

# 10/100Base-TX Hardened PoL/PoE Ethernet Extender, Black Box Part Number LBPS310A-KIT (includes one LBPS311A and one LBPS312A)

This quick start guide describes how to install and use the Hardened Ethernet Extender. This is the Hardened Ethernet Extender of choice for harsh environments constrained by space.

## Installation

**Transmitter:** This is a PoL (Power over Link) transmitter. Data and power can be delivered at the same time through one pair of copper wire to turn on and communicate with a Receiver via an RJ-11 phone jack or a 2-pin Terminal Block interface.

**Receiver:** This is a PoL (Power over Link) Receiver. The Receiver can be powered either by a Transmitter through one pair of copper wire or power supply. The Ethernet port supports IEEE802.3at PoE/PSE for PoE/PD applications.

**<Warning>**

- Remove the device power before installation.
- Remove the device power before any I/O and DIP switch configuration.
- Do not connect the Transmitter and Receiver to the same power source. Power loops back through the PoL linked via copper wire might damage the devices.

### PoL (Power over Link) Mode Enable Installation

- Ensure all power sources are disconnected from the Transmitter and the Receiver.
- Ensure Transmitter PoL (Power over Link) DIP switch is in **On** position (Up position).
- Set Transmitter Type DIP switch to Per (Performance, Up position) for better Line Speed (but poor noise immunity). Or set the Transmitter's DIP switch to Std (Standard, Down position) for standard Line Speed (but better noise immunity).
- Check if Receiver Mode is set to Rmt on the DIP switch (Remote, Up position).
- Connect one end of the one pair copper wire to RJ-11 phone jack or 2-pin Terminal Block interface of the Transmitter and the connect the other end to RJ-11 phone jack or 2-pin Terminal Block interface of the Receiver.
- Connect the power source to the Transmitter.
- Data and power can be delivered from Transmitter, and at the same time through one pair copper wire to turn on and communicate with Receiver.

**<Note>** The equipment is designed for building installation and not intended to be connected to exposed (outside plant) networks including campus environments or equivalent.

### PoL (Power over Link) Mode Disable Installation

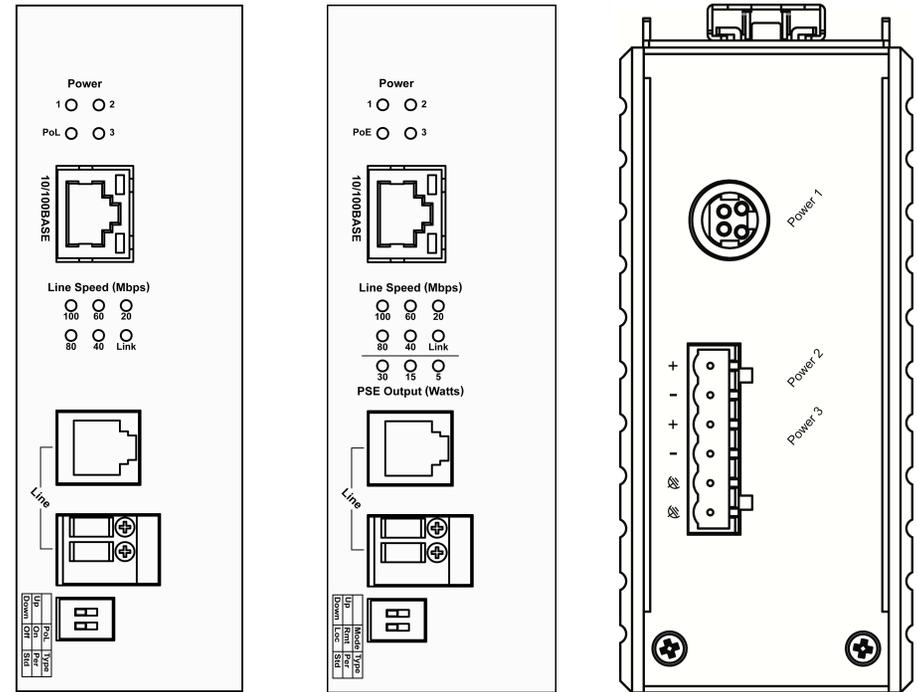
For longer distance (e.g. over 1.4 km) extension applications, the Receiver may not be able to receive power from Transmitter. A separate power supply may be applied to the Receiver.

- Ensure all power sources are disconnected from Transmitter and Receiver.
- Ensure Transmitter PoL (Power over Link) DIP switch is in **Off** position (Down position).
- Set Transmitter Type DIP switch to Per (Performance, Up position) for better Line Speed (but poor noise immunity). Or set the Type DIP switch of Transmitter to Std (Standard, Down position) for standard Line Speed (but better noise immunity).

- Connect the power source to the Transmitter.
- Check if Receiver Mode is set to Rmt on DIP switch (Remote, Up position).
- Connect the power source to the Receiver.
- Connect one end of the one pair copper wire to an RJ-11 phone jack or the 2-pin Terminal Block interface of the Transmitter and the other end to a RJ-11 phone jack or the 2-pin Terminal Block interface of the Receiver.
- Data can be transmitted between Transmitter and Receiver via copper wire.

## Physical Description

### The Port Status LEDs and Power Inputs



Transmitter

Receiver

- DC Terminal Block Power Inputs: 2.5A @ 48VDC (Peak current 3.26A). Two pairs of power inputs can be used to power up this Ethernet Extender. Redundant power supplies are supported. You only need to have one power input connected to run the Ethernet Extender.
- DC JACK Power input: 2.5 A @ 48 VDC (Peak current 3.26 A).

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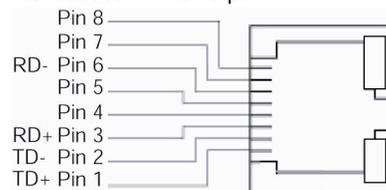
Power Input Assignment		
Power1	48 VDC	DC Jack
Power2	+	T: 46-57 VDC R: 46-57 VDC
	-	Power Ground
Power3	+	T: 46-57 VDC R: 46-57 VDC
	-	Power Ground
		Terminal Block
		Earth Ground

DIP Switch	Down	Up
Transmitter		
PoL	Disable Power over Link	Enable Power over Link
Type	Std (Standard) Standard line speed Better noise immunity	Per (Performance) Better line speed Poor noise immunity
Receiver		
Mode	Loc (Local), Set Receiver to Local Mode	Rmt (Remote), Set Receiver to Remote Mode
Type	Std (Standard) Standard line speed Better noise immunity	Per (Performance) Better line speed Poor noise immunity

## 10/100Base-TX and Ethernet Extender Connectors

### 10/100Base-TX Connection

The following lists the pinouts of 10/100Base-TX RJ-45 port.



Pin	Regular Port	PoE Port
1	Output Transmit Data +	Output Transmit Data +
2	Output Transmit Data -	Output Transmit Data -
3	Input Receive Data +	Input Receive Data +
4		Positive (VCC+)
5		Positive (VCC+)
6	Input Receive Data -	Input Receive Data -
7		Negative (VCC-)
8		Negative (VCC-)

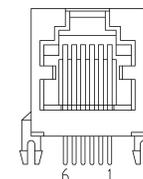
LEDs	State	Indication	
Power 1/2/3	Steady	Power received	
	Off	Power off	
PoL	Steady	Power Ethernet extension interface function is enabled	
	Off	No power is transmitted over Ethernet extension interface	
PoE	Steady	Powered device (PD) is connected	
	Off	Powered device (PD) is disconnected	
Link	Steady	A valid Extender connection established	
	Fast Flashing	Data transmission or receiving	
	Slow Flashing	Extender port under negotiation mode	
	Off	Extender interface connection is not established	
Line Speed	Steady	Displays the link speed in Mbps	
PSE Output	Steady	PoE power can be transmitted for PD	
	All off	No PoE power can be transmitted for PD	
	Green	Steady	A valid Ethernet connection established
		Flashing	Data transmission or receiving
		Off	Non-Ethernet connection is established
	Yellow	Steady	Link speed at 100Mbps
		Off	Link speed at 10Mbps

### Ethernet Extender Connection

RJ-11 and Terminal Block port pinouts:

Pin 3: Tip, Pin 4: Ring.

Use a telephone line to connect two RJ-11 or Terminal Block ports between two Hardened Ethernet Extenders.



## Functional Description

- Meets EN61000-6-2 & EN61000-6-4 EMC Generic Standard Immunity for industrial environment.
- Ethernet port: Supports IEEE802.3/802.3u/802.3x. Auto-negotiation: 10/100Mbps, full/half-duplex; Auto MDI/MDIX.
- Auto data rate negotiation for Ethernet extension interface.
- Six speeds with speed indicator LEDs on front panel of unit, up to 100 Mbps @ about 300 meters (984 ft.), down to 1 Mbps @ about 2,200 meters (7,218 ft.).
- Supports Power over Ethernet application up to 1,200 meters (3,937 ft.) for Max. 5 watts power consumed by PoE powered devices.
- Power consumption:
  - Enable** Power over Link (PoL) function: Max. 65 Watts
  - Disable** Power over Link (PoL) function: Transmitter: Max. 5 W  
Receiver: Max. 35 W with PoE output  
Max. 5 W without PoE output.
- Power Supply: Redundant T: 46-57 V, R: 46-57 VDC Terminal Block power inputs and 48 VDC Latched DC JACK interface.
- Operating temperature range @ -40°C to 75°C (-40°F to 167°F). Tested for functional operation @ -40°C to 85°C (-40°F to 185°F).
- Supports Din-Rail or Panel Mounting installation.

Power over Link (PoL) Enabled		
Distance	Data Rate	Receiver PoE Output
300M	100Mbps	30.0 W
400M	90Mbps	15.4 W
600M	60Mbps	14.0 W
800M	45Mbps	9.5 W
1000M	35Mbps	7.0 W
1200M	20Mbps	5.0 W

Power over Link (PoL) Disabled Power Supply Applied on Receiver		
Distance	Data Rate	Receiver PoE Output
1400 M	15M bps	30.0 W
1600 M	10 Mbps	30.0 W
1800 M	3 Mbps	30.0 W
Up to 2200 M	1Mbps	30.0 W

**<Note>** The Reference Performance is tested on 24AWG Telephone wire (0.5mm diameter, 1-pair wire, Cable impedance: 100ohm).