PowerWise® Extended Distance Frequently Asked Questions

Can I deploy a PowerWise® cable in lengths greater than 100m and still meet industry standards?

Industry standards exist to ensure all components within a communications system work together no matter what variables exist. With PoE extended distance, there are many variables to consider: wattage, bandwidth, quality of signal, distance, temperature, etc. When these variables are balanced, they can produce a system that works for a particular application, even if those variables exceed industry specification limits. PoE extended distance does not meet industry specifications as the intent is to work in lengths greater than 100m, but with the proper components it can reliably meet extended distance applications.

How does a technician perform a field test on a PowerWise® cable run that exceeds the 100m standards?

In your Fluke (or equivalent) device, use test limit *Superior Essex PowerWise Perm Link* to test both PowerWise® 1G and PowerWise® 10G for extended distances. If you cannot find this specification in your handset, check to make sure you have the latest update from your testing device manufacturer or contact tech.support@spsx.com. (Please note that if you are NOT deploying the cable over 100 meters, you should continue to use the TIA limits within the Fluke.)

Is there a warranty available for PowerWise® extended distance deployments?

Yes. Please see www.superioressexcommunications.com/warranties-policies as well as the two tables below for details.

Why is there a small copper wire under the jacket of the PowerWise® cable?

The PowerWise® copper products have a small copper wire located just under the cable jacket. This wire is enameled and therefore does not need to be bonded or grounded as the enameling serves as insulation. It assists the cable's ability to dissipate heat. The wire can be trimmed back flush with the jacket for termination.

Can active components, such as Power over Ethernet (PoE) extenders and media converters, be in a zone box?

Per the NEC codes, all active equipment in the plenum space must be enclosed and must conform to UL 2043: UL Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air Handling Spaces. Zone boxes were originally developed as a cross connection point for open office flexibility. However, these have been recognized in the most recent ANSI/BICSI-007-2020 Information Communication Technology Design and Implementation Practices for Intelligent Buildings and Premises standard allowing active components in zone boxes.

Can the PowerWise® 10G cable run longer distances than the PowerWise® 1G?

No, in fact the PowerWise® 10G cable runs shorter than the PowerWise® 1G cable because of the lay length and twist ratio of the pairs. A Category 6A cable is manufactured with a tighter twist rate to reduce signal interference or "crosstalk" between pairs within the jacket and with pairs in adjacent cables. This also adds to the NVP (Nominal Velocity of Propagation) of the cable, which is the time it takes for the signal to travel from one end to the other (noted as a percentage of the speed of light). One should always confirm the NVP in a field tester as that will also measure the length of the cable.

What type of connectors do I need for proper termination?

Most standard 8P8C modular plugs (commonly referred to as RJ45 connectors) will fit the PowerWise® copper cable as most are manufactured to accept 22-24 AWG conductors. Refer to tech guide TG079 *Modular Plug and Cable Compatibility Guide* for additional information on recommended modular plugs. Please also check warranty terms and conditions for accepted connectors. Recommended fiber connectors for PowerWise® Hybrid cable are LC and SC.

What distances can I run PowerWise® for different applications?

Testing cable performance is based on both external and internal factors such as environmental external effects as well as internal effects such as heat generated inside the jacketing, especially when cables are bundled. To prevent aging of the cable due to excessive heat, PowerWise® copper cables are constructed with high quality heat stable materials and with 22 AWG conductors which provide better heat dissipation than typical 23 AWG or 24 AWG Category 5e, 6, or 6A cables.

Superior Essex PowerWise® cables were tested by UL to assure data transmission properties and maximum power efficiency and safety. The table below indicates the maximum distances each of the PowerWise® cables can support for different applications based on testing at UL.

PowerWise® Extended Distance Maximum Supported Lengths:

		PowerWise® 1G		PowerWise® 10G	
Direct Attach[1] Application	**Transmission/ Standard**	**BER @ Ambient 20°C[2] Type 1 & 2**	**BER @ Max 70.1°C[3] Type 3 & 4**	**BER @ Ambient 20°C[2] Type 1 & 2**	**BER @ Max 70.1°C[3] Type 3 & 4**
Data & Power (Bandwidth & Speed)	Max Distance @ 10 Mb/s	200 m	200 m	200 m	200 m
Data & Power (Bandwidth & Speed)	Max Distance @ 100 Mb/s	200 m	140 m	195 m	190 m
Data & Power (Bandwidth & Speed)	Max Distance @ 1 Gb/s	160 m	140 m	155 m	145 m
Data & Power (Bandwidth & Speed)	Max Distance @ 10 Gb/s	120 m	105 m	110 m	105 m
PoE (Power Only)	Type 1	378 m	323 m	340 m	298 m
PoE (Power Only)	Type 2	236 m	202 m	212 m	186 m
PoE (Power Only)	Type 3	236 m	202 m	212 m	186 m
PoE (Power Only)	Type 4	237 m	203 m	214 m	187 m
HDBaseT	PoH	120 m	105 m	120 m	110 m
Power Efficiency		89.30%	88.50%	87.70%	86.80%

Data generated by UL using test methods UL 4299 and TIA TSB-184A.
See https://verify.ul.com/verifications/421 and https://verify.ul.com/verifications/422 for more details.

[1] Only Direct Attach (2-Connector Permanent Link) Applications are currently supported in extended distance applications.
[2] Simulates cable exposed to Type 1 or Type 2 PoE.
[3] Simulates cable exposed to Type 4 PoE.
BER = Bit Error Rate

Bit Error Rate was employed in this testing because it is the best test available to see how far a signal is readable by any protocol. BER shows the true real-world performance of a network, inclusive of active components, as it transmits real data over the appropriate protocol. BER testing shows how well the cable network really performs in combination with the active equipment.

Superior Essex also partnered with various camera manufacturers to determine maximum distances supporting IP security and PTZ cameras using PowerWise 1G®. Below is a compilation of data from Bosch, Hanwa, Axis, and Panasonic.

PowerWise® Extended Distance Maximum Supported Lengths:

				PowerWise® 1G
Direct Attach[1] Camera Type	**PoE**	**Bandwidth**	**Latency**	**Max Distance**
Any IP Security Camera	15 W	2 Mbps	100%	305 m
Any IP Security Camera	30 W	< 10 Mbps	100%	244 m
Any IP Security and Any PTZ Camera	60 W	100 Mbps	100%	200 m

[1] Only Direct Attach (2-Connector Permanent Link) Applications are currently supported in extended distance applications.

Can PowerWise® products be used in channel configurations?

Currently, the PowerWise® products used in extended distance applications are only being supported as direct attach (2-connector permanent link) configurations. Stated maximum supported lengths are based on direct attach links. It is not recommended to use channel configurations until more testing has been completed to prove this system type's reliability.

Can other category cables that are not PowerWise® products be used in lengths greater than 100m?

No. If you choose to use a non-PowerWise® cable for extended distance applications, do so at your own risk. PowerWise® products are optimized to provide the best power efficiency (reduced voltage drop), to prevent heat rise and material degradation, etc. by employing larger AWG copper and more robust materials.

Are there special instructions or guidelines for installing the PowerWise® copper products?

Because PowerWise® copper products have 22 AWG copper conductors, the maximum pulling tension is 40 lbf. All other installation guidelines such as bend radius and crush resistance can be found in TG002 *Premises Cable Installation Guide*.