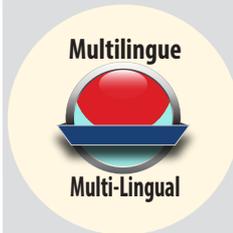


# KY-3028EMP+ Cyber-Secure Video

# Layer 2, 10 Port, Managed, PoE+ Din-Rail IEC61850, Ethernet Switch, IP40, Hazardous Locations



- 8 X 10/100Base(T)X PSE, RJ45 & 2 X 100/1000Base(X) SFP SLOTS (Supports UP 30 Watts on ALL 8 PSE Ports)
- Features STP /RSTP & Ring Protocols for Redundancy
- SNMP, HTTPS, SSH, TACACS+, ACL's ~ Security Features
- EMC performance Industrial Level 4, IP 40, Ruggedized
- Dual Power Inputs: 48 ~ 57 Volts DC for PoE+ (30 Watt)
- CE, FCC, Cyber-Secure Video Certified



## CLASS 1 Division 2 - Military Grade

### Overview

The KY-3028EMP+ is a High Security & High Performance PoE+ Ethernet Switch. It is equipped with DDMI Fiber Diagnostics for Fiber Maintenance & Troubleshooting. Designed for rugged applications and harsh environments, the switch supports the IEEE 802.3 af/at specification. Up to 30 Watts on ALL 8 PSE ports. Designed as a rugged switch for critical networks the unit supports DHCP and IEEE 1588v2 Precision Timing Protocol. Supports SHA2 SNMP Certificates and Extended Special Character Support for Secure SNMP operations. The switch operates in both the English and Spanish languages and can be changed with the push of a button. Extra long switch description & location labels. Each port can be fully labeled and described. This is a Class I Div 2 Hazardous location product.

### Features & Benefits

1. Up to 30 Watts per port - ALL 8 PSE Ports (PoE+)
  2. Redundancy - Supports STP / RSTP, MSTP, and FRP Ring Protocols for network reliability
  3. Supports DHCP Server & Client
  4. Supports Multicast Protocols for Video Support
  5. Multicast Protocol Supports IGMP Snooping, GMRP, and Static Multicast
  6. Network Partitioning: Supports VLAN and PVLAN
  7. Network Management Supports CLI, Telnet, Web HTTP, and SNMP v1, v2, v3
  8. Network Security Supports SSH, SSL, ACL, TACACS+, SHA2 Certificates & Extended Special Characters (SNMP)
  9. Device Management: TFTP, FTP and SFTP Upgrades
  10. Device Management supports Port Mirroring
  11. Alarm Output: IP/MAC conflicts, power port & Ring Alarms
  12. MVR- Multicast Vlan Registration, IEEE 802.1Q with GVRP
- IP40 / Class I Div2 / Hazardous Location - Military Grade

### Technical Specifications

#### Standards:

IEEE 802.3i, IEEE 802.3u, IEEE 802.3x, IEEE 802.3z, IEEE 802.3ad  
 IEEE 802.1D, IEEE 802.1p, IEEE 802.1Q, IEEE 802.1s, IEEE 802.1w  
 802.1X, IEEE 802.3x, IEEE 802.1AB, IEEE 802.3af, IEEE 802.3at  
 Fiber Diagnostics : DDM (Digital Diagnostic Monitoring)  
 UL 60950-1, EN 61000-4-2 (ESD), EN 61000-4-4 (EFT), EN 61000-4-6  
 (CS), EN 61000-4-3 (RS) Level 3, EN 61000-4-5 (Surge) Level 3  
 EN 61000-4-8 Level 3, IEC 60068-2-27 (Shock), IEC 60068-2-32  
 (Freefall), IEC 60068-2-6 (Vibration)

#### Protocols

FRP Ring, Ring+, VLAN, PVLAN, MSTP, DDMI, IEEE 1588v2,  
 IGMP Snooping, GMRP, MVR, Cyber-Secure Video  
 Telnet, HTTP, HTTPS, SNMPv1/v2/v3, RMON, LLDP, SNTP,  
 DHCP Server, DHCP Client  
 Sec, SSH, SSL, ACL, TACACS+, FTP, TFTP, SFTP, QinQ,  
 Cyber Secure Video, ARP, QoS, Syslog,  
 Clean Code Technology (CCT), American Certified Ethernet

#### Switch Properties

Priority Queues: 6, Security Queues: 6  
 Number of VLANS: 4094, VLAN ID: 1-4094  
 Number of Multicast Groups: 256  
 MAC Table 8 K, Packet Buffer: 8 Mb  
 Power over Ethernet Plus - 30 Watts - All 8 PSE Ports  
 Packet Forwarding Rate: 12.2 Gbps, Wire Speed All Ports  
 Switching Delay <5us, Secure Alarm <5us  
 Remote Temperature Sensing

#### Interfaces

8 X 10/100Base(T)X PSE - 30 Watt PoE+ Ports  
 IEEE 802.3 af and at compatible (48 Volt - PoE+)  
 2 X 100/1000Base(X) SFP Slots  
 Console Port: RS232 (RJ45 Connector)  
 Alarm Contact: 2 Pin / 250 VAC/ 350 VDC. 120 mA Max

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## KY-3028EMP+

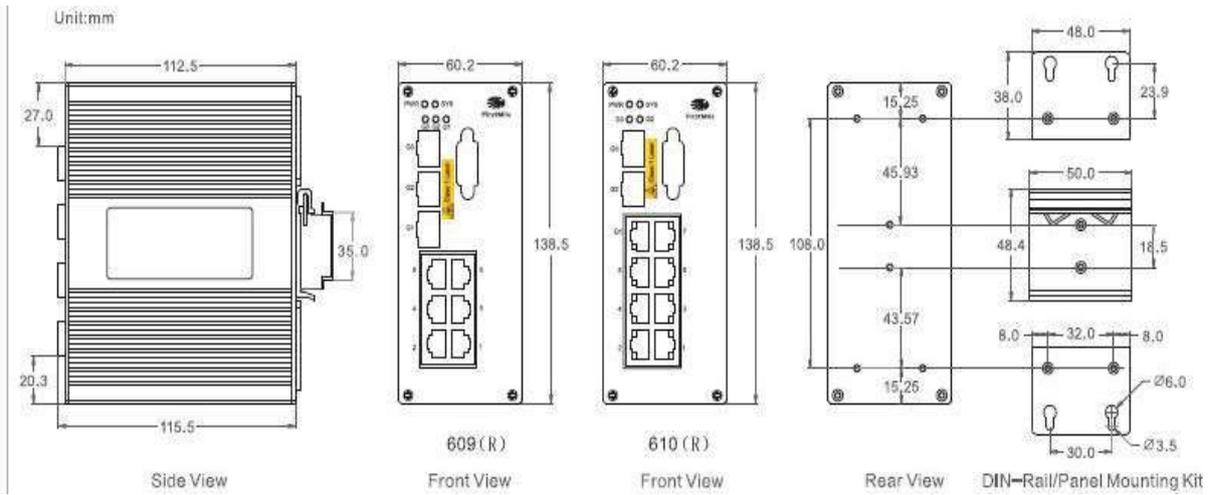
Physical Ports	
10/100Base-T(X) RJ-45 PSE Ports (30 Watts)	8
100/1000Base-X SFP / RJ45	2
Technology	
Ethernet Standards	IEEE 802.3 for 10Base-T, IEEE 802.3 af/at IEEE 802.3u for 100Base-TX and 100Base-FX IEEE 802.3z for 1000Base-X IEEE 802.3x for Flow control IEEE 802.3ad for LACP (Link Aggregation Control Protocol) IEEE 802.1D for STP (Spanning Tree Protocol) IEEE 802.1p for COS (Class of Service) IEEE 802.1Q for VLAN Tagging IEEE 802.1w for RSTP (Rapid Spanning Tree Protocol) IEEE 802.1s for MSTP (Multiple Spanning Tree Protocol) IEEE 802.1X for Authentication IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)
MAC Table	8192 MAC addresses
Priority Queues / Security Queues	6 / 6
Processing	Store-and-Forward
Switch Properties	Switching latency : 5 $\mu$ s Switching bandwidth : 9.6Gbps Max. Number of Available VLANs : 4096 IGMP multicast groups : 256 Port rate limiting : User Defined, IEEE 1588v2 Precision Timing
Security Features	Enable/disable ports, MAC based port security // CYBER-SECURE Video Port based network access control (802.1x) VLAN (802.1Q ) to segregate and secure network traffic Supports Q-in-Q VLAN for performance & security to expand the VLAN space Radius centralized password management SNMP v1/v2c/v3 encrypted authentication and access security
Software Features	STP/RSTP/MSTP (IEEE 802.1D/w/s) Redundant Ring with recovery time less than 10ms over 300 switches TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and GVRP supported IGMP v2/v3 (IGMP snooping support) for multicast filtering Port configuration, status, statistics, monitoring, security SNTP for synchronizing of clocks over network Supports PTP Client (Precision Time Protocol) clock synchronization DHCP Server / Client support Port Trunk support, Extended Special Character Support for SNMP, SHA2 Certificates MVR (Multicast VLAN Registration) support, Protocol 41 (IPv6 and IPv6 Secure)
Network Redundancy	Ring, Ring+, FTP Ring Dual Power Inputs, DDMI, Fiber Diagnostics RSTPe STP RSTP MSTP, MVR
Warning / Monitoring System	Relay output for fault event alarming / Fiber Diagnostic Monitoring // DDMI Syslog server / client to record and view events Include SMTP for event warning notification via email Event selection support, Remote Temperature Sensing
RS-232 Serial Console Port	RS-232 in RJ45 connector with console cable. Baud rate setting: 9600bps, 8, N, 1
LED Indicators	
Power Indicator	Green : Power LED x 2
R.M. Indicator	Green : Indicates that the system is operating in Ring Master mode
Ring Indicator	Green : Indicates that the system is operating in Ring mode
Fault Indicator	Amber : Indicates unexpected events occurred
10/100Base-T(X) RJ45 Port Indicator, PoE	Green for port Link/Activity Amber for Duplex/Collision
100/1000Base-X SFP Port Indicator	Green for port Link/Activity

Fault Contact	
Relay	Relay output to carry capacity of 0.5 Amps @ 48 Volts DC
Power	
Redundant Input Power	Dual DC inputs. 48~72 Volts DC on 7 Pin Block
Power Consumption (Typ.)	9 Watts, without PoE+
Overload Current Protection	YES
Reverse Polarity Protection	Present on terminal block
Physical Characteristics	
Enclosure	IP40 / Military Grade / Aluminum / Class 1 Division 2 / Gas Certified
Dimensions (W x D x H)	60.2(W) x 115.5(D) x 138.5(H) mm (Small Form Factor)
Weight (g)	750 g
Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	5% to 97% Non-condensing
Regulatory Approvals	
EMI	FCC Part 15, CISPR (EN55022) class A
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-11. EN61000-4-6 (CS), EN61000-4-8
Shock	IEC60068-2-27
Free Fall	IEC60068-2-32
Vibration	IEC60068-2-6
Safety	EN60950-1, UL 60950-1, NEMA TS-2
MTBF (Hours) (MIL-HDBK-217F2, GB, GC, 25°C)	294,689
Warranty	5 years
Cryptologic	
Cyber-Secure Video with Clean Code Technology	NSA / CSS Coding Guidelines / with Silicon Enhancements
Exceeds NEMA TS-2 for Traffic Control Equipment	



ORDER Model	Model	Description
	<b>KY-3028EMP+</b>	Industrial 10-Port Managed Ethernet Switch with 7 x 10/100Base-T(X) / and 1 X 10/100/1000 Base(T)X & 2 X 100/1000Base(X) SFP Slots, IP40, Ruggedized
<b>Packing List</b>		<b>Optional Accessories</b> (Can be purchased separately)
<ul style="list-style-type: none"> <li>• KY-3028EMP+</li> <li>• DIN-Rail Kit</li> <li>• Wall-mount Kit</li> <li>• Console Cable</li> <li>•</li> <li>•</li> </ul>		<ul style="list-style-type: none"> <li>• Gigabit SFP's - Single-Mode, Multi-Mode, Copper</li> <li>• Fiber or Copper Cables</li> <li>• KY-120-48 Power Supplies (Select Appropriate Wattage)</li> <li>• Optional DC Pig-Tail / Quick Power</li> </ul>

# Dimensions:



## Technical Specifications Addendum

### Power Supply

Power Consumption: < 9 Watts  
48 ~72 Volts, DUAL DC Input  
Surge Protected

### Critical Alarm Relay

Contact relay: 1A@24Volts DC

### Physical

Height: 115.5 mm  
Width: 60.2 mm  
Depth: 138.5 mm  
Weight: 750 g / 2.7lbs  
Ingress Protection: IP40  
Enclosure: Aluminum Military Grade  
Mounting: DIN rail or panel

### Switch Properties

Switching method: Cut Thru / Non-Blocking Fabric  
Switching latency: 5 us (100Mbps)  
Switching bandwidth: 9.6Gbps  
MAC addresses: 8192  
Priority Queues: 6 / Security Queues: 6  
Frame buffer memory: 8 Mbit  
Simultaneous VLANs: 255  
VLAN ID Range: 1 to 4094  
IGMP multicast groups: 256  
Port rate limiting: Yes  
Store & Forward with Security

### Approvals

Hazardous Locations: Class 1, Div 2  
ISO: Designed and manufactured using a ISO9001: 2008 certified quality program  
CE Marking  
Emissions: FCC Part 15 (Class A),  
EN55022 (CISPR22 Class A)  
UL 60950, EN60950) Safety Approved to 80 Degrees C  
Laser Eye Safety (FDA/CDRH): Complies with SFP specifications.

### EMI Immunity and Environmental Compliance

IEC 61000-6-2 Industrial (Generic)  
IEC 61800-3 Industrial (Variable Speed Drive Systems)  
IEC 61850-3 Electric Utility Substations  
IEEE 1613 Electric Utility Substations  
NEMA TS 2 Traffic Control Equipment

### Warranty

5 Years - Design or manufacturing / Can be extended to 6

### Network Management

HTTP graphical web-based, SSL (128-bit encryption)  
SNMP v1, v2c, v3 (56-bit encryption)  
Telnet, VT100, SSH/SFTP (128-bit encryption)  
Command Line Interface (CLI)  
IEEE PTP1588v2 PTP / Solar Winds Manageable  
Authentication and Accounting - TACACS+ (encrypted),  
RADIUS Client, SSH File Transfer Protocol (SFTP), PPP

### IEEE Compliance

802.3-10BaseT, 802.3ab Gigabit Ethernet, 802.3af/at  
802.3u-100BaseTX, 100BaseFX  
802.3x-Flow Control, IEEE1588-2008- Precision Timing v2  
802.3ad-Link Aggregation  
802.1D-MAC Bridges  
802.1D-Spanning Tree Protocol  
802.1p-Class of Service  
802.1Q-VLAN Tagging  
802.1w-Rapid Spanning Tree Protocol  
802.1x-Port Based Network Access Control  
802.1Q-2005 (formerly 802.1s) MSTP

### IETF RFC Compliance

RFC768-UDP	RFC2460, 4291-IPv6
RFC783-TFTP	RFC3415-SNMPv3-VACM
RFC791-IP	RFC3414-SNMPv3-USM
RFC792-ICMP	SNTP Server / Client
RFC793-TCP	Broadcast Storm Control
RFC826-ARP	DHCP Server
RFC854-Telnet	SNMPv123
RFC894-IP over Ethernet	Port / MAC Binding
RFC1112-IGMP v1	RMON
RFC1519-CIDR	Port Lock
RFC1541-DHCP (client)	LLDP
RFC2030-SNTP	Port Based VLAN
RFC2068-HTTP	ASCII Configuration files
RFC2236-IGMP v2	HTML Configuration files
RFC2284-EAP	802.1Q VLAN
RFC2475-Differentiated Services	RFC4254-SSH connection
RFC2865-RADIUS	RFC4251-SSH Protocol
	RFC4432-SSH Transport
	RFC6668-SHA-2 Data

### IETF SNMP MIBS

RFC1493-BRIDGE-MIB	ITS
RFC1907-SNMPv2-MIB	Transportation
RFC2012-TCP-MIB	Automation
RFC2013-UDP-MIB	Scientific
RFC2578-SNMPv2-SMI	SCADA
RFC2579-SNMPv2-TC	Telecommunications
RFC2819-RMON-MIB	Robotics
RFC2863-IF-MIB	Railway
DDMI - Digital Diagnostic Monitoring	Military
Port Mirroring	Security
TACACS+	Medical

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