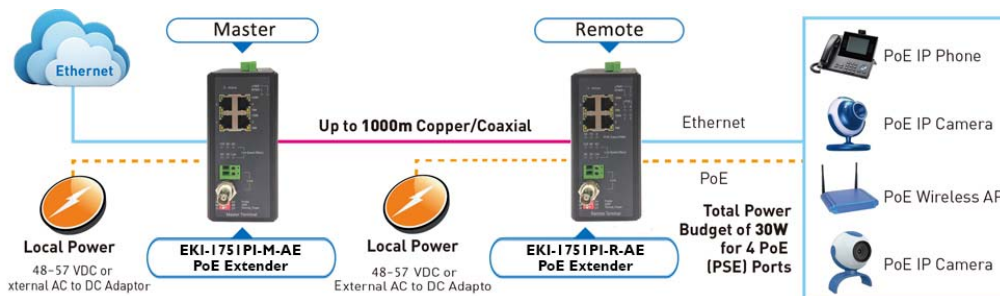


Figure 1.2 Remote Power Disable

1.5 Reference Performance Data

1.5.1 24AWG Copper Wire

SNR	6dB		6dB		
	Asymmetrical		Symmetrical		
Profile	Asymmetrical	Symmetrical	Asymmetrical	Symmetrical	PoE Output Power
Distance	Upstream Line Rate (Mbps)	Downstream Line Rate (Mbps)	Upstream Line Rate (Mbps)	Downstream Line Rate (Mbps)	PoE Output Power
300 m	65	100	100	100	30 W
400 m	45	95	70	70	20 W
600 m	30	65	45	45	15 W
800 m	10	45	27	27	7 W
1,000 m	6	35	18	18	5 W
1,200 m	1	20	8	16	4 W

1.5.2 Coaxial Cable

SNR	6dB		6dB		
	Asymmetrical		Symmetrical		
Profile	Asymmetrical	Symmetrical	Asymmetrical	Symmetrical	PoE Output Power
Distance	Upstream Line Rate (Mbps)	Downstream Line Rate (Mbps)	Upstream Line Rate (Mbps)	Downstream Line Rate (Mbps)	PoE Output Power
400 m	100	100	100	100	30 W
600 m	50	100	50	80	20 W
800 m	50	100	50	80	15 W
1000 m	45	90	50	60	10 W
1,200 m	40	70	50	50	8 W
1,400 m	35	55	40	35	6 W
1,600 m	30	40	35	30	5 W
1,800 m	10	35	20	20	4 W
2,000 m	5	30	15	15	4 W

Chapter 2

Hardware Description

2.1 Applications

EKI-1751PI Series are Long Reach PoE Extenders with four 10/100Base-TX IEEE 802.3at PoE Ports. This chapter shows the product outlook and Hardware interfaces.

2.2 Product Outlook

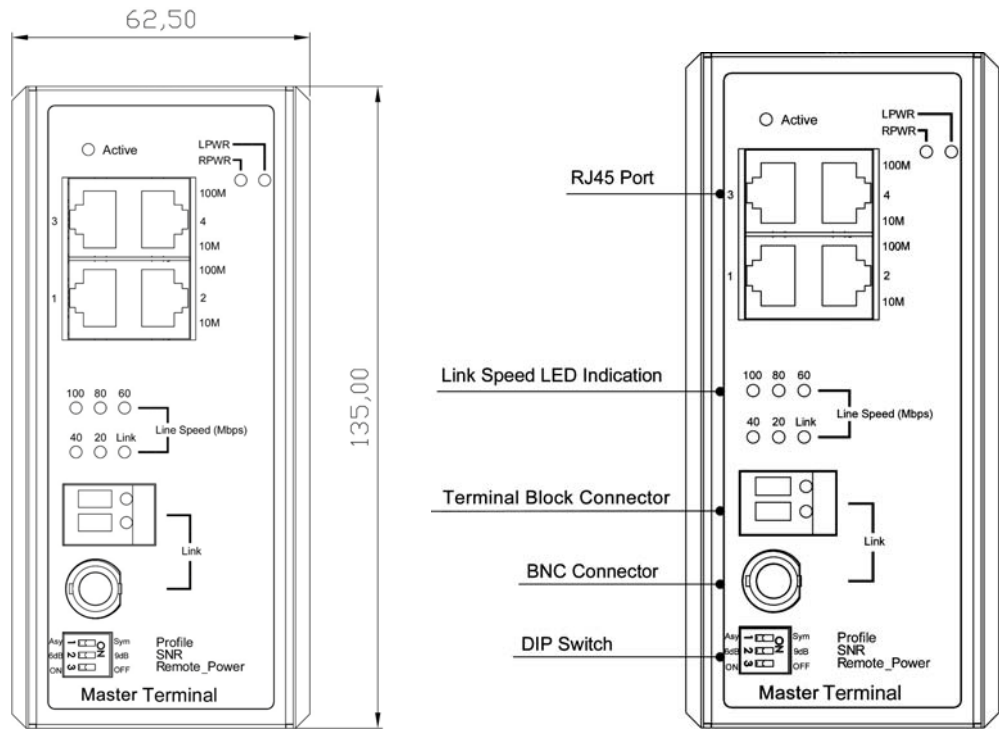


Figure 2.1 EKI-1751PI-M-AE Faceplate

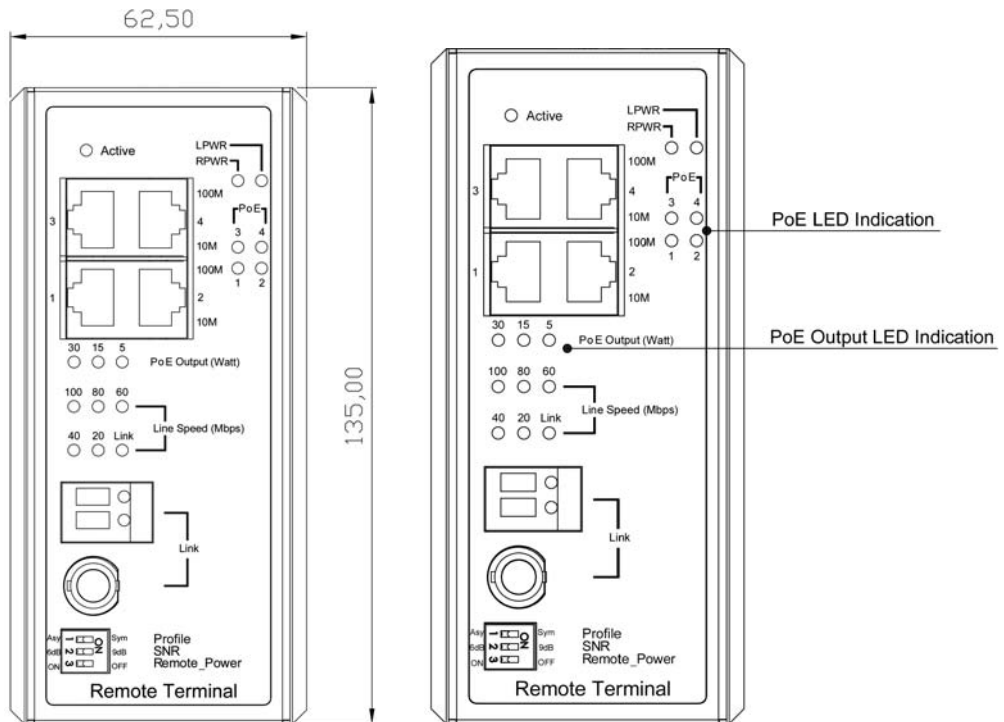


Figure 2.2 EKI-1751PI-R-AE Faceplate

2.3 Installation Accessory

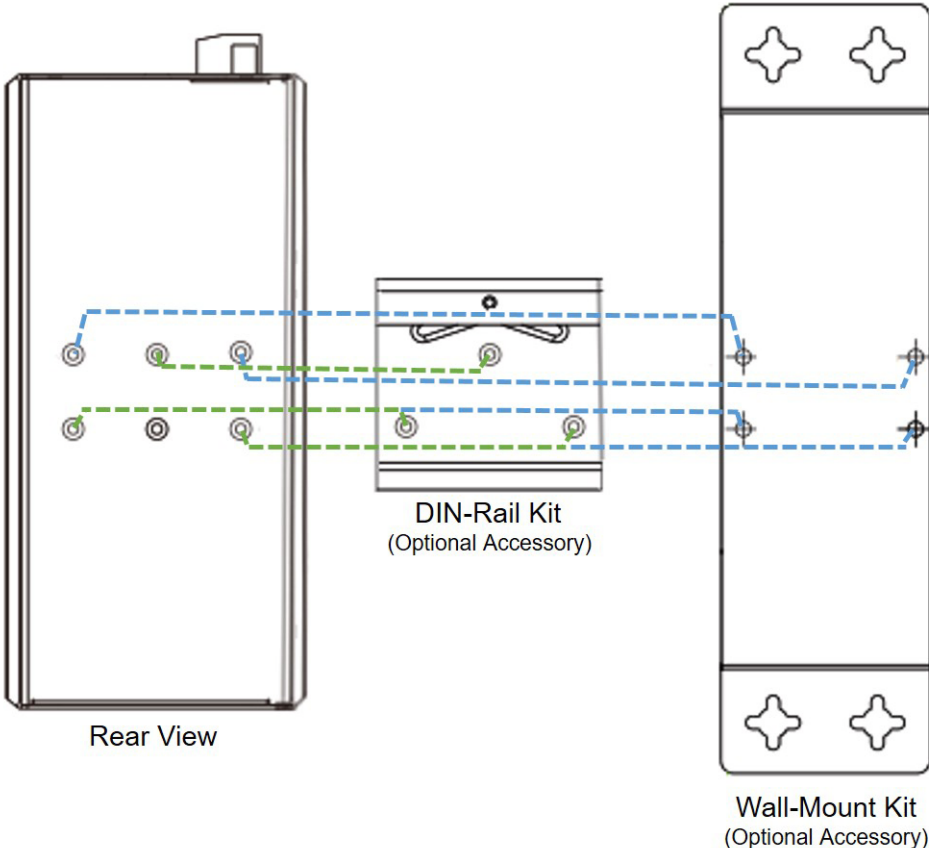


Figure 2.3 Installation Accessory

Chapter 3

LED Definition

3.1 LED indicators

The LED indicators could provide instant feedback to users; the behaviors of the LED are given in below table:

LED Name	Color	Indicator	Condition
Local Power	Green	Off	No local power input
		On	Local power received
Remote Power	Green	Off	No power is transmitted over Line
		On	Power is transmitted over Line
4 x PoE	Green	Off	No power is transmitted over Ethernet port
		On	Power is transmitted over Ethernet port
Link LED	Green	Very slow flashing	Link down
		Slow flashing	Handshaking
		Fast flashing	Data transmission or reviving
		On	Link up
Link Speed, 5 x LEDs	Green	On	Displays speed in Mbps (100M/80M/60M/40M/20M), if 80M LED is on then downstream link speed is in the range 80Mbps to 100Mbps.
PoE Output (Watt), 3 x LEDs	Green	On	Displays PoE PSE available output power in Watt(30W/15W/5W) - Remote Terminal Only
4 x RJ-45	Green	On	Ethernet link up and speed is 100M
		Flashing	Data transmission or receiving
		Off	Ethernet is no link up
	Yellow	On	Ethernet link up and speed is 10M
		Flashing	Data transmission or receiving
		Off	Ethernet is no link up

3.2 LED Display Status

According to your operation environment and power allocation, the display status of PoE Output LED will have three situations for EKI-1751PI-R-AE device.

1. When the PoE power voltage is above or equal 50V ($\geq 50V$), the PoE output is normally working and LED display is stable status.
2. If the voltage between 44V and 50V, the PoE output is warning status and LED display is blinking. The device will cut off PoE Output in port-2, port-3 and port-4 automatically to protect the device.
3. When detected under 44V low voltage ($< 44V$), the PoE output is not working and LED is off status.

Voltage	PoE Output Status	LED Display	PoE Output Mode
≥ 50	Normal	Stable	Keeping working
44V-50V	Warning	Blinking	<input checked="" type="checkbox"/> Cut off Port-2, Port-3, Port-4 <input checked="" type="checkbox"/> Keeping Port-1
$< 44V$	No Output	Off	No working

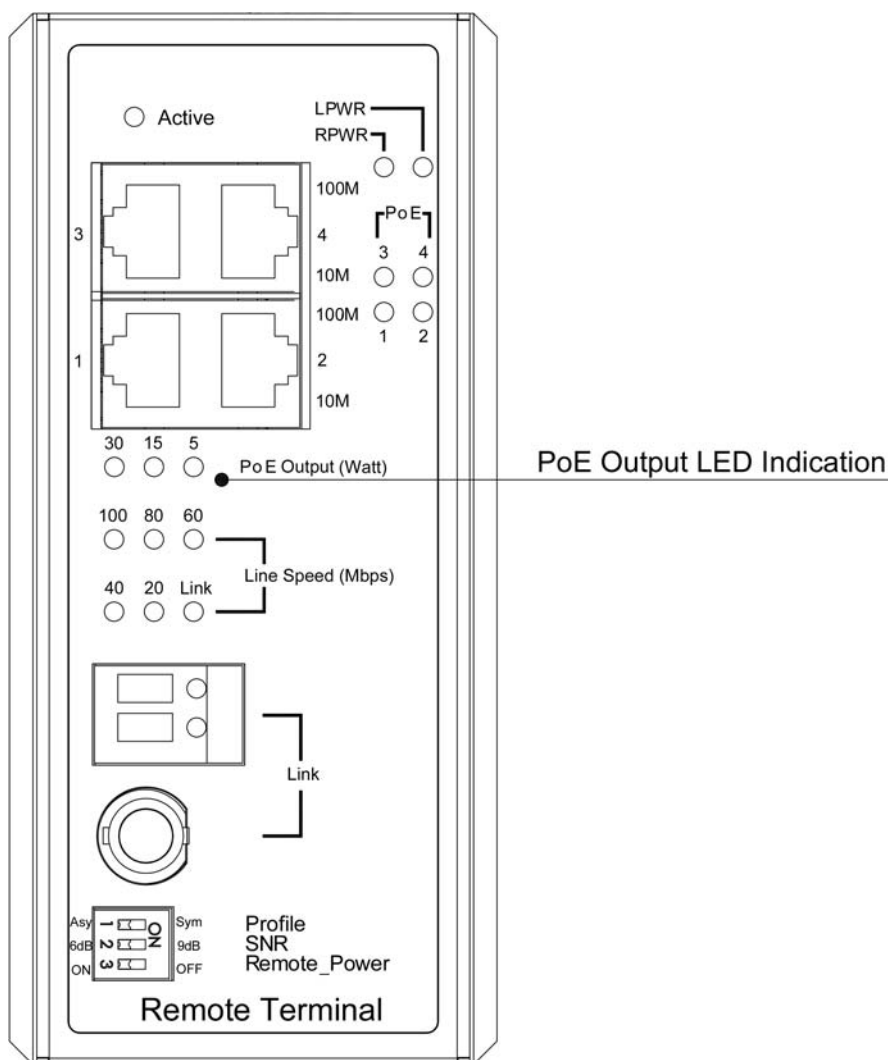


Figure 3.1 Installation Accessory

Chapter 4

Power

4.1 Power

- Input:
 - EKI-1751PI-M-AE: Provide two redundancy local input powers; power voltage is 48 V_{DC} to 57 V_{DC}, terminal Block.
 - EKI-1751PI-R-AE: Provide two redundancy local input powers; power voltage is 48 V_{DC} to 57 V_{DC}, terminal Block.
- Output:
 - EKI-1751PI-M-AE: Provide power output to Line (Remote Power Feeding) to support remote power.
 - EKI-1751PI-R-AE: Ethernet port provide 4-port PoE PSE function to 802.3at (30W).
- Power Consumption:
 - EKI-1751PI-M-AE: Max. 65W with Remote Power function enable
 - EKI-1751PI-R-AE: Max. 45W with Remote Power function enable, provide PoE PSE 30W, Max. 125W with local Power function enable, provide 4-port PoE PSE
- Protection:
 - Provide Over-Current protection and resettable smart Short-Circuit protection on both remote power interface and PoE PSE interface.

Chapter 5

3-Position DIP Switch

5.1 3-Position DIP Switch

Proscend EKI-1751PI Series are equipped with DIP Switch selection, which can allow users to select the parameters in order to meet the needs of different applications. The parameter options should be set identically on EKI-1751PI Series.

Option	Profile	SNR	Remote Power
On	Asymmetrical	6dB	Enable
Off	Symmetrical	9dB	Disable

5.1.1 Regulatory Compliance

EKI-1751PI Series are designed to comply with the following standards

- CE
- FCC Part 15 Class A
- EN60950

5.1.2 Installation/Operation [Precautions]

Note!



- *Disconnect all power from devices before attempting installation.*
- *Disconnect power to the devices before any I/O and DIP configuration.*
- **DO NOT** connect EKI-1751PI Series to the same power source. Possible damages may be caused to devices due to power loop back through the PoE connections via copper wire.
- *This point-to-point application is only for EKI-1751PI Series to connect together.*

Caution! Restricted Access Location



This server is intended for installation only in restricted access locations as defined where both these conditions apply:

- *Access is through the use of a lock or tool and key, or other means of security, and is controlled by the authority responsible for the location.*
- *Access can only be gained by service persons or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.*

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