EQCOLOGIC

Ethernet over Coax Converter/ Range Extender



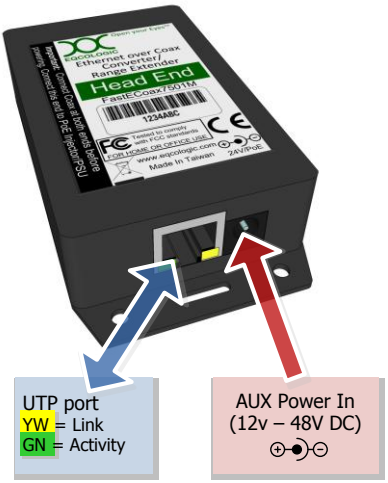
Part Numbers:

- FastECoax7501H (Head End)
- FastECoax7501C (Camera Side)
- FastECoax7501HC (Head End/Camera Side) Set

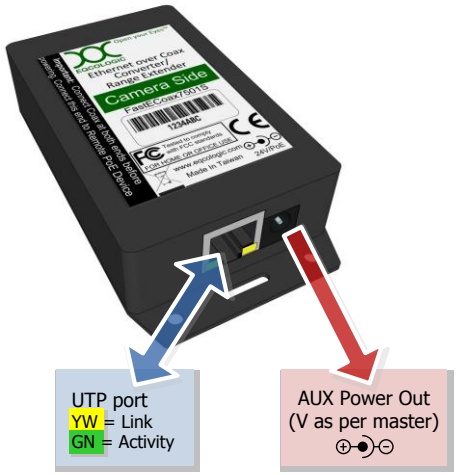
Description

The FastECoax 7501 transports Ethernet over 75Ω coaxial cables. The link consists of a pair of converters connected together via coax and terminated at each end with a RJ45 socket. Together the converters create a virtual UTP cable that is indistinguishable from any other UTP cable link. Power for the internal electronics can be supplied either using the Power over Ethernet (PoE) standard or via a separate AC adaptor.

Head End Adaptor



Camera Side Adaptor



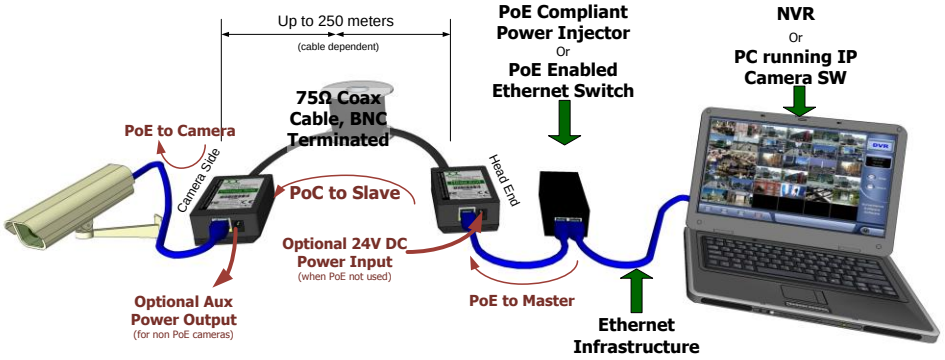
RJ45 LED description

	Description	LED On	LED Off	LED Flash
RJ45 Green	UTP port speed	100 Mbps	10 Mbps	
RJ45 Yellow	UTP port link	Link ok	Link fail	Link ok & activity

Required items (not supplied) to complete system:

- 75Ω coaxial cable with True 75Ω BNC connectors on each end (maximum length based on cable type – see specifications)
- PoE compliant PoE Power Injector, PoE compliant Ethernet switch or 12V DC adaptor (24V if powering Camera at far end)
  (Note: center pin positive).
- IP Camera or IP source (with or without PoE)
- DVR or PC (with PoE if Injector not used)
- Two CAT5/6 (UTP) patch cables (< 3 m) with RJ45 Connector

Typical use case



Setup:

Installation Instructions

❶ Connect Head End and Camera Side converters to ends of BNC terminated Coax cable placing Head End at the end where power is to be supplied

❷ Connect CAT5/6 patch cable to each converter

❸ Connect Camera Side Converter patch cable to IP camera/ DVR/ Switch/ PC

❹ Connect Head End Converter patch cable to PoE injector, PoE enabled Ethernet switch or local Ethernet infrastructure

❺ In non-PoE systems connect DC Adaptor to Head End Aux Power input

Important

The FastECoax7501H and FastECoax7501C converters must have 75Ω (+/- 3Ω) impedance.

The Characteristic impedance of the coaxial cable and connectors must all be 75Ω. Only use only BNC connectors that are clearly marked as "True 75Ω". The illustration (right) shows the difference between a 50Ω versus a 75Ω connector.





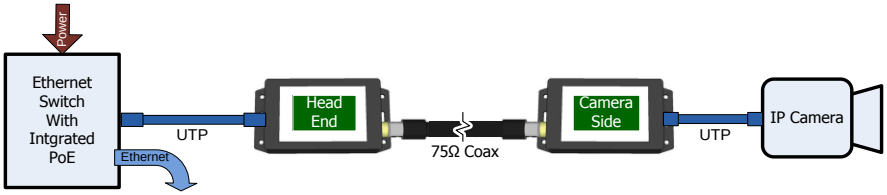
Power options:

There are a number of ways to power the converters:

- Head End converter can be powered via PoE, or via DC adapter
- Camera Side *must* be powered by the Head End over the coax cable
- An IP camera can be powered via PoE (via UTP from the Camera Side), via the Aux power out of the Camera Side, or using its own power adapter

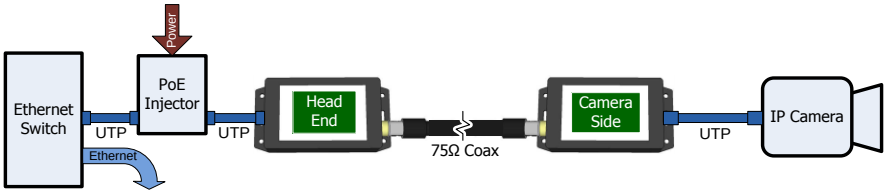
! Do not connect the Camera Side to a PoE power injector, or to a power adapter (the Camera Side power connector is output only).

Example 1: Ethernet switch with embedded PoE



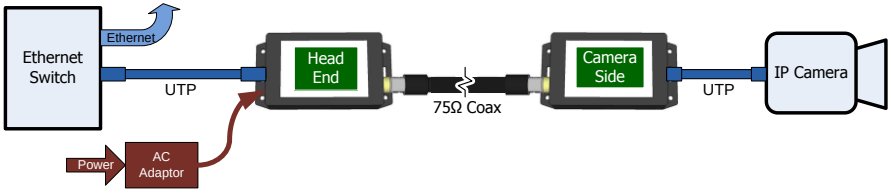
The converters are powered via PoE. PoE compatible cameras will automatically be powered by the Camera Side via UTP. Non-PoE IP camera must use its own power adapter.

Example 2: Using a stand-alone PoE injector



The converters are powered via PoE. PoE compatible cameras will automatically be powered by the Camera Side via UTP. Non-PoE IP camera must use its own power adapter.

Example 3: Using a Power adapter



The converters are powered via the power adapter. The IP camera can optionally be powered from the Camera Side Auxiliary power connector, which is at the same voltage as the power adapter (minus any voltage loss in the coax cable – see specifications).

Troubleshooting:

When the FastECoax7501 converters are paired they create a virtual UTP cable. The LEDs on the converters will only light if the complete link is established from the Ethernet device at one end of the cable to the Ethernet device at the other end. Once the whole link is established the Yellow LED will light and then flash to show Ethernet traffic.

Link establishment is also transparent. If a device at one end of the cable is only capable of operating at 10Mbps, the devices at each end of the link will negotiate the link to be 10Mbps. In this case the green LED will remain off, showing a connection at 10Mbps. The same happens for full/half duplex.

The FastECoax7501 supports Auto-MDI/MDI-X meaning that both straight and twisted patch cables will work. Only use short patch cables, less than 3 meters in length.

The Characteristic impedance of coaxial cable and BNC connectors must all match. The FastECoax7501H and FastECoax7501C Converters require 75Ω (+/- 3Ω) impedance. Most problems are caused by using poor quality BNC connectors that are not designed to be 75Ω. Always make sure that the BNC connectors are marked 'True 75 Ω'.

Symptom	Probable Cause
Converters will not connect	Ensure coax is 75Ω impedance
Converters will not connect	Ensure BNC connector is 75Ω impedance
Specified range not achieved	Ensure coax is 75Ω impedance
Specified range not achieved	Ensure BNC connector is 75Ω impedance
Slave Converter is not powered	See Power Options and Troubleshooting sections
Master Converter is now powered	Check PoE power supplied by Injector or Switch

Website: www.eqcologic.com
Support: http://www.eqcologic.com/inforequest.html

Technical Specifications

Coax Interface	
Connector	BNC True 75Ω
Cable Impedance	75Ω ± 3Ω
Connector/coax Return Loss	Return Loss > 25dB @ 1MHz - 200MHz
Data Throughput	200Mbps (Simultaneous 100Mbps in both directions) for all cable lengths
Ethernet Interface	
Connector (Head End)	RJ45 (PoE Device Compliant)
Connector (Camera Side)	RJ45 (PoE PSE Compatible)
Cable Type	Category 5 or above, Straight through or cross over (Auto MDI/MDIX)
Rates Supported	100BaseT / 10BaseT, full / half duplex. Virtual wire operation with Auto negotiation to match best capabilities of network equipment at each end
Power Supply Input (Head End only)	
PoE via RJ45	Fully IEEE 802.3af Power over Ethernet Standard Compliant, nominal 48 V
DC Feed via Aux Power connector	Min 12 V_{DC}, Max 48 V_{DC} (inner positive) PoE on RJ45 is disconnected if DC power applied via Aux Power first Min 24 V recommended if camera is to be powered
Power Supply Output (Camera Side only)	
PoE via RJ45	PoE Compatible, V_{IN} @ Head End -2V -Coax DC drop (varies with cable type/length)
DC Feed via Aux Power connector	V_{IN} @ Head End - 2V – Coax DC drop (varies with cable type/length) PoE on RJ45 is disconnected when DC output is used
Environmental	
Operating Temperature	0°C to 50°C
Relative humidity	Up to 85% non-condensing
Storage Temperature	-20°C to 70°C

Performance Specifications

Performance by coax type	Max coax length for error free operation	Camera Power available	
		48V DC adaptor	24V DC adaptor
RG6 Sample 1 (5.5dB/100m) (Belden 1694A)	180 meters / 580 feet	18W /	11W
RG6 Sample 2 (5.5dB/100m) (Carol Brand)	180 meters / 580 feet	13W /	1.8W
5C-HFBT Sample (4.7dB/100m) (Amphenol)	210 meters / 680 feet	18W /	11W
RG59 Sample (8dB/100m)	125 meters / 400 feet	19W /	13W
3C-2V Sample 1 (10dB/100m) (Hangzhou Linan Tongda Cable Co.,Ltd)	100 meters / 325 feet	19W /	13W
3C-2V Sample 2 (8dB/100m) (Hangzhou Huadi Cable Co, Ltd)	125 meters / 400 feet	19W /	14W
RG11 Sample (3.3dB/100m) (CommCcope F1160BVV)	250 meters / 800 feet	18W	8.7W