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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POWER OVER LONG REACH ETHERNET 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.

POWER OVER LONG REACH ETHERNET NETWORK SWITCH

PART 1 GENERAL

1.01   SUMMARY

    A.   Section includes a 24/48-port 10Mbps Ethernet-over-CAT3 UTP switch with power capability on each port.

    B.   Product – The PoLRE (Power over Long Reach Ethernet) data switch delivers Ethernet and Power over CAT3 UTP 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) CLEER – Coax Leveraged Ethernet Extended Reach

        (2) DVR – Digital Video Recorder

        (3) GbE – Gigabit Ethernet

        (4) GBIC – GigaBit Interface Converter

        (5) GUI – Graphical User Interface

        (6) IoT – Internet of Things

        (7) IP – Internet Protocol

        (8) LAN – Local Area Network

        (9) LLDP – Link Layer Discovery Protocol

        (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

        (16) SNMP – Simple Network Management Protocol

        (17) STP – Spanning Tree Protocol

        (18) 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) ICES-003

                (iii) 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

(e) AS/NZS 60950-1:2011

(4) 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@nvtphybridge.com

    B. Models NV-PL-024 series (24 port), NV-PL-048 (48 port)

    C. Alternates: None

2.02   GENERAL DESCRIPTION

    A. The Power over Long Reach Ethernet ("PoLRE") switch shall provide Ethernet and PoE over single pair UTP cable with up to five times the reach of traditional data switches.

    B. The PoLRE shall possess the following characteristics:

        (1) capable of delivering up to 15W of PoE to 24/48 IP end-points

        (2) pairs with a PhyLink to operate as a layer 2 managed network switch

        (3) converts conventional Ethernet to a signal that can be carried by a single pair UTP cable

        (4) uses previously installed UTP 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 PoLRE software shall allow the user to enable the GBIC interfaces in the user interface (command-line or web GUI).

        (7) The PoLRE software shall disable the Ethernet RJ45 interface (Gbe1 or Gbe2) if the corresponding GBIC interface (Gbic 1 or Gbic 2) is enabled.

        (8) The PoLRE software shall allow for the ability to bond the uplink (combo) ports, providing a total of 2Gb of uplink bandwidth.

    B. CAT3 UTP

        (1) The PoLRE (PL-024) shall have a single RJ21 male telco connector, 24 pairs used for each of the 24 downlink ports. The PoLRE (PL-048) shall have a two RJ21 male telco connector, 48 pairs used. It supports CAT3 UTP cable with a characteristic impedance of 100 ohms.

(2) Maximum cable distances are specified as: 365m (1200ft) for CAT3 UTP, 24 AWG

(3) The maximum data through-put shall be 20Mbps (total up plus down) and shall auto adapt to the cable conditions. This will support 10Mbps communication in both directions.

(4) Each Downlink channel shall support 10Mbps 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 PoLRE 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 PoLRE 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 PoLRE 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.

2.05   PoE

A. The PoLRE shall provide up to 15 watts of power over the CAT3 UTP connection to each end-point device.

B. The end-point devices must be IEEE 802.3af compliant.

2.06   POWER SHARING

A. The PoLRE shall allow for a power share setup for sharing power among multiple switches.

B. The PoLRE shall allow for up to 4 units to be stacked in a power sharing configuration.

C. The PoLRE shall have 2 rear male connectors, DC IN/OUT, for power sharing.

D. The PoLRE 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 PoLRE switch shall be exportable as a separate file.

(2) The PoLRE 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 PoLRE 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) PL-024 16.5W, PL-048 22W (not including PoE end-points)

   (3) Power injection (PoE)

      (a) -54VDC, 15W – end-point devices must be IEEE 802.3af compliant

B. Connectors

   (1) Ethernet

      (a) RJ45 (2) – Ethernet combo port

      (b) SFP cage (2) – Ethernet combo port

        (c) RJ45 – management port

        (d) RJ21 (1) – Ethernet + power connection

    (2) Serial

        (a) RJ45 – serial console port

    (3) 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: 3600g

    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 (-40°F to 185°F)

    H. Humidity: 10 – 95%, non-condensing @ 35°C

    I. MTBF (Mean Time Between Failure):   57 Years (499,320 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