Product description	Radio node	Cambium part number
CABLE, UL POWER SUPPLY CORD SET, 720mm, EU	V1000, V2000, V3000, and V5000	N000900L032A
CABLE, UL POWER SUPPLY CORD SET, 720mm, UK	V1000, V2000, V3000, and V5000	N000900L033A
CABLE, UL POWER SUPPLY CORD SET, 720mm, Brazil	V1000, V2000, V3000, and V5000	N000900L034A
CABLE, UL POWER SUPPLY CORD SET, 720mm, Israel	V1000, V2000, V3000, and V5000	N000900L037A

Refer to Maximum cable lengths for details of the maximum cable lengths and the maximum PoE output power for different powering options.

V1000 Power over Ethernet

The V1000 CN is always powered using Power over Ethernet (PoE) at a nominal 56V, as shown in the PoE power supply to V1000 figure using the Gigabit power injector supplied with the radio, or using an IEEE 802.3af PoE output from an Ethernet switch.

Figure 33: *PoE power supply to V1000*

Table 16: PoE, 15W 56V, 1 Gigabit DC injector (N000900L017A)

Category	Specification
Dimensions	118 mm (4.64 in) x 43 mm (1.69 in) x 32.4 mm (1.27 in)
Weight	0.18 Kg (0.39 lbs)
Temperature	0°C (32°F) to +50°C (140°F)
Humidity	10% to 95 % non-condensing
AC Input	90-264V AC, 47-63 Hz
DC Output Voltage	56V

Category	Specification
DC Output current	0.25A
Efficiency	Better than 84% at full load
Over Current Protection	Hiccup mode, recovers automatically after the fault condition is removed
Hold up time	At least 10 milliseconds
RJ45 POE Port	7,8 ------------- DC V- 5,6 ------------- DC V+

> **Note**
>
> The Gigabit power injector is supplied with the cnWave V1000 CN. Order part N000900L017A to obtain spares.

> **Warning**
>
> Always use an appropriately rated and approved AC supply cord-set in accordance with the regulations of the country of use.

V2000 Power over Ethernet

The V2000 CN is always powered using Power over Ethernet (PoE) at a nominal 56V using the Gigabit power injector supplied with the radio or using an IEEE 802.3af PoE output from an Ethernet switch.
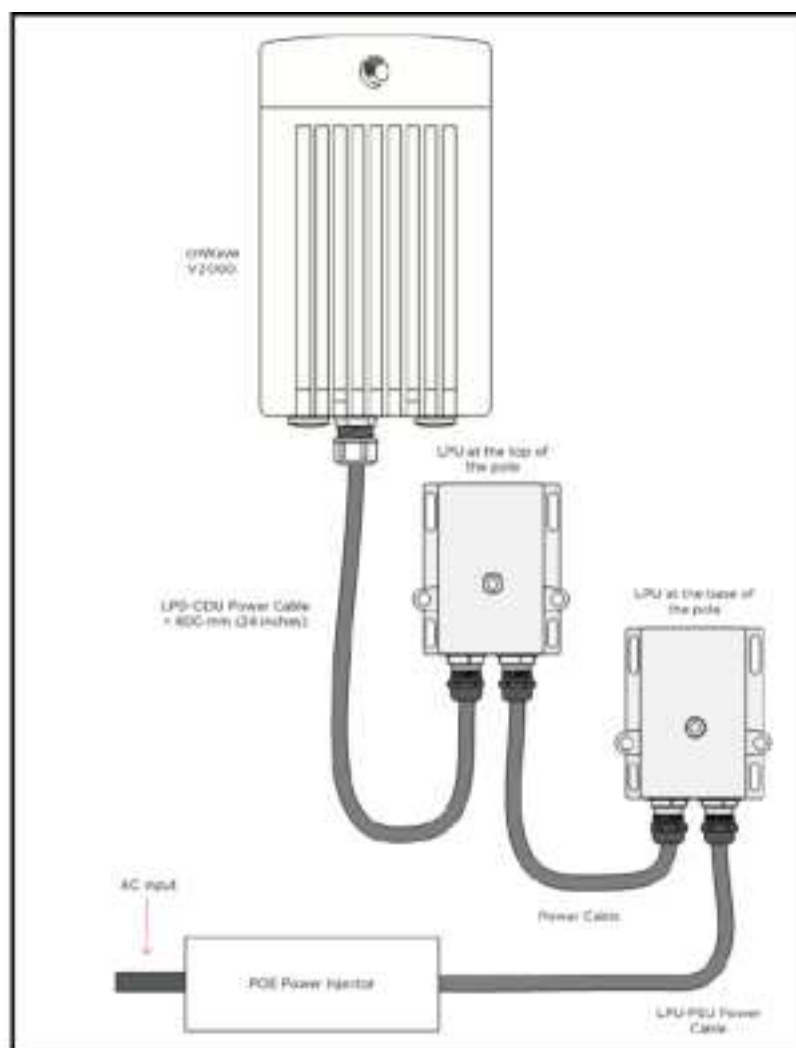
Table 17: PoE, 30W 56V, 5GbE DC injector (N000000L034B)

Category	Specification
Dimensions	140 mm (5.5 in) x 53 mm (2.08 in) x 35 mm (1.37 in)
Weight	0.24 Kg (0.5 lbs)
Temperature	0°C (32°F) to +50°C (140°F)
Humidity	10% to 95 % non-condensing
AC Input	90-264 V AC, 47-63 Hz
DC Output voltage	56V
DC Output current	0.54 A
Efficiency	Better than 88% at full load

Category	Specification
Over Current Protection	Hiccup mode, recovers automatically after the fault condition is removed
Hold up time	At least 10 milliseconds
RJ45 POE Port	1,2,7,8 ------------- DC V– 3,4,5,6 ------------- DC V+

V3000, V5000 Power over Ethernet

The V3000 CN and V5000 DN can be powered using DC power at a nominal 54V, using 14 AWG or 16 AWG cable, as shown in the DC power supply to V3000 or V5000 figure.
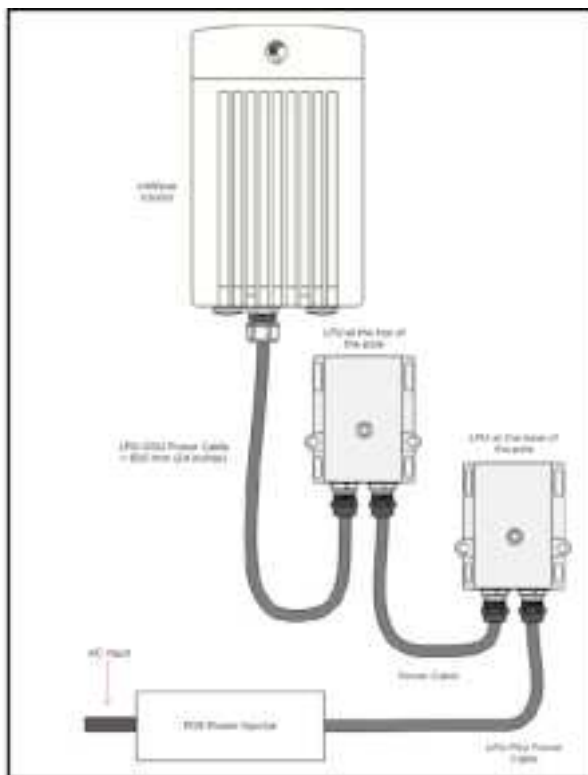
Figure 35: *PoE power supply to V3000 or V5000*

Table 18: PoE, 60W, 56V, 5 GbE DC injector (N000000L142A)

Category	Specification
Dimensions	140 mm (5.5 in) x 53 mm (2.08 in) x 35 mm (1.37 in)
Weight	0.24 Kg (0.5 lbs)
Temperature	0°C (32°F) to +50°C (140°F)
Humidity	10% to 95 % non-condensing
AC Input	90-264 V AC, 47-63 Hz
DC Output voltage	56V
DC Output current	1.07 A
Efficiency	Better than 88% at full load
Over Current Protection	Hiccup mode, recovers automatically after the fault condition is removed
Hold up time	At least 10 milliseconds
RJ45 POE Port	1,2,7,8 ------------- DC V- 3,4,5,6 ------------- DC V+

V3000, V5000 Outdoor AC/DC power supply unit

Figure 36: *DC power supply to V3000 or V5000*
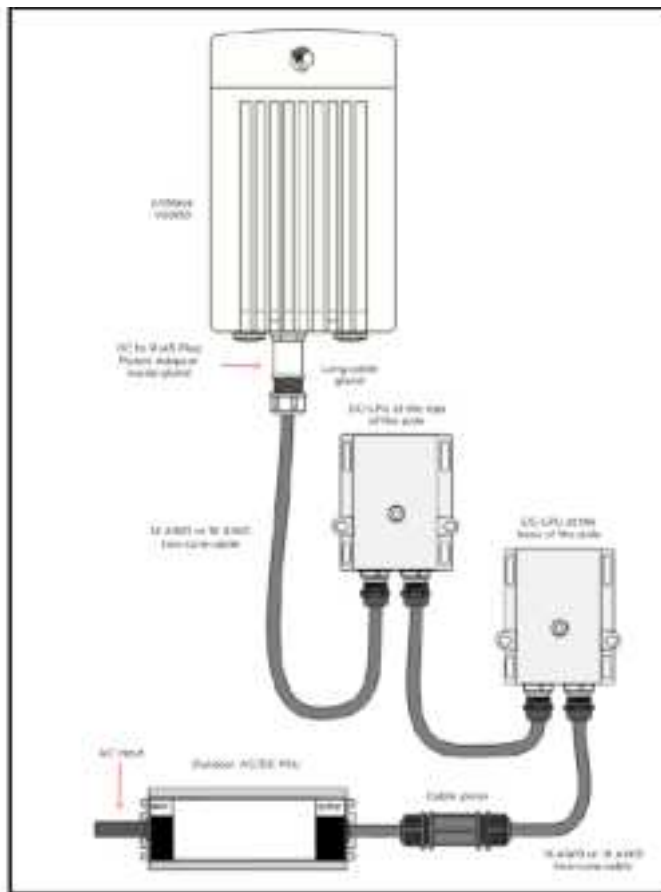
The outdoor PSU can be installed indoors, in an outdoor cabinet, or inside street furniture.

Figure 37: *Outdoor AC/DC PSU, 60 W, 54 VDC*

Figure 38: *Outdoor AC/DC PSU, 100 W, 54V DC (N000000L179B)*

Table 19: Outdoor AC/DC PSU, 54V DC

Category	PSU	Specification
Part number and Dimensions	N000000L178A (60W)	171 mm (6.7 in) x 62 mm (2.4 in) x 37 mm (1.5 in)
	N000000L179A(100W)	220 mm (8.7 in) x 68 mm (2.7 in) x 39 mm (1.5 in)
Power	60W	
	100W	
Temperature	-40°C (-40°F) to +60°C (140°F)	
Humidity	20 to 95 % non-condensing	
Waterproofing	IP65/IP67	
AC Input	90-305 V AC, 47-63 Hz	
DC Output Voltage	54V	
DC Output current	60W	1.15 A
	100W	1.77 A
Efficiency	Better than 90% at full load	
Over Current Protection	Hiccup mode, recovers automatically after the fault condition is removed	
Hold up time	At least 16 milliseconds	
Power factor	Better than 0.95	

Figure 39: *Cable joiner*

Figure 40: *DC to RJ45 plug power adapter*
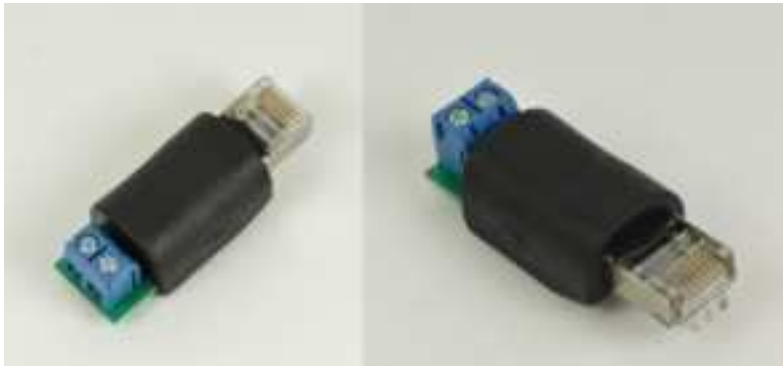
These cable joiners and DC to RJ45 cable adapters are used to connect to outdoor AC/DC PSU. Refer to Maximum cable lengths for details of the maximum cable lengths and the maximum PoE output power for different powering options.

> **Note**
>
> If you are using the mini RJ45 power adapter, you must use the cable gland (C000000L123A) to ensure that the cable is protected. This cable gland comes in the radio box. For more details about the cable gland, refer to Table 23.

PSU Specifications

The PSUs conform to the specifications are listed in Outdoor AC/DC PSU, 54VDC.

Ethernet and DC cables

Maximum cable lengths

Ethernet

For all cnWave radios, the maximum cable length for data transmission over copper Ethernet (100BASE-TX, 1000BASE-T, 2.5GBASE-T, 5GBASE-T, 10GBASE-T) is 100 m (328 ft) from the radio to the connected equipment.

It is recommended to use outdoor braided **CAT6A** cable for V2000, V3000, V5000, and outdoor braided **CAT5e** cable for V1000.

For installations where the auxiliary device is powered using ODU Aux POE port, refer to the Maximum cable lengths supported table.

The maximum cable length for fiber Ethernet (10GBASE-SR, 10GBASE-LR) connections depends on the fiber used. See SFP module kits on page 19 for details of the Ethernet standards supported and maximum permitted cable lengths.

Power over Ethernet (PoE)

The maximum length for supplying power from a 60 W DC injector over a CAT6A Ethernet cable is shown in the Maximum cable length for Power over Ethernet table. 60W DC injector is used to power on V2000, V3000, or V5000.

The maximum length for supplying power from a 30 W DC injector over a CAT6A Ethernet cable is shown in the Maximum cable length for Power over Ethernet table. 30W DC injector is used to power on V2000.

Table 20: Maximum cable length for PoE supported

Radio	PoE enabled	Maximum cable length
V2000	-	390m
	25W	100m
V3000	-	390m
	25W	72m
V5000	-	330m
	25W	0m to 5m

The available output power for auxiliary Power over Ethernet output in V2000, V3000, and V5000 is reduced at longer PoE cable lengths, as shown in the Maximum cable length for Power over Ethernet table.

Table 21: Maximum PoE output power

Radio	Cable length	Maximum Aux PoE output
V2000	0m to 20m	35W
	20m to 70m	30W
	70m to 100m	25W
V3000	0m to 72m	25.0W
	25m	24.6W
	100m	23.6W

Radio	Cable length	Maximum Aux PoE output
V5000	0m to 5m	25W
	10m	23.1 W
	20m	22.6W
	30m	22.1W
	40m	21.6W
	60m	20.6W
	80m	19.6W
	100m	18.6W

Using AC/DC PSU with a DC power feed

The maximum length for supplying power over a CAT6A Ethernet cable is shown in the Maximum cable length for DC power table.

Table 22: Maximum cable length for DC power

Radio	PSU	PoE enabled	Maximum cable length 14 AWG	Maximum cable length 16 AWG
V3000	60W	-	780m	490m
		25W	140m	90m
	100W	-	780m	490m
		25W	390m	250m
V5000	60W	-	660m	410m
		25W	Not supported	
	100W	-	660m	410m
		25W	360m	220m

Outdoor copper CAT6A Ethernet cable

Select an outdoor-rated CAT6A cable, ready terminated with RJ45 connectors in one of the following lengths:

- 25m

- 50m

- 100m

Alternatively, terminate bulk CAT6A cable with RJ45 connectors at a length to suit each installation.

> **Attention**
>
> Always use CAT6A or better cable that has an overall copper braid shield, is outdoor rated with a UV-resistant sheath.

Table 23: Terminated Ethernet cable part numbers

Cambium description	Cambium part number
CAT6A outdoor cable, 305m	N000082L172B
RJ45 connector for CAT6A cable	N000082L174B
CAT6A outdoor cable, 100m	N000000L155A
Cable gland for 4-6mm cable, M25, Qty 10	C000000L176A
Cable gland for 6-9mm cable, M25, Qty 10	C000000L123A
CAT5E Outdoor Cable, 100m drum	N000082L016A

Cable accessories

This section provides information about the required cable accessories.

Figure 41: *Standard cable gland*

Figure 42: *Long cable gland*

Cable accessories available from Cambium Networks are listed in the Cable accessory part numbers table below.

Table 24: Cable accessory part numbers

Cambium description	Cambium part number
Cable gland for 6-9mm cable, M25, Qty 10	C000000L123A
Cable gland Long, M25, Qty 5	C000000L124A
Grounding cable, 0.6m with M6 ring to M6 ring	C000000L138A
Cable gland for 4-6mm cable, M25, Qty 10	C000000L176A
DC to RJ45 plug power adapter	C000000L184A
Grounding cable, 1m with M6 ring to M6 ring	N000082L116A

> **Note**
>
> One cable gland for 6-9mm cable size is included with each cnWave radio. Order additional cable glands as spares, where smaller cable size is to be used, or where the V3000 or V5000 Aux port is to be used.

SFP Module kits

SFP Module kits allow the connection of a V3000 CN or V5000 DN radio to a network over a 10 Gigabit optical Ethernet interface in one of the following full-duplex modes:

- 10GBASE-SR

- 10GBASE-LR

Order SFP+ module kits from Cambium Networks (SFP module part numbers).

The SFP+ module must be used with the long cable gland.

Table 25: SFP module part numbers

Cambium description	Cambium part number
10G SFP+ MMF SR Transceiver, 850nm. -40C to 85C	SFP-10G-SR
10G SFP+ SMF LR Transceiver, 1310nm. -40C to 85C	SFP-10G-LR
1G SFP MMF SX Transceiver, 850nm. -40C to 85C	SFP-1G-SX
1G SFP SMF LX Transceiver, 1310nm. -40C to 85C	SFP-1G-LX
10G SFP+ BaseT (RJ45), -40C to 85C	SFP-10G-Cu-EXT
1000Base-T (RJ45) SFP Transceiver. -40C to 85C	SFP-1G-Copper

Direct attach copper (DAC) cable

The DAC cable is an accessory that eliminates the need for buying two SFP Transceivers and a OM3 optical cable required to run a 10 Gigabit link. It is a low cost solution used for:

- Connecting a V5000 device that is backhauled by a V3000 device, and

- Connecting V3000-to-V3000 backhauled link.

The DAC cable from Cambium Networks (**part number** : **DAC-10G-2M**) is a combination of Twinax copper cable factory terminated with SFP+ modules. It delivers data rates of up to 10 Gbps. It is an outdoor, UV protected cable with two-meters length and operates at tempearatures ranging between -40°C and 85°C.

The DAC cable (as shown in Figure 43) is a plug and play alternative that enables 10 Gigabit connectivity through the SFP+ port with no need for buying separate SFP+ transceivers and optical cables.