



NVT Phybridge enables our customers to transform their existing infrastructure and migrate to IP with confidence. NVT Phybridge products offer technologically advanced features including power over long reach Ethernet over single-pair UTP, multi-pair UTP or Coax, robust power, and power management, PowerWISE power sharing and quick and easy migration to IP end points and IoT. Complete switch solutions include PoLRE LPC, PoLRE24/48, EC10, CLEER24, FLEX8, FLEX24 and FLEX24-10G products. Complete adapter solutions include Phylink, EC-Base, EC-Link, EC-Link+, EC4, FLEX-Base, FLEX-C, FLEX-Link and FLEX4 media converters and cable extenders.

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COAX LEVERAGED ETHERNET EXTENDED REACH NETWORK ADAPTER

DIVISION 27 – COMMUNICATIONS

27 20 00	Data Communications
27 21 00	Data Communications Network Equipment
27 21 29	Switches & Hubs

COAX LEVERAGED ETHERNET EXTENDED REACH NETWORK ADAPTER

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes a 4-port 10/100Mbps Ethernet over Coax adapter with power capability.
- B. Product – The EC4 Ethernet over Coax Network Adapter delivers Ethernet and Power over Coax cable with multiple times the reach of traditional data switches.
- C. Related Requirements
 - (1) 27 10 00 Structured Cabling
 - (2) 27 16 00 Communications Connecting Cords, Device, and Adapters
 - (3) 27 16 16 Communications Media Converters, Adapters, and Transceivers
 - (4) 27 30 00 Voice Communications
 - (5) 27 31 23 IP Voice Switch

1.02 REFERENCES

- A. Abbreviations
 - (1) DVR – Digital Video Recorder
 - (2) GbE – Gigabit Ethernet
 - (3) GBIC – Gigabit Interface Converter
 - (4) GUI – Graphical User Interface
 - (5) IoT – Internet of Things
 - (6) IP – Internet Protocol
 - (7) LAN – Local Area Network
 - (8) LLDP – Link Layer Discovery Protocol
 - (9) LLDP-MED – Link Layer Discovery Protocol Media Endpoint Discovery
 - (10) Mbps – Megabits per second
 - (11) NTP – Network Time Protocol
 - (12) NVR – Network Video Recorder
 - (13) PoE – Power over Ethernet
 - (14) PoLRE – Power over Long Reach Ethernet
 - (15) SFP – Small Form-factor Pluggable Transceiver
 - (16) SNMP – Simple Network Management Protocol
 - (17) STP – Spanning Tree Protocol
 - (18) UPoE – Cisco Universal PoE standard
 - (19) UTP – Unshielded Twisted Pair wiring
 - (20) VLAN – Virtual Local Area Network

- B. Reference Standards
 - (1) Network
 - (a) IEEE – 802.3 Ethernet Standards
 - (2) EMC
 - (a) Emissions
 - (i) FCC Part 15, Class A
 - (ii) IECs-003
 - (iii) EN 55032:2012
 - (iv) EN 50121-4:2015
 - (b) Immunity
 - (i) EN 55024:2010
 - (ii) EN 50121-4:2015
 - (3) Safety
 - (a) UL 60950-1 2nd Ed 2014-10-14
 - (b) CSA C22.2 No. 60950-1-07 2nd Ed 2014-10
 - (c) IEC 60950-1:2005 + A1 + A2
 - (d) EN 60950-1:2006 + A11 + A12 + A1 + A2
 - (4) Environment
 - (a) EU RoHS Directive 2011/65

1.03 SUBMITTALS

- A. Product data
 - (1) Datasheets
 - (2) Installation and operation manuals
 - (3) DoC (Declaration of Conformity)
 - (4) Warranty documentation

1.04 QUALIFICATIONS

- A. The manufacturer shall have a minimum of five years experience in producing Ethernet switch equipment.
- B. Installers shall be trained and authorized by the manufacturer to install, integrate, test and commission the system.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver the device in the manufacturer's original, unopened, undamaged container with identification labels intact.
- B. Store the device in a temperature environment of -40°C to 85°C (-104°F to 185°F), protected from mechanical and environmental conditions as designated by the manufacturer.

1.06 WARRANTY AND SUPPORT

- A. The manufacturer shall provide a limited 5-year warranty for the product to be free of defects in material and workmanship.

END OF SECTION

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Manufacturer: NVT Phybridge, Inc.
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- B. Model NV-EC-04
- C. Alternates: None

2.02 GENERAL DESCRIPTION

- A. The EC4 shall provide Ethernet and PoE over Coax cable with up to six times the reach of traditional data switches.
- B. The EC4 shall possess the following characteristics:
 - (1) capable of supporting 4 IP endpoints.
 - (2) capable of delivering up to 30W of PoE to be shared across all connected IP endpoints.
 - (3) capable of operating in CLEER mode supporting extended Coax cable lengths when paired with a CLEER24 switch, EC10 switch or EC-Base.
 - (4) converts conventional Ethernet to a signal that can be carried by various types of 75Ω Coax cable.
 - (5) uses previously installed Coax cable to connect IP network endpoints such as IP cameras, IP phones, network switches, DVR/NVRs, PCs, and printers.
 - (6) capable of being powered via the CLEER24 switch, EC10 switch or EC- Base.

2.03 INTERFACES

- A. Ethernet (Downlink)
 - (1) Four Ethernet RJ45 connectors. These connections support a standard Ethernet cable: patch or crossover Cat5e/Cat6.
 - (2) The RJ45 shall support 10/100 BaseT full or half duplex and auto-negotiation of the transmission rate.
- B. Coax (Long Reach)
 - (1) The EC4 shall have a single female BNC connector for the long reach Ethernet over Coax port. It will support any 75Ω impedance coax cable.
 - (2) Maximum cable distances are specified as (based on a 75Ω impedance coax cable):
 - (a) RG59 – 100Mbps to 457m (1500ft)
 - (b) RG6 – 100Mbps to 610m (2000ft)
 - (c) RG11 – 100Mbps to 915m (3000ft)
 - (3) The maximum data through-put shall be 200Mbps (total up plus down) and shall auto adapt to the cable conditions. This will support 100Mbps communication in both directions.
 - (4) There shall be no signal degradation from 0m to the maximum supported distances.

2.04 INDICATORS

A. Ethernet Downlink

- (1) The Ethernet downlink RJ45 ports shall have two LEDs to indicate network connection status: Link status (LEFT - green) and activity status (RIGHT - amber).
- (2) The link status LED indicates the following: Off – no connection. On – link good.
- (3) The activity status LED indicates the following: Off – no activity. Flashing – network activity.

2.05 POE

- A. The EC4 shall be capable of providing up to 30 watts of power over the UTP connection to be shared between the four endpoint devices.
- B. The EC4 shall be capable of being powered via PoE from the CLEER24 switch, EC10 switch or EC-Base or an external local power supply.
- C. The EC4 Ethernet ports shall provide PoE on 4-pairs of the Ethernet patch cable 'always-on'.
- D. The endpoint device must be IEEE 802.3af, 802.3at compliant or Cisco UPoE compatible in order to be powered using PoE.

2.06 ELECTRICAL

A. Power

- (1) Sources
 - (a) CLEER24 Switch
 - (b) EC10 Switch
 - (c) EC-Base
 - (d) Local External DC PSU, Class II, Efficiency VI, Input voltage 100-240VAC, 50-60Hz, Output voltage 55VDC / 1A or 2A, Output connector: power barrel plug, (2.1mm ID and 5.5mm OD)
- (2) Power consumption
 - (a) 1W (not including PoE endpoints)
- (3) Power injection (PoE)
 - (a) -54VDC, 30W – endpoint devices must be IEEE 802.3af/at compliant or Cisco UPoE compatible to use the power injection

B. Connectors

- (1) Ethernet
 - (a) RJ45 (4) - Ethernet uplink ports
 - (b) Female BNC (1) - long reach Ethernet over Coax + power connection

2.07 MECHANICAL AND ENVIRONMENTAL

- A. Housing material: Plastic
- B. Mounting Not Mountable
- C. Dimensions (H x W x D): 0.98in. x 2.75in. x 4.3in. (25mm x 70mm x 110mm)
- D. Weight: 96g
- E. Thermal: Air cooled
- F. Temperature
 - (1) Operating: 0°C to 70°C (32°F to 158°F)
 - (2) Storage: -50°C to 85°C (-104°F to 185°F)
- G. Humidity: 10 – 95%, non-condensing @ 35°C
- H. MTBF (Mean Time Between Failure): 20+ Years (175,200+ Hours)

END OF SECTION

PART 3 EXECUTION

3.01 INSTALLERS

- A. Contractor personnel.

3.02 PREPARATION

- A. The network design and configuration shall be verified for compatibility and performance with the camera(s).
- B. Network configuration shall be tested and qualified by the contractor prior to camera installation.

3.03 INSTALLATION

- A. Before permanent installation of the system, the system shall be factory tested in conditions simulating the final installed environment.
 - (1) A report indicating successful test results shall be produced.

3.04 STORAGE

- A. The product shall be stored in an environment where temperature and humidity are in the range specified by the manufacturer.

END OF SECTION