

# Managed Ethernet Switches<sup>1</sup>

## MN-FNS Series

### Description<sup>2</sup>

The MN-FNS Series managed Ethernet switches from EDWARDS<sup>3</sup> are advanced managed switch solutions and accessories that provide for a fully scalable Ethernet network to support virtually any mass notification or life safety application. These networks may be dedicated for use by ECS/MNS/LSS systems or where permitted, may be part of a non-dedicated facility network.

UL Listed and supervised Ethernet connections between the EDWARDS FireWorks Computer Platforms, MN-FVPN Voice Over Internet Protocol Modules, MN-NETRLY4 Ethernet Input/Output Modules, MN-COM1S Ethernet/RS232 Communication Module, EST3, EST3X and other EDWARDS panels and panel networks can now be done over single-mode and/or multimode fiber optic cable. MN-FNS Ethernet switches may be interconnected to build spoke format networks, as well as Class B, Class X, Mesh, and Hybrid systems.<sup>4</sup>

MN-FNS Series Ethernet switches are powered by Cisco® Technologies and are listed to UL 864 and ULC S527. They provide powerful, flexible, and scalable interfaces to fiber optic networks, and are easy to install and configure. Models are available in single and dual inputs for 24 VDC filtered/regulated and 100-250 VAC.<sup>5</sup>

The MN-FNS4C2F3 switch has four copper RJ45 10/100 ports and two 10/100/1000 fiber optic ports. The MN-FNS8C2F3 switch has eight copper RJ45 10/100 ports and two 10/100/1000 fiber optic ports. The MN-FNS8C18F2 switch has eight copper RJ45 10/100 ports, 16 10/100 fiber optic ports and two 10/100/1000 fiber optic ports.<sup>6</sup>

Thanks to the exclusive Cisco Resilient Ethernet Protocol, all MN-FNS switches feature ultra-fast communications, as well as seamless redundant data path capabilities. The MN-FNS Series supports sophisticated encryption algorithms and offers extensive diagnostics and trouble-shooting tools.<sup>7</sup>

### Standard Features<sup>8</sup>

- UL 864 and ULC S527 listed<sup>9</sup>
- Powered by Cisco® Technologies
- For use with spoke format networks, as well as Class B, Class X, Mesh, and Hybrid systems
- Exclusive *Resilient Ethernet Protocol* for ultra-fast communications and seamless redundant path capability
- Dual power input options
- Browser or command-line setup
- *Network Assistant* utility simplifies system maintenance
- Hot-swappable Small Fiber Package Modules accommodate multimode, single-mode, or mixed-mode networks
- Fanless operation
- Compact footprints
- Can be mounted in EST3 cabinets

## Application 1

MN-FNS switches offer browser-based setup and support command line configuration. They are compatible with the powerful Cisco Network Assistant utility, which simplifies network maintenance and control. Diagnostic LEDs facilitate at-a-glance network and switch status.

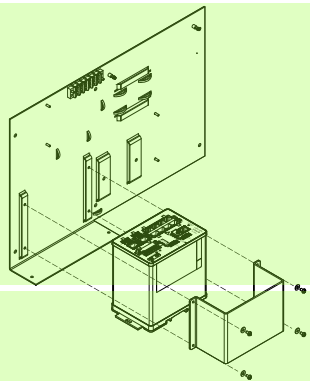
All switches use hot-swappable Small Form-Factor Pluggable (SFP) fiber optic cable transceiver modules that allow the system designer to choose the fiber optic media required by the network. These compact input/output devices make it easy to accommodate multimode, single-mode, or mixed-fiber networks. You can come into a switch with multimode fiber and leave on single-mode fiber or come in on standard power single-mode fiber and leave on high-power single-mode – all as required by the application.

MN-FNS Series switches feature fanless operation and compact footprints that offer efficient mounting options while requiring minimal use of cabinet space. Switches may be mounted in EST3 family cabinets such as the 3-RCC and 3-CAB series. The MN-FNS4C2F3 and MN-FNS8C2F3 may also be installed in an APS6A enclosure, while the MN-FNS8C18F2 may be rack-mounted or installed in EST3 cabinets.

## Compliance and Features 5

	MN-FNS4C2F3	MN-FNS8C2F3	MN-FNS8C2F2
UL 864	✓	✓	✓
ULC S527	✓	✓	✓
UL/CSA 60950-1	✓	✓	✓
UL 508	✓	✓	
CSA C22.2 No. 142	✓	✓	
EN 60950-1	✓	✓	✓
CE Marking	✓	✓	✓
Class 1, Div 2 A-D	✓	✓	
FCC Class A	✓	✓	✓
EN 55022A Class A	✓	✓	✓
VCCI Class A	✓	✓	✓
RoHS Compliance	✓	✓	✓
C-Tick (Australia)	✓	✓	
Russia certification	✓	✓	
Brazil certification	✓	✓	
IEC Shock & Vibration	✓	✓	✓
RJ45 Ports	4	8	8
10/100 Fiber Ports	0	0	16
Gigabit Ports	2	2	2
LAN BASE OS	✓	✓	✓

## Mounting 7



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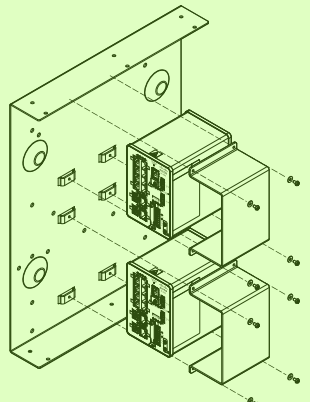
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Mounting the switch on an MN-BRKT1F

(Use a MN-FNS4HDK1 switch holder bracket for four-port switches. Use a MN-FNS8HDK1 switch holder bracket for eight-port switches.)

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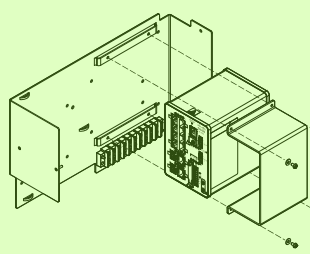
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Mounting the switch on an MN-BRKT8C18F

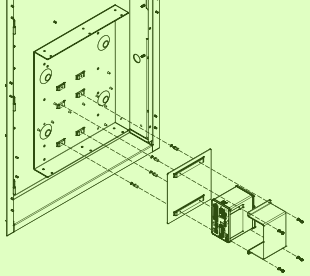
(Use a MN-FNS4HDK1 switch holder bracket for four-port switches. Use a MN-FNS8HDK1 switch holder bracket for eight-port switches.)



6

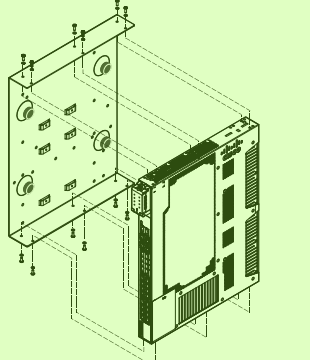
Mounting the switch on an MN-BRKT3F

(Use a MN-FNS4HDK1 switch holder bracket for four-port switches. Use a MN-FNS8HDK1 switch holder bracket for eight-port switches.)



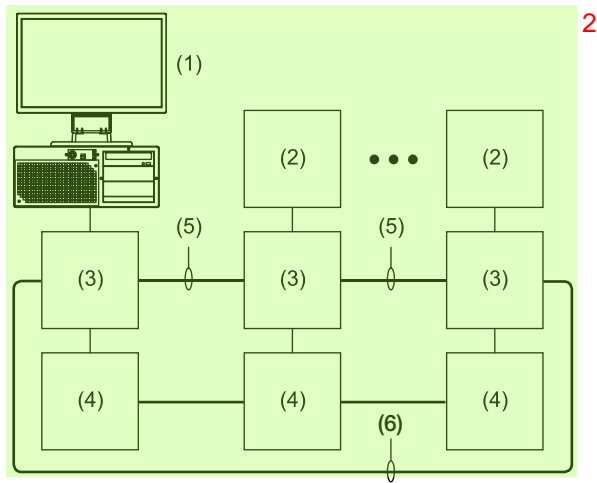
Mounting the switch on an MN-BRKT4F

The MN-BRKT4F provides support for installing a second MN-FNS Ethernet switch on the MNBRKT8C18F in a 3-RCCx cabinet.



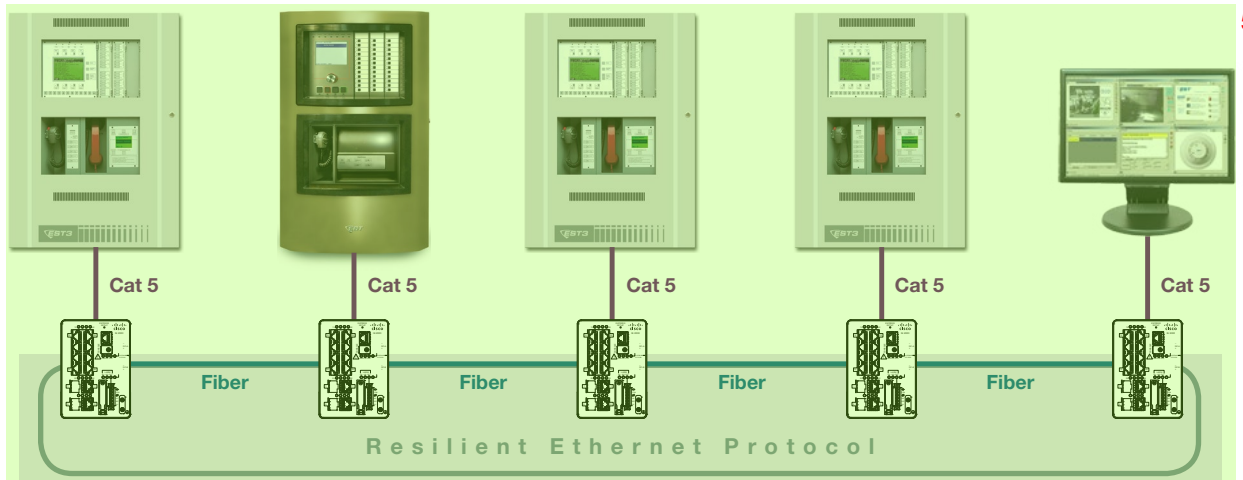
Mounting on MN-FNSRMK1 Rack-mount kit

## Typical Network Configuration <sup>1</sup>

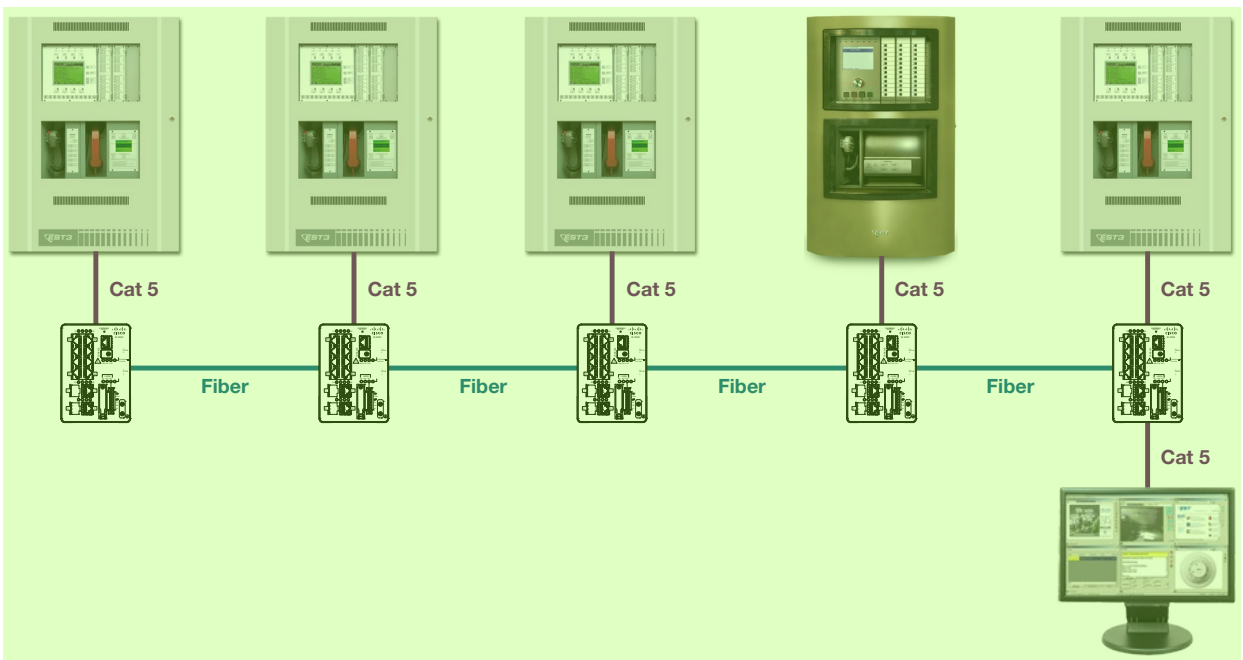


1. FireWorks workstation
2. EST3(X) life safety network (up to 64 cabinets per network)
3. MN-FNS Ethernet switch
4. UL/ULC Listed 24 VDC power supervision relay and trouble signal initiating device circuit
5. Class B communication link
6. Class X redundant communication link

## Dedicated Class X <sup>4</sup>



## Dedicated Class B <sup>6</sup>



# Specifications, Switches

## MN-FNS8C2F3 1

<b>Input Power</b>	
Voltage	24 VDC, nominal
Current	2 A, max.
<b>Fast Ethernet ports</b>	
Quantity	8
Signaling/data rate	10BaseT / 10 Mbps 100BaseTX / 100 Mbps
Cabling type	RJ-45, Category 5e or better
<b>Gigabit Ethernet ports</b>	
Quantity	2 (combination RJ-45/SFP)
<b>Signaling/data rate</b>	
RJ-45 port	10BaseT / 10 Mbps 100BaseTX / 100 Mbps 1000BaseTX / 1000 Mbps
SFP port	Varies with SFP module
<b>Cabling type</b>	
RJ-45 port	RJ-45, Category 5e or better
SFP port	Varies with SFP module
<b>Relay outputs</b>	
Quantity	1
Type	Common trouble
Style	Form C
Contact rating	1.0 A at 24 VDC
<b>Wire size</b>	
Ground	10 to 12 AWG (4.0 to 6.0 mm <sup>2</sup> )
DC-A and DC-B	18 AWG (1.0 mm <sup>2</sup> ) twisted-pair
Relay	18 AWG (1.0 mm <sup>2</sup> ) twisted-pair
Dimensions	5.10 × 3.60 × 5.26 in. (12.95 × 9.14 × 13.36 cm)
Weight	2.75 lbs. (1.25 kg)
Compatible enclosures	3-CAB21, 3-CAB14, 3-CAB7, 3-RCCx cabinets, and APS6x cabinets [1]

[1] When installed in an APS6x power supply cabinet, you cannot use the APS6x to power any equipment outside the cabinet. 3

## MN-FNS4C2F3 7

<b>Input Power</b>	
Voltage	24 VDC, nominal
Current	2 A, max.
<b>Fast Ethernet ports</b>	
Quantity	4
Signaling / data rate	10BaseT / 10 Mbps 100BaseTX / 100 Mbps
Cabling type	RJ-45, Category 5e or better
<b>Gigabit Ethernet ports</b>	
Quantity	2
Signaling / data rate	Varies with SFP module
Cabling type	Varies with SFP module
<b>Relay outputs</b>	
Quantity	1
Type	Common trouble
Style	Form C
Contact rating	1.0 A at 24 VDC
<b>Wire size</b>	
Ground	10 to 12 AWG (4.0 to 6.0 mm <sup>2</sup> )
DC-A and DC-B	18 AWG (1.0 mm <sup>2</sup> ) twisted-pair
Relay	18 AWG (1.0 mm <sup>2</sup> ) twisted-pair
Dimensions	5.10 × 2.95 × 4.51 in. (12.95 × 7.50 × 11.46 cm)
Weight	2.45 lbs. (1.11 kg)
Compatible enclosures	3-CAB21, 3-CAB14, 3-CAB7, 3-RCCx cabinets, and APS6x cabinets [1]
<b>Operating environment</b>	
Temperature	32 to 120°F (0 to 49°C)
Relative Humidity	0 to 93% noncondensing
[1] When installed in an APS6x power supply cabinet, you cannot use the APS6x to power any equipment outside the cabinet. 9	

## MN-FNS8C18F(2) 5

The MN-FNS8C18F2 Switch comes with the standard Cisco Layer 2 LAN BASE image. This switch can be upgraded at any time to the Cisco IP Services image by ordering and loading the MN-FNS8C18F2UK3 upgrade kit. 4

Input power	
MN-FNS8C18FAC	120 – 240 V, 60/50 Hz, 2A [2]
MN-FNS8C18FDC	18 – 33 VDC, 2A
Wire size	
MN-FNS8C18FAC	10 to 14 AWG (2.5 to 6.0 mm²)
MN-FNS8C18FDC	
Fast Ethernet RJ-45 ports	
Quantity	8
Signaling / data rate	10BaseT / 10 Mbps 100BaseTX / 100 Mbps
Cabling type	RJ-45, Cat 5e or better
Fast Ethernet SFP ports	
Quantity	16
Signaling / data rate	10BaseT / 10 Mbps 100BaseTX / 100 Mbps
Cabling type	Fiber-optic

<b>Gigabit Ethernet ports</b>	
Quantity	2
<b>Relay outputs</b>	
Quantity	1
Type	Common trouble
Style	Form C
Contact rating	1.0 A at 24 VDC
Dimensions (H × W × D)	1.75 × 17.5 × 14.0 in, (4.45 × 44.5 × 35.6 cm)
Weight	10 lb (4.5 kg) without power supply modules
Compatible enclosures	3-CAB21, 3-CAB14, 3-CAB7, and 3-RCCx cabinets [1]
<b>Operating environment</b>	
Temperature	32 to 120°F (0 to 49°C)
Relative Humidity	0 to 93% noncondensing
[1] You cannot install any other electronics in the same cabinet as the switch. 10	
[2] From a UL 1481 Listed uninterruptible power supply	

## Specifications, MN-FNSx SFP Transceiver Modules

### Cabling 1

SFP module	Wavelength (nm)	Fiber type	Core size (microns) [1]	Modal bandwidth (Mhz/km)	Cable distance
MN-FNSFEMM2K	1310	MMF	62.5 62.5 50 50	160 (FDDI-grade) 200 (OM1) 400 (400/400) 500 (OM2)	1.24 mi. (2 km)
MN-FNSFEDSM10K	1310	SMF	G.652	---	6.2 mi. (10 km)
MN-FNSGBDSM70K	1550	SMF	G.652	---	43.4 mi. (70 km)

[1] G.652, listed under core size for single mode fiber (SMF), refers to a ITU-T standard of commonly deployed non-dispersion-shifted single mode fiber with a core size of approximately 8 to 10 microns (µm).

### Optical 4

Model	Transceiver type	Transmit power (dBm)		Receive power (dBm)		Max channel insertion loss in dB (by fiber type) <sup>1</sup>	Transmit and receive wavelength (nm)
		Max	Min	Max	Min		
MN-FNSFEMM2K	100Base-FX, 1310 nm MMF	-14	-20	-14	-31	10	1270 to 1380
MN-FNSFEDSM10K	100Base-LX, 1310 nm SMF	-8	-15	-8	-28	10	1260 to 1360
MN-FNSGBDSM70K	1000Base-ZX, 1550 nm SMF	+5	0	-3	-23	20 (any SMF)	1500 to 1580
MN-FNSGBDSM10K	1000BASE-LX/LH, 1310 nm SMF	-3	-9.5	-3	-20	5 (G.652 SMF)	1260 to 1355
MN-FNSGBDSMDR	1000BASE DWDM CH 41 SMF	+4	0	-9	-28	25 (G.652 SMF)	1544.43 to 1544.63
MN-FNSGBSSM10KD	1000BASE-BX-D, 1490 nm SMF	-3	-9	-3	-19.5	5 (G.652 SMF)	1480 to 1500 (transmit) 1260 to 1360 (receive)
MN-FNSGBSSM10KU	1000BASE-BX-U, 1310 nm SMF	-3	-9	-3	-19.5	5 (G.652 SMF)	1260 to 1360 (transmit) 1480 to 1500 (receive)

[1] Maximum channel insertion loss is defined for maximum distance guaranteed as specified above and by fiber type. When links are deployed over shorter distances, additional channel insertion loss may be allowed.

## Ordering Information 7

### Ethernet Switches & Power Supplies

MN-FNS4C2F3	4 Fast Ethernet (RJ45), 2 GB SFP, Layer 3 Lite. 24 VDC.
MN-FNS8C18F2	Rack-mount, 8 Fast Ethernet (RJ45), 16 FE SFP, 2 GB Combo SFP/RJ45, Layer 2. Requires power supply modules.
MN-FNS8C18FAC	MN-FNS8C18F2 100-250 VAC (50 or 60 Hz) or 100-250 VDC power supply module, primary or backup. Requires MN-TK10 terminal strip and an MN-TP1201P (for 120V) or MN-TP230-E (for 230V) transient protector, which are ordered separately.
MN-FNS8C18FDC	MN-FNS8C18F 24 VDC power supply module, primary or backup
MN-FNS8C2F3	8 Fast Ethernet (RJ45), 2 GB Combo SFP/RJ45, Layer 3 Lite. 24 VDC.

### Ethernet Switch Mounting Hardware 9

MN-BRKT1F	MN-FVPN, MN-ABPM, MN-PASM2, MN-COM1S, MN-NETRLY4 and/or MN-FNS(4)(8) Series Switch mounting bracket for EST3 enclosures
MN-BRKT3F	MN-FVPN, MN-COM1S and/or MN-MN-FNS(4)(8) Series switch mounting bracket for APS6A/10A Series power supplies
MN-BRKT8C18F	EST3 cabinet mounting bracket for 1 MN-FNS8C18F or 2 MN-FNS(4)(8)(16) Series Switch mounting bracket
MN-FNSRMK1	MN-FNS8C18F Series switch installation kit. Used with MN-BRKT8C18F or 19" rack mounting.
MN-FNS4HDK1	MN-FNS4 Series switch holder bracket. Used with MN-BRKT Series. One required per switch.
MN-FNS8HDK1	MN-FNS8 Series switch holder bracket. Used with MN-BRKT Series. One required per switch.

### SFP 11

MN-FNSFEDSM10K	SFP. Single mode fiber, Dual filament, LC Connectors, FE, 0m to 10km, 10 dB fiber budget, 1310nm
MN-FNSFEMM2K	SFP. Multimode fiber, Dual filament, LC Connectors, FE, 0m to 2km, 10 dB fiber budget, 1310nm
MN-FNSGBDSM70K	SFP. Single mode fiber, Dual filament, LC Connectors, GB, 10m to 70km, 20 dB fiber budget, 1550nm
MN-FNSGBDSM10K	SFP. Single mode fiber, Dual filament, LC Connectors, GB, 550m to 10km, 5 dB fiber budget, 1310nm. Can only be used in GB ports
MN-FNSGBDSMDR-41	SFP. Single mode fiber. Dual filament. LC connectors. GB. Dense wave - division multiplexing (DWDM). ITU Channel 41. 25 dB fiber budget. 1544.43nm. Can only be used in GB ports
MN-FNSGBSSM10KD	SFP. Non-hardened, Single mode fiber, Single filament, LC Connectors, GB, 0m to 10km, 5 dB fiber budget, 1490nm, Must be used in pair with MN-FNSGBSSM10KX. Can only be used in GB ports
MN-FNSGBSSM10KU	SFP. Non-hardened, Single mode fiber, Single filament, LC Connectors, GB, 0m to 10km, 5 dB fiber budget, 1310nm, Must be used in pair with MN-FNSGBSSM10KR. Can only be used in GB ports

Accessories	
APS6A	Auxiliary/Booster Power Supply, 6.5A total, Expanded cabinet, 26a/h capacity, 115VAC
MN-FNSCABSD1	Blank SD card that can be PC formatted to be used with MN-FNS4C2F3 or MN-FNS8C2F3 Ethernet switches
MN-FNSLC2STMM1	62.5 micron multimode duplex fiber cable LC male connectors on one end to ST male connectors on the other.
MN-FNSRCKSD1	Formatted replacement SD card for MN-FNS8C18F(2)(3) Series Ethernet switches
MN-FNSST2STCON1	ST to ST barrel connector
MN-TK10	10 Position, 4 pole terminal kit for use with MN-NETRLY4 or MN-FVPN
MN-TP1201P	TP Series 120V AC line transient protector module
MN-TP24STD	TP Series 24V circuit transient protector module
MN-TPBLK1	TP Series Single circuit breaker lockout kit
MN-TPRJ45STD	TP Series RJ45 transient protector module
MN-FNS8C18F2UK3	MN-FNS8C18FL2 to Layer 3 Upgrade kit