

# NVT PHYBRIDGE FLEX24 DATASHEET



## **Fast Ethernet and PoE over Multi-Pair UTP with up to 2,000ft (610m) Reach**

### **FLEX24 Managed Switch**

The FLEX24 managed switch makes the modernization to IP devices (IoT) simple, secure and cost-effective. When paired with the FLEX Adapters, this powerful enterprise-grade switch delivers fast Ethernet and PoE over multi-pair UTP cable with up to 2,000ft (610m) reach - **that's 6Xs the reach of standard Ethernet switches.** The FLEX24 comes standard with robust power management capabilities and an industry leading, simple to use GUI interface.

With the FLEX24, customers are taking full advantage of Modern LAN principles, protecting existing infrastructure assets, and eliminating any need to rip/replace the established multi-pair UTP cabling. The FLEX24 managed switch optimizes network design with advanced interoperability and easy integration into the overall LAN creating a secure, robust and easy to manage path for IP endpoints.

- Accelerate your return on investment by reducing infrastructure costs.
- Simplify your IP modernization, collapsing planning and deployment time.
- Eliminate infrastructure barriers, risks, disruption and costs.
- Create a robust plug-and-play IP platform that is easy to deploy and manage.
- Be environmentally responsible during your IP upgrades.

### **Speed, Reach and Power**

FLEX24 delivers 10/100Mbps symmetrical (full duplex) and PoE++ (50W) over 4-pair UTP or PoE+ (30W) over 2-pair UTP with 2,000ft (610m) reach. It is designed to support the most demanding IP endpoints with plenty of bandwidth to spare. No speed degradation with longer distance or latency allowing for real time applications.

### **Industry Leading PowerWISE® Technology**

Power sharing for redundancy, load balancing, AC/DC options, hot swappable power supply and auto-sensing 100-240 VAC delivering 500 to 1,000 watts of power. FLEX24 is one of the most energy efficient switches on the market, consuming less than 17 Watts of power to operate.

### **Managed Switch with Plug-and-Play Option**

FLEX24 can either operate in a transparent mode functioning as a bridge, allowing for plug-and-play deployment, or as a fully managed switch with high value features specifically designed for the security industry, including:

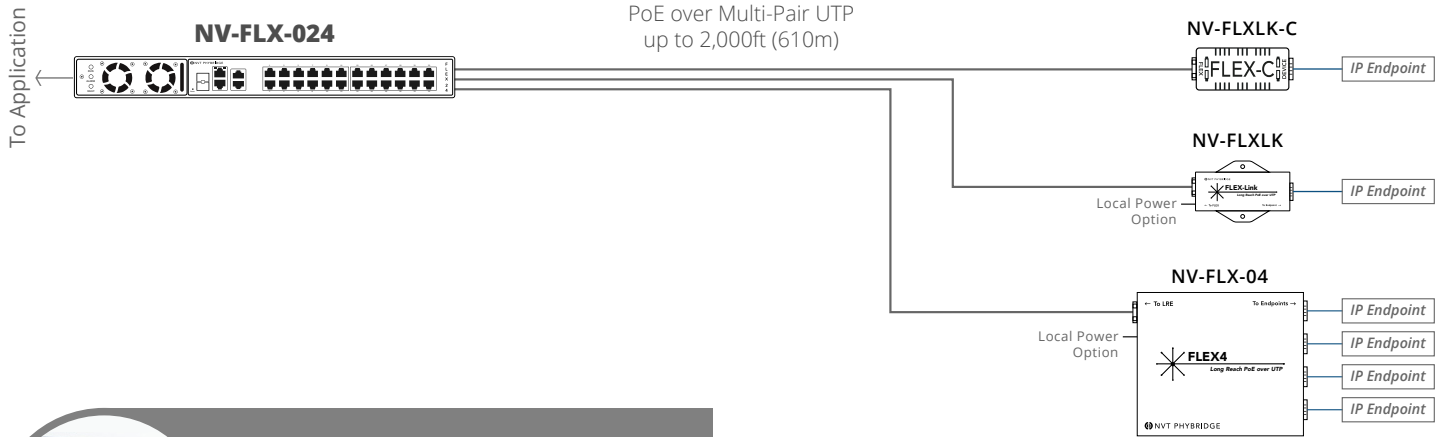
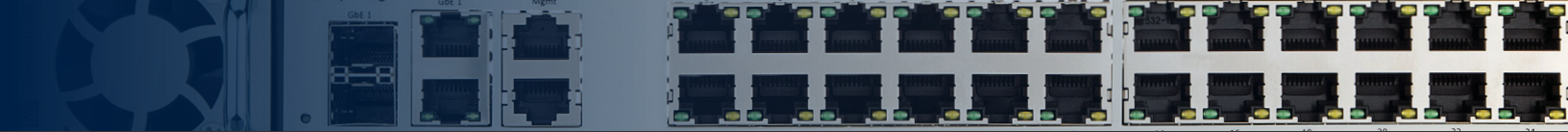
- Power management by port for easy reset of ports.
- Port MAC locking for higher security and peace of mind.
- Simple Network Manager, an intuitive Web GUI that makes managing the switch a breeze.

## **AT A GLANCE**

(NV-FLX-024)

- 24-port managed long reach PoE switch
- 10/100Mbps symmetrical (full duplex) and PoE++ (50W) over 4-pair UTP or PoE+ (30W) over 2-pair UTP with 2,000ft (610m) reach
- 2 x 1GB uplink ports, 2 x 1GB fiber uplink ports and dedicated management and console ports
- Intuitive, simple management GUI; remote access
- 500W (110v) or 1,000W (220v) auto sensing hotswappable power supply
- Power redundancy available
- Power management by port and MAC locking
- EN 50121-4 Standard for Railway/ Subway environments
- Enables long reach deployments of Megapixel IP cameras, wireless access points, IPTV terminals, etc.





### The Most Robust PoE Capabilities on the Market

Four switches can be stacked together for power sharing, load balancing and power redundancy. The FLEX24 switch comes standard with PowerWISE technology.

### FLEX24 Technical Specifications

<b>Model</b>	FLEX24
<b>Part Number</b>	NV-FLX-024
<b>Dimensions</b>	19 inches x 1U without rack ears: <ul style="list-style-type: none"> <li>1.75" x 17.13" x 9.92" (HxWxD)</li> <li>4.45cm x 43.5cm x 25.2cm (HxWxD)</li> </ul>
<b>Weight</b>	7.36 lb. (3.34 kg)
<b>Mounting</b>	Standalone, rack or shelf-mountable; 2 brackets included for installation
<b>Interface: Ethernet Uplink (Trunk IP)</b>	Maximum 2 uplinks, each 1Gb/s (full duplex), either: <ul style="list-style-type: none"> <li>2 mini-GBIC ports: 1000 Base-TX/SX/LX/EX/ZX/LHX (determined by SFP, transceiver module installed), Ethernet IEEE 802.3z, fiber optic cable (NVT Phybridge Fiber Modules Available); or</li> <li>2 RJ45 ports: 10/100/1000 Base-T auto-sensing, independent speed selection, Ethernet IEEE 802.3, CAT5e/6 copper cable</li> </ul>
<b>Interface: Downlink (PoE and IP to Adapter)</b>	24 x RJ45 Jacks with Link and Activity LED indicators Speed: 10/100Mb/s (full duplex) PoE Power: <ul style="list-style-type: none"> <li>50 Watts Maximum on 4-Pairs</li> <li>30 Watts Maximum on 2-Pairs</li> <li>Individual port power controls</li> </ul>

<b>Management</b>	1 LAN port (MGMT): RJ45, 10/100 Base-T auto-sensing, IEEE 802.3 1 UART console port: RJ45 (RJ45 to DB9 cable included)
<b>Power Supply</b>	Hot-Swappable Power Supply Unit Auto-sensing 100-240VAC, 50/60 Hz Power Output: 500W max at 110VAC, 1000W max at 220VAC *Optional 1000W at 110VAC power supplies available at additional cost.
<b>Power Consumption</b>	17W
<b>Power Injection (PoE)</b>	DC voltage: 48VDC to 58VDC IEEE 802.3af/at PoE++ (50 Watts) compatible
<b>PowerWISE® Power Sharing</b>	2 male connectors (rear) DC IN and DC OUT: 48VDC to 58VDC
<b>Operating temperature</b>	14°F to 122°F (-10°C to 50°C)
<b>Humidity</b>	10% to 95% (non-condensing) at 95°F (35°C)
<b>MTBF</b>	20 years

### FLEX24 Compliance and Agency Approval

<b>EMC</b>	Emissions: FCC Part 15, ICES-003, EN 55032:2012, EN 50121-4:2015 Class A Immunity: EN 55024:2010, EN 50121-4:2015
<b>Safety</b>	UL 60950-1 2nd Ed 2014-10-14, CAN/CSA C22.2 No. 60950-1-07 2nd Ed 2014-10 IEC 60950-1:2005+A1+A2, EN 60950-1:2006+A1+A2+A11+A12
<b>Environment</b>	RoHS Directive 2011/65

## FLEX24 Extended Technical Specifications

<b>Layer 2 Features</b>	<ul style="list-style-type: none"> <li>High performance Store and Forward architecture, runt/CRC filtering that eliminates erroneous packets to optimize the network bandwidth</li> <li>Supports VLANs             <ul style="list-style-type: none"> <li>- IEEE 802.1Q tagged VLAN</li> <li>- 512 concurrent per port</li> </ul> </li> <li>Supports Spanning Tree Protocol             <ul style="list-style-type: none"> <li>- STP (Spanning Tree Protocol)</li> <li>- RSTP (Rapid Spanning Tree Protocol)</li> </ul> </li> <li>Supports Link Aggregation             <ul style="list-style-type: none"> <li>- Ether-channel (static trunk)</li> </ul> </li> <li>Jumbo Frame             <ul style="list-style-type: none"> <li>- Max 4k size</li> </ul> </li> <li>Automatic Media-Dependent Interface Crossover (MDIX)</li> <li>IPV4/IPV6 Transport</li> </ul>
<b>Multicast</b>	Supports IGMP snooping v2 and v3
<b>Security</b>	<ul style="list-style-type: none"> <li>Authentication             <ul style="list-style-type: none"> <li>- Built-in RADIUS client to co-operate with the RADIUS servers, when installed.</li> <li>- RADIUS / TACACS+ login user access authentication, when installed.</li> </ul> </li> <li>Access Control List when TACACS is used</li> <li>MAC Security             <ul style="list-style-type: none"> <li>- Static MAC locking per port</li> </ul> </li> <li>SSH / SSL, when installed</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>Switch management interface             <ul style="list-style-type: none"> <li>- Web GUI switch management</li> <li>- Command line interface</li> <li>- SNMP v1, v2c, v3</li> <li>- SSH / SSL secure access, when installed.</li> </ul> </li> <li>User privilege levels control, with TACACS only.</li> <li>Built-in Trivial File Transfer Protocol (TFTP) client to backup configuration files</li> <li>System maintenance             <ul style="list-style-type: none"> <li>- Firmware upload/download via FTP</li> <li>- Configuration upload/download through Web interface</li> <li>- Hardware reset button for system reboot or reset to factory default</li> </ul> </li> <li>NTP Network Time Protocol</li> <li>Link Layer Discovery Protocol (LLDP)</li> <li>SNMP trap for interface linkup and linkdown notification</li> <li>Event message logging to remote Syslog server</li> </ul>

## Power & Distance Chart

FLEX24 used with FLEX-Link									
	20ft (6m)	250ft (76m)	500ft (152m)	750ft (228m)	1,000ft (305m)	1,250ft (381m)	1,500ft (457m)	1,750ft (533m)	2,000ft (610m)
Cat6 4-Pairs	50W	48	46	44	42	39	37	35	33
Cat6 2-Pairs	33W	31	29	28	26	24	22	20	18
Cat5e 4- Pairs	50W	47	44	41	38	35	33	30	27
Cat5e 2-Pairs	33W	31	28	25	23	20	18	15	12
FLEX24 used with FLEX-C									
Cat6 4-Pairs	33W	32	31	30	29	28	28	27	26
Cat6 2-Pairs	33W	31	29	28	26	24	22	20	18
Cat5e 4- Pairs	33W	32	31	29	28	27	25	24	23
Cat5e 2-Pairs	33W	31	28	25	23	20	18	15	12
FLEX24 used with FLEX4									
Cat6 4-Pairs	50W	48	46	44	42	39	37	35	33
Cat6 2-Pairs	33W	31	29	28	26	24	22	20	18
Cat5e 4- Pairs	50W	47	44	41	38	35	33	30	27
Cat5e 2-Pairs	33W	31	28	25	23	20	18	15	12

■ 100Mbit ■ 10Mbit

## FLEX FAMILY ADAPTER OPTIONS

### FLEX Adapter Options

There are three media converter options available to pair with the FLEX family of switches and extend PoE over Multi-Pair UTP. The FLEX-C and FLEX-Link are single endpoint solutions and the FLEX4 enables 4 IP endpoints from a single long run Multi-Pair UTP cable.

#### FLEX-C



#### FLEX-Link



#### FLEX4



	FLEX-C	FLEX-Link	FLEX4
<b>Power</b>	<ul style="list-style-type: none"> <li>Maximum 30W, delivered on 2-pairs (spare pairs)</li> <li>No local power option available</li> <li>Does not negotiate power requirements with IP device</li> <li>Device should be IEEE compliant</li> </ul>	<ul style="list-style-type: none"> <li>Maximum 50W, delivered on 4-pairs</li> <li>Local power option to support greater power delivery to IP device</li> <li>Adapter is IEEE-compliant and will negotiate power requirements with IP device</li> </ul>	<ul style="list-style-type: none"> <li>Maximum 30W, delivered on 2-pairs</li> <li>Local power option to support greater power delivery to IP device</li> <li>Adapter is IEEE-compliant and will negotiate power requirements with IP device</li> </ul>
<b>Casing</b>	Plastic	Metal	Metal
<b>Single-pair Supported</b>	No	Yes (needs local power)	Yes (needs local power)
<b>EN 50121-4 Standard</b>	No	Yes – approved to operate in a railway/subway environment	Yes – approved to operate in a railway/subway environment

### FLEX Adapters Technical Specifications

Model Number	FLEX-C	FLEX-Link	FLEX4
<b>Part Number</b>	NV-FLXK-C	NV-FLXK	NV-FLX-04
<b>Dimensions</b>	8.1cm x 3.8cm x 2.3cm (LxWxH); 3.19" x 1.50" x 0.90" (LxWxH)	8.8cm x 5.0cm x 2.5cm (LxWxH); 3.46" x 1.97" x 0.98" (LxWxH)	9.8cm x 9.6cm x 2.5cm (LxWxH); 3.86" x 3.78" x 0.98" (LxWxH)
<b>Weight</b>	44g (1.5oz.)	106g (3.74oz.)	214 g (7.6 oz.)
<b>Interface: Network Infrastructure side (FLEX)</b>	1 RJ45 port: UTP/STP cable (2-pair or 4-pair)	1 RJ45 port: UTP/STP cable (1-pair, 2-pair or 4-pair)	1 RJ45 port: UTP /STP cable (1-pair, 2-pair or 4-pair)
<b>Interface: IEEE Side (IP Device)</b>	1 RJ45 port; device must be IEEE 802.3 af/at compliant, 10/100Mbps connection to IP end device	1 RJ45 port; device must be IEEE 802.3 af/at compliant 50W, 10/100Mbps connection to IP end device	4 RJ45 ports: device must be IEEE 802.3 af/at compliant, 10/100Mbps connection to IP end device
<b>Power Supply</b>	PoE from the FLEX24 switch or local power from FLEX-Base, maximum 30W (over 2-pairs)	PoE from the FLEX24 switch or external power supply; maximum 50W (over 4-pairs) or 30W (over 2-pairs)	PoE from the FLEX switch, or external power supply; maximum 30W (over 2-pairs) each port
<b>DC IN (Barrel Connector)</b>		Optional (sold separately) 48V – 58VDC via an external AC/DC Power Adapter (IEC Class II isolated only) NOTE 1: Local power supply used must have its output isolated from Earth potential. NOTE 2: If voltage of local power supply is lower than the power voltage provided from the PoE switch, then power on the PoE switch should be turned off.	Optional (sold separately) 48V – 58VDC via an external AC/DC Power Adapter (IEC Class II isolated only) NOTE 1: Local power supply used must have its output isolated from Earth potential. NOTE 2: If voltage of local power supply is lower than the power voltage provided from the PoE switch, then power on the PoE switch should be turned off.
<b>Power Consumption</b>	1.3W	1.5W	1.5W
<b>Operating Temperature</b>	-40°C to 70°C <i>Tests conducted against international safety standard at maximum ambient temperatures of 60°C at 15W and 50°C at 30W</i>	-40°C to 70°C <i>Tests conducted against international safety standard at maximum ambient temperatures of 60°C at 30W and 50°C at 50W</i>	-40°C to 70°C <i>Tests conducted against international safety standard at maximum ambient temperatures of 60°C at 64W and 55°C at 120W</i>
<b>Mean Time Before Failure (MTBF)</b>	20+ years	20+ years	20+ years
<b>Humidity</b>	10% to 95% (non-condensing) at 35° C	10% to 95% (non-condensing) at 35° C	10% to 95% (non-condensing) at 35° C

### FLEX Adapters Compliance and Agency Approval

<b>EMC</b>	Emissions: FCC Part 15, ICES-003, EN 55032:2012, EN 50121-4:2015 Class A (FLEX4), Class B (FLEX-C and FLEX-Link) Immunity: EN 55024:2010, EN 50121-4:2015
<b>Safety</b>	UL 60950-1 2nd Ed 2014-10-14, CAN/CSA C22.2 No. 60950-1-07 2nd Ed 2014-10 IEC 60950-1:2005+A1+A2, EN 60950-1:2006+A1+A2+A11+A12
<b>Environment</b>	RoHS Directive 2011/65