KY-3000EM
Cyber-Secure Video

Layer 2, 10 Port, Managed, SCADA, Din-Rail IEC61850, Ethernet Switch, IP40, Hazardous Locations



- 7 X 10/100 & 1 X 10/100/100Base(T)X, RJ-45 Ports & 2 X 100/1000 Base(X) SFP SLOTS)
- 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: 12 ~ 36 Volts DC
- CE, FCC, Cyber-Secure Video Certified

IPv6

CLASS 1 Division 2 - Military Grade

Overview

The KY-3000EM is a High Security & High Performance Industrial Ethernet Switch. It is equipped with DDMI Fiber Diagnostics for Fiber Maintenance & Troubleshooting. Designed for ruggeded applications and harsh environments, the switch supports the IEEE & IEC specifications. Serves the ITS, Industrial markets. This switch is redundantly designed for critical network. The unit supports DHCP and IEEE 1588v2 Precision Timing Protocoll. 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. Ruggedized, Military Grade, with Precision Timing
2. Redundancy - Supports STP / RSTP, MSTP, and FRP Ring Protocols for network reliability
3. Supports DHCP Server & Client
4. Supports Multicast Prococols 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 Mangement: 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,
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
Multilingual, TACACS+
Packet Forwarding Rate: 12.2 Gbps, Wire Speed All Ports
Switching Delay <5us, Secure Alarm <5us
Remote Temperature Sensing

Interfaces

7 X 10/100 & 1 X 10/100/1000Base(T)X RJ-45 &
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-3000EM
Physical Ports	
10/100Base-T(X) RJ-45 Ports	7
100/1000Base-X SFP / RJ45	2 / 1
Technology	
Ethernet Standards	IEEE 802.3 for 10Base-T, 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 µs 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

DYMEC - American Industrial

Fault Contact	
Relay	Relay output to carry capacity of 0.5 Amps @ 48 Volts DC
Power	
Redundant Input Power	Dual DC inputs. 12~36 Volts DC on 7 Pin Block
Power Consumption (Typ.)	9 Watts
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	

IPv6

RPS

ADVANCED QoS

SFP 100/1000

ORDER Model	Model	Description
	KY-3000EM	**Industrial 10-Port Managed Ethernet Switch with 7 x 10/100Base-T(X) / and 1 x 100/1000Base(T)X & 2 X 100/1000Base(X) SFP SLots , IP40, Ruggedized**

Packing List

- KY-3000EM
- DIN-Rail Kit
- Wall-mount Kit
- Console Cable
-
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Optional Accessories (Can be purchased separately)

- Gigabit SFP's - Single-Mode, Multi-Mode, Copper
- Fiber or Copper Cables
- KY-120-X Power Supplies (Select Appropriate Wattage)

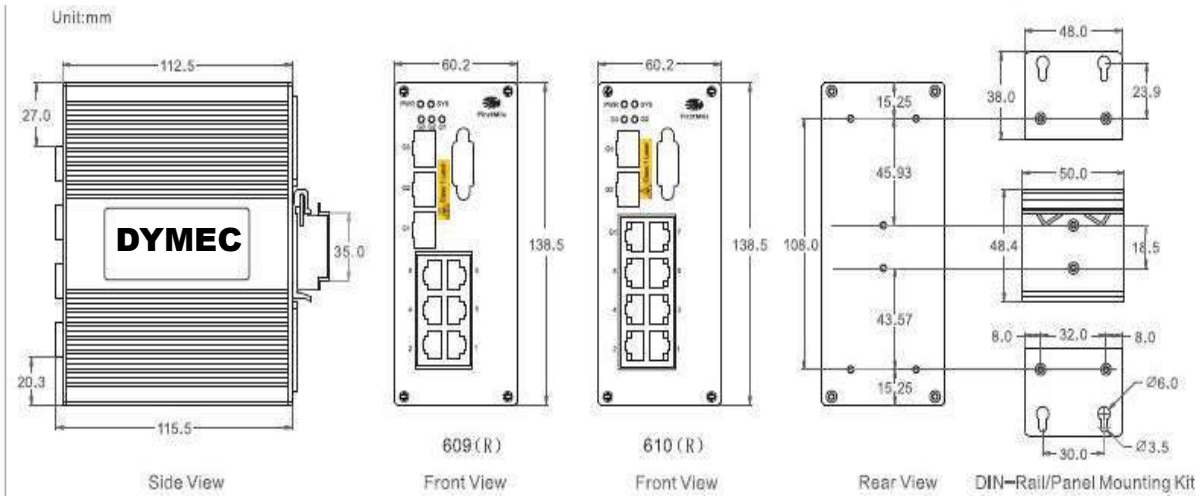
Optional DC Pig-Tail / Quick Power

DYMEC
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EMAIL: Sales@DYMEC.com
Telephone: (816) 988-7861
www.DYMEC.com

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Dimensions:



KY-3000EM
Technical Specifications Addendum

Power Supply

Power Consumption: < 9 Watts
12 ~36 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

DYMEC 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,
802.3u-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
RFC783-TFTP
RFC791-IP
RFC792-ICMP
RFC793-TCP
RFC826-ARP
RFC854-Telnet
RFC894-IP over Ethernet
RFC1112-IGMP v1
RFC1519-CIDR
RFC1541-DHCP (client)
RFC2030-SNTP
RFC2068-HTTP
RFC2236-IGMP v2
RFC2284-EAP
RFC2475-Differentiated Services
RFC2865-RADIUS
RFC2460, 4291-IPv6
RFC3415-SNMPv3-VACM
RFC3414-SNMPv3-USM
SNTP Server / Client
Broadcast Storm Control
DHCP Server
SNMPv123
Port / MAC Binding
RMON
Port Lock
LLDP
Port Based VLAN
ASCII Configuration files
HTML Configuration files
802.1Q VLAN
RFC4254-SSH connection
RFC4251-SSH Protocol
RFC4432-SSH Transport
RFC6668-SHA-2 Data

IETF SNMP MIBS

RFC1493-BRIDGE-MIB
RFC1907-SNMPv2-MIB
RFC2012-TCP-MIB
RFC2013-UDP-MIB
RFC2578-SNMPv2-SMI
RFC2579-SNMPv2-TC
RFC2819-RMON-MIB
RFC2863-IF-MIB
DDMI - Digital Diagnostic Monitoring
Port Mirroring
TACACS+

ITS
Transportation
Automation
Scientific
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Telecommunications
Robotics
Railway
Military
Security
Medical

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EMAIL: Sales@DYMEC.com
Telephone: (816) 988-7861
www.DYMEC.com