SWITCH INDUSTRIAL

Quick Installation Guide

KY-3000EM Series

Industrial Managed Ethernet Switch

⁙ Introduction

KY -3000 S eries are industrial managed redundant Ethernet switches. With complete support of Ethernet Redundancy protocols, Ring (recovery time <10ms over 300 interconnected units, Open-Ring, RSTPe and MSTP/RSTP/STP (IEEE 802.1s/w/D) can protect your critical data from network interruptions or temporary malfunctions with its fast recovery technology. Open-Ring technology is also supported, and is applied for other vendor's proprietary ring. KY--3000EM Series can be managed centralized and convenient by a powerful windows utility- In addition, the wide operating temperature range from -40 C to 80 C can satisfy most of operating environment. Therefore, the switch is one of the most reliable choices for a n y highly-managed Ethernet application.
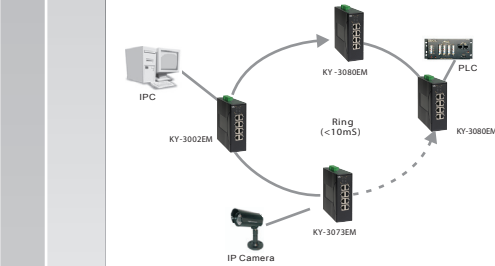
⁙ Features

> World's fastest Redundant Ethernet Ring: Ring (recovery time < 10ms over 300 units connected)
> Cyber-Secure Video with Clean Code Technology (NSA / CSS Coding Guidelines with Silicon Enhancements)
> Open-Ring support f o r the other vendor's ring technology in open architecture
> RSTPe supports applications with complex topologies
> STP/RSTP/MSTP supported
> Supports PTP Client (Precision Time Protocol) clock synchronization
> IGMP snooping for filtering multicast traffic
> Port Trunking for easy of bandwidth management
> RMON for traffic monitoring
> Event notification through Syslog, Email, SNMP trap, and Relay Output
> Port lock to prevent access from unauthorized MAC address
> Windows utility supports centralized management . / Configurable by Web-based, Telnet, Console, CLI
> Very wide operating temperature range from -40 to 80 C
> Rigid IP-30 housing design
> DIN-Rail and panel mounting enabled
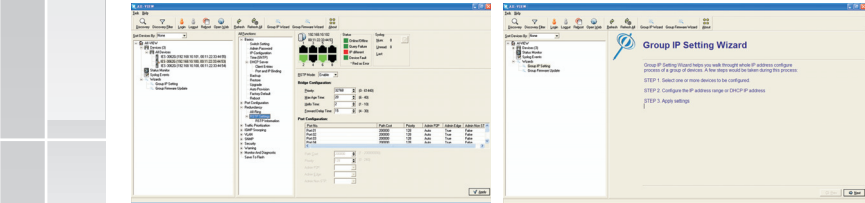
⁙ Ring Ethernet Redundant Technology

KUSA's switches are intelligent switches. Different from other traditional redundant switches, KUSA provides a set of Windows utiliti e s for users to manage and monitor all of industrial Ethernet switches on their industrial network.

◉ Redundant Ring (<10mS): Ring   ◉ Topology View

◉ Monitoring and Configuration interface

⁙ Specifications

◉ 8-port Managed Switches - Featuring Cyber-Secure Video (CSV)

KUSA Switch Models	KY-3000EM	KY-3062EM	KY-3062X-MM	KY-3062MX-SS	KY-3062MF-MM	KY-3062MF-SS
Physical Ports						
10/100 Base-T(X) Ports in RJ45 Auto MDI/MDIX	8	6	6	6	6	6
10/100/1000Base-T(X) Ports in RJ45 Auto MDI/MDIX	-	2	-	-	-	-
100Base-FX Multimode Port (2KM,1310nm,SC connector)	-	-	2	-	-	-
100Base-FX Singlemode Port (30KM,13100nm,SC connector)	-	-	-	2	-	-
1000Base-SX Multimode Port (550M,850nm,SC connector)	-	-	-	-	2	-
1000Base-LX Singlemode Port (10KM,1310nm,SC connector)	-	-	-	-	-	2
1000Base-X SFP Port	-	-	-	-	-	-
Gigabit combo in RJ-45 and SFP	-	-	-	-	-	-
Technology						
Ethernet Standards	IEEE 802.3 for 10Base-T, IEEE 802.3u for 100Base-T(X) and 100Base-FX, IEEE 802.3ab for 1000Base-T, IEEE 802.3ad for LACP (Link Aggregation Control Protocol), IEEE 802.3x for Flow control, 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	4					
Processing	Store-and-Forward					
Switch Properties	Switch latency: 6 us Switch bandwidth: 5.6Gbps Max. Number of Available VLANs: 4096 IGMP multicast groups: 1024 Port rate limiting: User Define					
Security Features	Enable/disable ports, MAC based port security / CYBER-SECURE Video & Clean Code Technology Port based network access control (802.1x) VLAN (802.1q) to segregate and secure network traffic Radius centralized password management SNMPv3 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 units PTP Client (Precision Time Protocol) clock synchronizing function TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and GVRP supported IGMP Snooping for multicast filtering Port configuration, status, statistics, monitoring, security					
Network Redundancy	Ring, Open-Ring, RSTPe, STP, RSTP, MSTP					
RS-232 Serial Console Port	RS-232in RJ45 connector with console cable. Baud rate setting: 9600bps, 8, N, 1					
LED indicators						
Power Indicator	Green: Power LED x3					
R.M. Indicator	Green: Flashing to indicate system operated in Ring Master mode					
Ring indicator	Green: Indicate system operated in Ring mode					
Fault Indicator	Amber: Indicate excepted event occurred					
10/100 Base-T(X)RJ45 Port Indicator	Green for port Link/Act. Amber for Duplex/Collision					
Fiber Port Indicator	Green for port Link/Act. Amber for Link					
Fault contact						
Relay	Relay output to carry capacity of 1A at 24 VDC					
Power						
Redundant Input power	Triple DC inputs. 12-48VDC on 7-pin terminal block, 12-48VDC on power jack					
Power consumption(Typ.)	4 Watts	7 Watts	8 Watts	8 Watts	6 Watts	6 Watts
Overload current protection	Present					
Reverse polarity protection	Present on terminal block					
Physical Characteristic						
Enclosure	IP-30					
Dimension (W x D x H)	52(W)x106(D)x144(H) mm (2.05x4.17x5.67 inch.)					
Weight (g)	710 g	722 g	735 g	735 g	740 g	740 g

Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 80°C (-40 to 176°F)
Operating Humidity	5% to 95% Non-condensing

Regulatory approvals	
EMI	FCC Part 15, CISPR (EN55022) class A. NEMA TS-2 for Traffic Control Equipment
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-4-11
Shock	IEC60068-2-27
Free Fall	IEC60068-2-32
Vibration	IEC60068-2-6
Safety	EN60950-1
Warranty	5 years

◉ 10-port/18-port Managed Switches

KUSA Switch Models	KY-3000EM Cyber-Secure Video	KY-3062EM Cyber-Secure Video	KY-3073EM Cyber-Secure Video
Physical Ports			
10/100 Base-T(X) Ports in RJ45 Auto MDI/MDIX	8	16	7
1000Base-X SFP Port	2	-	-
Gigabit combo in RJ-45 and SFP	-	2	3
Technology			
Ethernet Standards	IEEE 802.3 for 10Base-T, IEEE 802.3u for 100Base-T(X) and 100Base-FX, IEEE 802.3z for 1000Base-X, IEEE 802.3ad for LACP (Link Aggregation Control Protocol), IEEE 802.3x for Flow control, 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)	IEEE 802.3 for 10Base-T, IEEE 802.3u for 100Base-T(X) and 100Base-FX, IEEE 802.3z for 1000Base-X, IEEE 802.3ab for 1000Base-T, IEEE 802.3ad for LACP (Link Aggregation Control Protocol), IEEE 802.3x for Flow control, 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 (Rapid Spanning Tree Protocol), IEEE 802.1x for Authentication, IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)	IEEE 802.3 for 10Base-T, IEEE 802.3u for 100Base-T(X) and 100Base-FX, IEEE 802.3z for 1000Base-X, IEEE 802.3ab for 1000Base-T, IEEE 802.3ad for LACP (Link Aggregation Control Protocol), IEEE 802.3x for Flow control, 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 MSTP, RSTP (Rapid Spanning Tree Protocol), IEEE 802.1s for MSTP (Rapid Spanning Tree Protocol), IEEE 802.1x for Authentication, IEEE 802.1AB for LLDP (Link Layer Discovery Protocol)
MAC Table	8192 MAC addresses		
Priority Queues	4		
Processing	Store-and-Forward		
Switch Properties	Switch latency: 6 us Switch bandwidth: 5.6Gbps Max. Number of Available VLANs: 4096 IGMP multicast groups: 1024 Port rate limiting: User Define	Switch latency: 6 us Switch bandwidth: 7.2Gbps Max. Number of Available VLANs: 4096 IGMP multicast groups: 1024 Port rate limiting: User Defined	Switch latency: 6 us Switch bandwidth: 7.4Gbps Max. Number of Available VLANs: 4096 IGMP multicast groups: 1024 Port rate limiting: User Define
Security Features	Enable/disable ports, MAC based port security Port based network access control (802.1x) VLAN (802.1q) to segregate and secure network traffic Radius centralized password management SNMPv3 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 units PTP Client (Precision Time Protocol) clock synchronizing function TOS/Diffserv supported Quality of Service (802.1p) for real-time traffic VLAN (802.1Q) with VLAN tagging and GVRP supported IGMP Snooping for multicast filtering Port configuration, status, statistics, monitoring, security		
Network Redundancy	Ring, Open-Ring, RSTPe , STP, RSTP, MSTP		
RS-232 Serial Console Port	RS-232in RJ45 connector with console cable. Baud rate setting: 9600bps, 8, N, 1		
LED indicators			
Power Indicator	Green: Power LED x3		

R.M. Indicator	Green: Flashing to indicate system operated in Ring Master mode	
Ring indicator	Green: Indicate system operated in Ring mode	
Fault Indicator	Amber: Indicate unexpected event occurred	
10/100 Base-T(X) RJ45 Port Indicator	Green for port Link/Act. Amber for Duplex/Collision	
10/100/1000Base-T(X) RJ45 Port Indicator	Green for port Link/Act. Amber for 100Mbps indicator	
1000X/Fiber Port Indicator	Green for port Link/Act.	
Fault contact		
Relay	Relay output to carry capacity of 1A at 24 VDC	
Power		
Redundant Input power	Triple DC inputs. 12-48VDC on 7-pin terminal block, 12-45VDC on power jack	Dual DC input 12-48VDC on 6-pin terminal block
Power consumption(Typical)	9 Watts	12 Watts
Overload current protection	YES	
Reverse polarity protection	YES -on terminal block	
Physical Characteristic		
Enclosure	IP-30	
Dimension (W x D x H)	52(W)x106(D)x144(H) mm (2.05x4.17x5.67 inch.)	74.3(W)x109.2(D)x153.6(H) mm (2.93x4.3x6.05 inch.)
Weight (g)	730 g	1070 g
Environmental		
Storage Temperature	-40 to 85°C (-40 to 185°F)	
Operating Temperature	-40 to 80°C (-40 to 176°F)	
Operating Humidity	5% to 95% Non-condensing	
Regulatory approvals		
EMI	FCC Part 15, CISPR (EN55022) class A, NEMA TS-2 for Traffic Control Equipment	
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-4-11	
Shock	IEC60068-2-27	
Free Fall	IEC60068-2-32	
Vibration	IEC60068-2-6	
Safety	EN60950-1	
Warranty	5 years	

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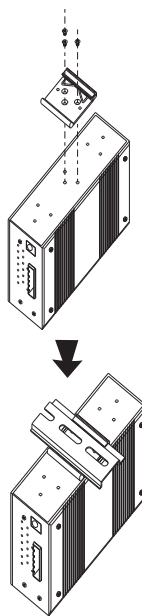# Quick Installation Guide

KY-3000EM Series

Industrial Managed Ethernet Switch
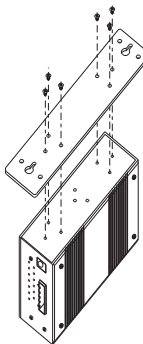
V+ V- G

Installation

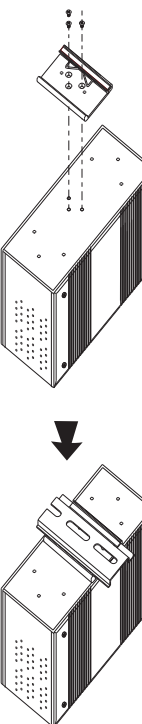### KY-3000 E M /3062 E M /3082 E M Series

■ DIN-Rail Install Step   ■ Wall-mounted Install Step
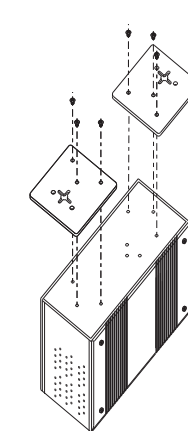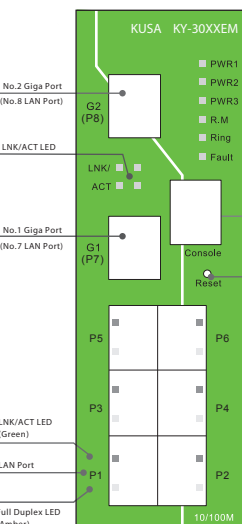

KY-3073EM/ KY-3162EM
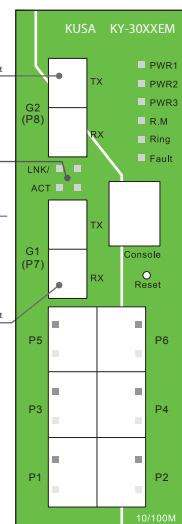
■ DIN-Rail Install Step   ■ Wall-mounted Install Step
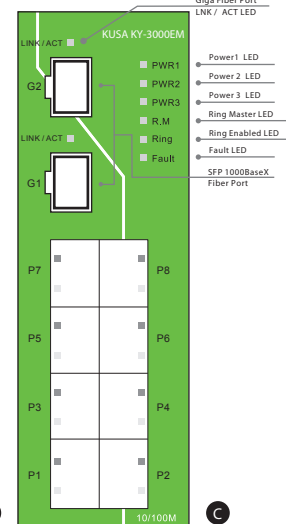

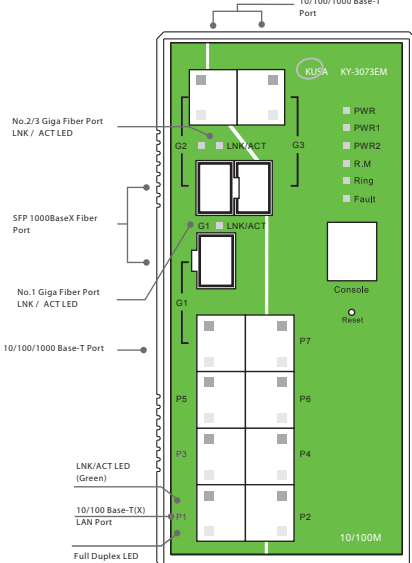## Front Panel

8-port Switches

■ Non-Fiber Product

KUSA KY-30XXEM

No.2 Giga Port (No.8 LAN Port) G2 (P8)
LNK/ACT LED
No.1 Giga Port (No.7 LAN Port) G1 (P7)

PWR1
PWR2
PWR3
R.M
Ring
Fault

LNK/ ACT
Console
Reset

Serial Console Port (Managed Switch Only, 9600 bps, 8N1)
Reset Button

P5 P6
P3 P4
P1 P2

LNK/ACT LED (Green)
LAN Port
Full Duplex LED (Amber)

10/100M

A

■ Fiber Product

KUSA KY-30XXEM

No.2 Giga Fiber Port (No.8 Fiber Port) G2 (P8)
Fiber LNK/ACT LED
No.1 Giga Fiber Port (No.7 Fiber Port) G1 (P7)

PWR1
PWR2
PWR3
R.M
Ring
Fault

TX
RX
LNK/ ACT
TX
RX
Console
Reset

P5 P6
P3 P4
P1 P2

10/100M

B

10-port Switches

■ KY-3082EM

KUSA KY-3000EM

Giga Fiber Port LNK / ACT LED
G2
LNK/ACT
G1

PWR1
PWR2
PWR3
R.M
Ring
Fault

Power1 LED
Power2 LED
Power 3 LED
Ring Master LED
Ring Enabled LED
Fault LED
SFP 1000BaseX Fiber Port

P7 P8
P5 P6
P3 P4
P1 P2

10/100M

C

10-port Switches

■ KY-3073EM

KUSA KY-3073EM

100/100/1000 Base-T Port
No.2/3 Giga Fiber Port LNK / ACT LED
G2 LNK/ACT G3
SFP 1000BaseX Fiber Port
G1 LNK/ACT
No.1 Giga Fiber Port LNK / ACT LED
10/100/1000 Base-T Port

PWR
PWR1
PWR2
R.M
Ring
Fault

Console
Reset

P7
P5 P6
P4
P2

LNK/ACT LED (Green)
10/100 Base-T(X) LAN Port
Full Duplex LED (Amber)

10/100M

D

18-port Switches

■ KY-3162EM

KUSA KY-3162EM

P15 P16
P13 P14
P11 P12
P9 P10

PWR
R.M
PWR1
PWR2
Fault

Console

G2
G1

P7 P8
P5 P6
P3 P4
P1 P2

SFP 1000BaseX Fiber Port
10/100/1000 Base-T Port

Gigabit Combo

10/100M
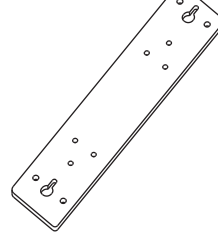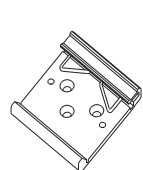
E
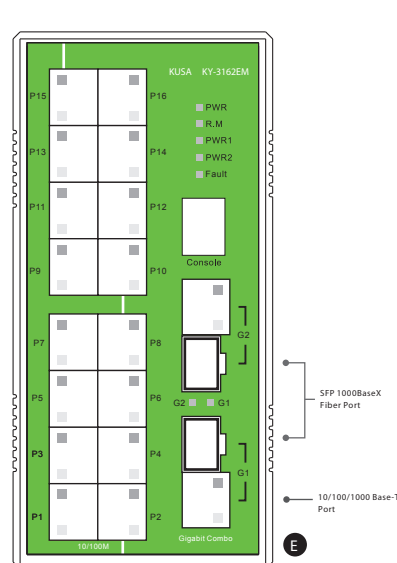
Accessory

① Wall-mounted kit   ② 45mm DIN-Rail kit   ③ Flat Screw (M3 X5)   ④ 7-Pin Terminal block

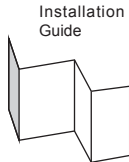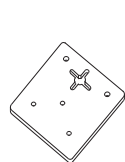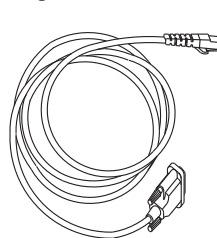⑤ 6-Pin Terminal block   ⑥ Dust Cover (RJ-45)   ⑦ Dust Cover (SFP)   ⑧ CD
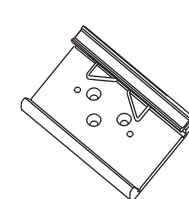
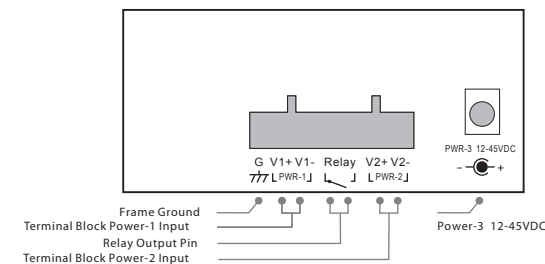⑨ Quick Installation Guide   ⑩ Wall-mounted kit   ⑪ Console Cable   ⑫ 66mm DIN-Rail kit
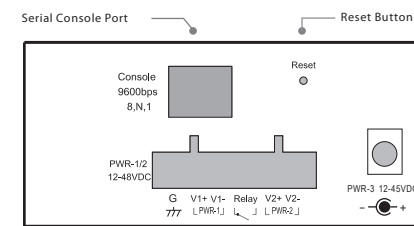
Packing list

Model name	Front Panel	Model Description	Accessory
KY-300XXEM	A	Industrial 8-port managed Ethernet switch with 8x10/100Base-T(X)	⑧X 1, ③X 1, ⑥X 6, ⑦X 1, ④X 8, ⑨X 1, ⑩X 1, ⑪X 1
KY-3062EM	A	Industrial 8-port managed Ethernet switch with 6x10/100Base-T(X) and 2x10/100/1000Base-T(X)	⑧X 1, ③X 1, ⑥X 6, ⑦X 1, ④X 8, ⑨X 1, ⑩X 1, ⑪X 1
KY-3062FX-MM	B	Industrial 8-port managed Ethernet switch with 6x10/100Base-T(X) and 2x100Base-FX, multi-mode	⑧X 1, ③X 1, ⑥X 6, ⑦X 1, ④X 6, ⑨X 1, ⑩X 1, ⑪X 1
KY-3062FX-SS	B	Industrial 8-port managed Ethernet switch with 6x10/100Base-T(X) and 2x100Base-FX, single-mode	⑧X 1, ③X 1, ⑥X 6, ⑦X 1, ④X 6, ⑨X 1, ⑩X 1, ⑪X 1
KY-3062GF-MM	B	Industrial 8-port managed Ethernet switch with 6x10/100Base-T(X) and 2x1000Base-SX, multi-mode	⑧X 1, ③X 1, ⑥X 6, ⑦X 1, ④X 6, ⑨X 1, ⑩X 1, ⑪X 1
KY-3062GF-SS	B	Industrial 8-port managed Ethernet switch with 6x10/100Base-T(X) and 2x1000Base-LX, single-mode	⑧X 1, ③X 1, ⑥X 6, ⑦X 1, ④X 6, ⑨X 1, ⑩X 1, ⑪X 1
KY-3000EM	C	Industrial 10-port managed Ethernet switch with 8x10/100Base-T(X) and 2x100/1000Base-X, SFP socket	⑧X 1, ③X 1, ⑥X 6, ⑦X 1, ④X 8, ⑨X 2, ⑩X 1, ⑪X 1, ②X 1
KY-3073EM	D	Industrial 10-port managed Ethernet switch with 7x10/100Base-T(X) and 3xGigabit combo ports, SFP socket	⑧X 6, ③X 1, ⑦X 10, ⑤X 3, ⑨X 1, ⑩X 1, ④X 2, ⑪X 1
KY-3162EM	E	Industrial 18-port managed Ethernet switch with 16x10/100Base-T(X) and 2xGigabit combo ports, SFP socket	⑧X 6, ③X 1, ⑦X 18, ⑤X 2, ⑨X 1, ⑩X 1, ⑫X 2, ④X 1

Power Connection Guide

8-port Switches

G V1+ V1- Relay V2+ V2-
PWR-1 PWR-2
PWR-3 12-45VDC

Frame Ground
Terminal Block Power-1 Input
Relay Output Pin
Terminal Block Power-2 Input
Power-3 12-45VDC

KY-3082EM

Serial Console Port   Reset Button

Console 9600bps 8,N,1
Reset
PWR-1/2 12-48VDC
PWR-3 12-45VDC

G V1+ V1- Relay V2+ V2-
PWR-1 PWR-2

KY-3073EM/ KY-3162EM

Power Supply
+24V   GND
Warning Device
Power Supply 12-48 VDC   V+ V-
Power Supply 12-48 VDC   V- V+

PWR-2 Fault PWR-1
1A@24V
V2- V2+ V1- V1+ DC12-48V

Frame Ground