NVT PHYBRIDGE

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 or multi pair UTP and 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, CLEER and FLEX products. Complete adapter solutions include PhyLink, EC-LINK, EC-04, FLEX-Base, FLEX-Link, FLEX-Link-C and FLEX4 media converters and cable extenders.

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COAX LEVERAGED ETHERNET EXTENDED REACH NETWORK SWITCH

DIVISION 27 – COMMUNICATIONS

27 20 00 Data Communications

27 21 00 Data Communications Network Equipment

27 21 29 Switches & Hubs

Notes to Specifier:

1. Where several alternative parameters or specifications exist, or where, the specifier has the option of inserting text, such choices are presented in **<bold text>**.
2. Explanatory notes and comments are presented in coloured text.

COAX LEVERAGED ETHERNET EXTENDED REACH NETWORK SWITCH

PART 1 GENERAL

1.01 SUMMARY

A. Section includes a 24-port 10/100Mbps Ethernet-over-Coax switch with power capability on each port.

B. Product – The CLEER24 data switch 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) Mbps – Megabits per second
   (10) NTP – Network Time Protocol
   (11) NVR – Network Video Recorder
   (12) PoE – Power over Ethernet
   (13) PoLRE – Power over Long Reach Ethernet
   (14) SFP – Small Form-factor Pluggable
   (15) SNMP – Simple Network Management Protocol
   (16) STP – Spanning Tree Protocol
   (17) UPoE – Cisco Ultra PoE standard
   (18) UTP – Un-Twisted Pair wiring
   (19) VLAN – Virtual LAN

B. Reference Standards
   (1) Network
      (a) IEEE – 802.3 Ethernet Standards
   (2) EMC
      (a) Emissions
         (i) FCC-47 CFR Part 15 Class A
         (ii) EN 55032:2012
      (b) Immunity

(i) EN 55024:2010

(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

(5) Mechanical
  (a) IEC 60297 – Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in.) series

1.03 SUBMITTALS

A. Product data
  (1) Data sheets
  (2) Installation and operation manuals
  (3) DoC (declaration of conformity)
  (4) Warranty documentation

1.04 QUALIFICATIONS

A. 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 switch in the manufacturer's original, unopened, undamaged container with identification labels intact.

B. Store the switch 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. Manufacturer shall provide a limited 1 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.
3457 Superior Court, Unit 3
Oakville, ON, Canada L6L 0C4
Phone: +1 905 901-3633
Web: www.nvtphybridge.com
E-mail: support@phybridge.com

B. Models NV-CLR-024 series

C. Alternates: None

2.02 GENERAL DESCRIPTION

A. The CLEER switch shall provide Ethernet and PoE over Coax cable with up to five times the reach of traditional data switches.

B. The CLEER switch shall possess the following characteristics:
(1) capable of delivering up to 30W of PoE to 24 IP end-points
(2) pairs with a LNK-02, EC-Link, EC-Link-C or EC4 to operate in long-reach mode as a layer 2 managed network switch
(3) capable of operating in CLEER mode supporting extended Coax cable lengths when paired with a LNK-02, EC-Link, EC-Link-C or EC4 adapter
(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 end-points such as IP cameras, IP phones, network switches, DVR/NVRs, PCs, and printers

2.03 INTERFACES

A. Ethernet (Combo Ports)
(1) Two Ethernet RJ45 connectors labelled GbE1 and GbE2. These connections support a standard Ethernet cable: patch or crossover Cat5e/Cat6.
(2) Two mini-GBIC connectors (for SFP modules) labelled Gbic 1 and Gbic 2. These connections support fiber optic cable (actual cable type depends on the SFP transceiver module installed).
(3) The RJ45 and GBIC connections act as a combo port, i.e. only 1 is active at a time.
(4) The RJ45 shall support 10/100/1000 BaseT full or half duplex and auto-negotiation of the transmission rate.
(5) The GBIC shall support 1000 Base-TX/SX/LX/EX/ZX/LHX full or half duplex (determined by SFP transceiver module installed).
(6) The CLEER software shall allow the user to enable the GBIC interfaces in the user interface (command-line or web GUI).
(7) The CLEER software shall disable the Ethernet RJ45 interface (GbE1 or GbE2) if the corresponding GBIC interface (Gbic 1 or Gbic 2) is enabled.
(8) The CLEER software shall allow for the ability to bond the uplink (combo) ports, providing a total of 2Gb of uplink bandwidth.

B. Ethernet (Downlink)

(1) The CLEER shall have a female BNC connector for each of the 24 downlink ports. It supports any coax cable with a nominal characteristic impedance of 75Ω.
(2) Maximum cable distances are specified as:
(a) RG-59 – 100Mbps to 457m (1500ft),
(b) RG-6 – 100Mbps to 610m (2000ft),
(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) Each Ethernet Downlink port shall support 100Mbps with no bandwidth sharing between ports.
(5) There shall be no signal degradation from 0m to the maximum supported distances.

C. Management Port
(1) The CLEER shall have one Ethernet RJ45 connector labelled MGMT. This is a dedicated port for out-of-band management of the switch.
(2) This port shall support 10/100 Base-T full or half duplex.
(3) This port shall support auto-negotiation of the transmission rate.

D. Console Port
(1) The CLEER shall have one serial RJ45 connector labelled Console. This is a dedicated port for management of the switch via a console terminal or PC.
(2) This port shall support a data rate of 115200 baud, 8 data bits, no parity and 1 stop bit.
(3) This port shall support a 3-wire interface (transmit, receive, ground). No control lines for handshaking are required.

2.04 INDICATORS

A. Power
(1) The CLEER shall have three LED power indicators: Run (green), Alarm (amber) and Fault (red).
(2) The Run LED indicates the following status: Off – power is off, On – power is on.
(3) The Alarm LED indicates the following status: Off – no alarm condition, On – there is an issue with the power supply.
(4) The Fault LED indicates the following status: Off – no fault, Flashing – switch fault.

B. Ethernet Uplink
(1) Each Ethernet combo RJ45 connector shall have two LEDs to indicate network connection status: Connection status (green) and activity status (orange).
(2) The connection 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.

C. Coax Downlink
(1) Each of the 24 downlink ports shall have an LED to indicate connection status.
(2) The LED indicates the following status: Off – no link, Flashing – link good with network activity, On – link good.

2.05 PoE

A. The CLEER shall provide up to 30 watts of power over the UTP connection to each end-point device.
B. The CLEER shall provide PoE in an always-on state. Non-PoE end-points are supported.

C. The end-point device must be IEEE 802.3af, 802.3at compliant or Cisco UPoE compatible in order to be powered using PoE.

2.06 POWER SHARING

A. The CLEER shall allow for a power share setup for sharing power among multiple switches.
B. The CLEER shall allow for up to 4 units to be stacked in a power sharing configuration.
C. The CLEER shall have 2 rear male connectors, DC IN/OUT, for power sharing.
D. The CLEER shall allow for the replacement of a failed AC power supply without disconnecting power or powering down any of the switches.

2.07 ADDITIONAL FEATURES

A. System Information
   (1) The system settings of the CLEER switch shall be exportable as a separate file.
   (2) The CLEER switch shall maintain an accessible log of system and network-triggered events.
      (a) The log shall be searchable.
      (b) The log shall be exportable to a standard text file.

2.08 SWITCH SOFTWARE

A. The CLEER shall have a built-in web server which supports browser-based configuration using Google Chrome, Mozilla Firefox, Apple Safari.
B. The software GUI shall allow access to switch information and all primary software functions, including:
   (1) System information: serial number, IP address, MAC address, software version, memory usage, temperature, uptime
   (2) Configuration
   (3) Port power control
   (4) Software updates
C. The Manufacturer shall offer configuration to implement the following actions:
   (1) Uplink port medium (copper or fiber)
   (2) Management port address settings
   (3) Downlink port power on/off, reset, description and lock MAC address
   (4) System
      (a) host name
      (b) set date and time, time zone, and NTP server synchronization
      (c) firmware upgrade
      (d) user access control
      (e) export and import configuration settings
      (f) view, search and export system logs
      (g) enable / disable networking services (Telnet, HTTP, LLDP, NTP, STP, SNMP)
      (h) configure remote log server
      (i) configure STP
      (j) configure SNMP
      (k) VLAN configuration

2.09 ELECTRICAL

A. Power
   (1) Sources

(a) Single field replaceable AC-DC PSU with a rated input voltage of 100 to 240VAC, 500W @ 100VAC, 1000W @ 240VAC
(b) Power share setup among up to 4 units – 54VDC nominal (42 to 58VDC)

(2) Power consumption
(a) 20W (not including PoE end-points)

(3) Power injection (PoE)
(a) -54VDC, 30W – end-point devices must be IEEE 802.3af/at compliant or Cisco UPoE compatible to use the power injection

B. Connectors

(1) Ethernet
(a) RJ45 (2) – Ethernet combo port
(b) SFP cage (2) – Ethernet combo port
(c) RJ45 – management port

(2) Coax
(a) Female BNC (24) – long reach Ethernet over Coax + power connection

(3) Serial
(a) RJ45 – serial console port

(4) External power
(a) AC power: 1 male IEC 60320/C-14 connector at rear of unit
(b) Power sharing: 2 male DC connectors (In/Out) at rear of the unit

2.10 MECHANICAL AND ENVIRONMENTAL

A. Housing material: Powder coated aluminum
B. Configuration: 1U rack (19 in.)
C. Mounting vertical surface or in a rack
D. Dimensions (H x W x D): 1.75in. x 17.13in. x 9.92in. (44.5mm x 435mm x 432mm)
E. Weight: 3340g
F. Thermal: Fan cooled
G. Temperature
(1) Operating: -10°C to 50°C (14°F to 122°F)
(2) Storage: -40°C to 85°C (-104°F to 185°F)
H. Humidity: 10 – 95%, non-condensing @ 35°C
I. MTBF (Mean Time Between Failure): 27 Years (236,520 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