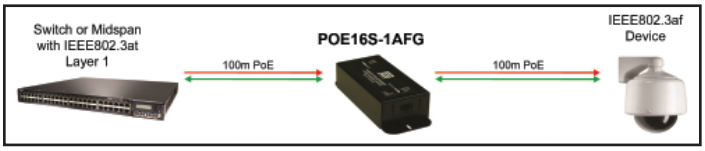
POE16S-1AFG User Manual
Power over Ethernet and Data Extender

Power over Ethernet has a range of about 100 meters from the network switch. Should PoE be needed at distances greater than 100 meters, solutions might include electrical rewiring for AC power at a remote location or moving network communications closets, both require extensive labor and are costly and time consuming. Phihong has developed a more cost effective option with the POE16S-1AFG. Users can now double the effective PoE Range of their devices to 200 meters while saving time and money.



By using your standard Category 5 or better Ethernet cables the POE16S-1AFG takes its power from an IEEE802.3at PoE Plus device (33.6W). The output power is then dropped to be IEEE802.3af compatible 19W.

Its design is intended for use when expanding existing networks. In the image seen above, the user wanted to add an additional security camera 200 meters from the network switch. The first Ethernet cable not exceeding 100 meters should be laid from the switch to the POE16S-1AFG with a PoE Plus or better midspan in between; another cable not exceeding 100 meters should run from the extender to the security camera. The POE16S-1AFG is designed to be plug-and-play, therefore is no additional software or hardware installation required. Upon powering up, the device will work automatically by taking the necessary power from the midspan and relaying it on to the PoE device.

Compatible IEEE802.3af devices include but are not limited to Security Cameras, Sensors, and wireless network and access controllers.

Installation Sequence:

1) Using the appropriate Ethernet cable, connect the PoE In to the midspan inside the communications cabinet.
2) Using an appropriate Ethernet cable, connect the PoE Out to the given device, i.e. security camera
3) Wait a few seconds to allow connectivity before reading the LED indicators.

PoE IN	Green LED 1: 10Mb activity Green LED 2: 100Mb activity Green LED 3: Gigabit activity
PoE OUT	Green LED 1: 10Mb activity Green LED 2: 100Mb activity Green LED 3: Gigabit activity
Ethernet	Green LED 1: Input power "ON" Red LED: Fault detected Green LED 2: Valid IEEE802.3af load detected and connected

Should any connection fault occur the LEDs will blink a code diagnosing the problem, for a complete listing of those fault codes, please see the listing below under troubleshooting. They are also listed on the data sheet for this product on the individual product page on the website, www.phihong.com.

Input Power	IEEE802.3at PoE Plus (30W) and IEEE802.3af compatible (19W)*. Input must be PoE.
Output Power	IEEE802.3af compliant 9W
Ethernet	Category 5 or better
Dimensions	120x60x32mm (4.72x2.36x1.26in)
Weight	0.5kg (1.1lb)
Operating Temperature	0 to +55°C 32 to +131°F
Humidity	5 - 90%

*If IEEE802.3af is the input power source then the output power is restricted to approximately 8W.

47800 Fremont Blvd.
Fremont, CA 94538, USA
Tel: 1-510-445-0100
Fax: 1-510-445-1678
Email: Poe@phihongusa.com

midspans.com

ADVANCING POE TECHNOLOGY

FAQ

What are the benefits to using PoE?

Power over Ethernet is best suited to users who want to expand and extend the capabilities of their existing network switches. PoE uses standard Category 5 or 6 cables and uses them to transfer both data and power to remote locations. Since extensive wiring is not needed, these remote locations are able to be easily changed. PoE power standards are also universal. Unlike traditional power supplies which are only compatible with specific standards to their region, PoE is able to self regulate to work with a variety of international power standards. PoE also offers more flexibility in power events, such as a surge or brownout.

Why am I limited to 100 meters?

Power can be transmitted over an Ethernet cable to distances that exceed 100 meters depending on the amount of power being put out by the midspan and loss on the cable across the distance. If the port powering the Ethernet puts out 15.4W (IEEE802.3af standard) of power and the distance is 100 meters then the power could dissipate to 12.95W in the worst case scenario by the time it reaches the end device. PoE is possible over distances greater than 100 meters but is not guaranteed or recommended as the IEEE specifications guarantees only 100 meters for data transmission. Should a distance exceed 100 meters or more then Phihong recommends the POE16S-1AFG extender. Although power is possible at greater distances, users may experience severe data loss after traveling 100 meters or more.

What is the difference between IEEE802.3af and IEEE802.3at?

In 2003 the IEEE made a standard for Power over Ethernet called 802.3af which defines application s requiring power up to 12.95W over an Ethernet cable. In 2005 the IEEE created a Task Force of which Phihong is a partner to draft a new PoE Plus to meet the needs of more power. The IEEE802.3at standard which was ratified in September 2009 expands that definition to include applications requiring up to 25.95W on a Category 5 eor 6 Ethernet cable for use on higher power PoE devices such as WiMAX or Pan/Tilt/Zoom Security Cameras, and would be compatible on networks with 10/100/1000 Base-T data rates. The POE16S-1AFG is-compliant with this both standards taking power from an IEEE802.3at PoE Plus compatible midspan or network switch and has an output that meets the IEEE802.3af standard.

Can I connect multiple devices to extend my reach beyond 200 meters?

Yes it is possible to add more than one device to extend the span of the cables to 300 meters or more. The PoE extenders will be able to act as repeaters for both power and data across the line. The power source however continues to be the network switch or midspan and users should expect loss of power after traveling long distances. If the device that is being powered does not require very much power then the more units can be combined. See diagram below picturing this scenario.

Do I need a special configuration for my network?

No, the POE16S-1AFG is set to DHCP detection and will automatically obtain an IP address and it should not affect any existing network applications. The device acts as an extender and repeater only. The data and power will enter the device and be relayed on to the powered device. There should be no change as if it were one continuous cable. Phihong does recommend professional installation to ensure that should any faults occur at installation, a technician is on hand to rectify the problems.

Where should I install my PoE Extender?

Your new PoE extender can be installed anywhere between the midspan or power injector and the device that needs powering provided that the extender's input and output connecting cables do not exceed the 100 meter limit. The device can be wall or table mounted, but under no circumstances may the device use the cables as support.

47800 Fremont Blvd.
Fremont, CA 94538, USA
Tel: 1-510-445-0100
Fax: 1-510-445-1678
Email: Poe@phihongusa.com

FAQ and Troubleshooting

Can I use this device with equipment that is not PoE ready?

No, this device will not act as a splitter to divide the data over Ethernet and power via a DC cable. There is a list of available splitters available on our website www.phihong.com. This unit may act as a data repeater to extend data only to 200 meters.

If your question is not listed here and need further information please contact Phihong Sales. For a full listing of available contact information please visit the Contact Us section of the Phihong website www.phihong.com.

Troubleshooting

Power-up Sequence:

Upon power-up, all LEDs will light for 2 seconds, as part of the self-test for the internal microprocessor software. After the 2 seconds, the "ON" LED will illuminate green. The DC output voltage is now available for powering a compliant load (to the 802.3af PoE standards).

Detection Sequence:

Once a compliant load is attached to the output RJ45 connector, the green "CONNECT" LED will illuminate. Should the load be non-compliant then the LEDs will blink a code signifying the cause for non-detection.

Detection Failure Codes:

1. Incorrect resistive signature – The green "CONNECT" and red "FAULT" LEDs will blink 3 times.
2. Incorrect capacitive signature – The green "ON" LED will blink 3 times.
3. Incorrect Voffset – The green "CONNECT" and green "ON" LEDs will blink 3 times.
4. Unstable current measurement – The green "ON" LED will blink 3 times
5. Low voltage sensed during detection (overload) – The red "FAULT" LED will blink 3 times

Features	
Input	33.6W - IEEE802.3at compatible
Output	19W - IEEE802.3af compliant
Ease of Installation	DHCP detection will automatically asign the unit an IP address
Safety Approval	CE Certified

After the LEDs blink 3 times the Power Injector will continue to try to detect a valid load. Until the correct load is applied, the LEDs will continue to blink. If there is an open circuit connected to the output RJ45 then the LEDs will not blink but the Power Injector will continue to try to detect a valid load.

Fault Sequence:

Should a fault occur such as an overload or short circuit then the red "FAULT" LED will illuminate. The red "FAULT" LED will illuminate for 2 seconds and then go off as the power supply tries to re-detect a valid load. If there is a problem detecting the load, the LED will indicate the possible fault as per the codes in the section above.

47800 Fremont Blvd.
Fremont, CA 94538, USA
Tel: 1-510-445-0100
Fax: 1-510-445-1678
Email: Poe@phihongusa.com