Ethernet Over Coax Adapters with PoE/PoC

Accelerate IP Camera Deployment

Summary

The surveillance camera market is steadily moving from analog to digital. The reasons are clear: better imaging, intelligent image processing and the benefits of fully networked integrated solutions. Many digial camera support IP-based communication and are designed to connect to network video recorders (NVRs) or video servers over Cat 5 or Cat 6 Ethernet cables.

But why waste perfectly functional 75Ω coaxial video cabling just to go digital? Microchip's Ethernet over coax media adapter allows 100Base-T standard-definition and high-definition megapixel IP cameras to use coax cabling to transmit IP-based communications to the NVR, servers or switches. Reusing the cable infrastructure also allows the analog-to-digital transition to be done one camera at a time as needed.

Microchip's Ethernet over coax adapters uniquely provide Power over Ethernet (PoE) bridging over the coax link to provide ample power (PoC) for remote devices, eliminating the need to bring separate power cables to cameras in remote locations.

Features

- Uses legacy analog video cabling (75Ω coax)
- Fully transparent 100Base-T full duplex Ethernet including link status pass-through
- Full 100 Mbps FDX over 250 meter coax runs*
  - Can be concatenated using repeaters for even longer cable runs
- Supports 10/100Base-T Ethernet standard-definition and high-definition video camera including PoE-powered devices
- Optional DC power pass-through for remote powering of low-voltage cameras
- Small 70 mm × 37 mm enclosure can be wall mounted or the board—without enclosure—can be placed inside the camera enclosure

Microchip's Ethernet over Coax adapters (EQCO-FastECoax7501) are installed in pairs. The Head-End adapter takes conventional 100Base-T Ethernet from the NVR and passes it through the PoE-compliant Ethernet switch, or a PoE injector, to the Camera-Side unit. It can be optionally powered by an AC adapter. Power and bidirectional data is passed over the coax cable to the Camera Side adapter at the far end which optionally powers the camera.

*Subject to maximum cable attenuation, see back for details.

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Technical Specifications

Coax Interface	
Connectors	BNC True 75Ω
Cable Impedance	75Ω ± 3Ω
Connector/Coax Return Loss	Return Loss > 25 dB @ 1–200 MHz
Data Throughput	200 Mbps (Simultaneous 100 Mbps in both directions (for all cable lengths)
Aux 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	100Base-T/10Base-T, full/half duplex. Virtual wire operation with AutoNegotiation to match best capabilities of network equipment at each end
Power Supply Input (Head End Input)	
PoE via RJ45	Fully IEEE 802.3af Power over Ethernet Standard Compliant, nominal 48 V
DC Feed via Aux Power Connector	Min. 12 VDC, Max. 48 VDC (inner positive) PoE on RJ45 is disconnected if DC power applied via Aux Power first Min. 24V recommended if camera is to be powered
Power Supply Output (Camera Side Output)	
PoE via RJ45	PoE Compatible, VIN @ Head End –2V-Coax DC drop (varies with cable type/length)
DC Feed via Coax	VIN @ Head End –2V-Coax DC drop per hop (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	Cable/Power Budget	
		48V DC Adapter	24V DC Adapter
RG6 Sample 1 (5.5 dB/100m) (Belden 1694A)	180 meters/ 580 feet	18W	11W
RG6 Sample 2 (5.5 dB/100m) (Carol Brand)	180 meters/ 580 feet	13W	1.8W
5C-HFBT Sample (4.7 dB/100m) (Amphenol)	210 meters/ 680 feet	18W	11W
RG59 Sample (8 dB/100m)	125 meters/ 400 feet	19W	13W
3C-2V Sample 1 (10 dB/100m) (Hangzhou Linan Tongda Cable Co., Ltd.)	100 meters/ 325 feet	19W	13W
3C-2V Sample 2 (8 dB/100m) (Hangzhou Huadi Cable Co., Ltd.)	125 meters/ 400 feet	19W	14W
RG11 Sample (3.3 dB/100m) (CommCcope F1160BVV)	250 meters/ 800 feet	18W	8.7W

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