

PoE and CONVERGE Pro 2 P-Link Peripheral Products

CONVERGE® P-Link devices are powered using PoE Injectors. In most cases a single PoE+ injector can power 3 P-Link devices. However, in some cases you will need a PoE+ injector or even a PoE++ injector per P-Link device. This document helps you determine what PoE injectors are needed.

Power over Ethernet (PoE) for P-Link Devices

P-Link uses PoE standards to deliver power to each peripheral device. However, P-Link uses a proprietary data transfer instead of the Ethernet standard.

PoE has been standardized by IEEE 802.3 standards. The following three types are available:

Type of PoE	IEEE Standard	Maximum Power
PoE	802.3af (Type A)	15.4 Watts
PoE+ or PoE Plus	802.3at (Type B)	36 Watts
4PPoE / PoE++	802.3bt (Type 4)	100 Watts

Related Product Datasheets

- [CONVERGE Pro 2](#)
- [BMA 360](#)
- [BMA CT](#)
- [BMA 2](#)
- [CONVERGE Huddle](#)
- [DIALOG® 20 Wireless Receiver](#)
- [USB Expander](#)
- [GPIO Expander](#)
- [Bluetooth Expander](#)
- [Touch Panel Controller](#)

Power Sourcing Equipment (PSEs) Powering Devices (PDs)

Per PoE standards, three modes are available to power devices, as follows:

Mode	Power Delivered on ...	Power Delivery Pins	Notes
A	The data pairs of 100-BASE-TX or 10-BASE-T cable	1, 2, 3, and 6	These are the same two pairs used for network data transmission. That is, mixed data and power.
B	The spare pairs of 100-BASE-TX or 10-BASE-T cable	4, 5, 7, and 8	These are spare pairs that are used for power. That is, no mix of data and power.
4PPoE / PoE++	Four pairs of 100-BASE-TX or 10-BASE-T, 2.5-GBASE-T 5-GBASE-T and 10-GBASE-T cable	Power is balanced across all pairs.	

Pin	Mode A	Mode B	4PPoE
1	DC +	Unused	DC +
2	DC +	Unused	DC +
3	DC -	Unused	DC -
4	Unused	DC +	DC +
5	Unused	DC +	DC +
6	DC -	Unused	DC -
7	Unused	DC -	DC -
8	Unused	DC -	DC -

ClearOne Pro Audio Products that Require PoE PD power sources (PDs)

- BMA 360
- BMA CT
- BMA CTH
- Huddle CTH
- Beamforming Mic Array 2
- CONVERGE Huddle
- USB Expander
- GPIO Expander
- DIALOG® 20 Wireless Receiver
- Bluetooth Expander
- Touch Panel Controller

ClearOne PoE Power Injectors (PSEs)

Power Injector	ClearOne Part Number
PoE	910-001-004, 15.4 W
PoE+	910-3200-202, 36 W
PoE++	910-3200-209, 90 W

To ensure best performance, ClearOne strongly recommends the use of ClearOne PSEs.

The following table provides detailed information about PoE injectors for specific ClearOne devices:

ClearOne PDs		Power Consumption	ClearOne PSEs					
Product	Part Number		PoE Power Injector (910-001-004, 15.4 W)		PoE+ Power Injector (910-3200-202, 36 W)		PoE++ Power Injector (910-3200-209, 90W)	
			Supported	Supports Daisy-Chain on P-Link Out	Supported	Supports Daisy-Chain on P-Link Out	Supported	Supports Daisy-Chain on P-Link Out
BMA 360	910-3200-208	16 W	X	X	✓	✓	✓	✓
BMA 360 x 2 Ch Speakers		54 W	X	X	X	X	✓	✓
BMA 360 x 4 Ch Speakers		90 W	X	X	X	X	✓	✓
BMA CT/CTH	910-3200-205/206	8 W	✓	✓	✓	✓	X	X
BMA CT/CTH x 2 Ch Speakers		34 W	X	X	✓	✓	X	X
CONVERGE Huddle/CTH	910-3200-701/706	14 W	X	X	✓	✓	X	X
CONVERGE Huddle/CTH x 2 Ch Speakers		34 W	X	X	✓	✓	X	X
Beamforming Mic Array 2	910-3200-201/201-B	8 W	✓	✓	✓	✓	X	X
CONVERGE Pro 2 GPIO Expander	910-3200-301	7 W	✓	✓	✓	✓	X	X
CONVERGE Pro 2 USB Expander	910-3200-302	4 W	✓	✓	✓	✓	X	X
DIALOG 20 Wireless Receiver	910-6100-201	2 W	✓	✓	✓	✓	X	X
Bluetooth Expander*	910-3200-303	2 W	✓	X	✓	X	X	X

* Because this device does not have a P-Link Out, when it is daisy-chained with other PDs, it must be the last device in the P-Link chain.

Note that P-Link In ports support only Mode B PoE injectors.



Note: P-Link devices use a proprietary protocol. Data is not passed over Ethernet switches.

Connection and Power Options for a BMA CT

A configuration of up to three BMA CT units requires power from only one 36 W PoE+ injector (ClearOne part number 910-320-202, 36 W). The injector can be connected at the CP2 mixer as shown in Figure 1, or the injector can be connected at the first BMA CT.

Daisy-chain 3 tiles per CP2 mixer

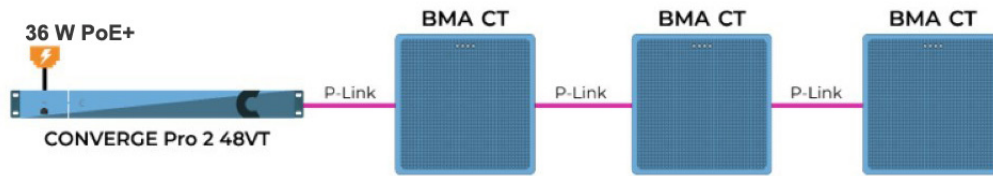


Figure 1. P-Link configuration with three BMA CT units, without speakers, powered by one 36 Watt PoE+ injector

A configuration of up to six BMA CT units connected to two CP2 mixers requires two 36 W PoE+ injectors. In the following diagram, one injector is connected to the CP2 to power the first three ceiling tiles in the chain. The second is connected to the fourth ceiling tile, as shown in Figure 2.

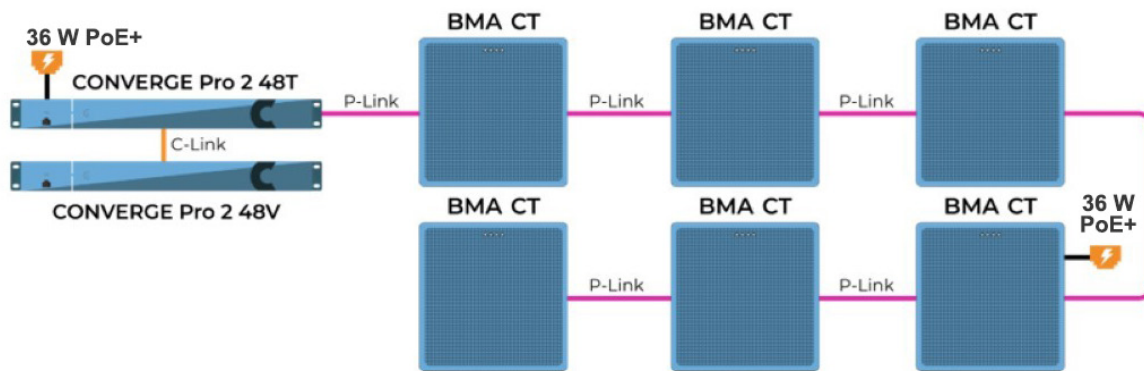


Figure 2. P-Link configuration with six BMA 360 units without speakers, powered with two 90 Watt PoE ++ injectors

Connection and Power Options for BMA CT and Peripherals

Up to three BMA CT and/or other P-Link peripheral devices can be powered by a single 36 W PoE+ power injector as illustrated in Figure 3 below. The diagram shows that after the third powered device, an additional 36 W PoE+ power injector must be used to power the next three devices in the chain.

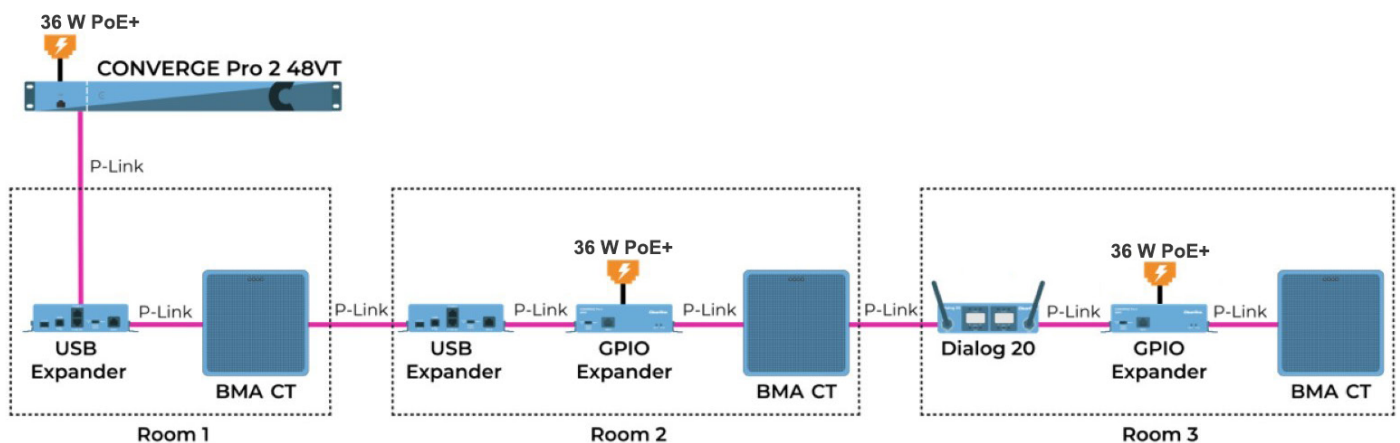


Figure 3. P-Link configuration with multiple peripherals

Connection and Power Options for BMA 360 Without Speakers

One 90 W PoE++ injector (ClearOne part number 910-3200-209, 90 W) can power up to three BMA 360 devices.

Similar to BMA CT units, when three BMA 360 units are connected, the power injector **must** be connected to the **first** BMA 360 in the chain, as shown in Figure 4.

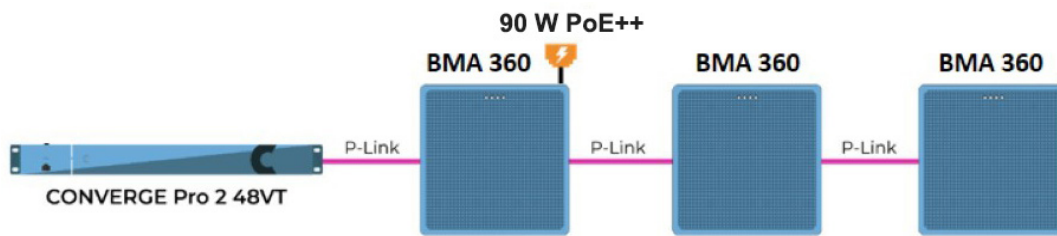


Figure 4. P-Link configuration with three BMA 360 units without speakers, powered with one 90 Watt PoE injector

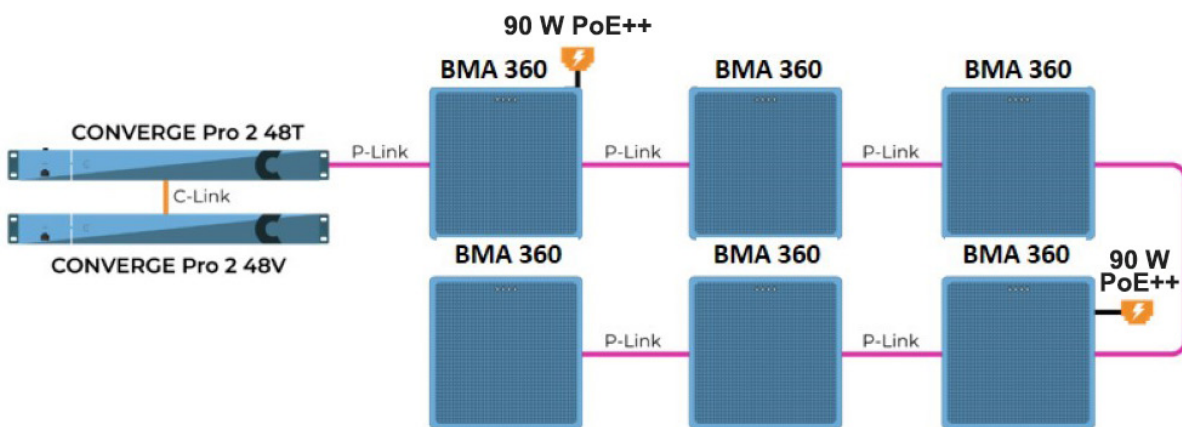


Figure 5. P-Link configuration with six BMA 360 units without speakers, powered with two 90 Watt PoE injectors

When you power peripherals, the power scheme for the BMA 360 and the BMA CT are the same.

Figure 6 shows a daisy-chain of three BMA 360 tiles with peripherals.

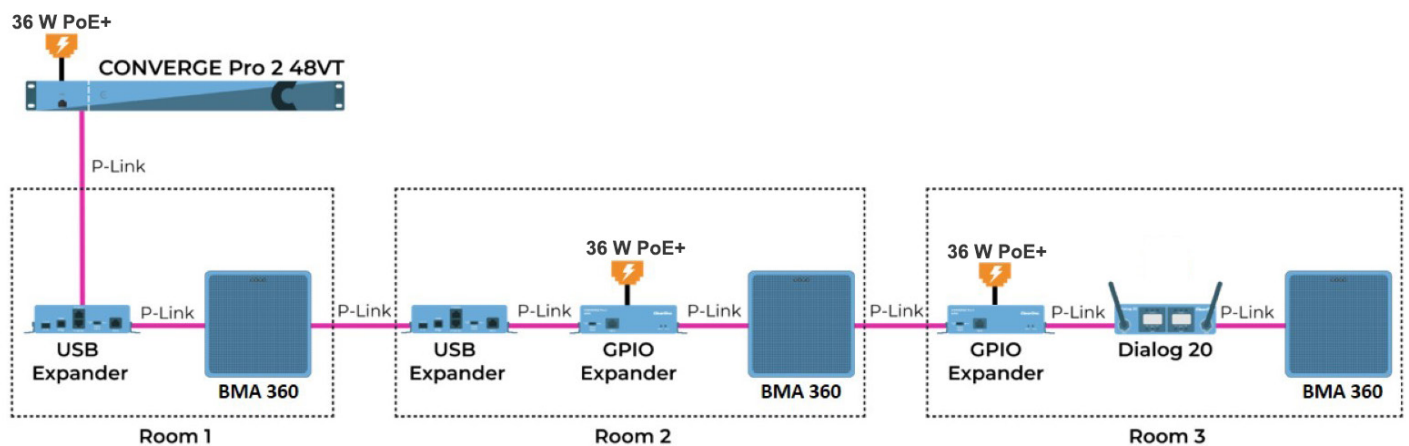


Figure 6. P-Link configuration with three BMA 360 units without speakers, with peripherals, powered with three 36 Watt PoE injectors

Connection and Power Options for BMA 360 With Speakers

If you attach speakers to the BMA 360 power amplifiers, you **must** connect a 90W PoE++ injector to **each** BMA 360, regardless of how many speakers you attach. Figure 7 illustrates this:

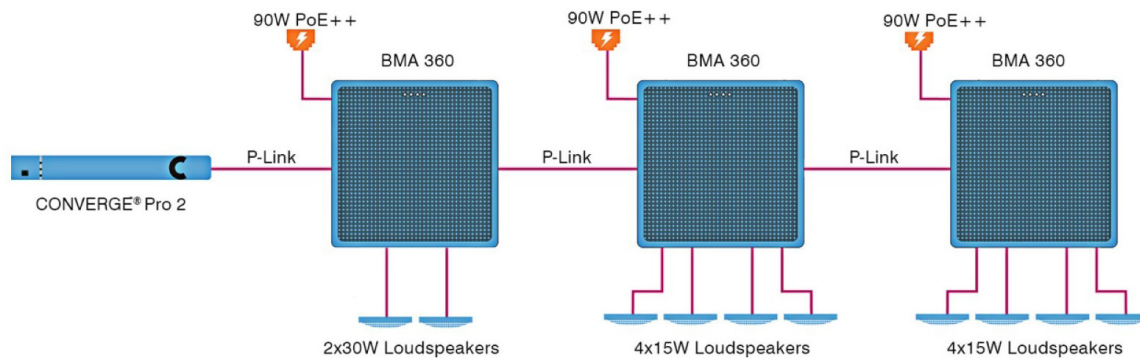


Figure 7. P-Link configuration with three BMA 360 units with speakers powered with three 90 Watt PoE injectors

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