

MATCHING

CABLES to IEEE 802.3.bt PoE



DESIGN



INSTALL



VERIFY

Matching cable to 802.3bt



IEEE 802.3bt is the latest high-power Power over Ethernet (PoE) standard, delivering up to 90W at the source and up to 71W at the powered device (PD). This increased power capability supports advanced IP cameras, access control devices, LED lighting, wireless access points, and other network-connected equipment that require higher operating power.

As PoE power levels increase, cable selection becomes increasingly important. Differences in cable category, conductor size, cable quality, and installation practices can significantly affect power delivery, transmission distance, and overall system reliability.



IEEE 802.3bt delivers power using all four pairs of a standard Ethernet cable. While native 802.3bt operation requires four-pair Ethernet cabling, extender technologies can transport PoE over alternative media such as coaxial cable and single-pair wiring while maintaining compatibility with PoE-powered devices based on the cable capacity.



PoE and Ethernet transmission standards were originally developed around Category 5 cabling. As network bandwidth requirements increased, Category 5e and Category 6 cabling were introduced with improved electrical performance, lower resistance, lower crosstalk, and support for Gigabit Ethernet and beyond. The lower resistance improved PoE transmission capability as well.

Matching cable to 802.3bt

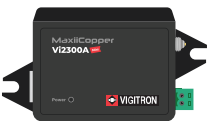


Because PoE power transmission generates heat within cable conductors, lower-resistance cabling generally performs better at higher power levels. CAT5e and CAT6 installations typically provide lower insertion loss and improved performance for high-power PoE applications compared with older CAT5 installations.



For standard Ethernet distances up to 100 meters (328 feet), the differences between cable categories may be modest. However, when extending PoE beyond 100 meters using Ethernet extenders, conductor size and cable quality become increasingly important.

Because PoE power transmission generates heat within cable conductors, lower-resistance cabling generally performs better at higher power levels. Most CAT5e cables use 24AWG conductors, while most CAT6 and CAT6A cables use larger 23AWG conductors. Lower AWG numbers indicate larger conductors, which reduce cable resistance and improve both PoE power delivery and maximum transmission distance.



Vigitron offers two families of UTP Ethernet extenders for extended-distance PoE applications. The Vi23xxA Series supports most PoE applications from Class 0 through Class 7. For the highest-power IEEE 802.3bt Class 8 devices, Vigitron recommends the Vi23xxAU Series, which is optimized for maximum power delivery over extended distances.



The following guidelines help select the appropriate cable and extender for each application. Actual performance may vary based on cable quality, installation, environmental conditions, connector quality, and device power requirements.

PoE Source: 802.3bt or UPoE (90W-57V)



bt PD class	Cat6 (23AWG) distance (feet)	Connected Device PoE Type
Class 0, 1, 2 and 3(12.95W)	3000	802.3af
Class 4(25.5W)	1600	802.3at
Class 5(40W)	1000	802.3bt
Class 6(51W)	800	802.3bt
Class 7(60W)	550	802.3bt
Class 8(71W)	380	802.3bt



bt PD class	Cat5e (24AWG) distance (feet)	Connected Device PoE Type
Class 0, 1, 2 and 3 (12.95W]	3000	802.3af
Class 4 (25.5W)	1500	802.3at
Class 5 (40W)	900	802.3bt
Class 6 (51W)	750	802.3bt
Class 7 (60W)	500	802.3bt



PoE Source: 802.3bt or UPoE (75W-57V)



bt PD class	Cat6 (23AWG) distance (feet)	Connected Device PoE Type
Class 0, 1, 2 and 3 (12.95W)	3000	802.3af
Class 4 (25.5W)	1600	802.3at
Class 5 (40W)	1000	802.3bt
Class 6 (51W)	800	802.3bt
Class 7 (60W)	450	802.3bt
Class 8 (71W)	N/A	802.3bt



bt PD class	Cat5e (24AWG) distance (feet)	Connected Device PoE Type
Class 0, 1, 2 and 3 (12.95W)	3000	802.3af
Class 4 (25.5W)	1500	802.3at
Class 5 (40W)	900	802.3bt
Class 6 (51W)	750	802.3bt
Class 7 (60W)	410	802.3bt

What to Use – When to use

For PoE Classes 0-7 up to 75W PSE source use the Vi23xxA series



Vi2300A



Vi2301A



Vi2304A



Vi2308A



Vi2316A

For PoE Class 8 up to 90W PSE source use the Vi23xxAU series



Vi2301AU



Why Choose Vigitron?



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