KYLAND

CATALOG

KYLAND

Industrializing Ethernet, Simplifying Industrial Communication

Company Introduction

Kyland focuses on research and implementation around the total solution of Industrial Control Networking. We are a leading innovator of solutions in the field of industrial networking technology. Our mission is to build the next generation industrial control ecosystems based on internet connectivity.

Kyland's primary R&D direction is: industrial Ethernet communications technologies, IP-based industrial Fieldbus technologies, network-based field controller technologies, cloud-based industrial controlling server technologies, network-based precise time/clock technologies and control message communication security technologies.

Kyland drove the creation of 3 international standards for industrial automation: IEC61158, IEC62439, IEEEC37.238, and GB/T 30094 for China. Kyland products incorporate international standards - KEMA, IEC 61850, EN50155, CE/FCC, UL508, ATEX, Class1 Div.2 & DNV as required by our vertical market focus. Kyland products have been deployed worldwide and have been proven to meet the requirements of harsh environments like nuclear power plants, substations, oil & gas fields, railway & public transportation, ITS, marine, and military.

Customer Service and Quality Assurance is a priority at Kyland. We offer professional pre and post-sale technical support and application training for our clients. Kyland products are warranted for 5 years. Kyland prides itself in offering products that provide the best price performance ratio in the market.

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Industrial Ethernet Solutions

5 HSR/PRP Redundancy Switches

6 Un-managed Ethernet Switches

7 EN50155 & ITS Ethernet Switches

8 PoE Ethernet Switches

SICOM6496

48G/96+8G Port Layer 3 Managed Rack Mountable Switches

- Modular design, supports max 48 gigabit fiber/copper ports or 8 gigabit SFP ports and 96 fast Ethernet ports
- Supports Layer 3 routing protocols such as RIP, OSPF and PIM
- Supports DT-Ring , MSTP and VRRP for network redundancy
- IP30 protection class

Overview

SICOM6496 is a layer 3 managed industrial Ethernet switch designed to operate reliably in electrically harsh and climatically demanding utility substation and industrial environments. SICOM6496 supports up to 48 gigabit fiber/copper ports or 8 gigabit SFP port and 96 fast Ethernet ports. SICOM6496 is a 19-inch rack mountable device and allows the front and rear panel mounting. SICOM6496 offers hardware wire-speed layer 3 switching, and supports many Layer 2 software features such as port, VLAN, multicast, QoS, fast redundant ring and Layer 3 functions such as RIP, OSFP. It supports Console, Telnet, Web management and network management software based on SNMP. SICOM6496 can provide solutions with high performance and high reliability for the industrial communication systems.

Software Functions

Switching Function

Supports VLAN
Supports GVRP
Supports port aggregation
Supports flow control
Support port rate limit

Redundancy Protocol

Supports VRRP
Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms
Supports RSTP/MSTP and compatible with STP

Multicast Protocol

Supports IGMP v1/v2
Supports IGMP snooping
Supports static multicast
Supports PIM-SM, PIM-DM

Routing Protocol

Supports RIPv1/v2
Supports OSFPv2
Supports static routing

Service Quality Management

Supports ACL
Supports SP and WRR queuing

Management & Maintenance

Supports Console, Telnet, and Web management methods
Supports SNMPv1/v2c and can managed by Kyvision
Supports file transfer and software update over FTP and TFTP
Supports the power alarm, port alarm, and ring alarm
Supports port mirroring
Supports Syslog
Supports LLDP
Supports RTC

IP Address Management

Supports Bootp
Supports DHCP server/relay/client

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)

Version: V1.11

- IEEE 802.3ab (1000Base-T)
- IEEE 802.3ad (port aggregation)
- IEEE 802.3z (1000Base-SX/LX)
- IEEE 802.3x (flow control)
- IEEE 802.1p (priority)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)
- IEEE 802.1s (MSTP)

Switch Properties

Priority queue	8
Number of VLANs	4K
VLAN ID	1–4093
Number of multicast groups	256
Routing table	30K
MAC table	16K
Packet buffer	512 Mbit
Packet forwarding rate	71.4 Mpps
Switching delay	< 10 μs

Interface

Gigabit ports
- 1000Base-X, SFP port
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet ports
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console port	RS232,RJ45
Number of slots	4

LED

LED on front panel
- Running LED: Run
- Power LED: PWR1, PWR2
- Port LED: LINK/ACT, LINK, ACT

Power Requirements

Power input	48DC(36-72VDC), 220AC/DC(85-264VAC/120-300VDC)
Power terminal	3-pin 7.62 mm-spacing plug-in terminal block
Power consumption	<150W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP30
Dimensions(WxHxD)	482.6mm×355mm×405mm (19×13.98×15.94in.)
Weight	<20Kg (44.09 pound)
Mounting	19 inch rack mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	137,000 hrs
Warranty	5 years

Approvals

Please check Kyland website for the latest updates.

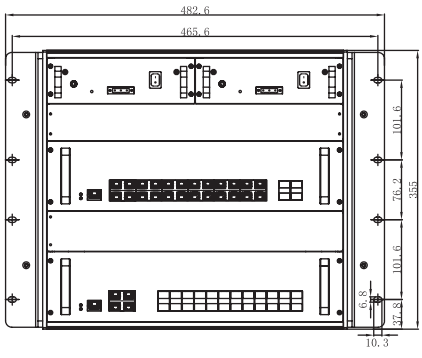
Industry Standard

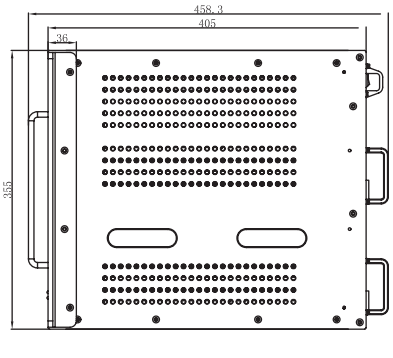
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

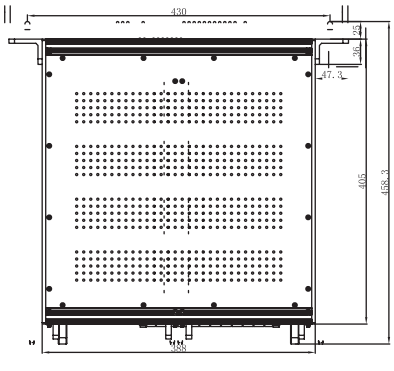
EMS
- IEC61000-4-2(ESD) ±6kV(contact),±8kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±2kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±2kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing







Ordering Information

Chasis	
SICOM6496-MB	SICOM6496 Chassis
Power Supply Module	
SM6.3-Power-H1	220AC/DC(85-264VAC/120-300VDC)
SM6.3-Power-L1	48DC(36-72VDC)
Interface Module	
SM6.3-4G20GE	4x1000Base-X,10/100/1000Base-T(X) Combo port;20x10/100/1000Base-T(X) RJ45 port
SM6.3-4G20GX	4x1000Base-X,10/100/1000Base-T(X) Combo port; 20x1000Base-X,SFP port
SM6.3-4GX48T	4x1000Base-X,SFP port; 48x10/100Base-T(X) RJ45 port
SM6.3-4GX8SFP40T	4x1000Base-X,SFP port; 8x100Base-FX,SFP port; 40x10/100Base-T(X) RJ45 port

Accessories

Accessory Model	Description
Gigabit SFP module	See the selection table of industrial gigabit SFP module.
100M Fiber SFP module	See the selection table of industrial 100M fiber SFP module.
DT-FCZ-RJ45-01	Single-port RJ45 dust plug

SICOM6424SM

24+4G Port Layer 3 Managed Rack Mountable Switches

- Supports max 4 gigabit fiber/copper ports and 24 fast Ethernet fiber/copper ports
- Internal modular design for easy expansion
- Supports Layer 3 routing protocols such as RIP, OSPF and PIM
- Supports DT-Ring , MSTP and VRRP for network redundancy
- Complies with IEC 61850-3 and IEEE1613
- IP40 protection class
- CE, FCC certification

Overview

SICOM6424SM is a layer 3 managed industrial Ethernet switch designed to operate reliably in electrically harsh and climatically demanding utility substation and industrial environments. SICOM6424SM supports up to 4 gigabit fiber/copper ports and 24 fast Ethernet fiber/copper ports, it meets the IEC 61850 and IEEE1613 standards. SICOM6424SM is a 19-inch 1U rack mountable device and allows the front and rear panel mounting. SICOM6424SM offers hardware wire-speed layer 3 switching, and supports many Layer 2 software features such as port, VLAN, multicast, QoS, fast redundant ring and Layer 3 functions such as VRRP, RIP, OSFP and PIM. It supports Console, Telnet, Web management and network management software based on SNMP. SICOM6424SM can provide solutions with high performance and high reliability for the industrial communication systems.

Software functions

Switching Function

Supports VLAN
Supports GVRP
Supports port aggregation
Supports flow control
Support port rate limit

Redundancy Protocol

Supports VRRP
Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms
Supports RSTP/MSTP and compatible with STP

Multicast Protocol

Supports IGMP v1/v2
Supports IGMP snooping
Supports static multicast
Supports PIM-SM, PIM-DM

Routing Protocol

Supports RIPv1/v2
Supports OSFPv2
Supports static routing

Service Quality Management

Supports ACL
Supports SP and WRR queuing

Management & Maintenance

Supports Console, Telnet, and Web management methods
Supports SNMPv1/v2c and can managed by Kyvision
Supports file transfer and software update over FTP and TFTP
Supports the power failure alarm, power alarm, port alarm, and ring alarm
Supports port mirroring
Supports Syslog
Supports LLDP
Supports RTC

IP Address Management

Supports Bootp
Supports DHCP server/relay/client

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)
- IEEE 802.3ab (1000Base-T)
- IEEE 802.3ad (port aggregation)

- IEEE 802.3z (1000Base-SX/LX)
- IEEE 802.3x (flow control)
- IEEE 802.1p (priority)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)
- IEEE 802.1s (MSTP)

Switch Properties

Priority queue	8
Number of VLANs	4K
VLAN ID	1–4093
Number of multicast groups	256
Routing table	16K
MAC table	16K
Packet buffer	512 Mbit
Packet forwarding rate	9.5 Mpps
Switching delay	< 10 μs

Interface

Gigabit ports
- 1000Base-X, SFP port
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet ports
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console port	RS232,RJ45
Alarm contact	3-pin 5.08mm-spacing plug-in terminal block, 250 VAC/220 VDC Max, 2 A Max, 60 W Max

LED

LED on front panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1, PWR2
- Port LED: LINK/ACT, LINK
- Port speed LED: 10M/100M
- Port duplex LED: DPX

Power Requirements

Power input
- 24DC(18-36VDC)
- 48DC(36-72VDC)
- 220AC/DCW(85-264VAC/77-300VDC)

Power terminal	5-pin 5.08 mm-spacing plug-in terminal block
Power consumption	<35W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(WxHxD)	482.6mm×44mm×420mm (19×1.73×16.54 in.)

- Weight 5Kg (11.02 pound)

Mounting	19 inch 1U rack mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	365,000 hrs
Warranty	5 years

Approvals

CE, FCC
Please check Kyland website for the latest updates.

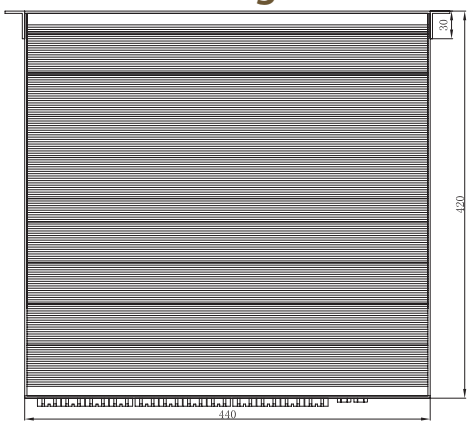
Industry Standard

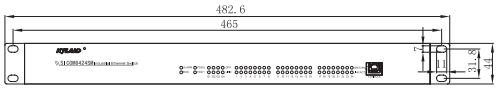
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-8(power frequency magnetic field) 100A/m(cont.),1000A/m(1s-3s)
- IEC61000-4-9(pulsed magnetic field) 1000A/m
- IEC61000-4-10(damped oscillation) 100A/m
- IEC61000-4-12(oscillatory wave) 2.5kV/CM,1kV/DM
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing





Order Information

	SICOM6424SM-Ports-Connector-PS1-PS2
Ports	
4GX24S	4x1000Base-X SFP Port;24x100Base-FX, single-mode fiber port
4GX24M	4x1000Base-X SFP Port;24x100Base-FX, multi-mode fiber port
4GX20S4T	4x1000Base-X SFP Port;20x100Base-FX, single-mode fiber port;4x10/100Base-T(X) RJ45 port
4GX20M4T	4x1000Base-X SFP Port;20x100Base-FX, multi-mode fiber port;4x10/100Base-T(X) RJ45 port
4GX16S8T	4x1000Base-X SFP Port;16x100Base-FX single-mode fiber port;8x10/100Base-T(X) RJ45 port
4GX16M8T	4x1000Base-X SFP Port;16x100Base-FX multi-mode fiber port;8x10/100Base-T(X) RJ45 port
4GX12S12T	4x1000Base-X SFP Port;12x100Base-FX single-mode fiber port;12x10/100Base-T(X) RJ45 port
4GX12M12T	4x1000Base-X SFP Port;12x100Base-FX multi-mode fiber port;12x10/100Base-T(X) RJ45 port
4GX8S16T	4x1000Base-X SFP Port;8x100Base-FX single-mode fiber port;16x10/100Base-T(X) RJ45 port
4GX8M16T	4x1000Base-X SFP Port;8x100Base-FX multi-mode fiber port;16x10/100Base-T(X) RJ45 port
4GX4S20T	4x1000Base-X SFP Port;4x100Base-FX single-mode fiber port;20x10/100Base-T(X) RJ45 port
4GX4M20T	4x1000Base-X SFP Port;4x100Base-FX multi-mode fiber port;20x10/100Base-T(X) RJ45 port
4GX24T	4x1000Base-X SFP Port;24x10/100Base-T(X) RJ45 port
4GE24S	4x10/100/1000Base-T(X) RJ45 port;24x100Base-FX single-mode fiber port
4GE24M	4x10/100/1000Base-T(X) RJ45 port;24x100Base-FX multi-mode fiber port
4GE20S4T	4x10/100/1000Base-T(X) RJ45 port;20x100Base-FX single-mode fiber port;4x10/100Base-T(X) RJ45 port
4GE20M4T	4x10/100/1000Base-T(X) RJ45 port;20x100Base-FX multi-mode fiber port;4x10/100Base-T(X) RJ45 port
4GE16S8T	4x10/100/1000Base-T(X) RJ45 port;16x100Base-FX single-mode fiber port;8x10/100Base-T(X) RJ45 port
4GE16M8T	4x10/100/1000Base-T(X) RJ45 port;16x100Base-FX multi-mode fiber port;8x10/100Base-T(X) RJ45 port
4GE12S12T	4x10/100/1000Base-T(X) RJ45 port;12x100Base-FX single-mode fiber port;12x10/100Base-T(X) RJ45 port
4GE12M12T	4x10/100/1000Base-T(X) RJ45 port;12x100Base-FX multi-mode fiber port;12x10/100Base-T(X) RJ45 port
4GE8S16T	4x10/100/1000Base-T(X) RJ45 port;8x100Base-FX single-mode fiber port;16x10/100Base-T(X) RJ45 port
4GE8M16T	4x10/100/1000Base-T(X) RJ45 port;8x100Base-FX multi-mode fiber port;16x10/100Base-T(X) RJ45 port
4GE4S20T	4x10/100/1000Base-T(X) RJ45 port;4x100Base-FX single-mode fiber port;20x10/100Base-T(X) RJ45 port
4GE4M20T	4x10/100/1000Base-T(X) RJ45 port;4x100Base-FX multi-mode fiber port;20x10/100Base-T(X) RJ45 port
4GE24T	4x10/100/1000Base-T(X) RJ45 port;24x10/100Base-T(X) RJ45 port
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS1	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
PS2	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
None	No secondary power supply

Accessories

Accessory Model	Description
Gigabit SFP module	See the selection table of industrial gigabit SFP module.
DT-FCZ-RJ45-01	Single-port RJ45 dust plug

SICOM6000

24+4G Port Layer 3 Managed Din-rail Modular Backbone Switches

- Supports max 4 gigabit combo ports and 24 fast Ethernet fiber/copper ports
- Modular design for easy expansion
- Embedded serial data server, and supports max 12 RS232/ RS485 ports
- Supports DT-Ring , RSTP/MSTP and VRRP for network redundancy
- Supports IGMP, IGMP snooping, PIM-SM, PIM-DM
- Supports Layer 3 routing protocols such as RIP, OSPF
- IP40 protection class

Overview

SICOM6000 is modular layer 3 managed industrial Ethernet switch for Din Rail installation. It offers 4 combo Gigabit SFP slots or 10/100/1000Base-T(X) ports, 24 100M copper/fiber ports or 12 RS232/ RS485 serial ports. SICOM6000 also comes with EMC industrial level 4 design and complies with IP40 protection class. SICOM6000 offers hardware wire-speed layer 3 switching, and supports many Layer 2 software features such as port, VLAN, multicast, QoS, fast redundant ring. It supports Console, Telnet, Web management and network management software based on SNMP. SICOM6000 can provide solutions with high performance and high reliability for the industrial communication systems.

Software Functions

Switching Function

Supports VLAN
Supports GVRP
Supports port aggregation
Supports flow control
Support port rate limit

Redundancy Protocol

Supports VRRP
Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms
Supports RSTP/MSTP and compatible with STP

Multicast Protocol

Supports IGMP v1/v2
Supports IGMP snooping
Supports static multicast
Supports PIM-SM, PIM-DM

Routing Protocol

Supports RIPv1/v2
Supports OSFPv2
Supports static routing

Service Quality Management

Supports ACL
Supports SP and WRR queuing

Management & Maintenance

Supports Console, Telnet, and Web management methods
Supports SNMPv1/v2c, Kyvision centralized management.
Supports file transfer and software update over FTP and TFTP
Supports the power failure alarm, power alarm, port alarm, and ring alarm
Supports port mirroring
Supports Syslog
Supports LLDP
Supports RTC

IP Address Management

Supports Bootp
Supports DHCP server/relay/client

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100base-FX)

- IEEE 802.3ab (1000Base-T)
- IEEE 802.3ad (port aggregation)
- IEEE 802.3z (1000Base-SX/LX)
- IEEE 802.3x (flow control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)
- IEEE 802.1s (MSTP)

Switch Properties

Priority queue	8
Number of VLANs	4K
VLAN ID	1–4093
Number of multicast groups	256
Routing table	30K
MAC table	16K
Packet buffer	512 Mbit
Packet forwarding rate	9.5 Mpps
Switching delay	< 10 μs

Interface

Gigabit ports
- 1000Base-X, SFP port
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet ports
- 100Base-FX, SFP port, LC connector
- 10/100Base-T(X), RJ45 port

Serial port	RS232/RS485,20-pin 3.81mm-spacing plug-in terminal block
Console port	RS232,RJ45
Alarm contact	3-pin 3.81mm-spacing plug-in terminal block, 250 VAC/220 VDC Max, 2 A Max, 60 W Max
Number of slots	6

LED

LED on front panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: POW, POW1, POW2
- Module status LED: L1 to L4
- Port LED: LINK
- Serial port LED:1T-4T,1R-4R

LED on rear panel
- Port LED: LINK/ACT
- Port speed LED: Speed

Power Requirements

Power input
- 24VDC(18-36VDC)
- 48VDC(36-72VDC)

Power terminal	5-pin 5.08 mm-spacing plug-in terminal block
Power consumption	<35W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(WxHxD)	320mm×165.5mm×236mm (12.60×6.52×9.29 in.)
Weight	<7Kg (15.432 pound)
Mounting	Din-rail or panel mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	251,487 hrs
Warranty	5 years

Approvals

For the latest dynamics of the product, visit the website of Kyland.

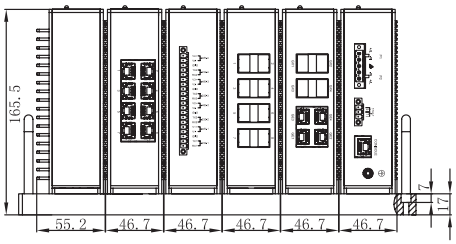
Industry standard

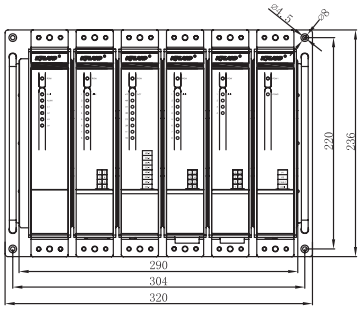
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

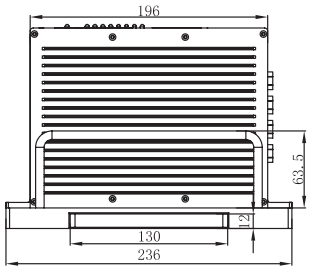
EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing







Ordering Information

Chasis	
SICOM6000-MB	SICOM6000 Chassis
Power Supply Module	
SM6.1-Power-L1	48VDC(36-72VDC), dual redundant power inputs
SM6.1-Power-L3	24VDC(18-36VDC), dual redundant power inputs
Interface Module	
SM6.1-4G	4x1000Base-X, 10/100/1000Base-T(X) Combo port
SM6.1-8T	8x10/100Base-T(X) RJ45 port
SM6.1-8SFP	8x100Base-FX, SFP port
SM6.1-4D	4xRS232/RS485 Serial port

Accessories

Accessory Model	Description
Gigabit SFP module	Please refer to Gigabit SFP module ordering table
100M SFP module	Please refer to 100M SFP module ordering table
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

SICOM3028GPT

28 Port Layer 2/3 Managed Rack Mountable Modular Switches

Preliminary

- Flexible modular design for easy expansion, supports max 28 gigabit fiber/copper ports.
- Supports DT-Ring ,DRP, MSTP and VRRP for network redundancy.
- Supports Layer 3 routing protocols such as RIP and OSPF.
- Supports IEEE 1588v2 and the synchronization precision reaches ±100 ns, supports ITU-T.G.8261/G.8262 synchronous Ethernet and the synchronization precision reaches ±50 ns.
- Supports GPS module, IRIG-B module, PTP over E1/T1 module, TMS-trigger module, serial server module and HSR/PRP module.
- Supports IEC 61850 MMS management.
- Supports cable test.
- IEC61850-3 & IEEE1613 (KEMA certified)
- CE, FCC, EN50155/50121

Overview

SICOM3028GPT is a intelligent modular platform which is an All-in-One solution integrating IEEE 1588v2, Sync-E, full gigabit, and both layer 2 & Layer 3 availability specifically designed to operate reliably in electrically harsh and climatically demanding utility substation and industrial environments. SICOM3028GPT supports up to 28 gigabit fiber/copper ports, meets the IEC 61850 and IEEE1613 standards. SICOM3028GPT is a 19-inch 1U rack mountable device and supports one 1U slot and six 0.5U slots which offers the maximum flexibility for easy expansion. SICOM3028GPT supports IEEE 1588v2 and synchronous Ethernet protocol with hardware time stamping and supports the BC, P2P TC, and E2E TC clock modes, it reaches a timing precision of 100 ns. It supports Power Profile and Telecom Profile, and supports many modules for time synchronous like GPS and IRIG-B module etc. SICOM3028GPT supports many Layer 2 software features such as port, VLAN, multicast, QoS, fast redundant ring and Layer 3 functions such as VRRP, RIP, and OSFP. It supports Console, Telnet, Web management and network management software based on SNMP. By expanding the serial server module, the product can provide up to 24 RS232/422/485 serial ports; by expanding the HSR/PRP module, the product can provide a zero-packet-loss redundancy solution. At present, the product is widely used at the intelligent substation and many other industrial communication systems.

Product Selection Table

Sub-model	Ports	L3 function	Time synchronization
SICOM3028GPT-L2GT	Up to 28 Gigabit ports	Do not support	Support
SICOM3028GPT-L2G	Up to 28 Gigabit ports	Do not support	Do not support
SICOM3028GPT-L2FT	Up to 4 Gigabit ports and 24 Fast Ethernet ports	Do not support	Support
SICOM3028GPT-L2F	Up to 4 Gigabit ports and 24 Fast Ethernet ports	Do not support	Do not support
SICOM3028GPT-L3GT	Up to 28 Gigabit ports	Support	Support
SICOM3028GPT-L3G	Up to 28 Gigabit ports	Support	Do not support
SICOM3028GPT-L3FT	Up to 4 Gigabit ports and 24 Fast Ethernet ports	Support	Support
SICOM3028GPT-L3F	Up to 4 Gigabit ports and 24 Fast Ethernet ports	Support	Do not support

Software Functions

Switching Function

Supports VLAN and PVLAN.
Supports port aggregation.
Supports flow control.
Supports broadcast storm suppression.

Redundancy Protocol

Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms.
Supports DHP and DRP and the recovery time<20 ms.
Supports RSTP/MSTP and compatible with STP.

Multicast Protocol

Supports IGMP snooping.
Supports GMRP.
Supports static multicast.
Supports GOOSE over IP tunnel (receiver)

L3 Function (Supported by partial sub-models only)

Supports RIPv1/v2.
Supports OSFPv2.
Supports BGPv4 (special version supports).
Supports static routing.
Supports VRRP.
Supports GOOSE over IP tunnel (sender)

Security

Supports IEEE 802.1x.
Supports HTTPS/SSL.
Supports SSH.
Supports RADIUS.
Supports TACACS+.
Supports user grading.
Supports MAC address binding.
Supports port isolate.

Service Quality Management

Supports ACL (Web interface doesn't support).
Supports SP and WRR queuing.

Management & Maintenance

Supports Console, Telnet, and Web management methods.
Supports SNMPv1/v2c/v3 and can managed by Kyvision.
Supports IEC 61850 MMS management.
Supports file transfer and software update over FTP and TFTP.
Supports the IP/MAC address conflict alarm, power failure alarm, power alarm, temperature alarm, port alarm, and ring alarm (Web interface doesn't support address conflict alarm).
Supports port mirroring.
Supports cable test (Web interface doesn't support).
Supports Syslog.
Supports LLDP.
Supports Link-check.
Supports NTP and SNTP.
Supports RTC.

IP Address Management

Supports Bootp.
Supports DHCP server/client.

Clock Synchronization (Supported by partial sub-models only)

Supports PTPv2 (IEEE 1588-2008).
Supports Power profile (C37.238).
Supports Telecom profile (in special version).
Supports synchronous Ethernet (ITU-T.G.8261/G.8262).
Supports TMS function.

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)
- IEEE 802.3ab (1000Base-T)
- IEEE 802.3ad (port aggregation)
- IEEE 802.3z (1000Base-SX/LX)
- IEEE 802.3x (flow control)
- IEEE 802.1p (priority)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)
- IEEE 802.1s (MSTP)
- IEEE 802.1x
- IEEE 1588-2008 (PTPv2)
- ITU-T.G.8261/G.8262 (synchronous Ethernet)

Switch Properties

Priority queue	8
Number of VLANs	4K
VLAN ID	1–4093
Number of multicast groups	256
Routing table	8K (L2 chassis do not involve)
MAC table	16K

Packet buffer
- 12Mbit (SICOM3028GPT-L3F/L3FT/L3G/L3GT)
- 8Mbit (SICOM3028GPT-L2F/L2FT/L2G/L2GT)

Packet forwarding rate
- 41.7Mpps (SICOM3028GPT-L2G/L2GT/L3G/L3GT)
- 9.5Mpps (SICOM3028GPT-L2F/L2FT/L3F/L3FT)

Switching delay < 10 μs

Interface

Console port Mini USB, RJ45
Alarm contact
- 3-pin 5.08mm-spacing plug-in terminal block, 250 VAC/220 VDC Max, 2 A Max,10A@1s 60 W Max

Slots for module
- 1U: 1
- 0.5U: 6

LED

LED on front panel
- Alarm LED: Alarm
- Running LED: Run
- Ring Role LED: Ring
- Synchronization finish LED: Lock
- Power LED: PWR1, PWR2
- Port LED: Link/ACT
- Port speed LED: Speed

LED on rear panel
- Port LED: Link/ACT
- Port speed LED: Speed

Power Requirements

Power input
- 24DC (18-36 VDC)
- 48DC (36-72 VDC)
- 220AC/DCW (85-264 VAC/77-300 VDC)

Power terminal
- 5-pin 5.08 mm-spacing plug-in terminal block

Power consumption	< 40 W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(W×H×D)	
▼ 482.6 mm × 44 mm × 359.7 mm	(19×1.73×14.16 in.)
Weight	< 10 Kg (22.046 pound)
Mounting	19 inch 1U rack mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% to 95% (non-condensing)

Quality Assurance

MTBF
- 360,000 hrs (SICOM3028GPT-L2F/L2G)
- 359,000 hrs (SICOM3028GPT-L2FT/L2GT)
- 371,000 hrs (SICOM3028GPT-L3F/L3G)
- 368,000 hrs (SICOM3028GPT-L3FT/L3GT)

Warranty 5 years

Approvals

- KEMA(pending), CE, FCC, EN50155/50121
- Please check Kyland website for the latest updates.

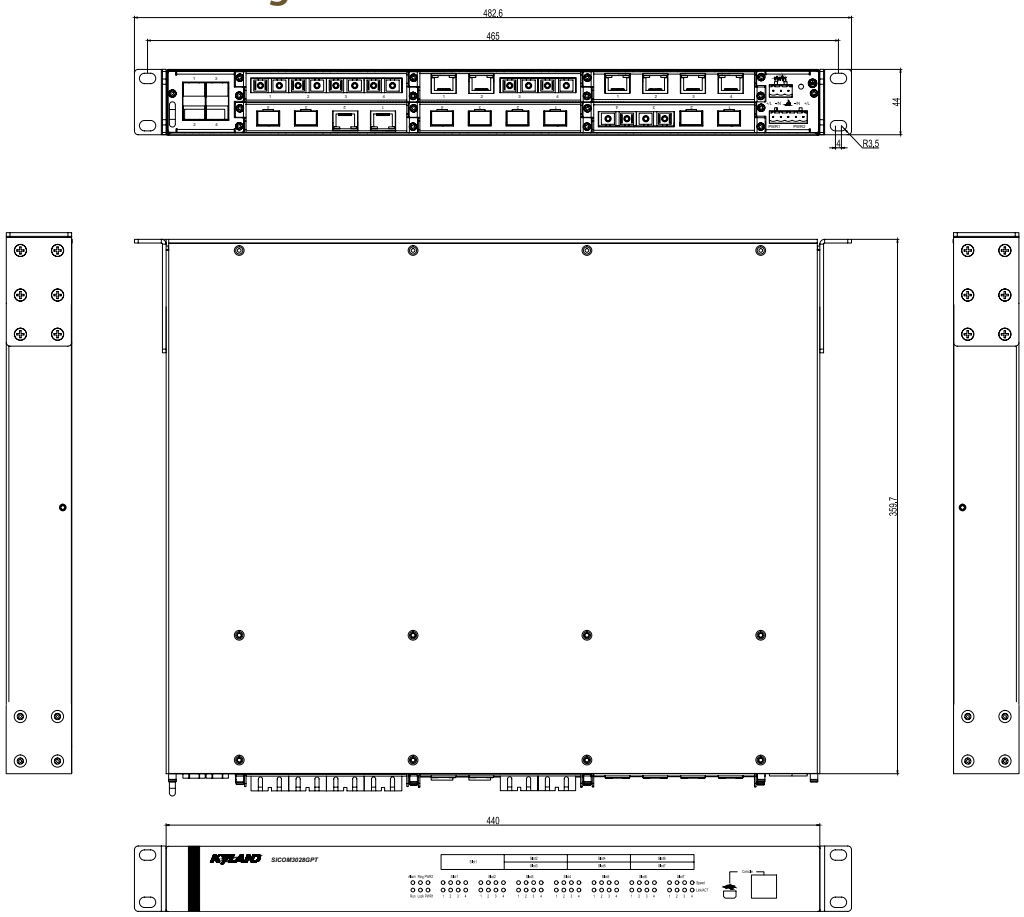
Industry standard

EMI
- FCC CFR47 Part 15, EN55022/CISPR22, Class A

EMS
- IEC61000-4-2(ESD) ±8 kV (contact), ±15 kV(air)
- IEC61000-4-3(RS) 10 V/m (80 MHz-2 GHz)
- IEC61000-4-4(EFT) Power Port: ±4 kV; Data Port: ±2 kV
- IEC61000-4-5(Surge) Power Port: ±2 kV/DM, ±4 kV/CM; Data Port: ±2 kV
- IEC61000-4-6(CS) 3 V (10 kHz-150 kHz); 10 V (150 kHz-80 MHz)
- IEC61000-4-8 (power frequency magnetic field) 100 A/m(cont.), 1000 A/m(1s-3s)
- IEC61000-4-9 (pulsed magnetic field) 1000 A/m
- IEC61000-4-10 (damped oscillation) 100 A/m
- IEC61000-4-12 (oscillatory wave) 2.5 kV/CM, 1 kV/DM
- IEC61000-4-16 (common mode conduction) 30 V(cont.), 300 V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

Chasis	SICOM3028GPT-SM-PS1-PS2
SM	
L2GT-MB	SICOM3028GPT 28G ports L2 Chassis with time synchronization
L2G-MB	SICOM3028GPT 28G ports L2 Chassis
L2FT-MB	SICOM3028GPT 24+4G ports L2 Chassis with time synchronization
L2F-MB	SICOM3028GPT 24+4G ports L2 Chassis
L3GT-MB	SICOM3028GPT 28G ports L3 Chassis with time synchronization
L3G-MB	SICOM3028GPT 28G ports L3 Chassis
L3FT-MB	SICOM3028GPT 24+4G ports L3 Chassis with time synchronization
L3F-MB	SICOM3028GPT 24+4G ports L3 Chassis
PS1	
HV	220AC/DCW (85-264 VAC/77-300 VDC)
L1	48DC (36-72 VDC)
L3	24DC (18-36 VDC)
PS2	
HV	220AC/DCW (85-264 VAC/77-300 VDC)
L1	48DC (36-72 VDC)
L3	24DC (18-36 VDC)
None	No secondary power supply

Ethernet Module	
Slot 1	**SM6.6-Ports-1U**
Ports	
4GX	4x1000Base-X, 10/100/1000Base-T(X) SFP port, 1U
4GE	4x10/100/1000Base-T(X) RJ45 port, 1U
2GX2GE	2x1000Base-X, 10/100/1000Base-T(X) SFP port; 2x10/100/1000Base-T(X) RJ45 port, 1U
Slot2-Slot7	**SM6.6-Ports-Connector-0.5U**
Ports	
4GX	4x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port, 0.5U
4GE	4x10/100/1000Base-T(X) RJ45 port, 0.5U
2GX2GE	2x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port; 2x10/100/1000Base-T(X) RJ45 port, 0.5U
2GX2S	2x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port; 2x100Base-FX, single-mode fiber port, 0.5U
2GX2M	2x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port; 2x100Base-FX, multi-mode fiber port, 0.5U
4S	4x100Base-FX, single-mode fiber port, 0.5U
4M	4x100Base-FX, multi-mode fiber port, 0.5U
2S2T	2x100Base-FX, single-mode fiber port; 2x10/100Base-T(X) RJ45 port, 0.5U
2M2T	2x100Base-FX, multi-mode fiber port; 2x10/100Base-T(X) RJ45 port, 0.5U
4T	4x10/100Base-T(X) RJ45 port, 0.5U
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km

Functional Module	
Slot2-Slot7	
SM6.6-HSR/PRP-GE-0.5U	HSR/PRP Redbox module, 2 1000Base-T RJ45 port
SM6.6-HSR/PRP-GX-0.5U	HSR/PRP Redbox module, 2 1000Base-X SFP port
SM6.6-PTP-BO-0.5U	PTP-to-IRIG-B convertor module, 2 IRIG-B(AC) outputs, 2 IRIG-B(DC) outputs, 1 PPS output
SM6.6-PTP-OVER-E1-0.5U	PTP over E1 clock synchronization module, balance interface
SM6.6-PTP-OVER-E1-UB-0.5U	PTP over E1 clock synchronization module, unbalance interface
SM6.6-GPS-OI-0.5U	GPS clock synchronization module, 1 GPS antenna input, 1 PPS output
SM6.6-GPS-OI-FI-0.5U	GPS clock synchronization module, 1 GPS antenna input, 1 5M/10M frequency input, 1 PPS output
SM6.6-4D-232/485/422-0.5U	Serial port server module, 4 RS232/422/485 serial ports
SM6.6-4D-A-4RS232/422/485-0.5U	Enhanced serial port server module, 4 RS232/422/485 serial ports, supports flow control and optical/electrical isolation
SM6.6-TMS-Trigger-1U	Time Management System trigger module, 1 IRIG-B output, 1 IRIG-B input, 2 channels for signal input, 2 channels for signal output, 1 Console port

Accessories

Accessory Model	Description
Gigabit SFP module	See the selection table of industrial gigabit SFP module.
100M SFP module	See the selection table of industrial 100M SFP module.
DT-FCZ-RJ45-01	Single-port RJ45 dust plug
DT-XL- Mini USB-USB-2m	2m USB console cable
DT-ZJQ-BNC-TNC-01	BNC(female) to TNC(female) connector
DT-XL-LMR400-TNC-BNC-20m	20m coaxial cable with BNC(male) to TNC(male) adaptor
DT-XL-LMR400-TNC-BNC-2m	2m coaxial cable with BNC(male) to TNC(male) adaptor
DT-GPS-ANT-01	GPS antenna, 5 V DC power supply, 1 TNC connector(female)
DT-SP-01	GPS surge protection, TNC connector(male) – TNC connector(female)

Module Adaptive Table

	SICOM3028GPT							
	L2GT	L2G	L2FT	L2F	L3GT	L3G	L3FT	L3F
SM6.6-HSR/PRP-GE-0.5U	√	√	√	√	√	√	√	√
SM6.6-HSR/PRP-GX-0.5U	√	√	√	√	√	√	√	√
SM6.6-PTP-BO-0.5U	√		√		√		√	
SM6.6-PTP-OVER-E1-0.5U	√		√		√		√	
SM6.6-PTP-OVER-E1-UB-0.5U	√		√		√		√	
SM6.6-GPS-OI-0.5U	√		√		√		√	
SM6.6-GPS-OI-FI-0.5U	√		√		√		√	
SM6.6-4D-232/485/422-0.5U	√	√	√	√	√	√	√	√
SM6.6-4D-A-4RS232/422/485-0.5U	√	√	√	√	√	√	√	√
SM6.6-TMS-Trigger-1U	√		√		√		√	
SM6.6-4GX-1U	√	√	√	√	√	√	√	√
SM6.6-4GE-1U	√	√	√	√	√	√	√	√
SM6.6-2GX2GE-1U	√	√	√	√	√	√	√	√
SM6.6-4GX-0.5U	√	√			√	√		
SM6.6-4GE-0.5U	√	√			√	√		
SM6.6-2GX2GE-0.5U	√	√			√	√		
SM6.6-2GX2M-ST05-0.5U	√	√			√	√		
SM6.6-2GX2M-SC05-0.5U	√	√			√	√		
SM6.6-2GX2M-FC05-0.5U	√	√			√	√		
SM6.6-2GX2S-ST40-0.5U	√	√			√	√		
SM6.6-2GX2S-SC40-0.5U	√	√			√	√		
SM6.6-2GX2S-FC40-0.5U	√	√			√	√		
SM6.6-2GX2S-SC60-0.5U	√	√			√	√		
SM6.6-2GX2S-SC80-0.5U	√	√			√	√		
SM6.6-4M-ST05-0.5U	√	√	√	√	√	√	√	√
SM6.6-4M-SC05-0.5U	√	√	√	√	√	√	√	√
SM6.6-4M-FC05-0.5U	√	√	√	√	√	√	√	√
SM6.6-4S-ST40-0.5U	√	√	√	√	√	√	√	√
SM6.6-4S-SC40-0.5U	√	√	√	√	√	√	√	√
SM6.6-4S-FC40-0.5U	√	√	√	√	√	√	√	√
SM6.6-4S-SC60-0.5U	√	√	√	√	√	√	√	√
SM6.6-4S-SC80-0.5U	√	√	√	√	√	√	√	√
SM6.6-2M2T-ST05-0.5U	√	√	√	√	√	√	√	√
SM6.6-2M2T-SC05-0.5U	√	√	√	√	√	√	√	√
SM6.6-2M2T-FC05-0.5U	√	√	√	√	√	√	√	√
SM6.6-2S2T-ST40-0.5U	√	√	√	√	√	√	√	√
SM6.6-2S2T-SC40-0.5U	√	√	√	√	√	√	√	√
SM6.6-2S2T-FC40-0.5U	√	√	√	√	√	√	√	√
SM6.6-2S2T-SC60-0.5U	√	√	√	√	√	√	√	√
SM6.6-2S2T-SC80-0.5U	√	√	√	√	√	√	√	√
SM6.6-4T-0.5U	√	√	√	√	√	√	√	√

GPT – Ethernet Modules

Ethernet Module for SICOM3028GPT

Preliminary

Ethernet Modules

Model	Image
SM6.6-4GX-1U	
SM6.6-4GE-1U	
SM6.6-2GX2GE-1U	
SM6.6-4GX-0.5U	
SM6.6-2GX2GE-0.5U	
SM6.6-4GE-0.5U SM6.6-4T-0.5U	

Model	Image
SM6.6-4M-SC05-0.5U SM6.6-4S-SC40-0.5U SM6.6-4S-SC60-0.5U SM6.6-4S-SC80-0.5U	
SM6.6-4M-ST05-0.5U SM6.6-4S-ST40-0.5U	
SM6.6-4M-FC05-0.5U SM6.6-4S-FC40-0.5U	
SM6.6-2GX2M-SC05-0.5U SM6.6-2GX2S-SC40-0.5U SM6.6-2GX2S-SC60-0.5U SM6.6-2GX2S-SC80-0.5U	
SM6.6-2GX2M-ST05-0.5U SM6.6-2GX2S-ST40-0.5U	
SM6.6-2GX2M-FC05-0.5U SM6.6-2GX2S-FC40-0.5U	
SM6.6-2M2T-SC05-0.5U SM6.6-2S2T-SC40-0.5U SM6.6-2S2T-SC60-0.5U SM6.6-2S2T-SC80-0.5U	
SM6.6-2M2T-ST05-0.5U SM6.6-2S2T-ST40-0.5U	
SM6.6-2M2T-FC05-0.5U SM6.6-2S2T-FC40-0.5U	

Key Features

- Designed for the SICOM3028GPT series and managed by SICOM3028GPT chassis.
- 1U or 0.5U structures, supports Gigabit/fast Ethernet, fiber/copper.
- Supports hot-swap for easy maintenance (only can replace the same type of module)

Overview

Ethernet modules are specifically designed for the SICOM3028GPT series to provide Ethernet data switching. These modules support Gigabit/fast Ethernet fiber/copper port, fast Ethernet fiber port supports single/multi mode and ST/SC/FC connector.

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-SX/LX)

Interface

Gigabit ports
- 1000Base-X, 100Base-FX, SFP port
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet ports
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 100Base-FX, SFP port(LC connector)
- 10/100Base-T(X), RJ45 port

LED
- Port LED: Link/ACT
- Port speed LED: Speed

Physical Characteristics

Housing Metal
Cooling Natural cooling, fanless
Dimensions(WxHxD)
- 1U:50.8mm×41.1mm×109.2mm(2×1.62×4.30 in.)
- 0.5U:122.6mm×20.25mm×106.6mm(4.83×0.80×4.20 in.)

Weight 0.3Kg (0.661 pound)

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Power Requirements

Power input 3.3VDC
Power terminal
- A type interface (powered by backplane)

Power consumption <3W

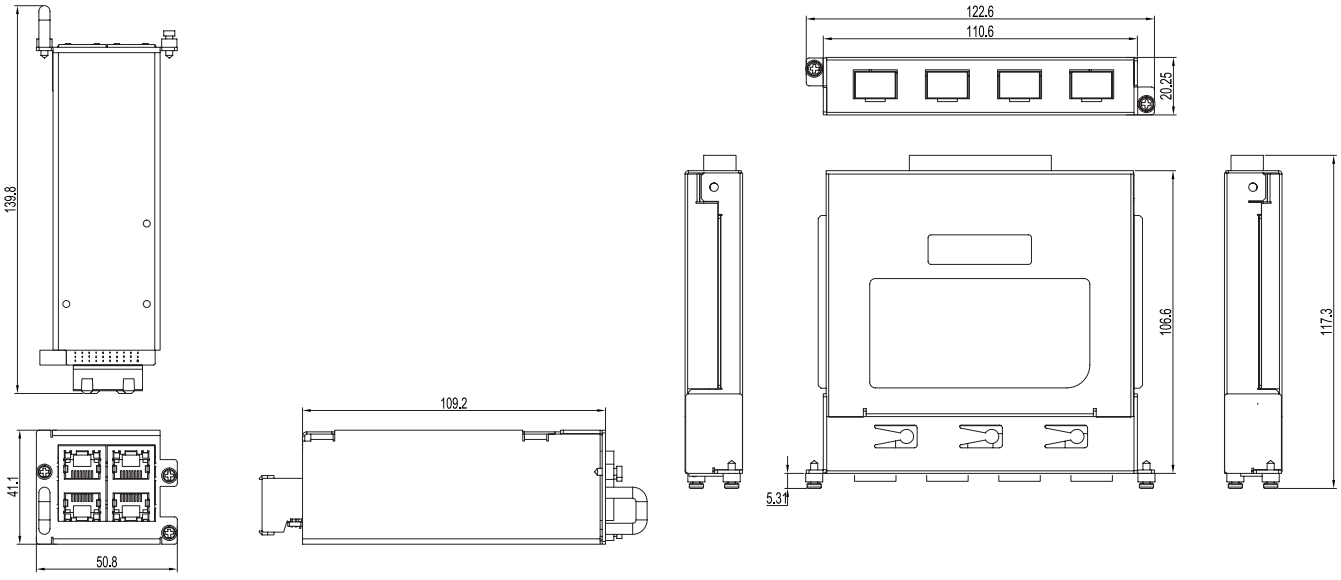
Quality Assurance

Warranty 5 years

Approvals

CE , FCC
Please visit www.kyland.com for the latest news

Mechanical Drawing



Ordering Information

Ethernet Module	
Slot 1	**SM6.6-Ports-1U**
Ports	
4GX	4x1000Base-X, 10/100/1000Base-T(X) SFP port, 1U
4GE	4x10/100/1000Base-T(X) RJ45 port, 1U
2GX2GE	2x1000Base-X, 10/100/1000Base-T(X) SFP port; 2x10/100/1000Base-T(X) RJ45 port, 1U
Slot2-Slot7	**SM6.6-Ports-Connector-0.5U**
Ports	
4GX	4x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port, 0.5U
4GE	4x10/100/1000Base-T(X) RJ45 port, 0.5U
2GX2GE	2x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port; 2x10/100/1000Base-T(X) RJ45 port, 0.5U
2GX2S	2x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port; 2x100Base-FX, single-mode fiber port, 0.5U
2GX2M	2x1000Base-X, 100Base-FX, 10/100/1000Base-T(X) SFP port; 2x100Base-FX, multi-mode fiber port, 0.5U
4S	4x100Base-FX, single-mode fiber port, 0.5U
4M	4x100Base-FX, multi-mode fiber port, 0.5U
2S2T	2x100Base-FX, single-mode fiber port; 2x10/100Base-T(X) RJ45 port, 0.5U
2M2T	2x100Base-FX, multi-mode fiber port; 2x10/100Base-T(X) RJ45 port, 0.5U
4T	4x10/100Base-T(X) RJ45 port, 0.5U
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km

GPT-GPS Module

GPS Module for SICOM3028GPT

Preliminary

- Designed for the SICOM3028GPT-L2GT,SICOM3028GPT-L2FT,SICOM3028GPT-L3GT,SICOM3028GPT-L3FT and managed by SICOM3028GPT chassis
- 14 channels GPS C/A coding receiver
- High precision stable crystal oscillator with excellent time keeping performance
- One PPS +5V TTL level output with BNC connector
- Supports one 5M/10M frequency input. (optional)
- Supports hot-swap for easy maintenance (only can replace the same type of module)

Overview

GPS clock synchronization module is specifically designed for SICOM3028GPT series which support PTP protocol. The GPS receiver and precise clock included in the module can provide an extremely precise GPS signal for host switches. The module also can provide high precision clock when the GPS signal is temporarily lost.

Product Specifications

Technical Specifications

Receiver	14 channels GPS C/A coding receiver
Sensitivity	
▼ Tracking Sensitivity: -160 dBm	
▼ Acquisition Sensitivity: -155 dBm	
Operating frequency	1575.42MHz±1.023MHz

Interface

GPS Input:	5VDC, BNC connector
PPS Output:	+5V, 50Ω, adjustable pulse width, BNC connector
Frequency input	5M/10M,Sine waveform, amplitude 1-3.3Vrms,BNC connector

LED

LEDs on front panel
- ▼ Satellite positioning LED: Fix
- ▼ System clock lock LED: Lock

Power Requirements

Power input	3.3VDC
Power terminal	
▼ A type interface (powered by backplane)	
Power consumption	<4.5W (booting), 3W (operating)

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Dimensions(WxHxD)	122.6mm×20.25mm×106.6mm (4.83×0.80×4.20 in.)
Weight	0.3Kg (0.661 pound)

Environmental Limits

Operating temperature	0°C to +50°C (32°F to 122°F)
Storage temperature	-20°C to +70°C (-4°F to 158°F)
Ambient Relative Humidity	5%-95% (non-condensing)

Quality Assurance

Warranty	5 years

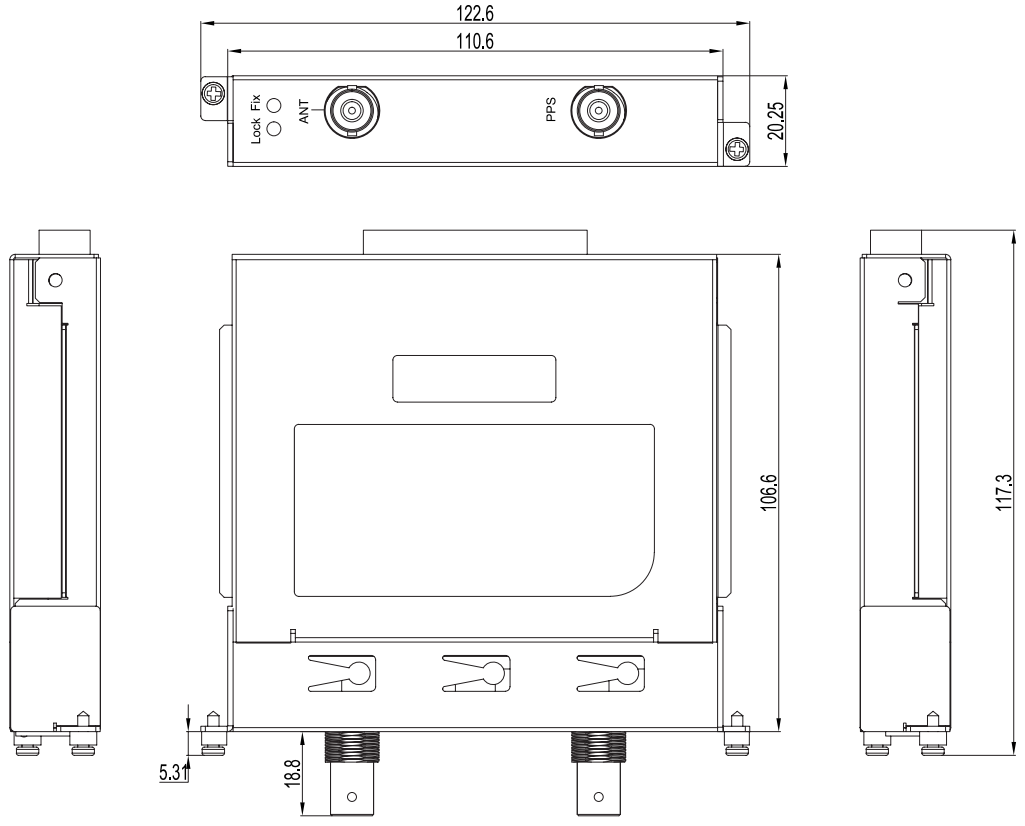
Approvals

CE (pending),
FCC (pending)
Please check Kyland website for the latest updates.

GPS Precision Parameters

	SM6.6-GPS-OI
Short term stability (t=1s)	$1x10^{-9}$ s
PPS precision	±100ns
1 day free run precision	$±2x10^{-8}$ s
1 year free run precision	$±4x10^{-7}$ s
GPS clock synchronization precision	$±1x10^{-11}$ s
Clock accuracy for 1 hour free run	±6 μs
Clock accuracy for 1 day free run	±865 μs
Clock accuracy for 1 year free run	±6.3 s
Time drifts with temperature changes while free run	$±2x10^{-7}$ s (0-50°C)
Lock time	<20 min (Cold boot, typical value)

Mechanical Drawing



Ordering Information

Model	Description
SM6.6-GPS-OI-0.5U	GPS module, one GPS input, BNC connector; one PPS output, BNC connector
SM6.6-GPS-OI-FI-0.5U	GPS module, one GPS input, BNC connector; one 5M/10M frequency input, BNC connector; one PPS output, BNC connector

GPT-IRIG-B Module

IRIG-B Module for SICOM3028GPT

Preliminary

- Designed for the SICOM3028GPT-L2GT,SICOM3028GPT-L2FT,SICOM3028GPT-L3GT,SICOM3028GPT-L3FT and managed by SICOM3028GPT chassis.
- PTP to IRIG-B high precision clock converting
- 2 IRIG-B(DC), 2 IRIB-B(AC), and 1 PPS outputs
- Supports IRIG-B000,B001,B002,B003,B004,B005,B006,B007,B120,B121,B122,B123,B124,B125,B126,B127 output
- Supports hot-swap for easy maintenance (only can replace the same type of module)

Overview

IRIG-B PTP clock converter output module is specifically designed for SICOM3028GPT series which support PTP protocol. It realizes the conversion from PTP to IRIG-B clock and PPS (Pulse Per Second). This allows the IRIG-B format industrial devices to receive PTP high precision clock through our switches conveniently. This enables a high precision synchronization in the whole industrial network. The module provides two IRIG-B (DC) outputs, two IRIG-B (AC) outputs and one PPS output.

Product Specifications

Interface

IRIG-B(DC)
- TTL, +5V level, 50Ω, trigger by rising edge, port load: 75mA,
- BNC connector or 2-Pin 5.08mm-spacing plug-in terminal block socket

IRIG-B(AC)
- Vp-p software adjustable, 600Ω, modulation ratio software
- adjustable, BNC connector or 2-Pin 5.08mm-spacing plug-in terminal block socket

PPS
- TTL, +5V level, 50Ω, trigger by rising edge, pulse width 20ms-200ms, software adjustable with step of 1ms, BNC connector

LED

LED on front panel
- Module running LED: Run

Power Requirements

Power input	3.3VDC
Power terminal	A type interface (powered by backplane)
Power consumption	<1W

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Dimensions(WxHxD)	122.6mm×20.25mm×106.6mm (4.83×0.80×4.20 in.)
Weight	0.35Kg (0.772 pound)

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5%-95% (non-condensing)

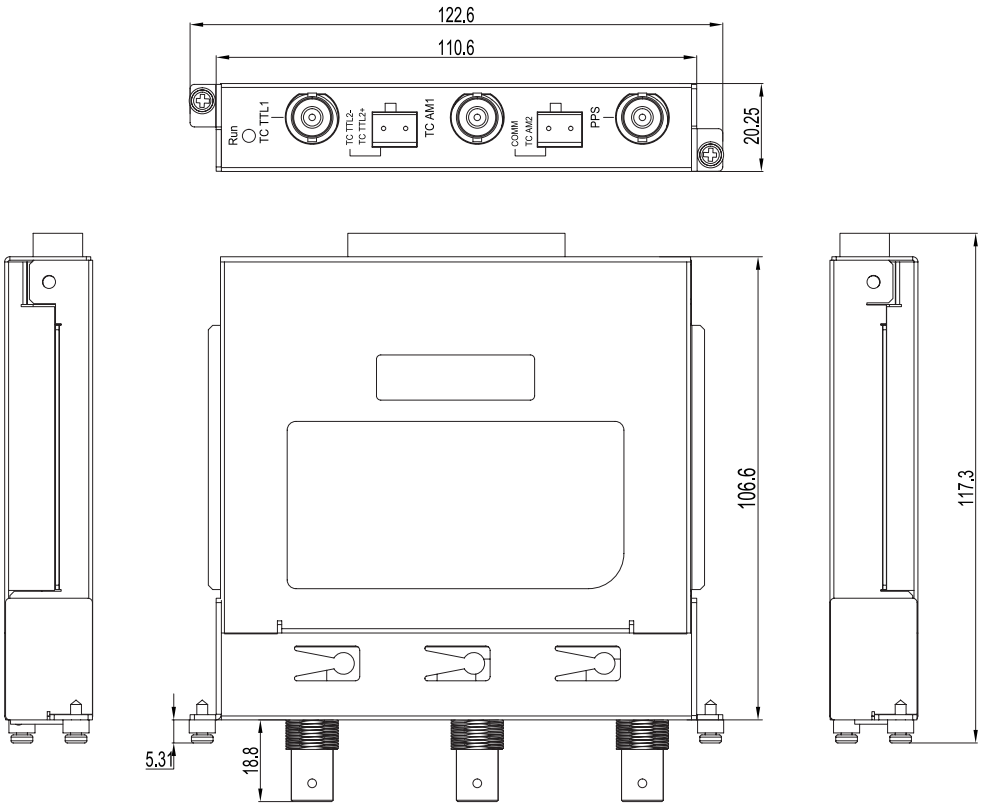
Quality Assurance

Warranty	5 years

Approvals

CE(pending), FCC (pending)
Please check Kyland website for the latest updates.

Mechanical Drawing



Ordering Information

Model	Description
SM6.6-PTP-BO-0.5U	IRIG-B module, 2 IRIG-B(DC), 2 IRIB-B(AC), and 1 PPS outputs

GPT-PTP over E1/T1 Module

PTP over E1/T1 Module for SICOM3028GPT

Preliminary

- Designed for the SICOM3028GPT-L2GT,SICOM3028GPT-L2FT,SICOM3028GPT-L3GT,SICOM3028GPT-L3FT and managed by SICOM3028GPT chassis.
- Plug-in interface module for time sync over SDH network
- ITU-T compliant E1/T1 interface with balanced or unbalance connection
- Less than 1μs synchronization accuracy
- Supports hot-swap for easy maintenance (only can replace the same type of module)

Overview

PTP over E1/T1 precision clock interface module is specifically designed for SICOM3028GPT series which support PTP protocol. It realizes precise transmission of Ethernet based clock messages over traditional SDH network with an accuracy of less than 1μs.

Product Specifications

Interface

E1/T1 Interface
- Speed: 2.048Mbps(E1), 1.544Mbps(T1)
- Resistor: Unbalanced 75Ω,Balanced 120Ω
- Connector: Unbalanced BNC, Balanced 4-pin 5.08 mm-spacing plug-in terminal block
- Electrical: ITU-T G.703, G.704
- Standard: ITU-T G.823

LED

LEDs on front panel
- Running LED: RUN
- Ethernet LED: Ethernet
- E1 LED: Link,Loss

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Dimensions(WxHxD)	122.6mm×20.25mm×106.6mm (4.83×0.80×4.20 in.)
Weight	0.3Kg (0.661 pound)

Power Requirements

Power input	3.3VDC
Power terminal	A type interface (powered by backplane)
Power consumption	<3W

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5%-95% (non-condensing)

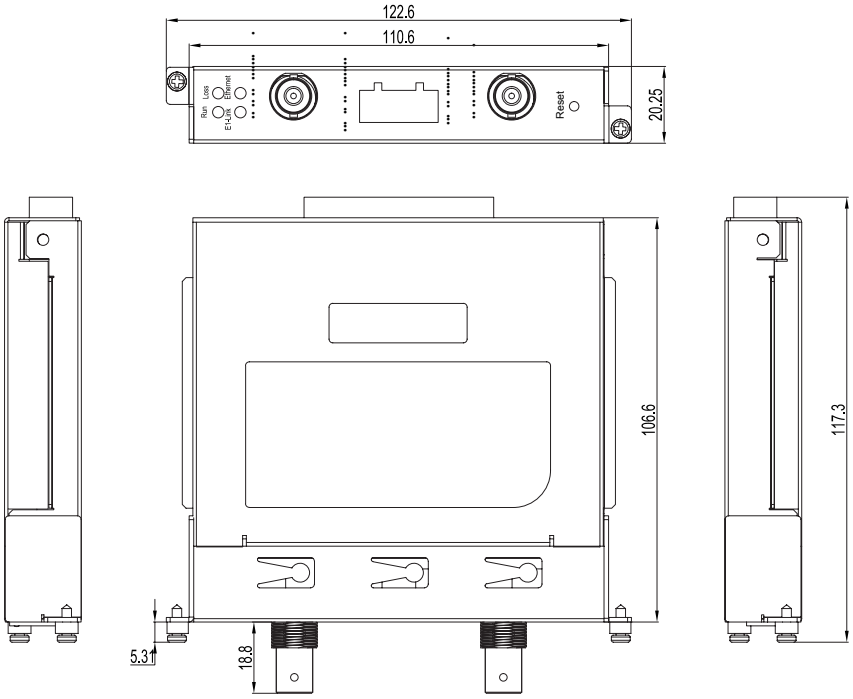
Quality Assurance

Warranty	5 years

Approvals

CE (pending), FCC (pending)
Please check Kyland website for the latest updates.

Mechanical Drawing



Ordering Information

Model	Description
SM6.6-PTP-OVER-E1-0.5U	PTP over E1 module, Balanced interface
SM6.6-PTP-OVER-E1-UB-0.5U	PTP over E1 module, Unbalanced interface

GPT-HSR/PRP Module

HSR/PRP Module for SICOM3028GPT

Preliminary

- Plug-in Redbox module for reliable industrial networking in SICO3028GPT series
- Full FPGA hardware solution with low switching latency
- Compliant implementation of HSR (IEC62439-3-5) and PRP (IEC62439-3-4)
- Supports hot-swap for easy maintenance (only can replace the same type of module)

Overview

HSR/PRP module is a plug-in Redbox module specially designed for SICOM3028GPT series realizing both IEC62439-3-5/HSR (High-availability Seamless Redundancy) and IEC62439-3-4/PRP (Parallel Redundancy Protocol). The selection of HSR and PRP is configurable in the software. This plug-in Redbox module, which supports two Gigabit ports, is a full FPGA hardware solution with low switching latency and high communication efficiency. Enriched with this HSR/PRP module, a reliable redundancy network with Zero Recovery Time and Zero Packet Loss can be established with the deployment of SICOM3028GPT series.

Product Specifications

Interface

Port A	1000Base-T RJ45 port or 1000Base-X SFP port
Port B	1000Base-T RJ45 port or 1000Base-X SFP port
Backplane	1000Base-T port

Technical Specifications

Protocol	HSR,PRP
Switching delay	< 3us
MAC table	512
Number of ring node	30

LED

LED on front panel	Port LED: Link/ACT Port speed LED: Speed

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Dimensions(WxHxD)	122.6mm×20.25mm×106.6mm (4.83×0.80×4.20 in.)
Weight	0.3Kg (0.661 pound)

Power Requirements

Power input	3.3VDC
Power terminal	A type interface (powered by backplane)
Power consumption	<5W

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5%-95% (non-condensing)

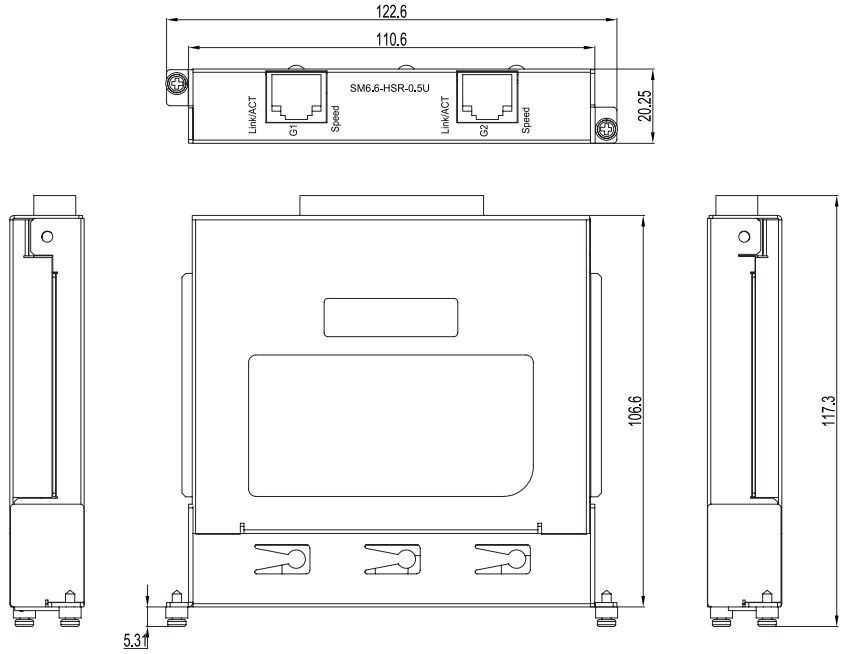
Quality Assurance

Warranty	5 years

Approvals

KEMA (pending), CE (pending), FCC (pending)
Please check Kyland website for the latest updates.

Mechanical Drawing



Ordering Information

Model	Description
SM6.6-HSR/PRP-GE-0.5U	HSR/PRP Redbox module,2x1000Base-T RJ45 port
SM6.6-HSR/PRP-GX-0.5U	HSR/PRP Redbox module,2x1000Base-X SFP port

GPT-Serial Device Server Module

Serial Device Server Module For SICOM3028GPT

Preliminary

- 4 RS232/422/485 serial ports, one 100M interface (backplane)
- Supports VLAN, white list, data mirror, configuration import/export.
- Reset button for easy module reset without need to reboot the device
- ±15kV ESD protection circuit for each serial port
- Compliant with EMC industrial level 4
- Supports hot-swap for easy maintenance (only can replace the same type of module)

Overview

Serial device server module is specially designed for SICOM3028GPT series supporting 4 selectable RS232 RS422 and RS485 serial ports in 10 pin RJ50 connector, isolated IP address and management. The enhanced version supports RTS carrier flow control, Optoelectronic isolation etc. This serial module is fully compliant with EMC level 4 with each serial port integrated with ±15KV ESD protection circuit. It enriches SICOM3028GPT series with standard serial device server functionalities for utility applications.

Software functions

Serial Port Function

Supports RS232/RS422/RS485 mode.
Supports RTS carrier flow control.
Supports TCP/UDP protocol
Supports VLAN
Supports static route
Supports white list

Management & Maintenance

Supports serial data mirror.
Supports configuration import/export.
Supports SSH
Supports SNTP.

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)
- IEEE 802.3x (flow control)

Interface

Serial port
- 4 RS232/422/485 serial ports, 10 pin RJ50 connector
- Bit error rate: 0
- Electrical characteristic: 3 wire RS232(5 wire RS232 for enhanced version), 4 wire RS422, 2 wire RS485
- Data bits: 5,6,7,8, default is 8
- Stop bits: 1, 1.5, 2, default is 1
- Parity bits: None, Even, Odd, Space, Mark, default is None
- Flow control: XON/XOFF, default is XOFF
- Baud Rate: 50bps-1000Kbps, default is 9600

LED

LED on front panel
- Running LED: RUN
- Serial port LED: TX,RX

Button

Reset: Serial device server system reboot

Transmission Distance

Serial port
- RS232: 15m;
- RS422/485: 1200m

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Dimensions(WxHxD)	122.6mm×20.25mm×106.6mm (4.83×0.80×4.20 in.)

Weight	0.22Kg (0.485 pound)

Power Requirements

Power input	3.3VDC
Power terminal	A type interface (powered by backplane)
Power consumption	<2.5W

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

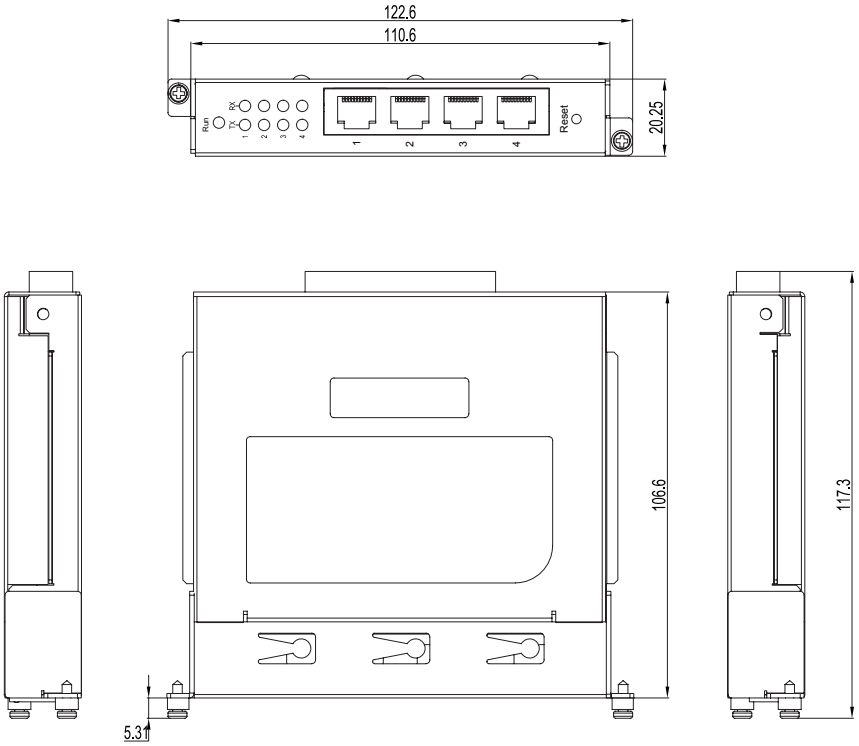
Quality Assurance

Warranty	5 years

Approvals

CE (pending), FCC (pending)
Please check Kyland website for the latest updates.

Mechanical Drawing



Ordering Information

Model	Description
SM6.6-4D-232/422/485-0.5U	Serial device server module, 4xRS232/422/485 serial port
SM6.6-4D-A-4RS232/422/485-0.5U	Serial device server module enhanced version, 4xRS232/422/485 serial port, supports RTS carrier flow control, Optoelectronic isolation

TMS-Trigger Module

TMS-Trigger Module for SICOM3028GPT

Preliminary

- Designed for the SICOM3028GPT-L2GT,SICOM3028GPT-L2FT,SICOM3028GPT-L3GT,SICOM3028GPT-L3FT and managed by SICOM3028GPT chassis.
- Internal time synchronized as PTP slave with SICOM3028GPT chassis
- Supports GOOSE publish and MMS report
- Supports optical/electrical signal input/output
- Supports hot-swap for easy maintenance (only can replace the same type of module)

Overview

TMS-trigger module is specifically designed for SICOM3028GPT series which support PTP protocol. This module works as a part of TMS(Time Management System), provide accurate trigger and response, it realizes the real-time monitoring to the synchronization condition of various devices in the network.

Product Specifications

Technical Specifications

Standard
- IEEE 1588-2008(PTPv2)
- IEC 61850-8-1(GOOSE and MMS)

Interface

IRIG-B port
- IRIG-B DC input/output, TTL, 4-pin 3.81mm-spacing plug-in terminal block

Electrical signal input
- Pulse, VDC110/220, 2-pin 3.81mm-spacing plug-in terminal block

Electrical signal output
- Pulse, 2-pin 3.81mm-spacing plug-in terminal block

Optical signal input
- Pulse, multi-mode SC connector

Optical signal output
- Pulse, multi-mode SC connector

Console port
- RS232,RJ45

LED

Running LED: Run
Power LED: PWR
Electrical signal output LED: DO1
Electrical signal input LED: DI1
Optical signal output LED: DO2
Optical signal input LED: DI2

Power Requirements

Power input	3.3VDC
Power terminal	A type interface (powered by backplane)
Power consumption	<1.5W

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Dimensions(WxHxD)	
▼ 122mm×41mm×106.6mm(4.80×1.61×4.20 in.)	
Weight	0.5Kg (1.102 pound)

Environmental Limits

Operating temperature	-20°C to +85°C (-4°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5%-95% (non-condensing)

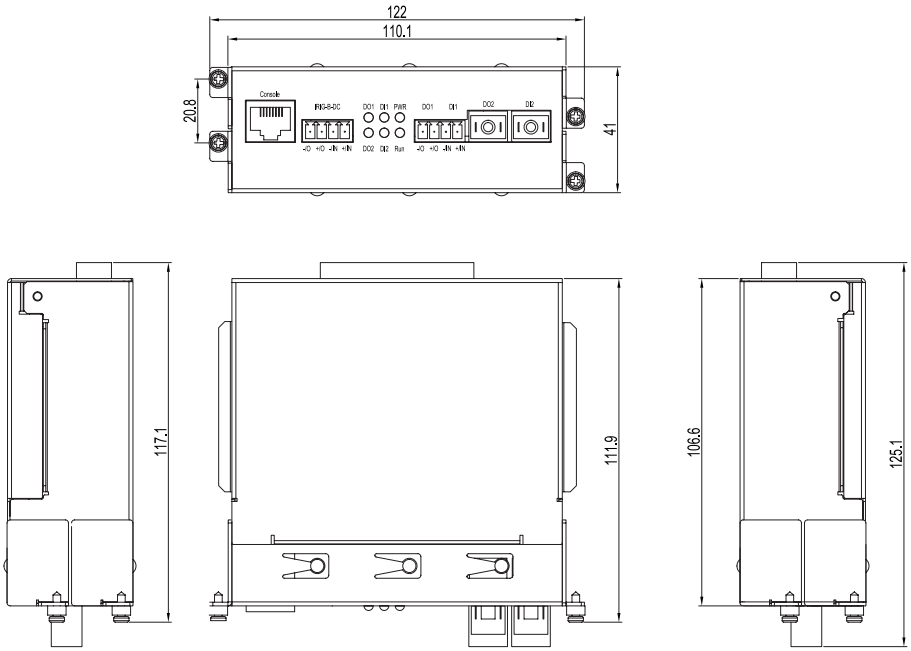
Quality Assurance

Warranty	5 years

Approvals

Please check Kyland website for the latest updates.

Mechanical Drawing



Ordering Information

Model	Description
SM6.6-TMS-Trigger-1U	TMS-trigger module, 1 IRIG-B output, 1 IRIG-B input, 2 signal input, 2 signal output, 1 Console port

IEC61850 modeling technology with build-in MMS service

Why IEC 61850 MMS Management?

In SAS system, IEC 61850 is widely accepted because of its many advantages, and is being extended to other fields.

In IEC 61850 SAS system, industrial Ethernet switch is used for the communication of process network and station network. The traditional industrial Ethernet switch uses SNMP as management protocol, and the EMS network management software or OPC software is used for device management, topology management and alarm management etc.

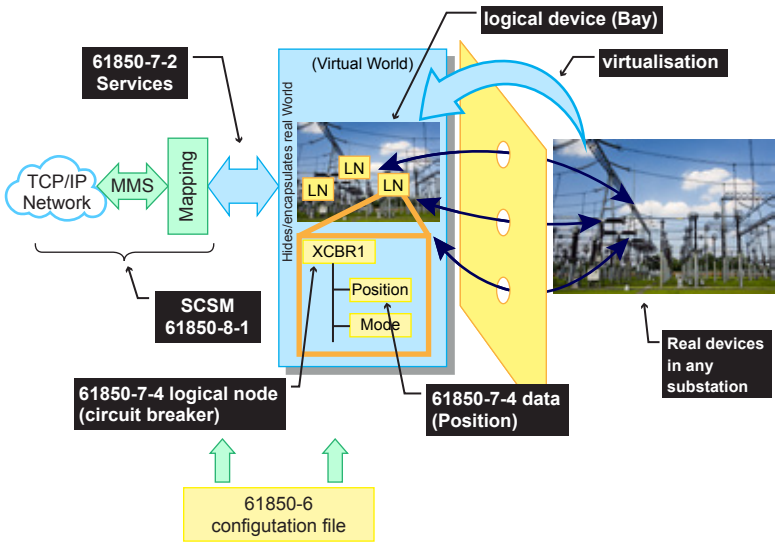
IEC61850 protocol use object oriented data modeling, abstract communication service interface for management. SNMP protocol is the way of management in telecommunication field, not suitable for smart grid industry and other industries of object oriented management model, could not be included in the in the smart grid management system. Development of industrial Ethernet management model based on IEC 61850 international standard is one of the key technologies of smart grid management.

Currently, SNMP is used for managing industrial Ethernet switches, but as the basic management mode in telecommunications, SNMP does not suit the object-oriented management mode of industrial platform such as a smart grid and cannot be integrated into the SAS management system. Therefore, developing IEC 61850-based industrial Ethernet switches management model is one of the key technologies for easy management of SAS.

Through modeling of industrial Ethernet switch for use in IEC 61850 management:

- Unified management of switches on the process layer and substation layer networks for digital substations.
- No additional devices or training on the knowledge of switches for the maintenance personnel of intelligent substations.
- No development on background. Only configuration is required for management due to the self-describing feature of IEC 61850.
- Transition to no manual intervention in intelligent substations. Status and alarm information is collected accurately and reported to the remote management system (provincial NMS).
- Automatic configuration, simplifying maintenance and management of switches.

What is IEC 61850 Data Modeling?



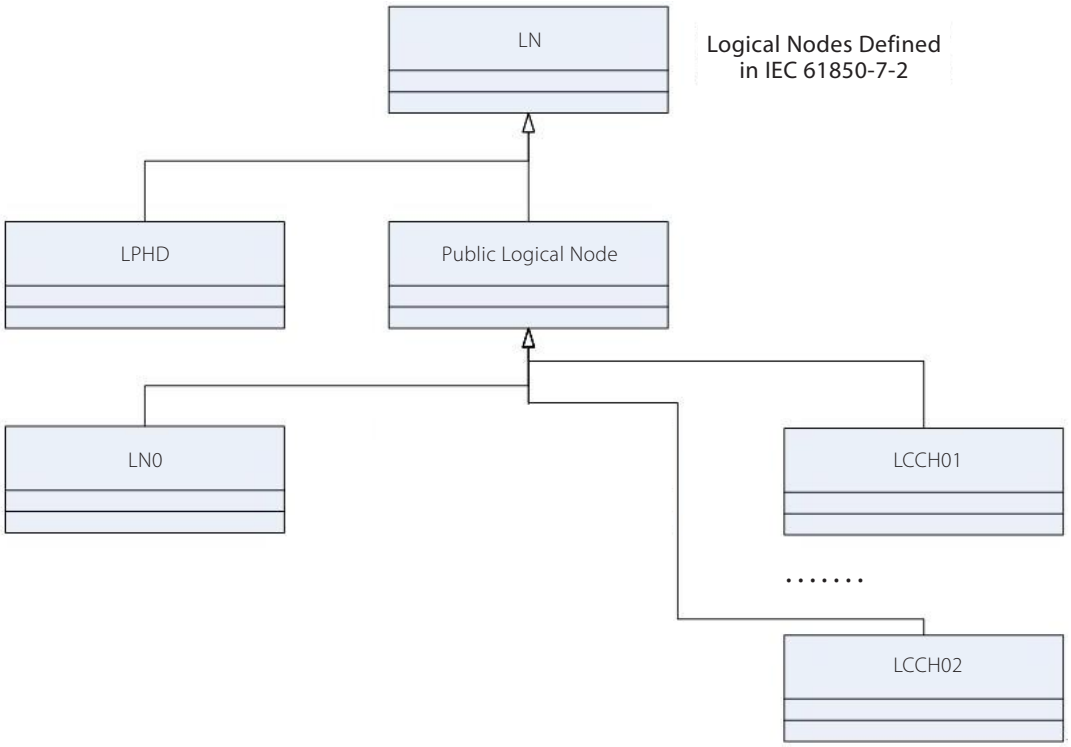
The IEC 61850 protocol stack virtualizes physical devices and functions into hierarchical data structures by information modeling, and performs certain functions by data exchange with the ACSI between different entities. Mapping between different communication protocols is implemented through SCSM, to achieve maximum compatibility and avoid impacts imposed by the development of communication protocol stacks. In system level, configuration language is standardized to achieve automatic maintenance and easy integration.

Industrial Ethernet Switch Data Model

In Appendix A of IEC 61850-90-4, a model of an IEEE802.1D compliant bridge for use in IEC 61850 management is defined. The model abstracts the physical device of the industrial Ethernet switch to a LN (logic node), and describes the attributes of LN The model consist of the physical base unit of the bridge and of a model for each port. The directory, dataset and report control block (BRCB, URCB) service realize the convenient management of industrial Ethernet switch in IEC 61850.

The data model is setup by following steps:

- To provide better monitoring function, Ethernet switch is regarded as a physical device in IEC 61850, running status can be queried.
- General logical node LN0.Since LN0 has nothing to do with function, only with physical device, is a specific description of the physical device; this part is compliant with the standards, no need to redefine
- Define and explain switch logic nodes (LPHD and LCCH). The mapping between data objects of LN and SNMP oid is explained to be understood by manufacturer to realize. The LCCH is a logical node defined for switch ports which contains information about port status, send and receive data counter, port configuration etc. One instance of the LCCH LN class is used for each available port.
- Data can be accessed through the service provided by MMS server.



Configuration File

Substation Configuration description Language (SCL) is the language and representation format specified by IEC 61850 for the configuration of electrical substation devices. This includes representation of modeled data and communication services specified by IEC 61850– 7 –X standard documents. The complete SCL includes data representation for substation device entities; its associated functions represented as logical nodes, communication systems and capabilities. The complete representation of data as SCL enhances the different devices of a substation to exchange the SCL files and to have a complete interoperability.

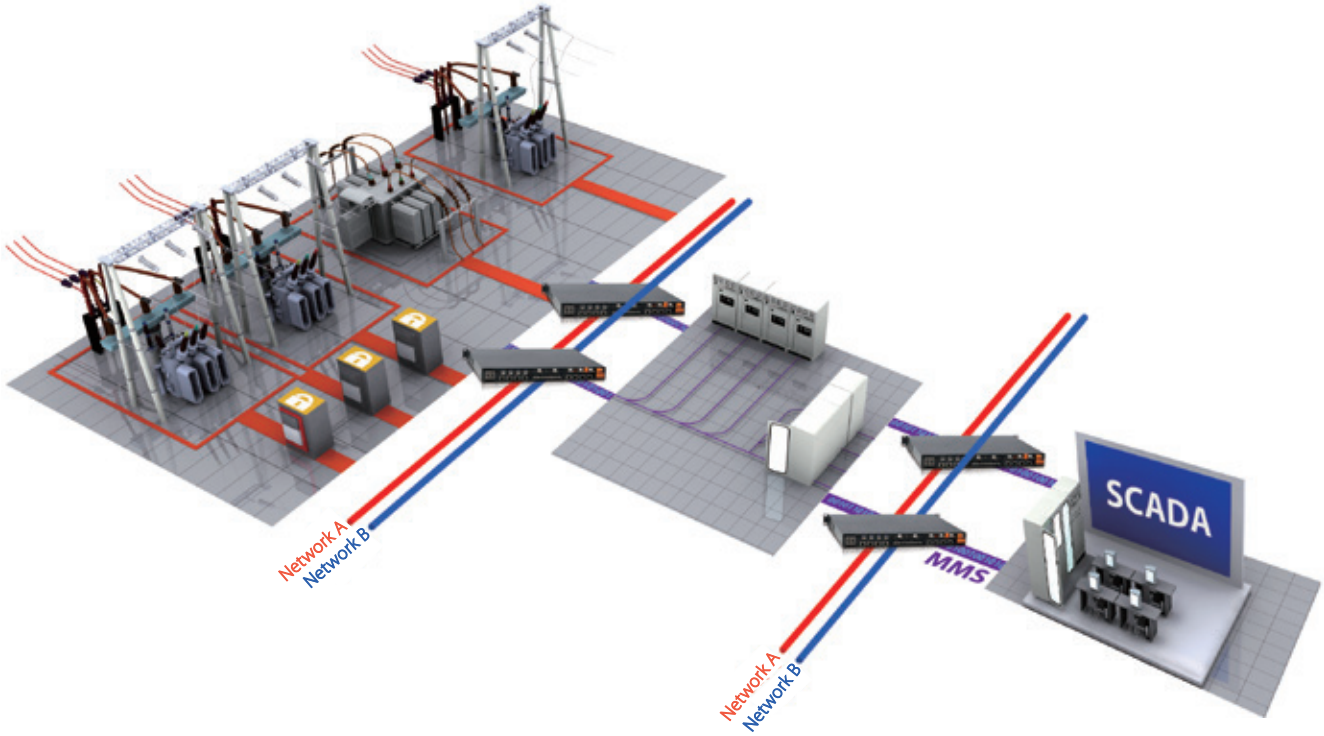
There are 4 types of SCL files in IEC 61850:

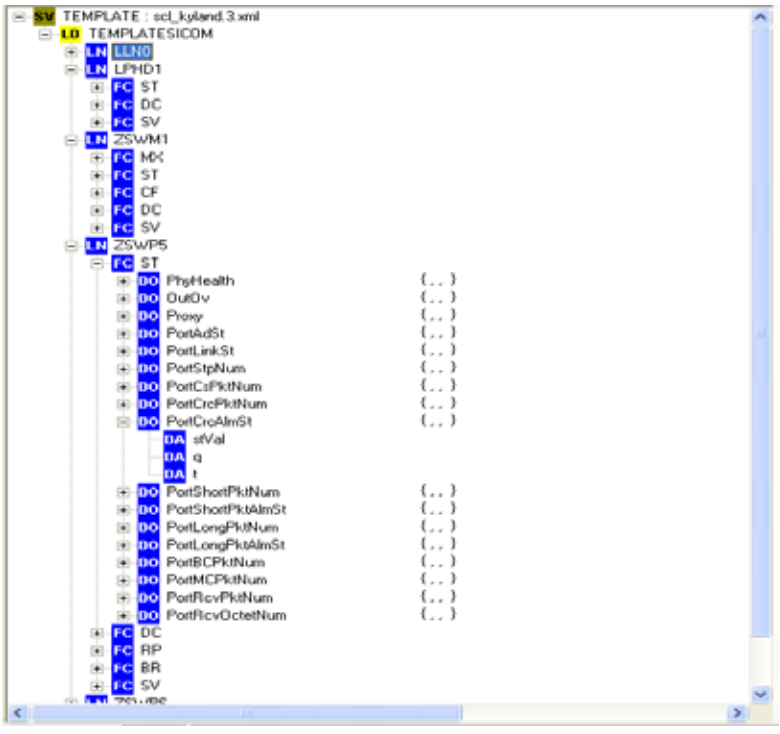
- IED Capability Description (ICD) file: It defines complete capability of an IED. This file needs to be supplied by each manufacturer to make the complete system configuration. The file contains a single IED section, an optional communication section and an optional substation part which denotes the physical entities corresponding to the IED.
- System Specification Description (SSD) file: This file contains complete specification of a substation automation system including single line diagram for the substation and its functionalities (logical nodes). This will have Substation part, Data type templates and logical node type definitions but need not have IED section.
- Substation Configuration Description (SCD) file: This is the file describing complete substation detail. It contains substation, communication, IED and Data type template sections. A .SSD file and different. ICD files contribute in making an SCD file.
- Configured IED Description (CID) file: It is a file used to have communication between an IED configuration tool to an IED. It can be considered as an SCD file stripped down to what the concerned IED need to know and contains a mandatory communication section of the addressed IED.

Four SCL configuration files realize the description and association of IED and SAS, which simplify the configuration and can realize the automatic update and remote configuration of IED and SAS. The SCL configuration file in a unified format greatly simplifies the system's integration and management difficulty.

When the industrial Ethernet switch supports MMS management, the system can regard industrial Ethernet switch as an IED device for management. The switch should provide ICD file, and to complete the automatic configuration of the CID file.

Typical Application





SICOM3024P

24+4G Port Layer 2 Managed Rack Mountable Switches

- Supports max 4 gigabit fiber/copper ports and 24 fast Ethernet fiber/copper ports
- Internal modular design for easy expansion
- Supports DT-Ring ,DRP, RSTP for network redundancy(special version supports DRP)
- Supports IEC 61850 MMS management(special version supports)
- Supports alarm and syslog upload
- Complies with IEC 61850-3 and IEEE1613
- KEMA, CE, FCC, UL certification(pending)

Overview

SICOM3024P is a layer 2 managed industrial Ethernet switch designed to operate reliably in electrically harsh and climatically demanding utility substation and industrial environments. SICOM3024P supports up to 4 gigabit fiber/copper ports and 24 fast Ethernet fiber/copper ports, meets the IEC 61850 and IEEE1613 standards and approved by KEMA. SICOM3024P is a 19-inch 1U rack mountable device and its internal modular design offers the maximum flexibility for easy expansion. SICOM3024P supports many Layer 2 software features such as port, VLAN, multicast, QoS, fast redundant ring. It supports Console, Telnet, Web management and network management software based on SNMP. At present, the product is widely used at the intelligent substation and many other industrial communication systems.

Software Functions

Switching Function

Supports VLAN and PVLAN
Supports port aggregation
Supports flow control
Support port rate limit
Supports broadcast storm suppression

Redundancy Protocol

Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms
Supports DHP and DRP and the recovery time<20 ms (special version supports)
Supports STP/RSTP

Multicast Protocol

Supports IGMP snooping
Supports GMRP
Supports static multicast

Security

Supports IEEE 802.1x (special version supports)
Supports HTTPS/SSL (special version supports)
Supports SSH (special version supports)
Supports RADIUS (special version supports)
Supports TACACS+ (special version supports)
Supports user grading (special version supports)
Supports MAC address binding (special version supports)
Supports port isolate

Service Quality Management

Supports ACL
Support 802.1p(CoS),DSCP
Supports SP and WRR queuing

Management & Maintenance

Supports Console, Telnet, and Web management methods
Supports SNMPv1/v2c/v3 and can managed by Kyvision (special version supports v3)
Supports IEC 61850 MMS management (special version supports)
Supports software update over FTP
Supports the IP/MAC address conflict alarm, power failure alarm, power alarm, temperature alarm, port alarm, and ring alarm
Supports RMON
Supports port mirroring
Supports Syslog
Supports LLDP
Supports Link-check

IP Address Management

Supports Bootp
Supports DHCP server/snooping/option 82 (special version supports snooping and option82)

Clock management

Supports SNTP server/client
Supports RTC

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-SX/LX)
- IEEE 802.3ad (port aggregation)
- IEEE 802.3x(flow control)
- IEEE 802.1p(priority)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)

Switch Properties

Priority queue	4
Number of VLANs	256
VLAN ID	1–4093
Number of multicast groups	256
MAC table	8K
Packet buffer	4Mbit
Packet forwarding rate	9.5Mpps
Switching Capacity	12.8Gbps
Switching delay	<10μs

Interface

Gigabit ports
- 1000Base-X, SFP port
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet ports
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 100Base-FX, SFP port(LC connector)
- 10/100Base-T(X), RJ45 port

Console port	RS232,RJ45
Alarm contact	3-pin 5.08mm-spacing plug-in terminal block, 250 VAC/220 VDC Max, 2 A Max, 60 W Max

LED

LED on front panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1, PWR2
- Port LED: Link/ACT
- Port speed LED: Speed

LED on rear panel
- Port LED: Link/ACT
- Port speed LED: Speed

Power Requirements

Power input
- 24DC(18-36VDC)
- 48DC(36-72VDC)
- 220AC/DCW(85-264VAC/77-300VDC)

Power terminal	5-pin 5.08 mm-spacing plug-in terminal block
Power consumption	<35W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(WxHxD)	482.6mm×44mm×322.5mm (19×1.73×12.70 in.)
Weight	4Kg (8.82 pound)
Mounting	19 inch 1U rack mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	346,889 hrs
Warranty	5 years

Approvals

KEMA, CE, FCC, UL508 (pending), Class I,Div2 (pending)
Please check Kyland website for the latest updates.

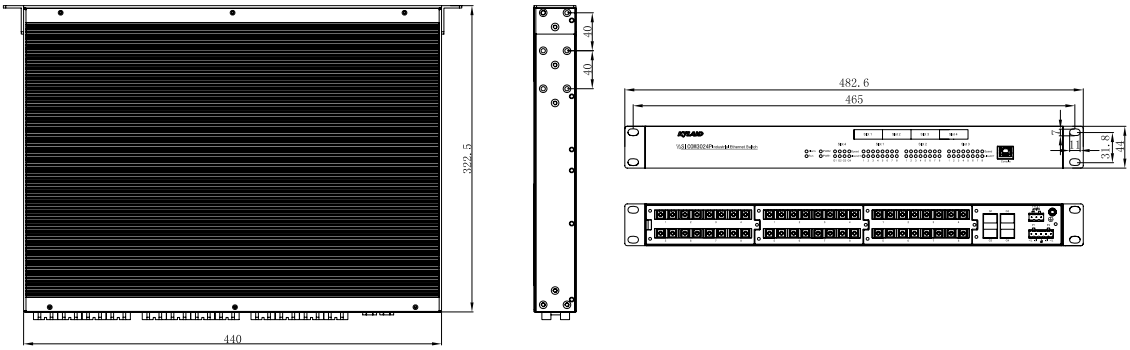
Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-8(power frequency magnetic field) 100A/m(cont.),1000A/m(1s-3s)
- IEC61000-4-9(pulsed magnetic field) 1000A/m
- IEC61000-4-10(damped oscillation) 100A/m
- IEC61000-4-12(oscillatory wave) 2.5kV/CM,1kV/DM
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

	SICOM3024P-Ports1Ports2-Connector-PS1-PS2
Ports1	**Gigabit ports**
4GX	4x1000Base-X,10/100/1000Base-T(X) SFP port
4GE	4x10/100/1000Base-T(X) RJ45 port
2GX	2x1000Base-X,10/100/1000Base-T(X) SFP port
None	No Gigabit port
Ports2	**Fast Ethernet ports**
24S	24x100Base-FX,single-mode fiber port
24M	24x100Base-FX,multi-mode fiber port
20S4T	20x100Base-FX,single-mode fiber port; 4x10/100Base-T(X) RJ45 port
20M4T	20x100Base-FX,multi-mode fiber port; 4x10/100Base-T(X) RJ45 port
16S8T	16x100Base-FX,single-mode fiber port; 8x10/100Base-T(X) RJ45 port
16M8T	16x100Base-FX,multi-mode fiber port; 8x10/100Base-T(X) RJ45 port
16S	16x100Base-FX,single-mode fiber port
16M	16x100Base-FX,multi-mode fiber port
12S12T	12x100Base-FX,single-mode fiber port; 12x10/100Base-T(X) RJ45 port
12M12T	12x100Base-FX,multi-mode fiber port; 12x10/100Base-T(X) RJ45 port
8S16T	8x100Base-FX,single-mode fiber port; 16x10/100Base-T(X) RJ45 port
8M16T	8x100Base-FX,multi-mode fiber port; 16x10/100Base-T(X) RJ45 port
8S	8x100Base-FX,single-mode fiber port
8M	8x100Base-FX,multi-mode fiber port
4S20T	4x100Base-FX,single-mode fiber port; 20x10/100Base-T(X) RJ45 port
4M20T	4x100Base-FX,multi-mode fiber port; 20x10/100Base-T(X) RJ45 port
2S22T	2x100Base-FX,single-mode fiber port; 22x10/100Base-T(X) RJ45 port
2M22T	2x100Base-FX,multi-mode fiber port; 22x10/100Base-T(X) RJ45 port
24T	24x10/100Base-T(X) RJ45 port
24SFP	24x100Base-FX,SFP port
16SFP8T	16x100Base-FX,SFP port; 8x10/100Base-T(X) RJ45 port
16SFP	16x100Base-FX,SFP port
8SFP16T	8x100Base-FX,SFP port; 16x10/100Base-T(X) RJ45 port

Connector	100M fiber port specifications
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port or connector is SFP
PS1	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
PS2	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
None	No secondary power supply

Accessories

Accessory Model	Description
Gigabit SFP module	See the selection table of industrial gigabit SFP module.
100M SFP module	See the selection table of industrial 100M SFP module.
DT-FCZ-RJ45-01	Single-port RJ45 dust plug

SICOM3024

24+4G Port Layer 2 Managed Rack Mountable Switches

- Supports max 4 gigabit SFP ports, 16 fast Ethernet RJ45 ports and 8 fast Ethernet fiber/copper ports
- Supports DT-Ring , RSTP for network redundancy
- Supports the IP/MAC address conflict alarm, power failure alarm, power alarm, port alarm, and ring alarm
- Complies with IEC 61850-3 and IEEE1613
- CE, FCC certification

Overview

SICOM3024 is a layer 2 managed industrial Ethernet switch designed to operate reliably in electrically harsh and climatically demanding utility substation and industrial environments. SICOM3024 supports up to 4 gigabit SFP ports, 16 fast Ethernet RJ45 ports and 8 fast Ethernet fiber/copper ports, meets the IEC 61850 and IEEE1613 standards. SICOM3024 is a 19-inch 1U rack mountable device and allows front and rear panel mounting. It supports many Layer 2 software features such as port, VLAN, multicast, QoS, fast redundant ring. It supports Console, Telnet, Web management and network management software based on SNMP. At present, the product is widely used in the power industry, railway industry, intelligent transportation industry and automatic control field.

Software Functions

Switching Function

Supports VLAN and PVLAN.
Supports port aggregation.
Supports flow control.
Support port rate limit
Supports broadcast storm suppression.

Redundancy Protocol

Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms.
Supports STP/RSTP

Multicast Protocol

Supports IGMP snooping.
Supports GMRP.

Security

Supports IEEE 802.1x. (special version supports)
Supports HTTPS/SSL. (special version supports)
Supports SSH. (special version supports)
Supports RADIUS. (special version supports)
Supports TACACS+.(special version supports)
Supports user grading. (special version supports)
Supports MAC address limit. (special version supports)
Supports port isolate. (special version supports)

Service Quality Management

Supports ACL
Supports SP and WRR queuing.

Management & Maintenance

Supports Console, Telnet, and Web management methods.
Supports SNMPv1/v2c/v3 and can managed by Kyvision. (special version supports v3)
Supports software update and configuration import/ export over FTP.
Supports the IP/MAC address conflict alarm, power failure alarm, power alarm, port alarm, and ring alarm
Supports RMON.
Supports port mirroring.
Supports Syslog. (special version supports)
Supports LLDP.
Supports Link-check.
Supports loop detection. (special version supports)
Supports CRC protection. (special version supports)

IP Address Management

Supports DHCP server/snooping/option 82. (Web interface doesn't support, and special version supports snooping and option82)

Clock Management

Supports SNTP server/client.

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-SX/LX)
- IEEE 802.3x(flow control)
- IEEE 802.1p(priority)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)

Switching Properties

Priority queue	4
Number of VLANs	256
VLAN ID	1–4093
Number of multicast groups	256
MAC table	8K
Packet buffer	2Mbit
Packet forwarding rate	9.5Mpps
Switching delay	<10μs

Interface

Gigabit ports	1000Base-X, SFP port

Fast Ethernet ports
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console port	RS232,RJ45

Alarm contact
- 3-pin 3.81mm-spacing plug-in terminal block, 250 VAC/220 VDC Max, 2 A Max, 60 W Max

LED

LED on front panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1, PWR2
- Port LED: Link/ACT
- Port speed LED: Speed

LED on rear panel
- Port LED: Link/ACT
- Port speed LED: Speed

Power Requirements

Power input
- 12DC(9-18VDC)
- 24DC(18-36VDC)
- 48DC(36-72VDC),
- 220AC/DCW(85-264VAC/77-300VDC)

Power terminal
- 5-pin 5.08 mm-spacing plug-in terminal block

Power consumption	<21.6W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(WxHxD)	482.6mm×44mm×245mm (19×1.73×9.64 in.)
Weight	3Kg (6.61 pound)
Mounting	19 inch 1U rack mounting

Environmental Limits

Operating temperature	-40°C to + 85°C (-40°F to 185°F)
Storage temperature	-40°C to + 85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	318,296 hrs
Warranty	5 years

Approvals

CE, FCC,
Please check Kyland website for the latest updates.

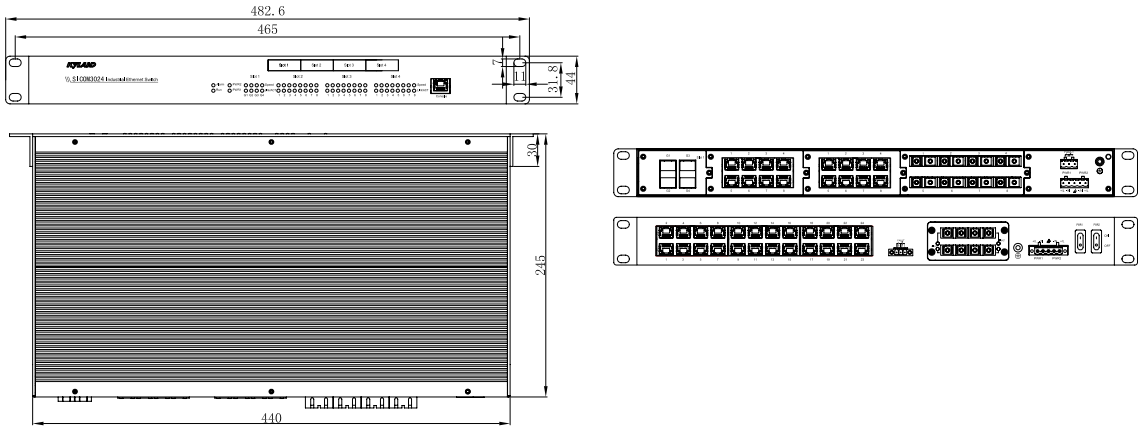
Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-8(power frequency magnetic field) 100A/m(cont.),1000A/m(1s-3s)
- IEC61000-4-9(pulsed magnetic field) 1000A/m
- IEC61000-4-10(damped oscillation) 100A/m
- IEC61000-4-12(oscillatory wave) 2.5kV/CM,1kV/DM
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

	SICOM3024-Ports-Connector-PS1-PS2
Ports	
4GX8S16T	4x1000Base-X SFP port;8x100Base-FX single-mode fiber port;16x10/100Base-T(X) RJ45 port
4GX8M16T	4x1000Base-X SFP port;8x100Base-FX multi-mode fiber port;16x10/100Base-T(X) RJ45 port
4GX6S18T	4x1000Base-X SFP port;6x100Base-FX single-mode fiber port;18x10/100Base-T(X) RJ45 port
4GX6M18T	4x1000Base-X SFP port;6x100Base-FX multi-mode fiber port;18x10/100Base-T(X) RJ45 port
4GX4S20T	4x1000Base-X SFP port;4x100Base-FX single-mode fiber port;20x10/100Base-T(X) RJ45 port
4GX4M20T	4x1000Base-X SFP port;4x100Base-FX multi-mode fiber port;20x10/100Base-T(X) RJ45 port
4GX2S22T	4x1000Base-X SFP port;2x100Base-FX single-mode fiber port;22x10/100Base-T(X) RJ45 port
4GX2M22T	4x1000Base-X SFP port;2x100Base-FX multi-mode fiber port;22x10/100Base-T(X) RJ45 port
4GX24T	4x1000Base-X SFP port;24x10/100Base-T(X) RJ45 port
4GX16T	4x1000Base-X SFP port;16x10/100Base-T(X) RJ45 port
8S16T	8x100Base-FX single-mode fiber port;16x10/100Base-T(X) RJ45 port
8M16T	8x100Base-FX multi-mode fiber port;16x10/100Base-T(X) RJ45 port
6S18T	6x100Base-FX single-mode fiber port;18x10/100Base-T(X) RJ45 port
6M18T	6x100Base-FX multi-mode fiber port;18x10/100Base-T(X) RJ45 port
4S20T	4x100Base-FX single-mode fiber port;20x10/100Base-T(X) RJ45 port
4M20T	4x100Base-FX multi-mode fiber port;20x10/100Base-T(X) RJ45 port
2S22T	2x100Base-FX single-mode fiber port;22x10/100Base-T(X) RJ45 port
2M22T	2x100Base-FX multi-mode fiber port;22x10/100Base-T(X) RJ45 port
24T	24x10/100Base-T(X) RJ45 port
4S24T	4x100Base-FX single-mode fiber port;24x10/100Base-T(X) RJ45 port
4M24T	4x100Base-FX multi-mode fiber port;24x10/100Base-T(X) RJ45 port
2S24T	2x100Base-FX single-mode fiber port;24x10/100Base-T(X) RJ45 port
2M24T	2x100Base-FX multi-mode fiber port;24x10/100Base-T(X) RJ45 port

Connector	100M fiber port specifications
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
PS2	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
None	No secondary power supply

Accessories

Accessory Model	Description
Gigabit SFP module	See the selection table of industrial gigabit SFP module.
DT-FCZ-RJ45-01	Single-port RJ45 dust plug

SICOM2024M

28 Port Layer 2 Managed Rack Mountable Switches

- Supports max 4 fast Ethernet fiber ports and 24 fast Ethernet RJ45 ports
- Supports the IP/MAC address conflict alarm, power failure alarm, power alarm, port alarm
- Allow front and rear panel mounting
- Complies with IEC 61850-3 and IEEE1613
- CE, FCC certification

Overview

SICOM2024M is a layer 2 managed industrial Ethernet switch designed to operate reliably in electrically harsh and climatically demanding utility substation and industrial environments. SICOM2024M supports up to 4 fast Ethernet fiber ports and 24 fast Ethernet RJ45 ports, meets the IEC 61850 and IEEE1613 standards. SICOM2024M is a 19-inch 1U rack mountable device and allows front and rear panel mounting. It supports many Layer 2 software features such as port, VLAN, multicast, QoS, RSTP. It supports Console, Telnet, Web management and network management software based on SNMP. At present, the product is widely used at the intelligent substation and many other industrial communication systems.

Software Functions

Switching Function

Supports VLAN and PVLAN.
Supports port aggregation.
Supports flow control.
Support port rate limit
Supports broadcast storm suppression.

Redundancy Protocol

Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms. (special version supports)
Supports STP/RSTP

Multicast Protocol

Supports IGMP snooping.
Supports GMRP. (special version supports)
Supports static multicast. (special version supports)

Service Quality Management

Supports ACL (special hardware version supports)
Supports SP and WRR queuing.

Management & Maintenance

Supports Console, Telnet, and Web management methods.
Supports SNMPv1/v2c and can managed by Kyvision.
Supports software update over FTP.
Supports the IP/MAC address conflict alarm, power failure alarm, power alarm, port alarm
Supports port mirroring.
Supports Syslog. (special version supports)
Supports LLDP.
Supports Link-check.

IP Address Management

Supports DHCP server. (special version supports)

Clock Management

Supports SNTP server/client.

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3x(flow control)
- IEEE 802.1p(priority)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)

Switch Properties

Priority queue	4
Number of VLANs	256
VLAN ID	1–4093
Number of multicast groups	256
MAC table	8K
Packet buffer	2Mbit
Packet forwarding rate	4.2Mpps
Switching delay	<10μs

Interface

Fast Ethernet ports
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console port	RS232,RJ45
Alarm contact	3-pin 3.81mm-spacing plug-in terminal block, 250 VAC/220 VDC Max, 2 A Max, 60 W Max

LED

LED on front panel
- Running LED:Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR2
- Port LED:Link/ACT,Speed;DPX,Link

LED on rear panel
- Port LED: Link/ACT
- Port speed LED: Speed
- Fiber port LED: A,B

Power Requirements

Power input
- 24DC(18-36VDC)
- 48DC(36-72VDC)
- 220AC/DCW(85-264VAC/77-300VDC)

Power terminal	5-pin 5.08 mm-spacing plug-in terminal block
Power consumption	<16.8W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(WxHxD)	482.6mm×44mm×245mm (19×1.73×9.64 in.)
Weight	2.5Kg (5.51 pound)
Mounting	19 inch 1U rack mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	338,566 hrs
Warranty	5 years

Approvals

CE, FCC
Please check Kyland website for the latest updates.

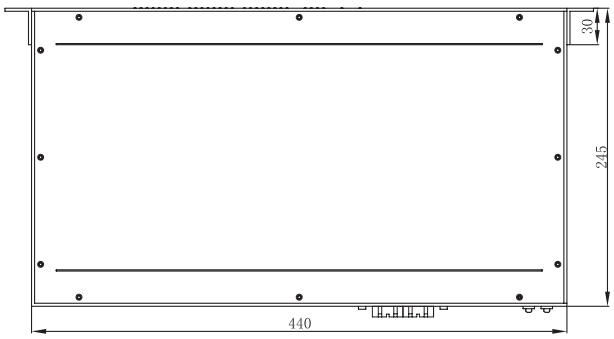
Industry Standard

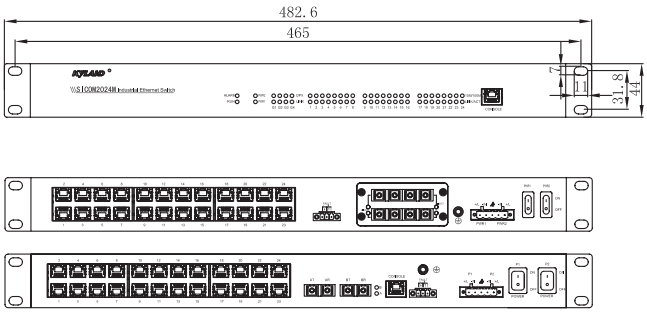
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-8(power frequency magnetic field) 100A/m(cont.),1000A/m(1s-3s)
- IEC61000-4-9(pulsed magnetic field) 1000A/m
- IEC61000-4-10(damped oscillation) 100A/m
- IEC61000-4-12(oscillatory wave) 2.5kV/CM,1kV/DM
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing





Ordering Information

	SICOM2024M-Ports-Connector-PS1-PS2
Ports	
4S24T	4x100Base-FX, single-mode fiber port;24x10/100Base-T(X) RJ45 port
4M24T	4x100Base-FX, multi-mode fiber port;24x10/100Base-T(X) RJ45 port
2S24T	2x100Base-FX, single-mode fiber port;24x10/100Base-T(X) RJ45 port
2M24T	2x100Base-FX, multi-mode fiber port;24x10/100Base-T(X) RJ45 port
24T	24x10/100Base-T(X) RJ45 port
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
PS2	
HV	220AC/DCW(85-264VAC/77-300VDC)
L1	48DC(36-72VDC)
L3	24DC(18-36VDC)
None	No secondary power supply

Accessories

Accessory Model	Description
DT-FCZ-RJ45-01	Single-port RJ45 dust plug

SICOM3216

16+2G Port Layer 2 Managed DIN-Rail Switches

- 2 Gigabit Combo ports, 2 fast Ethernet fiber/RJ45 optional ports, 14 10/100Base-T(X) ports
- Supports DT-Ring, DRP and RSTP protocols
- Supports one-key recovery
- Support cable check
- Provides Mini USB Console port
- IP40 protection class
- UL508 (pending), Class I Div 2 (pending), CE, FCC certificates

Overview

SICOM3216 is one of Kyland green Ethernet switch series which supports max 18 ports including 2 Gigabit combo ports, 14 10/100Base-TX ports and 2 Fast Ethernet fiber/RJ45 optional ports. The SICOM3216 series support DRP (recovery time<20ms), DT-Ring (recovery time<50ms), RSTP, VLAN, multicast, QoS, SSH, SSL and many other Layer 2 software features, and support CLI, Telnet, Web management methods, Kyvision centralized management based on SNMPv1/v2c/v3. It is specially designed for harsh environments with -40°C to +85°C wide temperature range, EMC level 4, IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, and can be deployed in wind power, distribution network automation, transportation, oil & gas and many other industrial applications.

Software Functions

Switching

Support VLAN, PVLAN
Support GVRP
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support DRP with the recovery time<20ms
Support STP/RSTP

Multicast

Support IGMP Snooping,
Support GMRP
Support static multicast

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support IEEE802.1X
Support MAC address binding with switch ports

Service Quality

Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP/TFTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support cable check
Support Syslog
Support LLDP
Support Link-check

IP Management

Support DHCP server/snooping/client, DHCP Option 82

Clock Management

Support SNTP Client

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-X)
- IEEE 802.3x(Flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)
- IEEE802.1X

Switching Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	2Mbit
Packet Forwarding Rate	5.4Mpps
Switching Delay	<10μs

Interface

Gigabit Port
- 1000Base-X, SFP slot
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port Mini USB

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block, 250VAC/220VDC Max,2A Max

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR2
- Ring LED: Ring
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT(Fiber port)

Button

Reset: Reboot and restore default configuration

Power Requirements

Power Input
- 24-48VDC
- 12-24VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<18W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	88mm×135mm×137mm(W×H×D)
Weight	1.25Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

MTBF	465,000 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending), CE,FCC

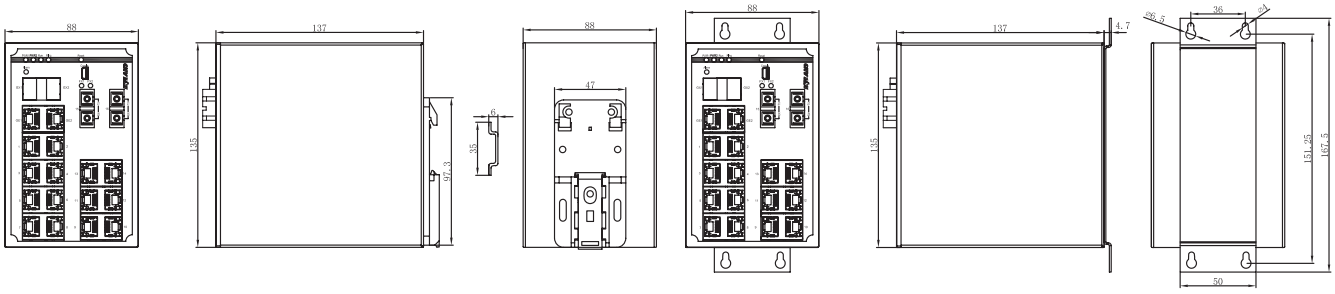
Industrial Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	SICOM3216-Ports-Connector-PS1-PS2
Ports	
16T	16×10/100Base-T(X) RJ45 ports
2S14T	2×100Base-FX, single mode fiber ports;14×10/100Base-T(X) RJ45 ports
2M14T	2×100Base-FX, multi mode fiber port;14×10/100Base-T(X) RJ45 ports
2G16T	2×1000Base-X,10/100/1000Base-T(X) Combo ports;16×10/100Base-T(X) RJ45 ports
2G2S14T	2×1000Base-X,10/100/1000Base-T(X) Combo ports;2×100Base-FX, SM fiber ports;14×10/100Base-T(X) RJ45 ports
2G2M14T	2×1000Base-X,10/100/1000Base-T(X) Combo ports;2×100Base-FX, MM fiber port;14×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs

Accessories

Accessory model	Description
Gigabit SFP Module	Please refer to the Gigabit SFP module ordering table
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port
DT-XL-Mini USB -USB-2m	Mini USB to USB cable for Console management, 2m

SICOM3016

20 Port Layer 2 Managed DIN-Rail Switches

- 4 100Base-FX ports, 16 10/100Base-T(X) ports
- Supports DT-Ring and RSTP protocols
- Provide 24V, 110V, 220V optional power input model
- CE, FCC certificates

Overview

SICOM3016 is a high-performance network-managed industrial Ethernet switch specially designed by KYLAND for industrial applications. It's DIN-Rail installation and supports max 4 100Base-FX and 16 10/100Base-T(X) ports. Its solid metal case, single-rib-shape fanless design for high-efficient heat dissipation, overcurrent, overvoltage and EMC protection at power input side, and excellent EMC protection of RJ45 port allow SICOM3016 to reliably work in harsh and dangerous industrial environments. The SICOM3016 series support DT-Ring (recovery time<50ms), RSTP, VLAN, multicast, QoS, and many other Layer 2 software features, and support CLI, Telnet, Web management methods, Kyvision centralized management based on SNMPv1/v2c.

Software Functions

Switching

Support VLAN, PVLAN
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support RSTP

Multicast

Support IGMP Snooping
Support static multicast

Service Quality

Support SP, WRR queue scheduling

Management and Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c, Kyvision centralized management
Support software upgrade by FTP
Support IP/MAC conflict, power, port and ring alarm
Support RMON
Support port mirroring
Support LLDP
Support Link-check

Clock Management

Support SNTP Server/Client

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3x(Flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	2Mbit
Packet Forwarding Rate	3.0Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port	RS232,RJ45 connector
Alarm Contact	2-pin 3.81mm-spacing plug-in terminal block, 250VAC/220VDC Max,2A Max

LED

LEDs on Front Panel
Running LED: Run
Alarm LED: Alarm
Power LED: PWR1,PWR2
Interface LED: Link/ACT,Speed (RJ45 port); Link/ACT(Fiber port)

Power Requirements

Power Input
- 24VDC
- 100-240VAC, 50/60Hz; 220VDC
- 110VDC

Power Terminal
- 3-pin 3.81mm-spacing plug-in terminal block (24VDC)
- 3-pin 7.62mm-spacing plug-in terminal block (110VDC, 220VAC/DC)

Power Consumption	<9.7W
Overload Protection	Support
ReverseProtection	Support
Redundancy Protection	Support (24VDC)

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	75mm×165mm×123mm(W×H×D)
Weight	1.2Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5- 95% (non-condensing)

Warranty

MTBF	333,775 hrs
Warranty	5 years

Approvals

CE, FCC

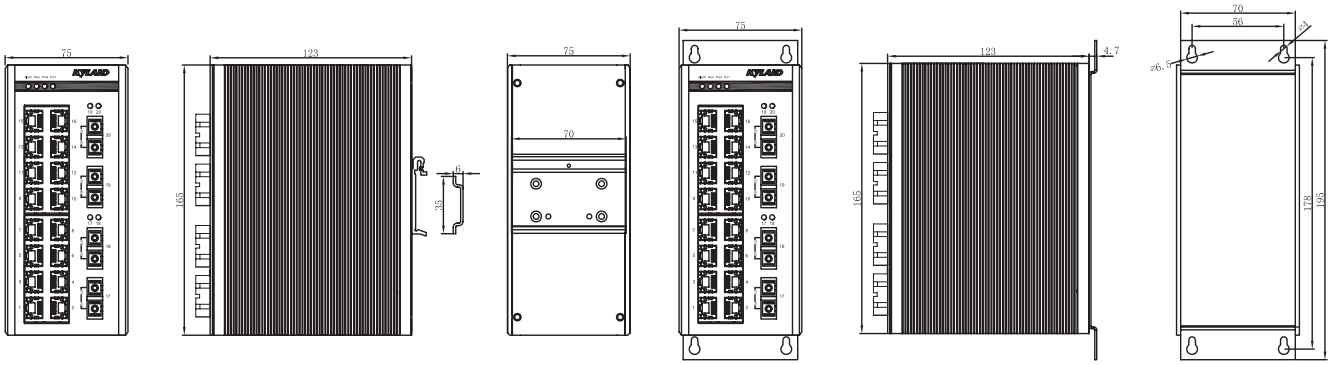
Industrial Standards

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±6kV(contact),±8kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±2kV;Data Port:±1kV
- IEC61000-4-5(Surge) Power Port: ±1kV/DM, ±2kV/CM; Data Port: ±1kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	SICOM3016-Ports-Connector-PS1-PS2 SICOM3016-Ports-Connector-PS1
Ports	
4S16T	4×100Base-FX, single mode fiber ports;16×10/100Base-T(X) RJ45 ports
4M16T	4×100Base-FX, multi mode fiber ports;16×10/100Base-T(X) RJ45 ports
2S16T	2×100Base-FX, single mode fiber ports;16×10/100Base-T(X) RJ45 ports
2M16T	2×100Base-FX, multi mode fiber ports;16×10/100Base-T(X) RJ45 ports
2S8T	2×100Base-FX, single mode fiber ports;8×10/100Base-T(X) RJ45 ports (H1 model only)
2M8T	2×100Base-FX, multi mode fiber ports;8×10/100Base-T(X) RJ45 ports (H1 model only)
1S16T	1×100Base-FX, single mode fiber port;16×10/100Base-T(X) RJ45 ports
1M16T	1×100Base-FX, multi mode fiber port;16×10/100Base-T(X) RJ45 ports
16T	16×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1-PS2	
L3-L3	24VDC, redundant power inputs
PS1	
H1	100-240VAC, 50/60Hz; 220VDC, single power input
H2	110VDC, single power input

Accessories

Accessory model	Description
DT-BGAZ-05	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

SICOM3016B

16+4G Port Layer 2 Managed DIN-Rail Switches

- 4 Gigabit Combo ports, 16 10/100Base-T(X) ports
- Supports DT-Ring and RSTP protocols
- Intelligent network management
- Provide 24V, 48V, 220V optional power input model
- IEC61850-3 & IEEE1613 (pending)

Overview

SICOM3016B is a high-performance network-managed industrial Ethernet switch specially designed by KYLAND for industrial applications. It's DIN-Rail installation and supports max 4 combo Gigabit SFP slots or 10/100/1000Base-T(X) ports and 16 10/100Base-T(X) ports. Its solid metal case, single-rib-shape fanless design for high-efficient heat dissipation, overcurrent, overvoltage and EMC protection at power input side, and excellent EMC protection of RJ45 port allow SICOM3016B to reliably work in harsh and dangerous industrial environments. The SICOM3016B series support DT-Ring (recovery time<50ms), RSTP, VLAN, multicast, QoS, and many other Layer 2 software features, and support CLI, Telnet, Web management methods, Kyvision centralized management based on SNMPv1/v2c.

Software Functions

Switching

Support VLAN, PVLAN
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support RSTP

Multicast

Support IGMP Snooping,
Support GMRP
Support static multicast

Service Quality

Support ACL
Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c, Kyvision centralized management
Support software upgrade by FTP
Support IP/MAC conflict, power, port and ring alarm
Support RMON
Support port mirroring
Support Syslog
Support LLDP
Support Link-check

Clock Management

Support SNTP Client

Technical Specification

Technical Parameters

Standard

- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-SX/LX)
- IEEE 802.3x(Flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	4Mbit
Packet Forwarding Rate	8.3Mpps
Switching Delay	<10μs

Interface

Gigabit Port
- 1000Base-X, SFP slot
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet Port	10/100Base-T(X), RJ45 port
Console Port	RS232,RJ45 connector

Alarm Contact
- 3-pin 3.81mm-spacing plug-in terminal block, 250VAC/220VDC Max,2A Max

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR2
- Interface LED: Link/ACT,Speed (RJ45 port); Link/ACT(Fiber port)

Power Requirements

Power Input
- 48VDC
- 24VDC
- 100-240VAC, 50/60Hz; 220VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<14W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support (24/48VDC)

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	75mm×165mm×123mm(W×H×D)
Weight	1.2Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

MTBF	334,038 hrs
Warranty	5 years

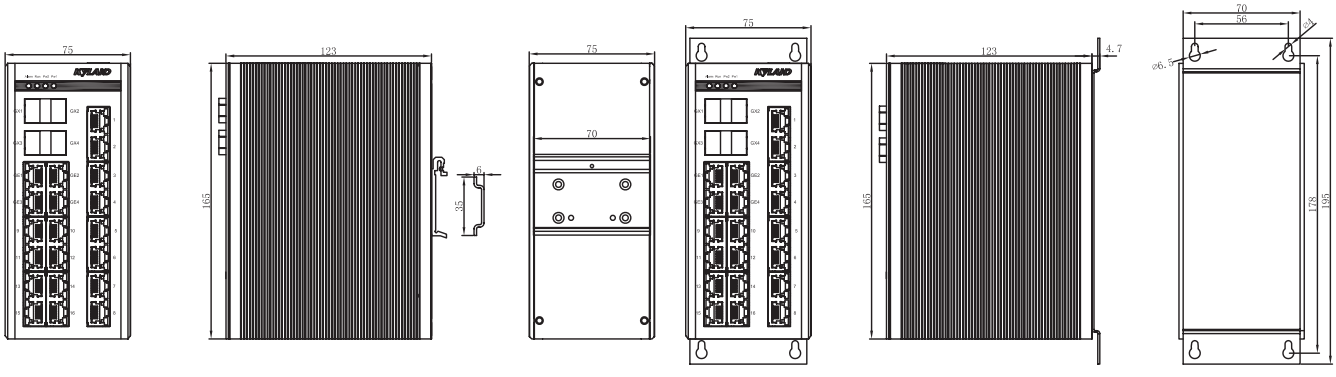
Industrial Standards

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	SICOM3016B-Ports-PS1-PS2 SICOM3016B-Ports-PS1
Ports	
4G16T	4×1000Base-X,10/100/1000Base-T(X) Combo ports; 16×10/100Base-T(X) RJ45 ports
2G2GE16T	2×1000Base-X, 10/100/1000Base-T(X) Combo ports; 2×10/100/1000Base-T(X) RJ45 ports; 16×10/100Base-T(X) RJ45 ports
PS1-PS2	
L1-L1	48VDC, redundant power inputs
L3-L3	24VDC, redundant power inputs
PS1	
H1	100-240VAC, 50/60Hz; 220VDC, single power input

Accessories

Accessory model	Description
Gigabit SFP Module	Please refer to the Gigabit SFP module ordering table
DT-BGAZ-05	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

SICOM3010G

10G Port Layer 2 Full Gigabit Managed DIN-Rail Switches

- 2 Gigabit Combo ports , 2 Gigabit SFP slots, 6 10/100/1000Base -TX ports
- Supports DT-Ring protocols, DRP and RSTP
- Supports one-key recovery
- Provides Mini USB Console port
- Support cable check
- IP40 protection class
- UL508 (Pending), Class I Div 2 (Pending), CE, FCC certificates

Overview

SICOM3010G is equipped with 10 Gigabit ports, making it ideal for building a Gigabit backbone network which requires a higher bandwidth for transferring large amounts of video, voice, and data across a network quickly. The SICOM3010G series support DRP (recovery time<20ms), DT-Ring (recovery time<50ms), RSTP, VLAN, multicast, QoS, SSH, SSL and many other Layer 2 software features, and support CLI, Telnet, Web management methods, Kyvision centralized management based on SNMPv1/v2c/v3. It is specially designed for harsh environments with -40℃ to 85℃ wide temperature range, EMC level 4, IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation and can be deployed in communication demanding applications, such as video and process monitoring, shipbuilding, ITS, and DCS systems.

Software functions

Switching

Support VLAN, PVLAN
Support GVRP
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support DRP with the recovery time<20ms
Support STP/RSTP

Multicast

Support IGMP Snooping,
Support GMRP
Support static multicast

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support IEEE802.1X
Support MAC address binding with switch ports

Service Quality

Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP/TFTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support cable check
Support Syslog
Support LLDP
Support Link-check

IP Management

Support DHCP server/snooping/client, DHCP Option 82

Clock Management

Support SNTP Client

Product Specifications

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z (1000Base-SX/LX)
- IEEE802.3x (Flow control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)
- IEEE802.1X

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	14.9Mpps
Switching Delay	<5μs

Interface

Gigabit Port
- 1000Base-X, SFP slot
- 10/100/1000Base-T(X), RJ45 port

Console Port Mini USB

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block,250VAC/220VDC Max, 2A Max

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR2
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT(Fiber port)

Button

Reset: Reboot and restore default configuration

Power Requirements

Power Input
- 24-48VDC
- 12-24VDC

Power Terminal	5-pin 5.08mm-spacing plug-in terminal block
Power Consumption	<18W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	88mm×135mm×137mm(W×H×D)
Weight	1.25Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

Operating Temperature	345,000 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending), CE, FCC

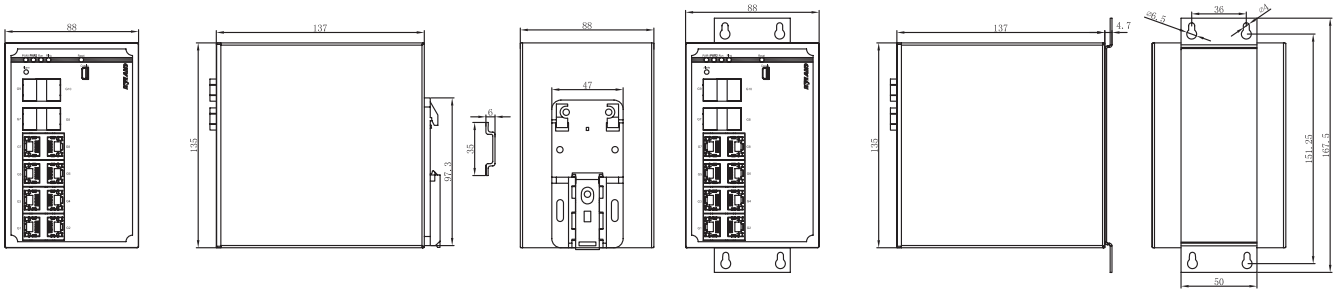
Industrial Standards

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV; Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM, ±4kV/CM; Data Port:±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery
- IEC60068-2-6(Vibration)
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free Fall)

Mechanical Drawing



Ordering Information

	SICOM3010G-Ports-PS1-PS2
Ports	
2G6GE	2×1000Base-X,10/100/1000Base-T(X) Combo ports; 6×10/100/1000Base-T(X) RJ45 ports
2G2GX6GE	2×1000Base-X,10/100/1000Base-T(X) Combo ports; 2×1000Base-X SFP slots; 6×10/100/1000Base-T(X) RJ45 ports
PS1-PS2	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs

Accessories

Accessory model	Description
Gigabit SFP Module	Please refer to Gigabit SFP module ordering table
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port
DT-XL- Mini USB -USB-2m	Mini USB to USB cable for Console management, 2m

SICOM3306

6+3G Port Layer 2 Managed DIN-Rail Switches

- 3 Gigabit SFP slots, 6 10/100Base-T(X) ports
- Supports DT-Ring, DRP and RSTP protocols
- Supports one-key recovery
- Provides Mini USB Console port
- Support cable check
- IP40 protection class
- UL508, Class I Div 2, CE, FCC certificates

Overview

SICOM3306 is one of Kyland green low power consumption industrial Ethernet switch series. It is equipped with 3 Gigabit SFP ports and 6 10/100Base-TX ports, making it ideal for building a Gigabit optic ring and leaving a spare Gigabit port for uplink use. The SICOM3306 series, certified by CE, FCC, UL508 and CID2, support DRP (recovery time<20ms), DT-Ring (recovery time<50ms), RSTP, VLAN, multicast, QoS, SSH, SSL and many other Layer 2 software features, and support CLI, Telnet, Web management methods, Kyvision centralized management based on SNMPv1/v2c/v3. It is especially designed for harsh environments with -40°C to 85°C wide temperature range, EMC level 4, IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, and can be deployed in wind power, distribution network automation, transportation, oil & gas and many other industrial applications.

Software Functions

Switching

Support VLAN, PVLAN
Support GVRP
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support DRP with the recovery time<20ms
Support STP/RSTP

Multicast

Support IGMP Snooping,
Support GMRP
Support static multicast

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support IEEE802.1X
Support MAC address binding with switch ports

Service Quality

Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP/TFTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support cable check
Support Syslog
Support LLDP
Support Link-check

IP Management

Support DHCP server/snooping/client, DHCP Option 82

Clock Management

Support SNTP Client

Product Specifications

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3z(1000Base-X)
- IEEE 802.3x(Flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)
- IEEE802.1X

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	5.3Mpps
Switching Delay	<10μs

Interface

Gigabit Port 1000Base-X, SFP slot

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port Mini USB

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block,250VAC/220VDC Max,2A Max

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR2
- Ring LED: Ring
- Interface LED: Link/ACT,Speed (RJ45 port); Link/ACT(Fiber port)

Button

Reset: Reboot and restore default configuration

Power Requirements

Power Input
- 24-48VDC
- 12-24VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<9.1W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40

Dimension
- 53.6mm×135mm×106.5mm(W×H×D)

Weight	0.76Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

MTBF	410,000 hrs
Warranty	5 years

Approvals

UL508*, Class I Div 2*,CE, FCC
*: UL certified max operating temperature is 75°C.

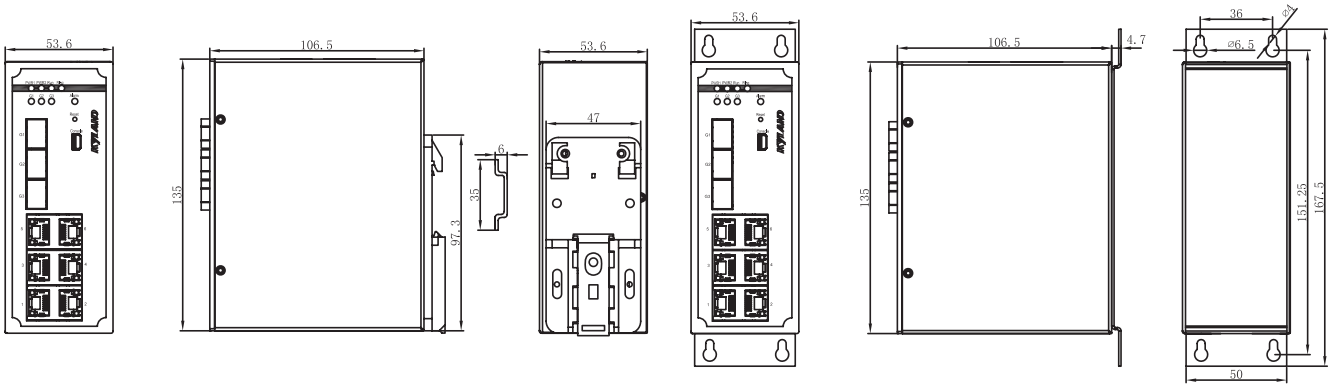
Industrial Standards

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	SICOM3306-Ports-Connector-PS1-PS2
Ports	
3GX6T	3×1000Base-X, SFP slots;6×10/100Base-T(X) RJ45 ports
2GX6T	2×1000Base-X, SFP slots;6×10/100Base-T(X) RJ45 ports
1GX8T	1×1000Base-X, SFP slot;8×10/100Base-T(X) RJ45 ports
1GX2S6T	1×1000Base-X, SFP slots; 2×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
1GX2M6T	1×1000Base-X, SFP slot; 2×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1-PS2	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs

Accessories

Accessory model	Description
Gigabit SFP Module	Please refer to the Gigabit SFP module ordering table
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port
DT-XL-Mini USB -USB-2m	Mini USB to USB cable for Console management, 2m

SICOM3000

8+2G Port Layer 2 Managed DIN-Rail Switches

- 2 Gigabit SFP slots, 2 Fast Ethernet fiber/RJ45 optional ports and 6 10/100Base-TX ports
- Supports DT-Ring protocols, DRP and RSTP
- Supports GMRP, DHCP, SNMP, QoS
- HTTPS, SSH enhance network security
- IEC61850-3 & IEEE1613 (Pending in KEMA)
- UL508 (Pending), Class I Div 2 (Pending), CE, FCC

Overview

The SICOM3000 Series is an industrially hardened, fully managed Ethernet switch, providing two Gigabit SFP ports, two 100M fiber/copper optional ports and six Fast Ethernet copper ports. The SICOM3000 series provides a high level of immunity to electromagnetic interference and heavy electrical burst, surges typical of environments found in electric utility substations, railway trackside or in curb side traffic control cabinets. The operating temperature range from -40°C to 85°C, IP40 metal enclosure, 12V/24V/48V/220V power input types allows the SICOM series to be placed in almost any location. It supports DRP (recovery time<20ms), DT-Ring (recovery time<50ms), RSTP, VLAN, multicast, QoS, SSH, SSL and many other Layer 2 software features to increase network reliability, along with concentrative management based on Kyvision3.0, CLI, WEB interface.

Software functions

Switching

Support VLAN, PVLAN
Support GVRP
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support DRP with the recovery time<20ms
Support STP/RSTP

Multicast

Support IGMP Snooping,
Support GMRP
Support static multicast

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support IEEE802.1X
Support MAC address binding with switch ports

Service Quality

Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP/TFTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support cable check
Support Syslog
Support LLDP
Support Link-check

IP Management

Support DHCP server/snooping/client, DHCP Option 82

Clock Management

Support SNTP Client

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T and 100Base-FX)
- IEEE 802.3z (1000Base-SX/LX)
- IEEE802.3x (Flow control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)
- IEEE802.1X

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	2Mbit
Packet Forwarding Rate	4.2Mpps
Switching Delay	<10μs

Interface

Gigabit Port 1000Base-X, SFP slot

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port RS232,RJ45 connector

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block,250VAC/220VDC Max, 2A Max

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR2
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT(Fiber port)

Power Requirements

Power Input
- 24-48VDC
- 12-24VDC
- 100-240VAC, 50/60Hz; 110-220VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<10W
Overload Protection	Support
ReverseProtection	Support
Redundancy Protection	Support (12/24/48VDC)

Physical Characteristics

Housing	Metal, fanless
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	75mm×140mm×123mm (W×H×D)
Weight	1.0Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

Operating Temperature	223,350 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending), CE, FCC

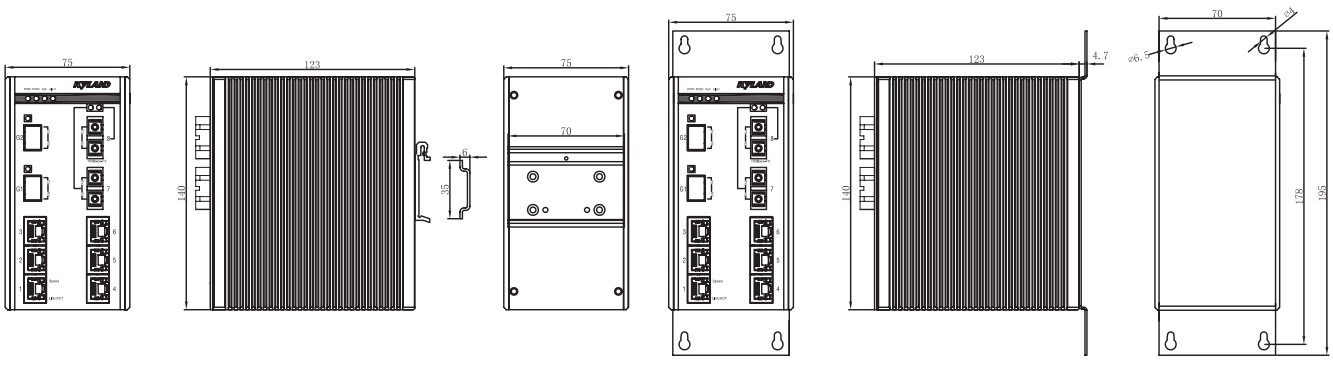
Industrial Standards

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV; Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM, ±4kV/CM; Data Port:±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery
- IEC60068-2-6(Vibration)
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free Fall)

Mechanical Drawing



Optical Fiber

	100 BaseFX			
	Multi-mode	Single-mode, 40km	Single-mode, 60km	Single-mode, 80km
Wavelength	1310nm	1310nm	1310nm	1550nm
Tx Max.	-10dBm	-4dBm0	dBm	0dBm
Tx Min.	-20dBm	-7dBm	-3dBm	-5dBm
Rx Sensitivity	-32dBm	-34dBm	-34dBm	-34dBm
Saturation	-6dBm	-3dBm	-3dBm	-3dBm
Fiber Optical Cable	50/125μm	9/125μm	9/125μm	9/125μm
Max. Distance	5km	40km	60km	80km

Ordering Information

	SICOM3000-Ports-Connector-PS1-PS2 **SICOM3000-Ports-Connector-PS1**
Ports	
2GX2S6T	2×1000Base-X, SFP slots; 2×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2GX2M6T	2×1000Base-X, SFP slots; 2×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2GX8T	2×1000Base-X, SFP slots; 8×10/100Base-T(X) RJ45 ports
2S6T	2×100Base-FX, single mode fiber ports;6×10/100Base-T(X) RJ45 ports
2M6T	2×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
8T	8×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1-PS2	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs
PS1	
HV	100-240VAC, 50/60Hz; 110-220VDC , single power input

Accessories

Accessory model	Description
Gigabit SFP Module	Please refer to Gigabit SFP module ordering table
DT-BGAZ-05	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

SICOM3009A

9 Port Layer 2 Managed DIN-Rail Switches

- 3 fast Ethernet fiber/RJ45 optional ports, 6 10/100Base-T(X) ports
- Supports DT-Ring, DRP and RSTP protocols
- Supports one-key recovery
- Provides Mini USB Console port
- Support cable check
- IEC61850-3 & IEEE1613 (KEMA certified)
- UL508, Class I Div 2, CE, FCC

Overview

SICOM3009A is one of Kyland green low power consumption industrial Ethernet switch series. It is equipped with 3 100Base-FX optic ports and 6 10/100Base-TX copper ports, making it ideal for building a fast Ethernet fiber optic ring and leaving a spare fiber port for uplink use. The SICOM3009A series, certified by CE, FCC, UL508 and CID2, support DRP (recovery time<20ms), DT-Ring (recovery time<50ms), RSTP, VLAN, multicast, QoS, SSH, SSL and many other Layer 2 software features, and support CLI, Telnet, Web management methods, Kyvision centralized management based on SNMPv1/v2c/v3. It is especially designed for harsh environments with wide operattemperature range, EMC level 4, IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, and can be deployed in wind power, distribution network automation, transportation, oil & gas and many other industrial applications.

Software Functions

Switching

Support VLAN, PVLAN
Support GVRP
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support DRP with the recovery time<20ms
Support STP/RSTP

Multicast

Support IGMP Snooping,
Support GMRP
Support static multicast

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support IEEE802.1X
Support MAC address binding with switch ports

Service Quality

Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP/TFTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support cable check
Support Syslog
Support LLDP
Support Link-check

IP Management

Support DHCP server/snooping/client, DHCP Option 82

Clock Management

Support SNTP Client

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T and 100Base-FX)
- IEEE 802.3x (Flow Control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)
- IEEE802.1X

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	1.4 Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port Mini USB

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block,250VAC/220VDC Max,2A Max

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm (12/24/48VDC model)
- Power LED: PWR1,PWR2
- Ring LED: Ring
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT(Fiber port)

Button

Reset: Reboot and restore default configuration

Power Requirements

Power Input
- 24-48VDC
- 12-24VDC
- 100-240VAC, 50/60Hz; 110-220VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block (12/24/48VDC)
- 3-pin 5.08mm-spacing plug-in terminal block (220VAC/DC)

Power Consumption	<8.1W
Overload Protection	Support
ReverseProtection	Support
Redundancy Protection	Support (12/24/48VDC)

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40

Dimension
- 53.6mm×135mm×106.5mm(W×H×D) (12/24/48VDC)
- 66mm×135mm×106.5mm (W×H×D) (220VAC/DC)

Weight	0.76Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature
- -40°C to +85°C(12/24/48VDC)
- -40°C to +75°C(220VAC/DC)

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	350,877 hrs
Warranty	5 years

Approvals

UL508*, Class I Div 2*, CE, FCC
*: UL certified max operating temperature is 75°C.

Industrial Standards

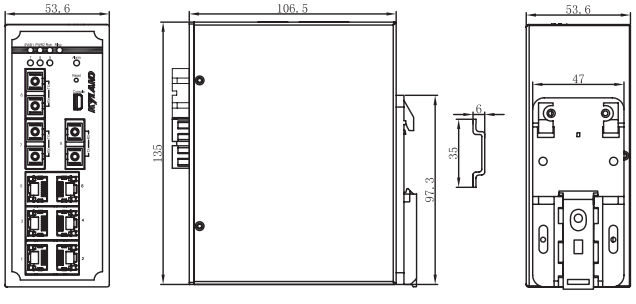
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

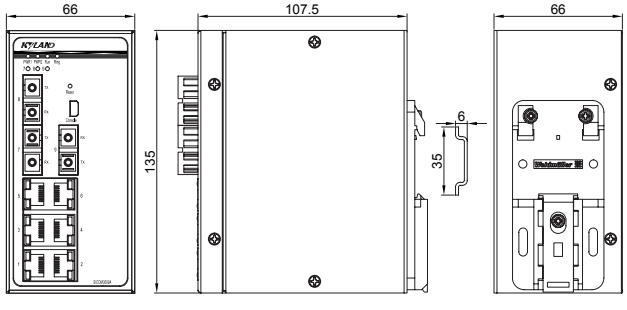
Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

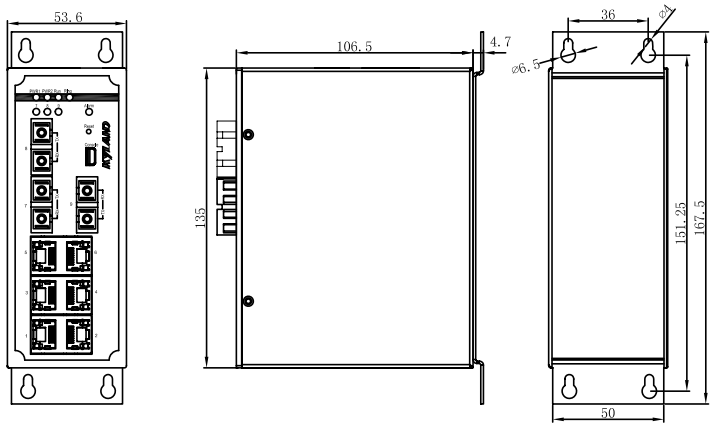
Din Rail Mounting (Low voltage version)



Din Rail Mounting (High voltage version)



Panel Mounting (Low voltage version)



Ordering Information

	SICOM3009A-Ports-Connector-PS1-PS2 SICOM3009A-Ports-Connector-PS1
Ports	
3S6T	3×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
3M6T	3×100Base-FX, multi mode fiber port; 6×10/100Base-T(X) RJ45 ports
2S6T	2×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2M6T	2×100Base-FX, multi mode fiber port; 6×10/100Base-T(X) RJ45 ports
1S7T	1×100Base-FX, single mode fiber port; 7×10/100Base-T(X) RJ45 ports
1M7T	1×100Base-FX, multi mode fiber port; 7×10/100Base-T(X) RJ45 ports
8T	8×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1-PS2	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs
PS1	
HV	100-240VAC, 50/60Hz; 110-220VDC , single power input

Accessories

Accessory model	Description
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port
DT-XL- Mini USB -USB-2m	Mini USB to USB cable for Console management, 2m

SICOM4000

24+4G Port Layer 2 Managed Din-rail Modular Switches

- Supports max 4 Gigabit SFP ports and 24 fast Ethernet fiber/ copper ports
- Modular design for easy expansion
- Embedded serial data server, and supports max 24 RS232/ RS485 ports
- Supports DT-Ring , RSTP for network redundancy.
- IP40 protection class
- CE, FCC certification

Overview

SICOM4000 is a DIN-Rail modular managed industrial Ethernet switch supporting up to 4 Gigabit SFP ports, 24 100M copper/fiber ports or 24 RS232/RS485 serial ports. It also comes with EMC industrial level 4 design and complies with IP40 protection class. SICOM4000 supports many Layer 2 software features such as port, VLAN, multicast, QoS, fast redundant ring. It supports Console, Telnet, Web management and network management software based on SNMP.

Software Functions

Switching Function

Supports VLAN
Supports port aggregation.
Supports flow control.
Support port rate limit
Supports broadcast storm suppression.

Redundancy Protocol

Supports DT-Ring, DT-Ring+, and DT-VLAN and the recovery time<50 ms.
Supports STP/RSTP

Multicast Protocol

Supports IGMP snooping.
Supports static multicast.

Service Quality Management

Supports ACL
Supports SP+WRR and WRR queuing.

Management & Maintenance

Supports Console, Telnet, and Web management methods.
Supports SNMPv1/v2c, Kyvision centralized management.
Supports software update and configuration import/export over FTP.
Supports the power failure alarm, port alarm, and ring alarm
Supports port mirroring.
Supports RMON

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3z(1000Base-SX/LX)
- IEEE 802.3x(flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)

Switch Properties

Priority queue	4
Number of VLANs	256
VLAN ID	1–4093
Number of multicast groups	256
MAC table	8K
Packet buffer	3Mbit
Packet forwarding rate	9.5Mpps
Switching delay	<10μs

Interface

Gigabit ports	1000Base-X, SFP port
Fast Ethernet ports	

- 100Base-FX, single/multi mode, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Serial ports	RS232/RS485
Console port	RS232,RJ45

Alarm contact
- 2-pin 3.81mm-spacing plug-in terminal block,250 VAC/220 VDC Max, 120mA Max

Number of slots	10

LED

LED on front panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1, PWR2
- Port LED: Link/ACT, Speed

LED on rear panel
- Port LED: Link/ACT
- Port speed LED: Speed

Power Requirements

Power input
- 24VDC(18-36VDC)
- 48VDC(36-72VDC),

Power terminal 3-pin 3.81 mm-spacing plug-in terminal block

Power consumption
- <24W (full Ethernet ports)
- <36W (full serial ports)

Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(WxHxD)	416mm×170mm×158mm (16.38×6.69×6.22 in.)
Weight	<8Kg(17.637 pound)
Mounting	Din-rail or panel mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	282,000 hrs
Warranty	5 years

Approvals

CE, FCC

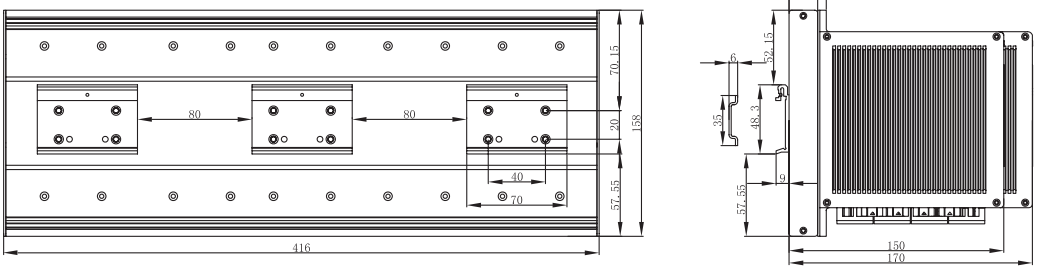
Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

Chasis	
SICOM4000-MB	SICOM4000 Chassis
Power Supply Module	
SM4.1-Power-L1	48VDC(36-72VDC), dual redundant power inputs
SM4.1-Power-L3	24VDC(18-36VDC), dual redundant power inputs
Interface Module	**SM4.1-Ports-Connector-PS**
Ports	
4GX	4x1000Base-X,10/100/1000Base-T(X) SFP port
4S	4x100Base-FX, single-mode fiber port
4M	4x100Base-FX, multi-mode fiber port
2S2T	2x100Base-FX, single-mode fiber port;2x10/100Base-T(X) RJ45 port
2M2T	2x100Base-FX, multi-mode fiber port;2x10/100Base-T(X) RJ45 port
4T	4x10/100Base-T(X) RJ45 port
4D	4xRS232/RS485 serial port
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km

Accessories

Accessory Model	Description
Gigabit SFP module	Please refer to the Gigabit SFP module ordering table
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KIEN7009

9 Port Layer 2 Simple Managed DIN-Rail Switches

- 3 fast Ethernet fiber/RJ45 optional ports, 6 10/100Base-T(X) ports
- Supports DT-Ring and DRP protocols
- Supports one-key recovery
- Provides Mini USB Console port
- UL508, Class I Div 2, CE, FCC certificates

Overview

KIEN7009 is one of Kyland green low power consumption industrial Ethernet switch series. It is equipped with 3 100Base-FX optic ports and 6 10/100Base-TX copper ports, making it ideal for building a fast Ethernet fiber optic ring and leaving a spare fiber port for uplink use. The KIEN7009 series, certified by CE, FCC, UL508 and CID2, is a light managed device, supporting DRP, DT-Ring, VLAN, SSH, SSL and other protocols to increase system reliability. It is designed especially for harsh environments with wide operating temperature range, EMC level 4, IP40 protection class, and can be deployed in wind power, distribution network, automation, transportation, oil & gas and many other industrial applications.

Software Functions

Switching

Support VLAN, PVLAN

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support DRP with the recovery time<20ms

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support MAC address binding with switch ports

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP and TFTP
Support power, port and ring alarm
Support RMON
Support Link-check

Product Specifications

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-T and 100Base-FX)
- IEEE 802.3x(Flow Control)
- IEEE 802.1Q(VLAN)

Switch Properties

Number of VLANs	256
VLAN ID	1–4093
MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	1.4Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port Mini USB

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block,250VAC/220VDC Max, 2A Max

LED

LEDs on Front Panel

- Running LED: Run
- Alarm LED: Alarm (12/24/48VDC model only)
- Power LED: PWR1,PWR2
- Ring LED: Ring
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT(Fiber port)

Button

Reset: Reboot and restore default configuration

Power Requirement

Power Input
- 24-48VDC
- 12-24VDC
- 100-240VAC, 50/60Hz; 110-220VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block (12/24/48VDC)
- 3-pin 5.08mm-spacing plug-in terminal block (220VAC/DC)

Power Consumption	<8.1W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support (12/24/48VDC)

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40

Dimension
- 53.6mm×135mm×106.5mm(W×H×D) (12/24/48VDC)
- 66mm×135mm×106.5mm (W×H×D) (220VAC/DC)

Weight	0.76Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature
- -40°C to +85°C(12/24/48VDC)
- -40°C to +75°C(220VAC/DC)

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	385,000 hrs
Warranty	5 years

Approvals

UL508*, Class I Div 2*,CE, FCC
*: UL certified max operating temperature is 75°C.

Industry Standard

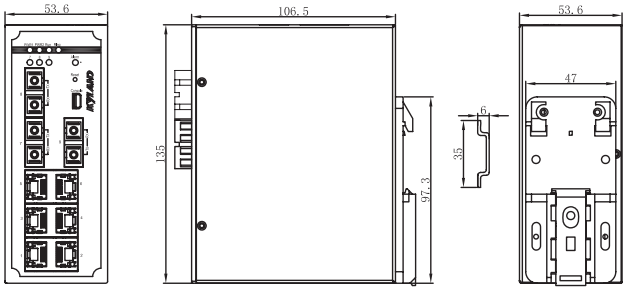
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port:±2kV
- IEC61000-4-6(CS) 10V (150kHz–80MHz)

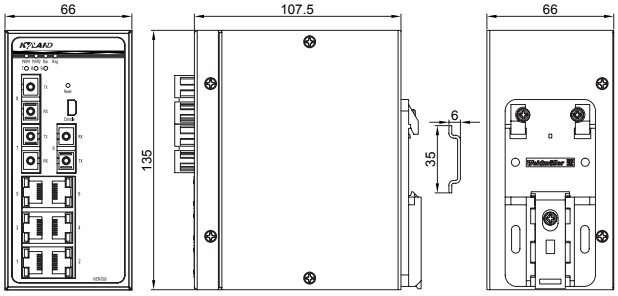
Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

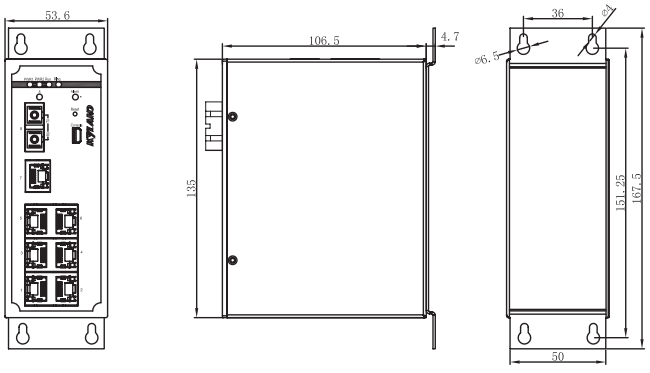
Din Rail Mounting (Low voltage version)



Din Rail Mounting (High voltage version)



Panel Mounting (Low voltage version)



Ordering Information

	KIEN7009-Ports-Connector-PS1-PS2 KIEN7009-Ports-Connector-PS1
Ports	
3S6T	3×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
3M6T	3×100Base-FX, multi mode fiber port; 6×10/100Base-T(X) RJ45 ports
2S6T	2×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2M6T	2×100Base-FX, multi mode fiber port; 6×10/100Base-T(X) RJ45 ports
2S4T	2×100Base-FX, single mode fiber ports; 4×10/100Base-T(X) RJ45 ports
2M4T	2×100Base-FX, multi mode fiber port; 4×10/100Base-T(X) RJ45 ports
1S7T	1×100Base-FX, single mode fiber port; 7×10/100Base-T(X) RJ45 ports
1M7T	1×100Base-FX, multi mode fiber port; 7×10/100Base-T(X) RJ45 ports
8T	8×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1-PS2	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs
PS1	
HV	100-240VAC, 50/60Hz; 110-220VDC , single power input

Accessories

Accessory Model	Description
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port
DT-XL-Mini USB-USB-2m	Mini USB to USB cable for Console management, 2m

Ruby3

Managed Redundancy Box

Preliminary

- Compliant implementation of both PRP (IEC62439-3-4) and HSR (IEC62439-3-5)
- Supports combo ports as HSR/PRP port
- Supports IEEE 1588v2 and the synchronization precision reaches ±100 ns.
- Supports reset button for system reboot
- Complies with IEC 61850-3 and IEEE1613.

Overview

Ruby3 from Kyland is specially designed for reliable industrial networking realizing both PRP (Parallel Redundancy Protocol) and HSR (High-availability Seamless Redundancy) which are defined in IEC62439-3. The Ruby3 provides the ultimate in network reliability and zero failover time from network faults. Full FPGA hardware solution enables Kyland Ruby3 low switching latency and PRP/HSR is selectable via software with the same hardware platform. Precision time synchronization in accordance with IEEE 1588v2 is supported on Kyland Ruby3.

Software Functions

Redundancy Protocol

Supports HSR and the recovery time is 0 ms.
Supports PRP and the recovery time is 0 ms.

Management & Maintenance

Supports Console, Telnet, and Web management methods.
Supports software update over FTP.
Supports power failure alarm
Supports LLDP.

Clock Synchronization

Supports PTPv2 (IEEE 1588-2008).

Product Specifications

Technical Specifications

Standard
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-SX/LX)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEC62439-3-5(HSR)
- IEC62439-3-4(PRP)

Switch Properties

Number of VLANs	1
VLAN ID	1–4094
MAC table	512
Number of ring nodes	12
Switching delay	< 5 μs

Interface

Gigabit ports
- 1000Base-X, 100Base-FX, SFP port
- 100/1000Base-T(X), RJ45 port

Console port RS232,RJ45
Alarm contact
- 3-pin 5.08mm-spacing plug-in terminal block,250 VAC/220 VDC Max, 2 A Max, 60 W Max

LED

LED on front panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1, PWR2
- Port LED: Link/ACT
- HSR/PRP mode LED:PRP/HSR

Button

Reset: supports system reboot

Power Requirements

Power input
- 24DCW(18-72VDC),
- 220AC/DCW(85-264VAC/77-300VDC)

Power terminal
- 5-pin 5.08 mm-spacing plug-in terminal block

Power consumption	<8W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40

Dimensions(WxHxD)
- 66×135×107.5 mm (2.60×5.31×4.23 in.)

Weight	1.25Kg (2.756pound)
Mounting	Din-rail or panel mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% to 95% (non-condensing)

Quality Assurance

MTBF	351,889 hrs
Warranty	5 years

Approvals

Please visit www.kyland.com for the latest news

Industry Standard

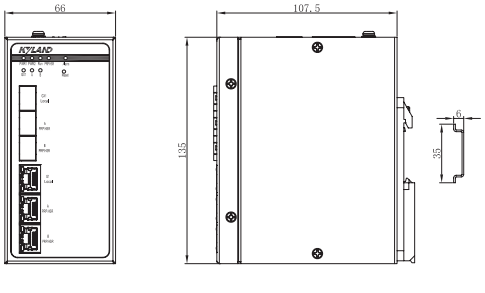
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

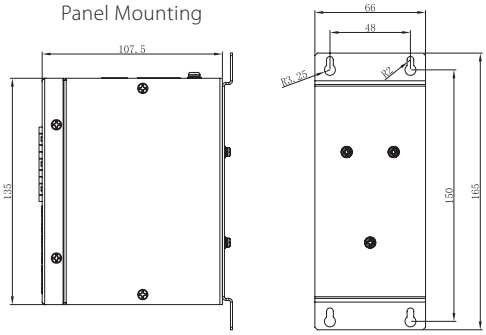
Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	Ruby3-Ports-PS
Ports	
3G	3x1000Base-X, 100Base-FX, 100/1000Base-T(X) Combo port;
PS	
HV	220AC/DCW(85-264VAC/77-300VDC)
L2-L2	24DCW(18-72VDC), dual redundant power inputs

Accessories

Accessory Model	Description
Gigabit SFP module	See the selection table of industrial gigabit SFP module.
100M Fiber SFP Module	See the selection table of industrial 100M Fiber SFP module.
DT-FCZ-RJ45-01	Single-port RJ45 dust plug
DT-BGAZ-09	Panel mounting board

Network Redundancy Technology Evolution for Industrial Automation

With the popularity and maturity of Ethernet technologies, more and more mission critical services and applications for Industrial Automation are now transmitted through Ethernet. In order to commit high availabilities of the network, several different network failure switch-over technologies, such as spanning tree (STP), rapid spanning tree (RSTP), as well as proprietary ring protocols have been developed. The switch-over time upon link or node failure have been reduced dramatically from several seconds to hundred milliseconds, and now even less than 50 milliseconds in a single ring. Moreover, the other key requirement is to have diverse inter-ring connections, and thus several ring coupling, dual homing or chain technologies were developed to compose a sophisticated multiple ring network with millisecond switch-over time.

In general, such sub-second level switch-over mechanism is good enough for network redundancy. But in some occasions, a full duplicated system is preferred. Either doubling all the components in the system or doubling the packets will help provide a perfectly redundant network with zero switch-over time. HSR (High Availability Seamless Redundancy) and PRP (Parallel Redundancy Protocol) are then innovated to help build highly redundant networks for most severe industrial applications.

Kyland is an international leading Industrial Ethernet solution provider. We have had integrated the most typical redundant technologies, STP/RSTP and also MSTP into our products. And we have then contributed to the international standard of IEC62439-6, DRP which enables <20ms recovery time regardless the complexity of inter-ring connections. In order to offer a more versatile solution portfolio, we have also launched products with HSR/PRP capability.

	STP/RSTP/MSTP	DT-Ring	DRP	HSR/PRP
Public Standard	IEEE Standard	Proprietary	IEC62439-6	IEC62439-3
Applicable Network Scale	<40 nodes	50-250 nodes	unlimited	HSR: 14 nodes PRP: unlimited
Recovery Time	> 1 s	< 20-50 ms	< 20 ms	Zero switch-over time (duplicated packets)
Recovery Time Dependency of Network Scale	N * number of nodes	Almost independent	Almost independent	Not applicable
Ease of Configuration	Medium (root, bridge, priority)	Simple (root)	Simple (not required)	Simple (not required)
Topology	Any	Ring	Ring	HSR: Ring PRP: Tree
Direct Interconnection with Ethernet	Yes	Yes	Yes	HSR: No PRP: Yes

Comparison of redundancy technologies

Distributed Redundancy Protocol

What is DRP?

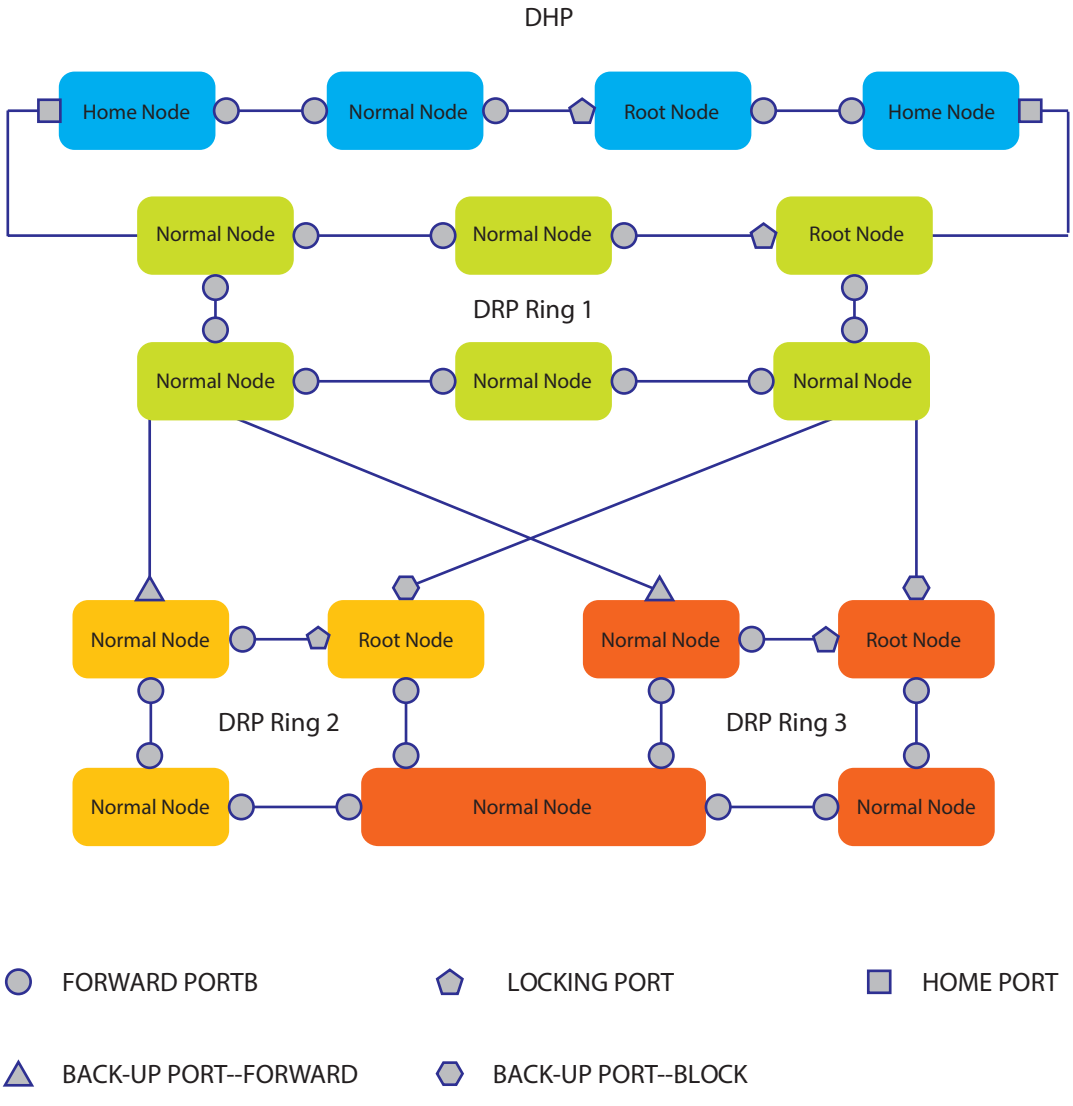
- It is an international standard: IEC62439-6
- It is a redundancy protocol to:
  - -Avoid broadcast storm
  - -Protect network from link failures or node failure

DHP: Dual Homing Protocol

Kyland patented layer 2 chain solution for network expansion (able to attach to any existing network with fast recovery time)

Technological Benefits of DRP

- Master node automatic election
- Network recovery time < 20ms, regardless network scale
- Supports versatile ring technologies
  - -Simple ring topology
  - -Intersected ring topology
  - -Tangent ring topology
  - -VLAN-based redundant ring topology



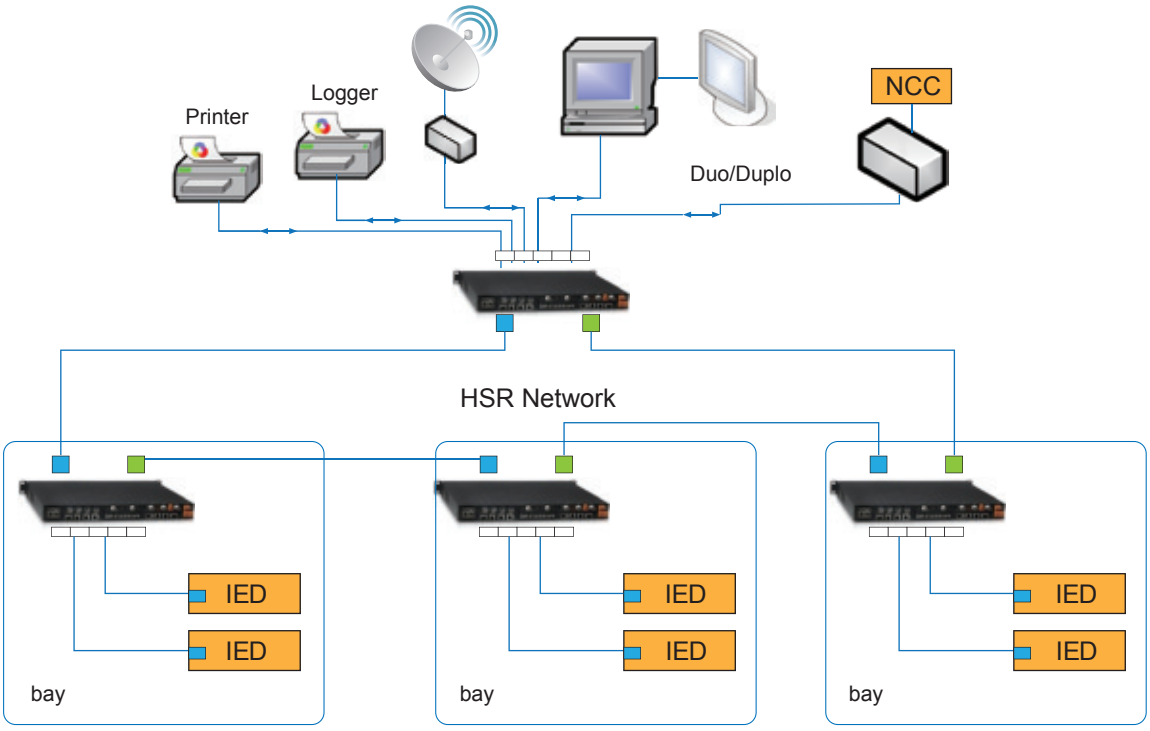
High-availability Seamless Redundancy & Parallel Redundancy Protocol

What is HSR/PRP?

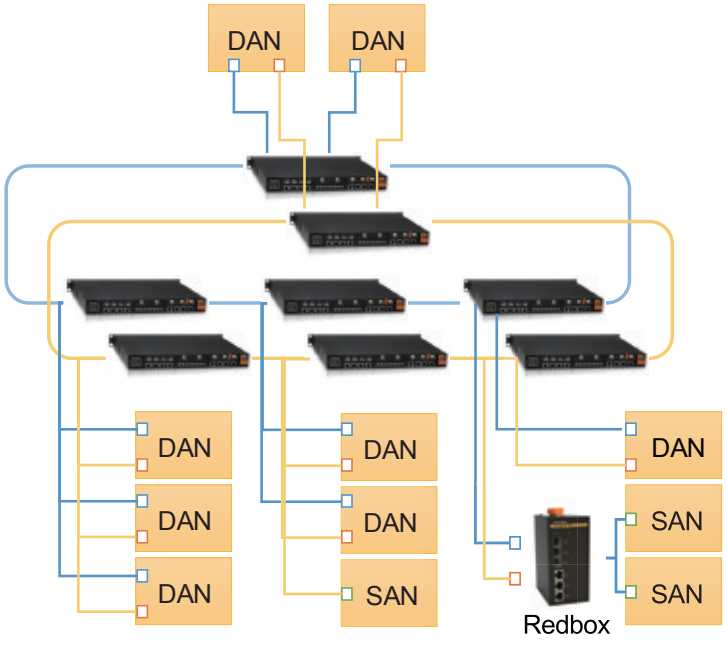
- It is an international standard: IEC62439-3
- It is a network redundancy protocol which guarantees communications

Technical Benefits of HSR/PRP

- Zero switch-over time (through packet duplication and transmission)
- Suitable for mission critical applications
- Transparent to other parts of the network (IEEE1588v2 packets can be tratransmitted)



HSR application



PRP application

Recommended Products

SICOM3028GPT

- 28G or 24+4G Ports Layer 2 or Layer 3 Gigabit Managed Rack-mount Modular IEC61850 & IEEE1588 Industrial Ethernet Switch
- Supports STP/RSTP/MSTP
- Supports DT-Ring
- Supports DRP
- Supports HSR/PRP module

Ruby3

- Managed HSR/PRP Redbox (Redundancy Box) or 10 Ports PRP/HSR Switches

SICOM3306PT

- 6+3G Ports Layer 2 Managed DIN-Rail IEC61850 & IEEE1588 Industrial Ethernet Switch
- Supports STP/RSTP/MSTP
- Supports DT-Ring
- Supports DRP

SICOM3000

- 8+2G Ports Layer 2 Managed DIN-Rail IEC61850 Industrial Ethernet Switch
- Supports STP/RSTP/MSTP
- Supports DT-Ring
- Supports DRP

SICOM3010G

- 10G Ports Layer 2Full Gigabit Managed DIN-Rail IEC61850 Switch
- Supports STP/RSTP/MSTP
- Supports DT-Ring
- Supports DRP

KIEN1026

26 Port Layer 2 Unmanaged Rack Mountable Switches

- Supports max 2 fast Ethernet fiber ports and 24 fast Ethernet RJ45 ports
- Allow front and rear panel mounting
- IP40 protection class
- CE, FCC certification

Overview

KIEN1026 is an entry-level unmanaged industrial Ethernet switch specially designed by KYLAND for industrial applications. It supports up to 24 10/100Base-T(X) and 2 100Base-FX ports, Aluminum IP40 protection class and -40 to 85°C operating temperature. Its high-performance switch engine, solid and closed case, and excellent EMC protection (level 4) make KIEN1026 applicable in all kinds of harsh and dangerous industrial environments.

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)

Switch Properties

MAC table	8K
Packet buffer	4Mbit
Packet forwarding rate	4.2Mpps
Switching delay	<10μs

Interface

Fast Ethernet ports
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

LED

LED on front panel
- Power LED: PWR1, PWR2
- Port LED: Link/ACT
- Port speed LED: Speed

LED on rear panel
- Port LED: Link/ACT
- Port speed LED: Speed
- Fiber port LED:A, B

Power Requirements

Power input
- 24DC(18-36VDC),
- 220AC/DCW(85-264VAC/77-300VDC)

Power terminal
- 5-pin 5.08 mm-spacing plug-in terminal block

Power consumption	<15W
Overloadprotection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40

Dimensions(WxHxD)
- 482.6mm×44mm×245mm (19×1.73×9.64 in.)

Weight	2.5Kg (5.51 pound)
Mounting	19 inch 1U rack mounting

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F - 185°F)
Storage temperature	-40°C to +85°C (-40°F - 185°F)
Ambient Relative Humidity	5%-95% (non-condensing)

Quality Assurance

MTBF	341,336 hrs
Warranty	5 years

Approvals

CE, FCC
Please visit www.kyland.com for the latest news

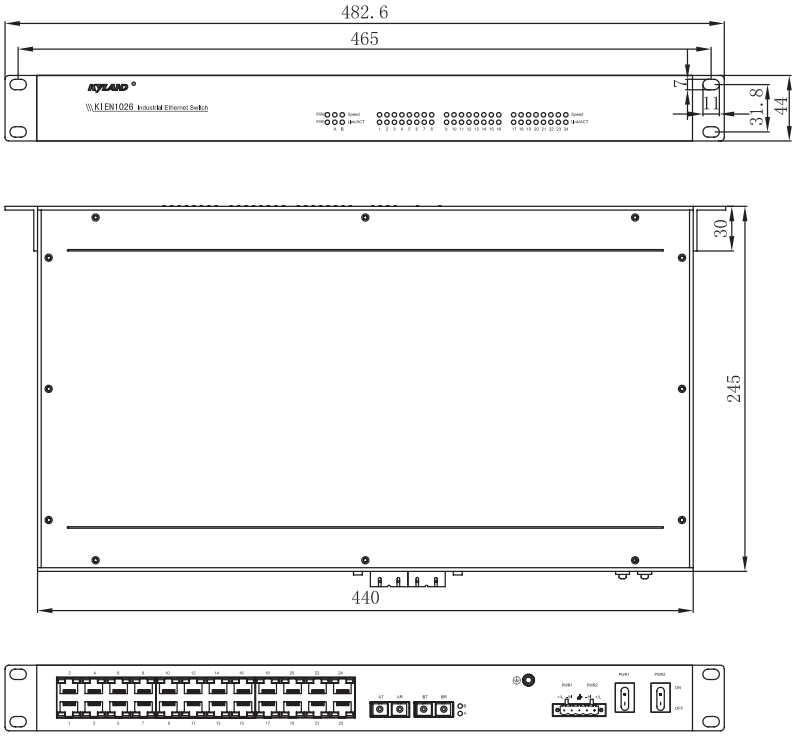
Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±6kV(contact),±8kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz);3V/m(2-2.7GHz)
- IEC61000-4-4(EFT) Power Port:±2kV;Data Port:±2kV
- IEC61000-4-5(Surge)Power Port:±2kV/DM,±2kV/CM; Data Port:±2kV
- IEC61000-4-6(CS) 10V(150kHz-80MHz)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

	KIEN1026-Ports-Connector-PS1-PS2
Ports	
2S16T	2x100Base-FX single-mode fiber port;16x10/100Base-T(X) RJ45 port
2M16T	2x100Base-FX multi-mode fiber port;16x10/100Base-T(X) RJ45 port
2S24T	2x100Base-FX single-mode fiber port;24x10/100Base-T(X) RJ45 port
2M24T	2x100Base-FX multi-mode fiber port;24x10/100Base-T(X) RJ45 port
16T	16x10/100Base-T(X) RJ45 port
24T	24x10/100Base-T(X) RJ45 port
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS1	
HV	220AC/DCW(85-264VAC/77-300VDC)
L3	24DC(18-36VDC)
PS2	
HV	220AC/DCW(85-264VAC/77-300VDC)
L3	24DC(18-36VDC)
None	No secondary power supply

Accessories

Accessory Model	Description
DT-FCZ-RJ45-01	Single-port RJ45 dust plug

KIEN3016A

16 Port Unmanaged DIN-Rail Switches

- 2 Fast Ethernet fiber/RJ45 optional ports, 14 10/100Base-T(X) ports
- EMC performance reaches industrial level 4
- IP40 protection class
- UL508 (pending), Class I Div 2(pending), CE, FCC certificates

Overview

The KIEN3016A series are Kyland Green Ethernet series, offering up to 16 Fast Ethernet ports, plug and play. The solid metal housing with IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, wide operating temperature range from -40°C to 85°C, and excellent EMC performance give the switches an stable and reliable operating capability in the harsh industrial environments, and make them ideal for setting up robust Fast Ethernet connection in power, ITS, factory automation, video surveliane and other indsutrial applications.

Software Functions

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100Base-FX)

Switch Properties

MAC Table	8K
Packet Buffer	2Mbit
Packet Forwarding Rate	2.4Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED:PWR1,PWR2
- Interface LED:Link/ACT, Speed (RJ45 port); Link/ACT (Fiber port)

Power Requirements

Power Input
- 24-48VDC
- 12-24VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<12W
Overload Protection	Support
ReverseProtection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling Mode	Natural cooling, fanless
Protection Class	IP40
Dimension	88mm×135mm×137mm(W×H×D)
Weight	1.2Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	361,000 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending), CE, FCC

Industrial Standards

EMI

- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS

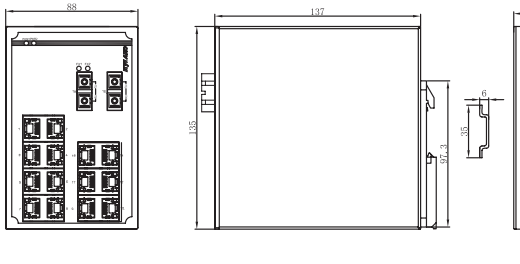
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM, ±4kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery

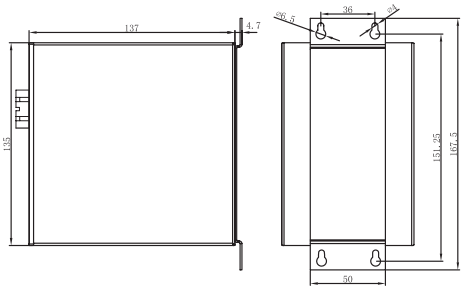
- IEC60068-2-6(Vibration)
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free Fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	KIEN3016A-Ports-Connector-PS1-PS2
Ports	
2S14T	2×100Base-FX, single mode fiber ports; 14×10/100Base-T(X) RJ45 ports
2M14T	2×100Base-FX, multi mode fiber ports; 14×10/100Base-T(X) RJ45 ports
16T	16×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs

Accessories

Accessory Model	Description
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KIEN1009

9 Port Unmanaged DIN-Rail Switches

- 1 optional uplink Gigabit SFP port , 2 fast Ethernet fiber/RJ45 optional ports, 6 10/100Base-T(X) ports
- EMC performance reaches industrial level 4
- IP40 protection class
- UL508, Class I Div 2, CE, FCC certificates

Overview

The KIEN1009 series are Kyland ultra low power consumption Green Ethernet series, offering abundant port combinations and supporting 1 optional Gigabit uplink port and 8 Fast Ethernet ports, plug and play. The solid metal housing with IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, wide operating temperature range from -40°C to 85°C, and excellent EMC performance give the switches stable and reliable operating capability in the harsh industrial environments. The KIEN1009 series has been certified by CE, FCC, UL508 and CID2, making them ideal for setting up robust Fast Ethernet connection in the global power, ITS, factory automation, video surveliane and other industrial applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100Base-FX)
- IEEE 802.3z (1000Base-X)

Switch Properties

MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	1.4Mpps
Switching Delay	<10μs

Interface

Gigabit Port	1000Base-X, SFP slot

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT(fiber port)

Power Requirements

Power Input
- 24-48VDC
- 12-24VDC
- 100-240VAC,50/60Hz; 110-220VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block (12/24/48VDC)
- 3-pin 5.08mm-spacing plug-in terminal block (220VAC/DC)

Power Consumption
- <6.5W (12/24/48VDC)
- <7.5W (220VAC/DC)

Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support (12/24/48VDC)

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40

Dimension
- 53.6mm×135mm×106.5mm (W×H×D)(12/24/48VDC)
- 66mm×135mm×106.5mm (W×H×D) (220VAC/DC)

Weight	0.76Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature
- -40°C to +85°C(12/24/48VDC)
- -40°C to +75°C(220VAC/DC)

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	397000h
Warranty	5 years
Certificates	UL508*, Class I Div 2*, CE, FCC

*: UL certified max operating temperature is 75°C.

Industrial Standards

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV (contact), ±15kV (air)

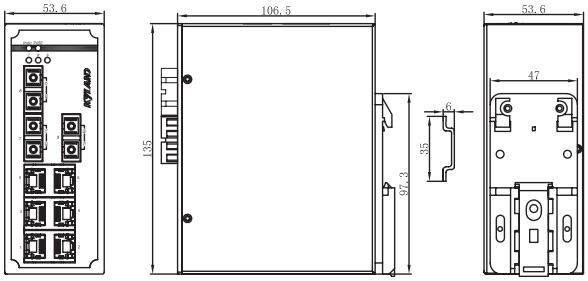
IEC61000-4-3(RS) 10V/m (80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port: ±4kV; Data Port: ±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port: ±2kV

IEC61000-4-6(CS) 10V(150kHz–80MHz)

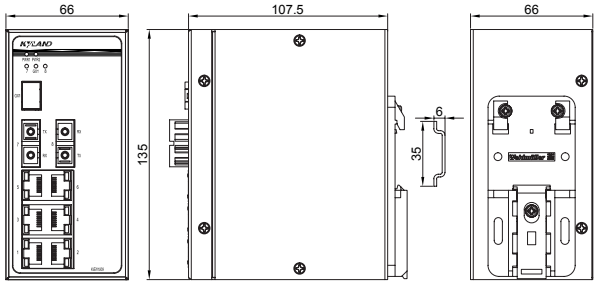
Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

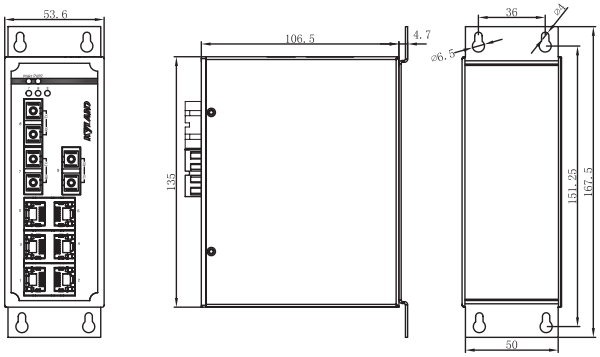
Din Rail Mounting (12/24/48VDC model)



Panel Mounting (12/24/48VDC model)



Din Rail Mounting (220VAC/DC model)



Ordering Information

	KIEN1009-Ports-Connector-PS1-PS2 KIEN1009-Ports-Connector-PS1
Ports	
1GX2S6T	1×1000Base-X, SFP slots; 2×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
1GX2M6T	1×1000Base-X, SFP slots; 2×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
3S6T	3×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
3M6T	3×100Base-FX, multi mode fiber port; 6×10/100Base-T(X) RJ45 ports
2S6T	2×100Base-FX, single mode fiber port; 6×10/100Base-T(X) RJ45 ports
2M6T	2×100Base-FX, multi mode fiber port; 6×10/100Base-T(X) RJ45 ports
1S7T	1×100Base-FX, single mode fiber port; 7×10/100Base-T(X) RJ45 ports
1M7T	1×100Base-FX, multi mode fiber port; 7×10/100Base-T(X) RJ45 ports
8T	8×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs
HV	100-240VAC, 50/60Hz; 110-220VDC, single power input

Accessories

Accessory Model	Description
Gigabit SFP module	Please refer to the Gigabit SFP module ordering list
DT-BGAZ-02	Panel for panel mounting (12/24/48VDC Model)
DT-BGAZ-14	Panel for panel mounting (220VAC/DC Model)
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KIEN1005G

5G Port Full Gigabit Unmanaged DIN-Rail Switches

- Green Ethernet solution with full load power consumption as low as 3.4W
- 5 Gigabit RJ45 ports
- EMC performance reaches industrial level 4
- IP40 protection class
- CE,FCC certificates

Overview

The KIEN1005G full Gigabit series belong to Kyland ultra low power consumption Green Ethernet series, equipped with 5 Gigabit ports, plug and play, its full load power consumption is as low as 3.4 watts. The solid metal housing with IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, reduandant power inputs, wide operating temperature range from -40°C to 85°C, and excellent EMC performance give the switches stable and reliable operating capability in the harsh industrial environments, and make them ideal for setting up high bindwidth Ethernet connections in power, factory automation, oil and gas and other indsutrial applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX)
- IEEE 802.3ab(1000Base-T)

Switch Properties

MAC Table	1K
Packet Buffer	1Mbit
Packet Forwarding Rate	7.4Mpps
Switching Delay	<5μs

Interface

Gigabit Port	10/100/1000Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED:PWR1, PWR2
- Interface LED:Link/ACT, Speed (RJ45 port)

Power Requirement

Power Input
- 24-48VDC
- 12-24VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	3.4W (full load),0.99W (no load)
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	30mm×115mm×91.5mm(W×H×D)
Weight	0.46Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	357,000 hrs
Warranty	5 years

Approvals

CE,FCC

Industrial Standards

EMI

- FCC CFR47 Part 15,EN55022/CISPR22,Class A

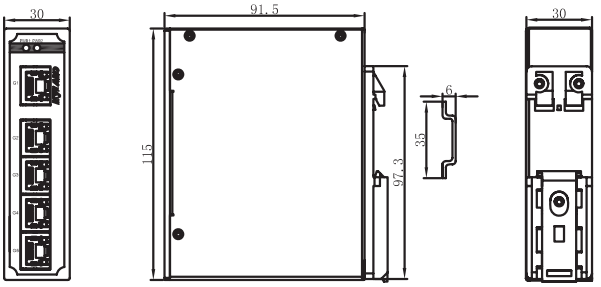
EMS

- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port:±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

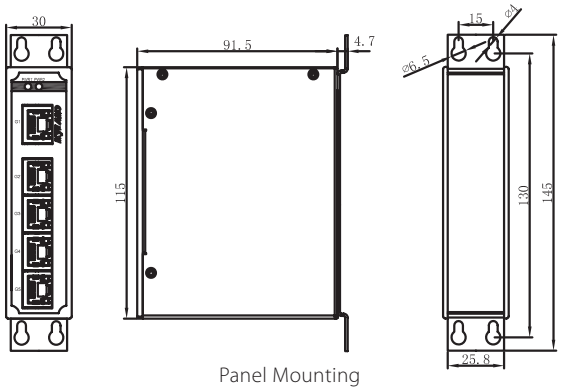
Machinery

- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Din Rail Mounting



Panel Mounting

Ordering Information

	KIEN1005G-Ports-PS1-PS2
Ports	
5GE	5×10/100/1000Base-T(X) RJ45 ports
PS	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs

Accessories

Accessory Model	Description
DT-BGAZ-01	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KIEN1008G

8G Port Full Gigabit Unmanaged DIN-Rail Switches

- 2 Gigabit Combo ports and 6 10/100/1000Base-TX ports
- EMC performance reaches industrial level 4
- IP40 protection class
- UL508 (pending), Class I Div 2(pending),CE, FCC certificates

Overview

The KIEN1008G full Gigabit series belong to Kyland ultra low power consumption Green Ethernet series, equipped with 8 Gigabit ports, plug and play. The solid metal housing with IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, reduandant power inputs, wide operating temperature range from -40°C to 85°C, and excellent EMC performance give the switches stable and reliable operating capability in the harsh industrial environments, and make them ideal for setting up high bindwidth Ethernet connections in power, factory automation, oil and gas and other insutrial applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z (1000Base-X)

Switch Properties

MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	11.9Mpps
Switching Delay	<5μs

Interface

Gigabit Port
- 1000Base-X, SFP slot
- 10/100/1000Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED:PWR1, PWR2
- Interface LED:Link/ACT, Speed (RJ45 port), Link/ACT (fiber port)

Power Requirement

Power Input
- 24-48VDC
- 12-24VDC

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<16W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	88mm×135mm×137mm(W×H×D)
Weight	1.2Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	357,000 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending), CE, FCC

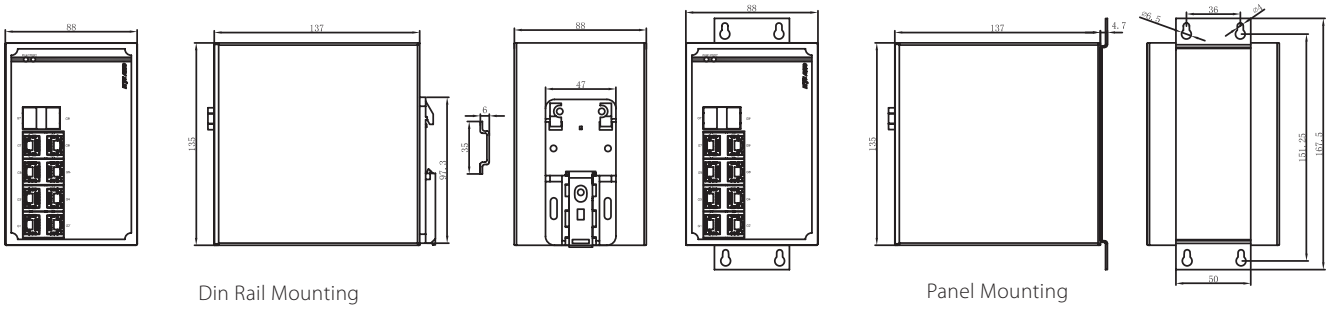
Industrial Standards

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port:±2kV
- IEC61000-4-6(CS) 10V(150kHz–80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Din Rail Mounting

Panel Mounting

Ordering Information

	KIEN1008G-Ports-PS1-PS2
Ports	
2G6GE	2×1000Base-X,10/100/1000Base-T(X) Combo ports; 6×10/100/1000Base-T(X) RJ45 ports
8GE	8×10/100/1000Base-T(X) RJ45 ports
PS	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs

Accessories

Accessory Model	Description
Gigabit SFP module	Please refer to the Gigabit SFP module ordering list
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KIEN1005A/KIEN1005

5 Port Unmanaged DIN-Rail Switches

- 1 Fast Ethernet fiber/RJ45 optional port, 4 10/100Base-T(X) ports
- IP40 protection class
- Green Ethernet solution with full load power consumption as low as 3.5W
- KIEN1005A's EMC performance reaches industrial level 4
- CE, FCC certificates

Overview

The KIEN1005A series belong to Kyland ultra low power consumption Green Ethernet series, equipped with 5 Fast Ethernet ports, plug and play, its full load power consumption is as low as 3.5 watts. The solid metal housing with IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation, 12V/24V/48V/220V optional power supply, wide operating temperature range from -40°C to 85°C, and excellent EMC performance give the switches stable and reliable operating capability in the harsh industrial environments, and make them ideal for setting up robust Fast Ethernet connection in power, ITS, factory automation, and other insutrial applications. The KIEN1005 5-port unmanaged switch provides 1 Fast Ethernet fiber/RJ45 optional port, 4 10/100Base-TX ports, and supports 12V and 220V single power input.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100Base-FX)

Switch Properties

MAC Table
- 2K (KIEN1005A)
- 1K (KIEN1005)

Packet Buffer
- 1Mbit (KIEN1005A)
- 512Kbit (KIEN1005)

Packet Forwarding Rate	0.8Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED:
  - PWR1, PWR2 (KIEN1005A)
  - PWR (KIEN1005)
- Interface LED:Link/ACT, Speed (RJ45 port); Link/ACT (Fiber port)

Power Requirements

Power Input(KIEN1005A)
- 24-48VDC
- 12-24VDC

100-240VAC,50/60Hz; 110-220VDC

Power Input(KIEN1005)
- 12-24VDC
- 220VAC

Power Terminal(KIEN1005A)
- 5-pin 5.08mm-spacing plug-in terminal block (12/24/48VDC)
- 3-pin 5.08mm-spacing plug-in terminal block (220VAC/DC)

Power Terminal(KIEN1005)
- 3-pin 3.81mm-spacing plug-in terminal block

Power Consumption
- KIEN1005A<2.7W (12/24/48VDC)
- KIEN1005A<3.5W (220VAC/DC)
- KIEN1005<3.6W

Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	KIEN1005A (12/24/48VDC) Support

Physical Characteristics

Housing	Metal
Cooling Mode	Natural convection, fanless
Protection Class	IP40

Dimension
- 30mm×115mm×91.5mm (W×H×D) (KIEN1005A)
- 36.5mm×120mm×90mm (W×H×D) (KIEN1005)

Weight
- 0.46Kg (KIEN1005A)
- 0.3Kg (KIEN1005)

Mounting: DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	454730h
Warranty	5 years

Approvals

CE, FCC

Industrial Standards

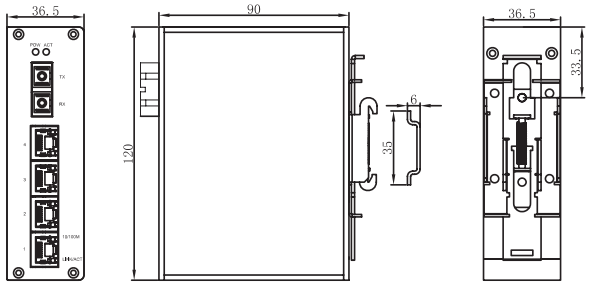
EMI
- FCC CFR47 Part 15, EN55022/CISPR22, Class A

EMS
- IEC61000-4-2(ESD) ±8kV (contact), ±15kV (air)
- IEC61000-4-3(RS) 10V/m (80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port: ±4kV; Data Port: ±2kV
- IEC61000-4-5 (Surge) Power Port: ±2kV/DM, ±4kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS) 10V (150kHz–80MHz)

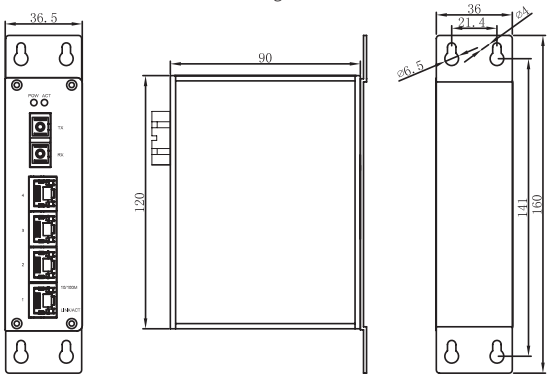
Machinery
- IEC60068-2-6(Vibration)
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free Fall)

Mechanical Drawing

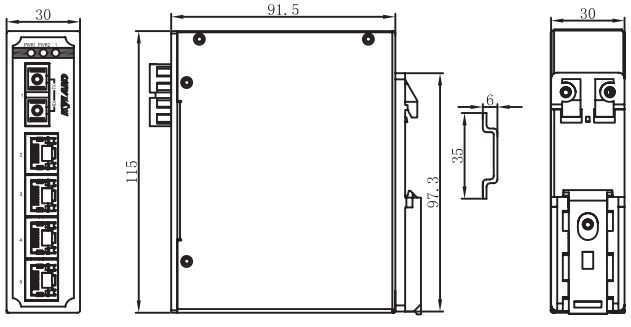
Din Rail Mounting (KIEN1005)



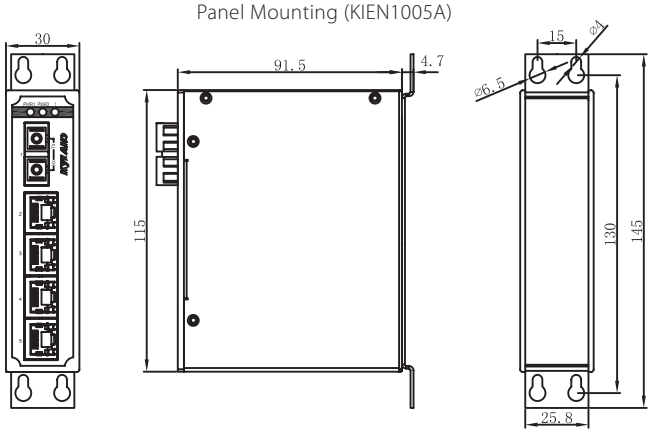
Panel Mounting (KIEN1005)



Din Rail Mounting (KIEN1005A)



Panel Mounting (KIEN1005A)



Ordering Information

	KIEN1005A-Ports-Connector-PS
Ports	
5T	5×10/100Base-T(X) RJ45 ports
1S4T	1×100Base-FX, single mode fiber port; 4×10/100Base-T(X) RJ45 ports
1M4T	1×100Base-FX, multi mode fiber port; 4×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
L2-L2	24-48VDC, redundant power inputs
L5-L5	12-24VDC, redundant power inputs
HV	100-240VAC, 50/60Hz; 110-220VDC, single power input

	KIEN1005-Ports-Connector-PS
Ports	
5T	5×10/100Base-T(X) RJ45 ports
1S4T	1×100Base-FX, single mode fiber port; 4×10/100Base-T(X) RJ45 ports
1M4T	1×100Base-FX, multi mode fiber port; 4×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
H3	220VAC, single power input
L5	12-24VDC, single power input

Accessories

Accessory Model	Accessory Description
DT-BGAZ-01	Panel for panel mounting (KIEN1005A)
DT-BGAZ-03	Panel for panel mounting (KIEN1005)
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Opal5

5 Port Entry-level Unmanaged DIN-Rail Switches

NEW

- 1 Fast Ethernet fiber/RJ45 optional port, 4 10/100Base-T(X) ports
- Both standard and wide operating temperature models are available
- IP30 protection class
- UL508, Class I Div 2, ATEX Zone 2, IECEx, CE, FCC

Overview

Opal5 unmanaged 5-port switch is specially designed for automation control applications. It is equipped with one fast Ethernet fiber/RJ45 optional port and 4 10/100Base-TX RJ45 ports. Opal5 supports SC/ST/SFP type fiber ports, redundant power inputs, metal housing with IP30 protection class, thus ensuring fast and reliable data transmission in harsh industrial environments. Opal5 provides both standard (-10°C to 60°C) operating temperature range model and wide (-40°C to 75°C) operating temperature range models to meet different applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and100Base-FX)

Switch Properties

MAC Table	2K
Packet Buffer	1Mbit
Packet Forwarding Rate	0.75Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST connector
- 100Base-X, SFP slot
- 10/100Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT (Fiber port)

DIP-Switch

Enable/Disable broadcast storm protection

Power Requirements

Power Input	12-48VDC/18-30VAC
Power Terminal	
▾ 4-pin 5.08mm-spacing plug-in terminal block	
Power Consumption	<3.4W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP30
Dimension	30mm×115mm×68mm (W×H×D)
Weight	0.2Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature
- -10°C to +60°C (Opal5-E)
- -40°C to +75°C

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	4,500,764 hrs
Warranty	5 years

Approvals

UL508, Class I Div 2, ATEX Zone 2, IECEx, CE, FCC
(The certificate status for 1SFP4T models are pending.)

Industrial Standards

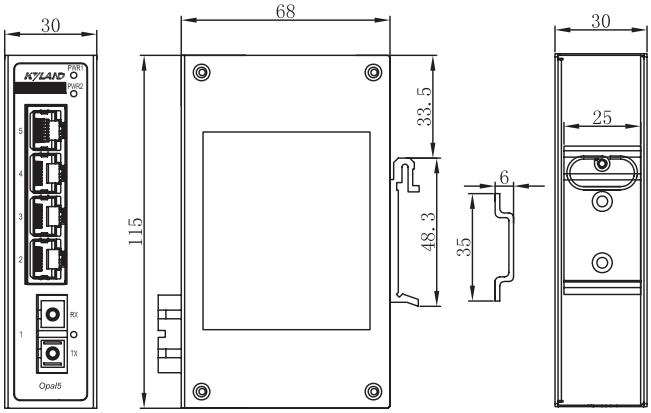
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD): ±6kV (contact), ±8kV (air)

IEC61000-4-3(RS): 10V/m (80MHz–2GHz)
- IEC61000-4-4(EFT): Power Port: ±2kV; Data Port: ±1kV
- IEC61000-4-5(Surge): Power Port: ±1kV/DM, ±2kV/CM; Data Port: ±1kV
- IEC61000-4-6(CS): 10V (150kHz–80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	Opal5-X-Ports-Connector-PS
	Operating temperature range
E	-10°C~+60°C operating temperature
None	-40°C~+75°C operating temperature
Ports	
5T	5×10/100Base-T(X) RJ45 ports
1S4T	1×100Base-FX, single mode fiber port; 4×10/100Base-T(X) RJ45 ports
1M4T	1×100Base-FX, multi mode fiber port; 4×10/100Base-T(X) RJ45 ports
1SFP4T	1×100Base-X,SFP slot; 4×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
LV-LV	12-48VDC/18-30VAC, redundant power inputs

Accessories

Model	Description
100Base-X SFP module	Please refer to the 100Base-X SFP module ordering list
DT-BGAZ-13	Panel for Panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Opal8

8 Port Entry-level Unmanaged DIN-Rail Switches

- 2 Fast Ethernet fiber/RJ45 optional ports, 6 10/100Base-T(X) ports
- Both standard and wide operating temperature models are available
- IP30 protection class
- UL508, Class I Div 2, ATEX Zone 2, IECEx, CE, FCC

Overview

Opal8 unmanaged 8-port switch is specially designed for automation control applications. It is equipped with two fast Ethernet fiber/RJ45 optional ports and 6 10/100Base-TX RJ45 ports. Opal8 supports SC/ST/SFP type fiber ports, redundant power inputs, metal housing with IP30 protection class, thus ensuring fast and reliable data transmission in harsh industrial environments. Opal8 provides both standard (-10 to 60°C) operating temperature range model and wide (-40 to 75°C) operating temperature range models to meet different needs of applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100Base-FX)

Switch Properties

MAC Table	2K
Packet Buffer	1Mbit
Packet Forwarding Rate	1.2Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST connector
- 100Base-X, SFP slot
- 10/100Base-T(X), RJ45 port

LED

LEDs on Front Panel Power LED: PWR1, PWR2
Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT (Fiber port)

DIP-Switch

Enable/Disable broadcast storm protection

Power Requirements

Power Input	12-48VDC/18-30VAC
Power Terminal	
▼ 4-pin 5.08mm-spacing plug-in terminal block	
Power Consumption	<4.6W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP30
Dimension	46mm×115mm×68mm(W×H×D)
Weight	0.32Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature
- -10°C to +60°C (Opal8-E)
- -40°C to +75°C

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	4,044,813 hrs
Warranty	5 years

Approvals

UL508,Class I Div 2, ATEX Zone 2, IECEx, CE, FCC
(The certificate status for 1SFP7T and 2SFP6T models are pending.)

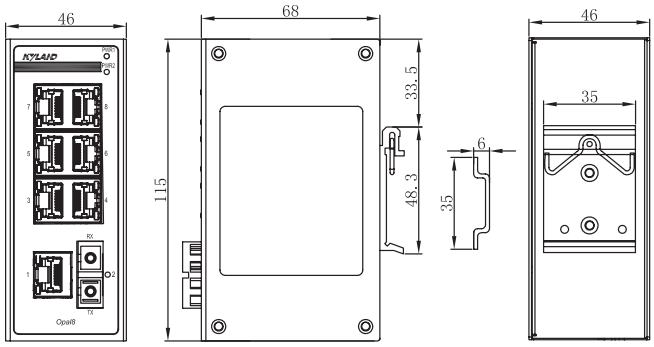
Industrial Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD): ±6kV (contact), ±8kV (air)
- IEC61000-4-3(RS): 10V/m (80MHz–2GHz)
- IEC61000-4-4(EFT): Power Port: ±2kV; Data Port: ±1kV
- IEC61000-4-5(Surge): Power Port: ±1kV/DM, ±2kV/CM; Data Port: ±1kV
- IEC61000-4-6(CS): 10V (150kHz - 80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	Opal8-X-Ports-Connector-PS
XO	**perating temperature range**
E	-10°C-+60°C operating temperature
None	-40°C-+75°C operating temperature
Ports	
8T	8×10/100Base-T(X) RJ45 ports
1S7T	1×100Base-FX, single mode fiber port; 7×10/100Base-T(X) RJ45 ports
1M7T	1×100Base-FX, multi mode fiber port; 7×10/100Base-T(X) RJ45 ports
1SFP7T	1×100Base-X, SFP slot; 7×10/100Base-T(X) RJ45 ports
2S6T	2×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2M6T	2×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2SFP6T	2×100Base-X, SFP slots; 6×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
LV-LV	12-48VDC/18-30VAC, redundant power inputs

Accessories

Model	Description
100Base-X SFP module	Please refer to the 100Base-X SFP module ordering list
DT-BGAZ-10	Panel for Panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Opal10

6+4G Port Entry-level Unmanaged DIN-Rail Switches

- Support 2 10/100/1000Base-TX ports, 2 Gigabit SFP ports and 6 10/100Base-TX ports
- Setting SFP port speed (100M/1000M) by DIP Switch
- Both standard and wide operating temperature models are available
- IP30 protection class
- UL508 (Pending), Class I Div 2 (Pending), ATEX Zone 2 (Pending), IECEx (Pending), CE (pending), FCC (Pending)

Overview

Opal10 unmanaged DIN-Rail switch is specially designed for automation control applications. It is equipped with up to 6 10/100Base-TX RJ45 ports, 2 10/100/1000Base-TX RJ45 ports and 2 SFP ports which can be set to be 100M or 1000M by DIP-Switch located on the top of the switch, making the applications more flexible. Opal10 supports redundant power inputs, metal housing with IP30 protection class, thus ensuring fast and reliable data transmission in harsh industrial environments. Opal10 provides both standard (-10°C to 60°C) operating temperature range model and wide (-40°C to 75°C) operating temperature range models to meet different needs of applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100Base-FX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z (1000Base-X)

Switch Properties

MAC Table	8K
Packet Buffer	4Mbit
Packet Forwarding Rate	4.2Mpps
Switching Delay	<10μs

Interface

Gigabit Port
- 1000Base-X, SFP slot
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet Port
- 100Base-X, SFP slot
- 10/100Base-T(X), RJ45 port

LED

LED on Front Panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT, Speed (Fiber port)

DIP-Switch

Enable/Disable broadcast storm protection
Set the SFP port speed to 100M or 1000M

Power Requirements

Power Input	12-48VDC/18-30VAC
Power terminal	
4-pin 5.08mm-spacing plug-in terminal block	
Power Consumption	<10W
Overload protection	Support
Reverse protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP30
Dimension	54mm×134mm×106mm (W×H×D)
Weight	0.5Kg
Mounting	DIN-Rail or Panel mounting

Environmental Limits

Operating Temperature

- -10°C to +60°C (Opal10-E)
- -40°C to +75°C

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	2,093,638 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending),ATEX Zone 2 (Pending), IECEx (Pending), CE, FCC

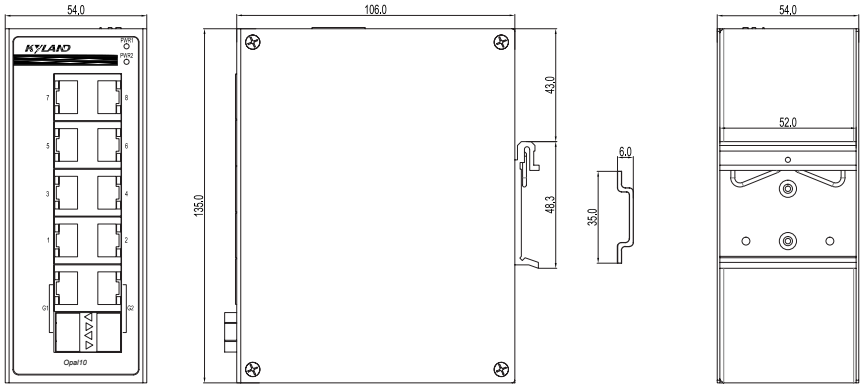
Industry Standard

EMI
- FCC CFR47 Part 15, EN55022/CISPR22, Class A

EMS
- IEC61000-4-2(ESD): ±6kV (contact), ±8kV (air)
- IEC61000-4-3(RS): 10V/m (80MHz - 2GHz)
- IEC61000-4-4(EFT): Power Port: ±2kV; Data Port: ±1kV
- IEC61000-4-5(Surge): Power Port: ±1kV/DM, ±2kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS): 10V (150kHz - 80MHz)

Machinery
- IEC60068-2-6(Vibration)
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free Fall)

Mechanical Drawing



Ordering Information

	Opal10-X-Ports-PS1-PS2
XO	**perating temperature range**
E	-10℃-+60℃ operating temperature
None	-40℃-+75℃ operating temperature
Ports	
2GX2GE6T	2 X 1000Base-X, SFP slots, 2 X 10/100/1000Base-T(X) RJ45 ports; 6X10/100Base-T(X) RJ45 ports
PS	
LV-LV	12-48VDC/18-30VAC, redundant power inputs

Accessories

Model	Description
Gigabit SFP module	Please refer to the Gigabit SFP module ordering list
100Base-X SFP module	Please refer to the 100Base-X SFP module ordering list
DT-BGAZ-11	Panel for Panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Opal20

18+2G Port Entry-level Unmanaged DIN-Rail Switches

Preliminary

- Flexible port combinations, supporting max 2 10/100/1000 Base-TX ports, 2 100Base-FX ports, 16 10/100Base-TX ports
- Both standard and wide operating temperature models are available
- IP30 protection class
- UL508 (Pending), Class I Div 2 (Pending), ATEX Zone 2 (Pending), IECEx (Pending), CE, FCC

Overview

Opal20 series is a well-designed entry level unmanaged switches with compact structure, flexible port combinations and reliable performance, fulfilling different demands in automation control applications. Opal20 supports 2 optional 10/100/1000Base-TX ports, 2 optional 100Base-FX ports and up to 16 10/100Base-TX RJ45 ports. Opal20 support SC/ST/SFP type fiber ports, redundant power inputs, metal housing with IP30 protection class, thus ensuring fast and reliable data transmission in harsh industrial environments. Opal20 provide both standard (-10°C to 60°C) operating temperature range model and wide (-40°C to 75°C) operating temperature range models to meet different applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100Base-FX)
- IEEE 802.3ab(1000Base-T)

Switch Properties

MAC Table	8K
Packet Buffer	2Mbit
Packet Forwarding Rate	5.7Mpps
Switching Delay	<10μs

Interface

Gigabit Port	10/100/1000Base-T(X), RJ45 port

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST connector
- 100Base-X, SFP slot
- 10/100Base-T(X), RJ45 port

LED

LED on Front Panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT, Speed (Fiber port)

DIP-Switch

Enable/Disable broadcast storm protection

Power Requirements

Power Input	12-48VDC/18-30VAC

Power terminal
- 4-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<21W
Overload protection	Support
Reverse protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP30
Dimension	80mm×134mm×106mm (W×H×D)
Weight	0.5Kg
Mounting	DIN-Rail or Panel mounting

Environmental Limits

Operating Temperature
- -10°C to +60°C(Opal20-E)
- -40°C to +75°C

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	1,587,575 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending),ATEX Zone 2 (Pending), IECEx (Pending), CE, FCC

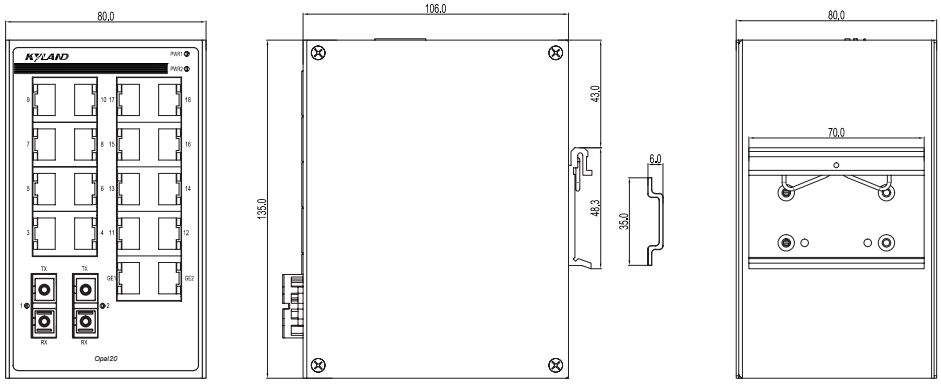
Industry Standard

EMI
- FCC CFR47 Part 15, EN55022/CISPR22, Class A

EMS
- IEC61000-4-2(ESD): ±6kV (contact), ±8kV (air)
- IEC61000-4-3(RS): 10V/m (80MHz - 2GHz)
- IEC61000-4-4(EFT): Power Port: ±2kV; Data Port: ±1kV
- IEC61000-4-5(Surge): Power Port: ±1kV/DM, ±2kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS): 10V (150kHz - 80MHz)

Machinery
- IEC60068-2-6(Vibration)
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free Fall)

Mechanical Drawing



Ordering Information

	Opal20-X-Ports-Connector-PS
XO	**perating temperature range**
E	-10℃-+60℃ operating temperature
None	-40℃-+75℃ operating temperature
Ports	
2GE2S16T	2X10/100/1000Base-T(X) RJ45 ports; 2X100Base-FX, single mode fiber ports; 16X10/100Base-T(X) RJ45 ports
2GE2M16T	2X10/100/1000Base-T(X) RJ45 ports; 2X100Base-FX, multi mode fiber ports; 16X10/100Base-T(X) RJ45 ports
2GE2SFP16T	2X10/100/1000Base-T(X) RJ45 ports; 2X100Base-X, SFP slots; 16X10/100Base-T(X) RJ45 ports
2GE16T	2X10/100/1000Base-T(X) RJ45 ports; 16X10/100Base-T(X) RJ45 ports
2S16T	2X100Base-FX, single mode fiber ports; 16X10/100Base-T(X) RJ45 ports
2M16T	2X100Base-FX, multi mode fiber ports; 16X10/100Base-T(X) RJ45 ports
2SFP16T	2X100Base-X, SFP slots; 16X10/100Base-T(X) RJ45 ports
16T	16X10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
LV-LV	12-48VDC/18-30VAC, redundant power inputs

Accessories

Model	Description
100Base SFP module	Please refer to the 100Base SFP module ordering list
DT-BGAZ-12	Panel for Panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Opal5G

5G Port Entry-level Full Gigabit Unmanaged DIN-Rail Switches

NEW

- Support 5 10/100/1000Base-TX RJ45 ports
- Setting jumbo frame transmission function (up to 10KB) by DIP-Switch
- Both standard and wide operating temperature models are available
- IP30 protection class
- UL508 (Pending), Class I Div 2 (Pending), ATEX Zone 2 (Pending), IECEx (Pending), CE, FCC

Overview

Opal5G series, Kyland produced 5-port unmanaged switches, are characterized by its full Gigabit interface, compact size, economical and plug-and-play design, generally used to connect the high bandwidth Ethernet in factory automation, petrochemical, ITS, and other applications. Opal5G support 5 10/100/1000Base-TX RJ45 ports, along with metal housing with IP30 protection class, thus ensuring fast and reliable data transmission in harsh industrial environments. The two DIP-switches located on the top of the device are used to enable/disable Broadcast Storm Protection (BSP) function and Jumbo frame transmission function, respectively. Opal5G provide both standard (-10°C to 60°C) and wide (-40°C to 75°C) operating temperature range models to meet different applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX)
- IEEE 802.3ab(1000Base-T)

Switch Properties

MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	7.4 Mpps
Switching Delay	<5μs
Jumbo Frame Size	10KB

Interface

Gigabit Port	10/100/1000Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED: PWR1, PWR
- Interface LED: Link/ACT, Speed (RJ45 port)

DIP-Switch

Enable/Disable broadcast storm protection function
Enable/Disable Jumbo frame transmission function (up to 10KB)

Power Requirements

Power Input	12-48VDC/18-30VAC
Power Terminal	
▼ 4-pin 5.08mm-spacing plug-in terminal block	
Power Consumption	<6W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP30
Dimension	30mm×115mm×68mm (W×H×D)
Weight	0.3Kg
Mounting	DIN-Rail or Panel mounting

Environmental Limit

Operating Temperature	
▼ -10°C to +60°C(Opal5G-E)	
▼ -40°C to +75°C	
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5°C 95% (non-condensing)

Warranty

MTBF	3,241,152 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending), ATEX Zone 2 (Pending), IECEx (Pending), CE, FCC

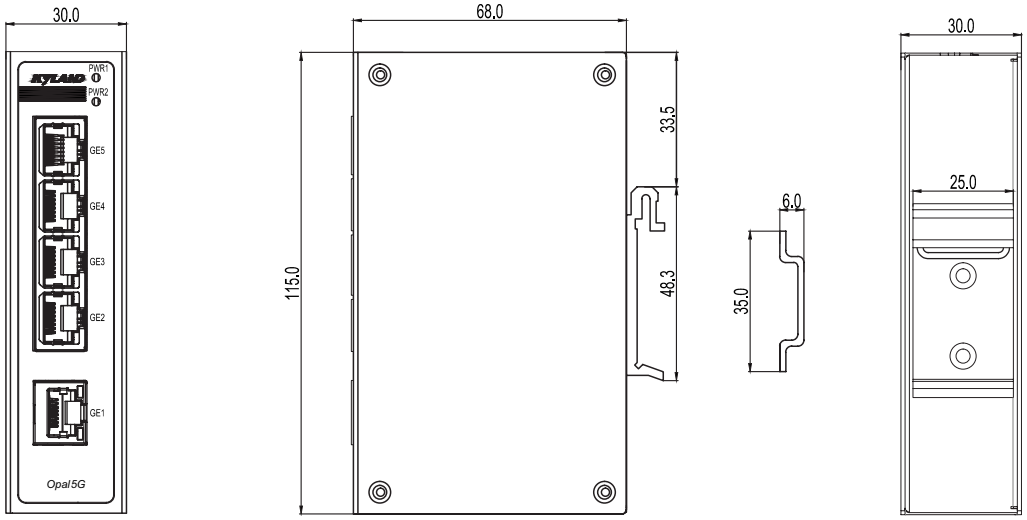
Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD): ±6kV (contact), ±8kV (air)
- IEC61000-4-3(RS): 10V/m (80MHz - 2GHz)
- IEC61000-4-4(EFT): Power Port: ±2kV; Data Port: ±1kV
- IEC61000-4-5(Surge): Power Port: ±1kV/DM, ±2kV/CM; Data Port: ±2kV
- IEC61000-4-6(CS): 10V (150kHz - 80MHz)

Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	Opal5G-X-Ports-PS1-PS2
XO	**perating temperature range**
E	-10°C-+60°C operating temperature
None	-40°C-+75°C operating temperature
Ports	
5GE	5X10/100/1000Base-T(X) RJ45 ports
PS	
LV-LV	12-48VDC/18-30VAC, redundant power inputs

Optional Accessories

Model	Description
DT-BGAZ-13	Panel for Panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Opal10G

10G Port Entry-level Full Gigabit Unmanaged DIN-Rail Switches

NEW

- 2 Gigabit SFP slots, 8 10/100/1000Base-T(X) ports
- Setting jumbo frame transmission function (up to 9.6KB) by DIP-Switch
- Both standard and wide operating temperature models are available
- IP30 protection class
- UL508 (Pending), Class I Div 2 (Pending), ATEX Zone 2 (Pending), IECEx (Pending), CE, FCC

Overview

Opal10G series, Kyland produced 10-port unmanaged switches, are characterized by its full Gigabit interface, compact size, economical and plug-and-play design, generally used to connect the high bandwidth Ethernet in factory automation, petrochemical, ITS, and other applications. Opal10G support 2 Gigabit SFP ports and up to 8 10/100/1000Base-TX RJ45 ports, along with metal housing with IP30 protection class, thus ensuring fast and reliable data transmission in harsh industrial environments. The two DIP-switches located on the top of the device are used to enable/disable Broadcast Storm Protection (BSP) function and Jumbo frame transmission function, respectively. Opal10G provide both standard (-10℃ to 60℃) and wide (-40℃ to 75℃) operating temperature range models to meet different applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z (1000Base-X)

Switch Properties

MAC Table	8K
Packet Buffer	4Mbit
Packet Forwarding Rate	14.9Mpps
Switching Delay	<5μs
Jumbo Frame Size	9.6KB

Interface

Gigabit Port
- 1000Base-X, SFP slot
- 10/100/1000Base-T(X), RJ45 port

LED

LEDs on Front Panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 port); Link/ACT (Fiber port)

DIP-Switch

Enable/Disable broadcast storm protection
Enable/Disable Jumbo frame transmission function (up to 9.6KB)

Power Requirements

Power Input	12-48VDC/18-30VAC
Power Terminal	
▾ 4-pin 5.08mm-spacing plug-in terminal block	
Power Consumption	<12W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP30
Dimension	54mm×134mm×106mm (W×H×D)
Weight	0.5Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature
- -10 to +60°C (Opal10G-E)
- -40°C to +75°C

Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

MTBF	2,497,305 hrs
Warranty	5 years

Approvals

UL508 (Pending), Class I Div 2 (Pending), ATEX Zone 2 (Pending), IECEx (Pending), CE, FCC

Industrial Standard

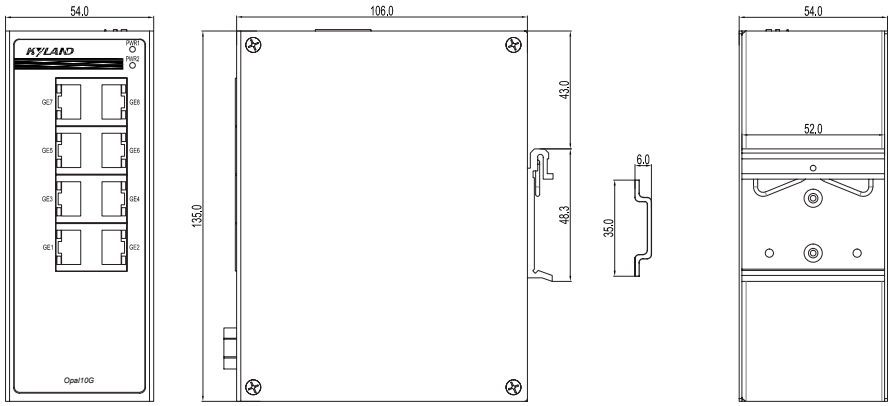
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD): ±6kV (contact), ±8kV (air)
- IEC61000-4-3(RS): 10V/m (80MHz – 2GHz)
- IEC61000-4-4(EFT): Power Port: ±2kV; Data Port: ±1kV
- IEC61000-4-5(Surge): Power Port: ±1kV/DM, ±2kV/CM; Data Port: ±1kV
- IEC61000-4-6(CS): 10V (150kHz - 80MHz)

Machinery

- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	Opal10G-X-Ports-PS
X	**Operating temperature range**
E	-10℃-+60℃ operating temperature
None	-40℃-+75℃ operating temperature
Ports	
2GX8GE	2 X 1000Base-X SFP slots, 8 X 10/100/1000Base-T(X) RJ45 ports
8GE	8X10/100/1000Base-T(X) RJ45 ports
PS	
LV-LV	12-48VDC/18-30VAC, redundant power inputs

Optional Accessories

Model	Description
Gigabit SFP module	Please refer to the Gigabit SFP module ordering list
DT-BGAZ-11	Panel for Panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Go Green with Kyland

Kyland, a fast growing technology leader in the industrial communication market, recognizes our corporate responsibilities as an international entity to reduce the carbon footprint and protect the environment through our Green Ethernet concept for industrial applications.

- Green Ethernet is an idea to apply energy saving technologies in the product design to reduce the power consumption and heat dissipation. This will not only save the electricity cost and carbon footprint to the environment, but also enable the products a longer life span thus reduce the impact to the environment caused by the product replacement after the end of product life cycle.
- Green Ethernet is also an idea to design our products to be free of toxic chemicals in line with the RoHS directive Kyland has created an ISO14001 certified environmental management system that allows our company as a whole to reduce our operations' impact on the environment.

Energy Saving Technologies

In Kyland's history, coal mining business has once become a very important vertical market for Kyland. Energy saving technologies and intrinsic safe industrial Ethernet switches are the major requests for this vertical market. Due to this reason, Kyland has devoted itself on the energy saving technologies development and then leads to its whole Green Ethernet portfolios while we realize the Green Ethernet concept can benefit all the industries.

Nowadays, to design it Green has been deeply rooted among Kyland product development as one most important principle. All the chipsets and components are strictly selected to have the lowest power consumption. The major contribution comes from Marvell chipsets & their smart energy efficient technology which are powered within the whole Green Ethernet portfolios.

Following chart lists the benchmark of the full load power consumption of both Kyland Green Ethernet portfolios and other brand products in the market. Kyland solution saves average 32% and maximum 92% power consumptions compared with other brand.

Longer Lifespan (MTBF)

For the electronic devices, the heat dissipation is the key factor to the lifespan of their electronic components. Less power consumption will significantly lead to a more reliable and longer lifespan which not only save the cost for the replacement after the product lifecycle ends, but also reduce the impact to the environment caused by the product replacement.

Kyland Green Ethernet portfolios have an average MTBF of 392,737 hrs (44 years)

	Full Load Power Consumption (Watts)	Other Brand Full Load Power Consumption (Watts)	Power Saving (%)
KIEN1005A-5T	2.16	2.4	11%
KIEN1005A-1M/S4T	2.64	2.64	0%
KIEN1009-8T	3.5	3.12	-11%
KIEN1009-1M/S7T	3.8	5.04	33%
KIEN1009-2M/S6T	4.1	6.24	52%
KIEN1009-3M/S6T	4.4	7.44	69%
KIEN3016A-16T	6.1	6.48	6%
KIEN3016A-2M/S14T	6.6	10.56	60%
KIEN1005G	3.4	4.8	41%
KIEN1008G	7.5	7.68	2%
KIEN7009-8T	5.5	6.24	13%
KIEN7009-2M/S6T	6.1	8.4	38%
KIEN7009-3M/S6T	6.9	7.68	11%
SICOM3009A-8T	5	6.24	25%
SICOM3009A-2M/S6T	5.6	8.64	54%
SICOM3216-16T	8	9.84	23%
SICOM3216-2M/S14T	8.6	12.24	42%
SICOM3216-2G16T	10.5	12.24	17%
KOM600	2	3.84	92%
KOM300A	2.2	3.84	75%

	MTBF (hrs)
KIEN1005A	454,730
KIEN1009	397,000
KIEN1005G	357,000
KIEN1008G	357,000
KIEN3016A	361,000
KIEN7009	385,000
SICOM3009A	350,877
SICOM3000BA	384,273
SICOM3009BA	376,919
KIEN1008BA	385,000
SICOM3005A	307,699
KOM600G	546,000
KOM600	546,000
KOM300A	462,741
KOM300M	462,741
Average	392,737

RoHS

Kyland works with its suppliers to comply with the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment. The RoHS directive prohibits the importation of electronic equipment containing certain hazardous substances to the European Union and took effect on July 1, 2006. Kyland fully complied with the RoHS Directive even before this date.

ISO14001

Kyland was ISO 14001 certified in March 2011 for implementing the following Environment Quality Policy:

- Following Environmental Law and other requirements
- Decreasing the impact of our products on the environment
- Promoting Green Products
- Saving energy and treasuring resources
- Preventing environmental pollution
- Maintaining employees' safety and health

Successful Story

Wichita Traffic Goes Green and Saves Dollars with 500 Kyland SICOM3170 Traffic Switches

In July 2010, Kyland SICOM3170 Switch has been selected by the City of Wichita, Kansas. The multi-million dollar Intelligent Traffic system project has installed approximately 500 of the Kyland SICOM3170 Ethernet Traffic Switches. By using the SICOM3170 switch designed for use in a detector rack – the City of Wichita will save $20,000.00 annually in electricity costs alone compared to other products. The SICOM3170 uses just 8 watts in operating power. The Intelligent Traffic Project puts the City of Wichita in the forefront of the GREEN REVOLUTION and 21st Century Traffic Systems.

"SICOM3170 saves energy, inexpensive to operate, is the fastest, and out performs ALL the other switches. Fantastic for crowded traffic cabinets" -DOT Testing Engineer

Green Ethernet Products

	Description	Max full load power consumption (watts)	MTBF (hrs)
KIEN1005A	5 Port Unmanaged Din-Rail Switch	2.64	454,730
KIEN1009	9 Port Unmanaged Din-Rail Switch	4.4	397,000
KIEN1005G	5G Port Full Gigabit Unmanaged Din-Rail Switch	3.4	357,000
KIEN1008G	8G Port Full Gigabit Unmanaged Din-Rail Switch	7.5	357,000
KIEN3016A	16 Port Unmanaged Din-Rail Switch	6.6	361,000
KIEN7009	Layer 2 9 Port Simple Managed Din-Rail Switch	6.9	385,000
SICOM3009A	Layer 2 9 Port Managed Din-Rail Switch	5.6	350,877
SICOM3216	Layer 2 16+2G Port Managed Din-Rail Switch	10.5	410,000
SICOM3000BA	Layer 2 6+3G Port Managed Din-Rail Intrinsic Safety Switch	5.2	384,273
SICOM3009BA	9 Port Managed Embedded Intrinsic Safety Switch	3.9	376,919
KIEN1008BA	8 Port Unmanaged Din-Rail Intrinsic Safety Switch	5.5	385,000
SICOM3005A	6 Port Managed Din-Rail Serial Device Server Integrated Ethernet Switch	12	307,699
KOM600G	2G Port Gigabit Unmanaged Din-Rail Copper to Fiber Media Converter	4.5	546,000
KOM600	2 Port Unmanaged Din-Rail Copper to Fiber LFP Media Converter	2	546,000
KOM300A	3 Port Unmanaged Din-Rail Copper to Fiber Media Converter	2.2	462,741
KOM300M	3 Port Managed Din-Rail Copper to Fiber Media Converter	2.7	462,741
SICOM3170	7+3G Port Managed Traffic Ethernet Switch	8	370,000

Aquam8512A

8+4G/9+3G Port Layer 3 Managed EN50155 Industry Ethernet Switches

Preliminary

- Supports a maximum of 3 10/100/1000Base-TX and 9 10/100Base-TX ports or 4 10/100/1000Base-TX and 8 10/100Base-TX ports, and support a maximum 9 PoE ports.
- Supports X-coded M12 connector with Gigbit prots, and D-coded M12 connector with 100M ethernet ports
- Supports optional bypass function
- Supports DT-Ring protocols and RSTP/MSTP,DRP ring network redundancy protection and VRRP
- Supports Layer 3 routing protocols such as OSPF
- Complies with IEC61375 standard, supports TTDP(Train Topology Discovery Protocol)
- Complies with the requirements of EN50155 and EN50121 industrial standards
- IP65 protection class, please contact with our company if IP67 needed

Overview

The Aquam8512A series switches, specially designed for rail industries, support up to 8 Fast Ethernet interfaces and 4 Gigabit uplink interfaces, support panel mounting, support a wide range of operation temperature(-40°C to +70°C), and meets the EN50155, EN50121 and other rail transit industry standard. The switches support IP65 and IP67 protection class to meet the requirements of dustproof and waterproof performance, and support M12 interface form to ensure the tightness and the firmness of the connection port, which especially suitable for application that are subject to high vibration and shock.

The Aquam8512A series switches support PoE function, support isolated power supply of a wide range (Power input range is up to 24VDC~110VDC), provide 9 fast Ethernet M12 ports with 9 IEEE 802.3at PoE+ (compatible with IEEE802.3af) ports, and can be used to power up to 9 IEEE 802.3at compliant powered devices (PDs), eliminating the need for additional wiring. The switches are classified as power source equipment (PSE) and provide maximum PoE power up to 30.8 watts per port and a total of 61.6 watts+ for the whole PoE port.

The Aquam8512A series switches support Layer 3 routing protocols such as OSPF, and supports IGMP protocol and PIM protocol to implement multicast routing, support DHCP protocols for automatic IP address assignment, and support DRP, DT Ring and RSTP ring network redundancy protocol for flexible networking in order to meet the market demand of railway.The switches can be widely used in PIS, CCTV, video monitoring system and train control system, also apply to any other industrial applications of harsh vibration and shock, and high EMC compatibility.

Software Functions

Switching

Supports VLAN,PVLAN
Supports GVRP(pending)
Supports port trunking
Supports LACP(pending)
Supports port flow control
Supports speed limit, broadcast storm control

Redundancy

Supports VRRP
Supports DT-ring, DT-ring+, DT-VLAN with the recovery time<50ms
Supports DRP, with the recovery time<20ms
Supports RSTP/MSTP

Multicast

Supports IGMP-snooping
Supports GMRP
Supports static multicast

Routing

Supports OSFPv2
Supports static routing
Supports IGMP(pending)
Supports PIM-SM, PIM-DM(pending)

Network Security

Supports IEEE 802.1x
Supports HTTPs/SSL, SFTP Client(pending)
Supports SSH
Supports RADIUS
Supports TACACA+(pending)
Supports user classification

Service Quality

Supports ACL
Supports 802.1p and TOS/DiffServ, Supports SP,WRR queue scheduling

Management & Maintenance

Supports Console,Telnet,WEB management methods
Supports SNMPv1/v2c/v3,Kyvison centralized management
Supports software upgrade by FTP/TFTP
Supports RMON(pending)
Supports IP/MAC conflict alarm, power failure alarm, port alarm and ring alarm
Supports port mirroring
Supports Syslog
Supports LLDP

IP Management

Supports DHCP server/client/server option 82

Clock Management

Supports SNTP Client

Characteristic Function

Supports bypass power failure bypass function
Supports TTDP protocol(pending)
Supports R-NAT(pending)
Supports Auto-Backup and Configuration(pending)

Technical Specification

Technical Parameters

Standard IEEE 802.3i(10Base-T)
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3x(Flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1s(MATP)
- IEEE 802.1w(RSTP)
- IEEE 802.1X
- IEC 61375-2-5

Switch Properties

Priority Queues	8
Number of VLANs	4lk
VLAN ID	1–4093
Number of Multicast Groups	256
Routing Table	8K
MAC Table	16K
Packet Buffer	4Mbit
Packet Forwarding Rate	7.1Mpps
Switching Delay	<10us

Interface

Gigabit Port
- 10/100/1000Base-T(X), M12 connector

Fast Ethernet Port
- 10/100Base-T(X), M12 connector

Console Port	RS232, M12 connector
USB	M12 connector

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR
- Interface LED: Link/ACT
- POE LED: ACT(POE models only)

Power Requirements

Power Input
- Non-PoE models: 24VDC, 48VDC, 72-110VDC
- PoE models: 24-110VDC

Power Terminal	M12-4pin connector
Power Consumption	< 18 W (non-PoE models) < 108W (PoE models)
Overload Protection	Support
Reverse Connection Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Nature cooling, fanless
Protection Class	IP67
Dimensions	100mm×142.3mm×111.7mm
Weight	<2Kg (H×W×D)
Mounting	panel mounting

Environmental Limits

Operating Temperature	-40°C to +70°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 ~ 95% (non-condensing)

Warranty

MTBF	764615h
Warranty	5 years

Approvals

CE(pending),LVD(pending),EN50155(pending),EN50121(pending), EN45545(pending)

Industry Standard

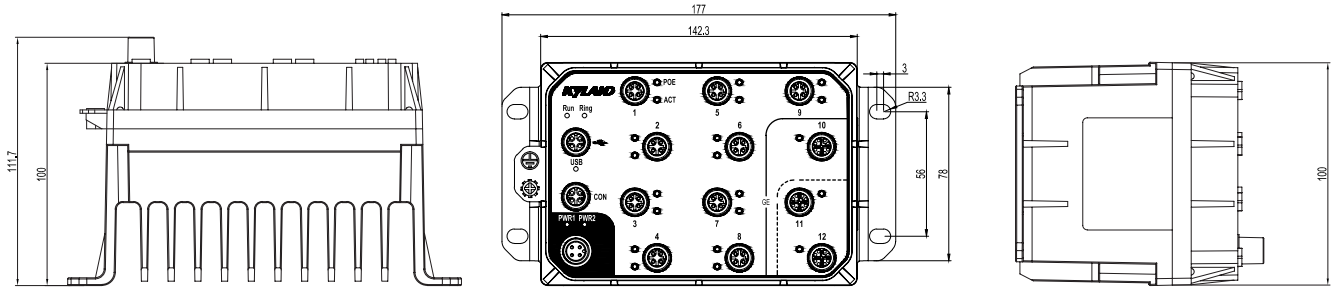
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2 (ESD) ±6kV (contact), ±8kV (air)
- IEC61000-4-3 (RS) 20V/m (80MHz-2GHz)
- IEC61000-4-4 (EFT) Power Port: ±2kV; Data Port: ±2kV
- IEC61000-4-5 (Surge) Power Port: ±1kV/DM, ±2kV/CM
- IEC61000-4-6 (CS) 10V (150kHz-80MHz)
- IEC61000-4-8(Power frequency magnetic field)50Hz 100A/m
- IEC61000-4-9(Pulsed magnetic field)300A/m
- IEC61000-4-29 (Voltage Short interruptions) 10ms 100%

Safety
- EN60950-1

Machinery
- IEC61373 (Vibration and Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	Aquam8512A-Ports-PS1-PS2
Ports	
None PoE models	
3GE9T	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 port;
4GE8T	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 port;
9T	9 X 10/100BASE-T(X) M12 port;
B-3GE9T	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 port; Gigabit ports support one pair of Bypass function;
B-4GE8T	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 port; Gigabit ports support two pairs of Bypass function;
PoE models (pending)	
3GE9P (pending)	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 PoE port;
4GE8P (pending)	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 PoE port;
9P (pending)	9 X 10/100BASE-T(X) M12 PoE port;
B-3GE9P (pending)	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 PoE port; Gigabit ports support one pair of Bypass function;
B-4GE8P (pending)	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 PoE port; Gigabit ports support two pairs of Bypass function;
PS1-PS2	
None PoE models	
H6-H6	72-110VDC, redundant power inputs
L14-14 4	8VDC, redundant power inputs
L13-L13	24VDC, redundant power inputs
PoE models	
WV-WV (pending)	24-110VDC, redundant power inputs

Accessories

Accessory Model	Description	Note
M12-A-4P-F	Female cable connector with M12, A-Coding, 4 Pin	Power Interface Connector
M12-A-4P-M	Male cable connector with M12, A-Coding, 4 Pin	Console or USB interface Connector
M12-D-4P-M	Male cable connector with M12, D-Coding, 4 Pin	10/100/1000Base-TX interface Connector
M12-X-8P-M	Male cable connector with M12, X-Coding, 8 Pin	10/100/1000Base-TX Connector
DT-XL-PWR-M12-XXX-3m	3m connecting line with M12 connector for power ports (from M12 to the exposed end)	Power cable with M12 connector

Aquam8012A

8+4G/9+3G Port Layer 2 Managed EN50155 Industry Ethernet Switches

Preliminary

- Supports a maximum of 3 10/100/1000Base-TX and 9 10/100Base-TX ports or 4 10/100/1000Base-TX and 8 10/100Base-TX ports, and support a maximum 9 PoE ports.
- Support optical Bypass function
- Supports the selection of POE models and non-POE models
- POE supports IEEE802.3af and IEEE802.3at standards, as well as a maximum of 9 POE ports
- Supports M12 connectors for power port and interface ports
- Supports DRP protocols and RSTP ring network redundancy protection
- Supports rapid configuration and backup
- Complies with the requirements of EN50155 and EN50121 industrial standards
- IP65 protection class , please contact with our company if IP67 needed.

Overview

The Aquam8012A series switches, specially designed for rail industries, support up to 8 Fast Ethernet interfaces and 4 Gigabit uplink interfaces, support panel mounting, support a wide range of operation temperature(-40°C to +70°C), and meets the EN50155, EN50121 and other rail transit industry standard. The switches support IP65 and IP67 protection class to meet the requirements of dustproof and waterproof performance, and support M12 interface form to ensure the tightness and the firmness of the connection port, which especially suitable for application that are subject to high vibration and shock.

The Aquam8012A series switches support PoE function, support Isolated power supply of a wide range (Power input range is up to 24VDC~110VDC), provide 9 fast Ethernet M12 ports with 9 IEEE 802.3at PoE+ (compatible with IEEE802.3af) ports, and can be used to power up to 9 IEEE 802.3at compliant powered devices (PDs), eliminating the need for additional wiring. The switches are classified as power source equipment (PSE) and provide maximum PoE power up to 30.8 watts per port and a total of 61.6 watts+ for the whole PoE port.

Aquam8012A series Ethernet switches support DHCP protocols for automatic IP address assignment, and support DRP, DT Ring and RSTP ring network redundancy protocol for flexible networking in order to meet the market demand of railway.The switches can be widely used in PIS, CCTV, video monitoring system and train control system, also apply to any other industrial applications of harsh vibration and shock, and high EMC compatibility.

Software Functions

Switching

Supports VLAN,PVLAN,GVRP
Supports port trunking
Supports LACP(pending)
Supports port flow control
Supports speed limit, broadcast storm control

Redundancy

Supports DRP, with the recovery time<20ms
Supports STP/RSTP/MSTP
DT-Ring/DT-Ring+

Multicast

Supports IGMP-snooping
Supports static multicast
Supports GMRP(pending)

Network Security

Supports MAC address binding with switch ports(pending)
Supports user classification
Supports IEEE 802.1x(pending)
Supports TACACA+(pending)
Supports RADIUS(pending)
Supports HTTPs, SFTP client(pending)
Supports SSH(pending)

Service Quality

Supports ACL
Supports SP,WRR queue scheduling

Management & Maintenance

Supports Console,Telnet,WEB management methods
Supports SNMPv1/v2c/v3,Kyvison centralized management
Supports RMON(pending)
Supports software upgrade by TFTP/HTTP
Supports IP/MAC conflict alarm, power supply alarm, port alarm, ring alarm
Supports port mirroring
Supports Syslog
Supports LLDP

IP Management

Supports DHCP server/ client/snooping option 82

Clock Management

Supports SNTP Client

Characteristic Function

Supports power failure bypass function
Supports Auto-Configuration Backup(pending)

Technical Specification

Technical Parameters

Standard IEEE 802.3i(10Base-T)
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3at(PoE plus)
- IEEE 802.3af(PoE)
- IEEE 802.3x(Flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)
- IEEE 802.1X

Switch Properties

Priority Queues	8
Number of VLANs	4094
VLAN ID	1–4094
Number of Multicast Groups	1024
MAC Table	8K
Packet Buffer	2Mbit
Packet Forwarding Rate	7.1Mpps
Switching Delay	<10us

Interface

Gigabit Port
- 10/100/1000Base-T(X),M12 X-coded connector

Fast Ethernet Port
- 10/100Base-T(X),M12 D-coded connector

Console Port	RS232,M12 connector
USB	M12 connector

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR
- Interface LED: Link/ACT
- POE LED: ACT(POE models only)

Power Requirements

Power Input
- Non-PoE models: 24VDC, 48VDC, 72-110VDC
- PoE models: 24-110VDC

Power Terminal	M12-4pin connector
Power Consumption	< 13W (non-PoE models) < 101W (PoE models)
Overload Protection	Support
Reverse Connection Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Nature cooling,fanless
Protection Class	IP65
Dimensions	100mm×142.3mm×111.7mm(H×W×D)
Weight	<2Kg
Mounting	panel mounting

Environmental Limits

Operating Temperature	-40°C to +75°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

MTBF	733606h
Warranty	5 years

Approvals

CE(pending),LVD(pending),EN50155(pending),EN50121(pending),EN45545(pending)

Industry Standard

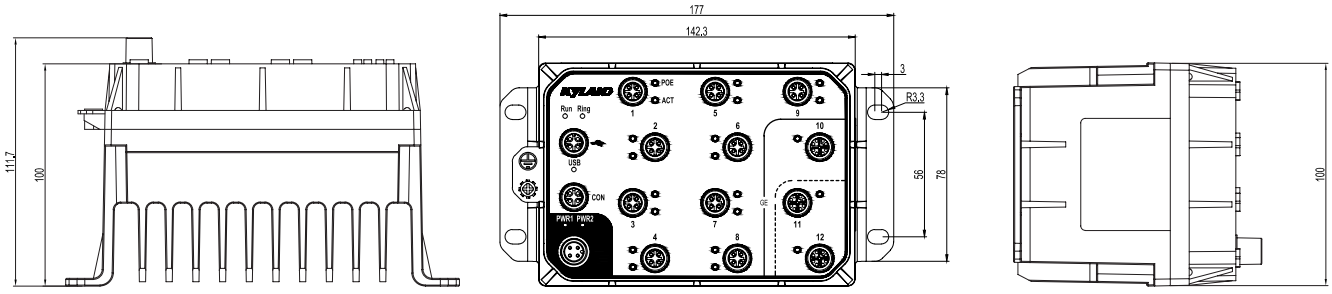
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2 (ESD) ±6kV (contact), ±8kV (air)
- IEC61000-4-3 (RS) 20V/m (80MHz-2GHz)
- IEC61000-4-4 (EFT) Power Port: ±2kV; Data Port: ±2kV
- IEC61000-4-5 (Surge) Power Port: ±1kV/DM, ±2kV/CM
- IEC61000-4-6 (CS) 10V (150kHz-80MHz)
- IEC61000-4-8(Power frequency magnetic field)50Hz 100A/m
- IEC61000-4-9(Pulsed magnetic field)300A/m
- IEC61000-4-29 (Voltage Short interruptions) 10ms 100%

Safety
- EN60950-1

Machinery
- IEC61373 (Vibration and Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

	Aquam8012A-Ports-PS1-PS2
Ports	
None PoE models	
3GE9T	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 port;
4GE8T	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 port;
9T	9 X 10/100BASE-T(X) M12 port;
B-3GE9T	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 port; Gigabit ports support one pair of Bypass function;
B-4GE8T	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 port; Gigabit ports support two pairs of Bypass function;
PoE models (pending)	
3GE9P (pending)	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 PoE port;
4GE8P (pending)	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 PoE port;
9P (pending)	9 X 10/100BASE-T(X) M12 PoE port;
B-3GE9P (pending)	3 X 10/100/1000BASE-T(X) M12 port; 9 X 10/100BASE-T(X) M12 PoE port; Gigabit ports support one pair of Bypass function;
B-4GE8P (pending)	4 X 10/100/1000BASE-T(X) M12 port; 8 X 10/100BASE-T(X) M12 PoE port; Gigabit ports support two pairs of Bypass function;
PS1-PS2	
None PoE models	
H6-H6	72-110VDC, redundant power inputs
L14-14 4	8VDC, redundant power inputs
L13-L13	24VDC, redundant power inputs
PoE models	
WV-WV (pending)	24-110VDC, redundant power inputs

Accessories

Accessory Model	Description	Note
M12-A-4P-F	Female cable connector with M12, A-Coding, 4 Pin	Power Interface Connector
M12-A-4P-M	Male cable connector with M12, A-Coding, 4 Pin	Console or USB interface Connector
M12-D-4P-M	Male cable connector with M12, D-Coding, 4 Pin	10/100/1000Base-TX interface Connector
M12-X-8P-M	Male cable connector with M12, X-Coding, 8 Pin	10/100/1000Base-TX Connector
DT-XL-PWR-M12-XXX-3m	3m connecting line with M12 connector for power ports (from M12 to the exposed end)	Power cable with M12 connector

Aquam5

5 Port Unmanaged EN50155 Industrial Ethernet Switches

- Supports a maximum of 5 10/100Base-TX ports
- Supports M12 connectors
- Supports panel mounting
- Supports redundant power input
- Complies with the requirements of EN50155 and EN50121 industrial standards
- IP65/67 protection class

Overview

Aquam5 as IP65/67 and unmanaged Ethernet Switch, supports 5 Fast Ethernet interfaces of with M12 connector to ensure the tightness and the firmness of the connection and ensure reliable operation, especially suitable for application that are subject to high vibration and shock. Aquam5 supports panel mounting, supports IP65/67 protection class to meet the requirements of dustproof and waterproof performance, supports a wide range of operation temperature(-40°C to 75°C), and meets EN50155, EN50121, EN55022 Class A&B and FCC CFR47 Part 15 standard requirements, making the product is suitable for the industrial field of various harsh environment, especially rail transportation and atuomation industry with strict requirements on reliability.

Software Functions

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- IEEE 802.3x(Flow control)

Switch Properties

MAC Table	2K
Packet Buffer	1Mbit
Packet Forwarding Rate	1.2Mpps
Switching Delay	<10us

Interface

Fast Ethernet Port	10/100Base-T(X), M12 connector

LED

LEDs on Front Panel
- Power LED: PWR1,PWR
- Interface LED: Link/ACT

Power Requirements

Power Input	24VAC/DC(12-48VDC/18-30 VAC)
Power Terminal	M12
Power Consumption	< 3.4W
Overload Protection	Support
Reverse Connection Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Nature cooling,fanless
Protection Class	IP65/67
Dimensions	74mm×220mm×38mm(W×H×D)
Weight	<1.5Kg
Mounting	DIN-Rail or panel mounting

Environmental Limits

Operating Temperature	-40°C to +75°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	≥300,000 hrs
Warranty	5 years

Approvals

CE, FCC, UL61010, EN50155, EN50121

Industry Standard

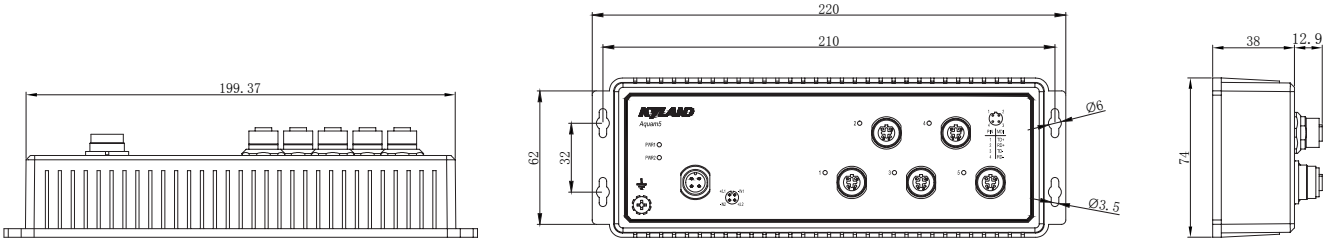
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2 (ESD) ±6kV (contact), ±8kV (air)
- IEC61000-4-3 (RS) 20V/m (80MHz-2GHz)
- IEC61000-4-4 (EFT) Power Port: ±2kV; Data Port: ±2kV
- IEC61000-4-5 (Surge) Power Port: ±1kV/DM, ±2kV/CM
- IEC61000-4-6 (CS) 10V (150kHz-80MHz)
- IEC61000-4-8(Power frequency magnetic field)50Hz 100A/m
- IEC61000-4-9(Pulsed magnetic field)300A/m
- IEC61000-4-29 (Voltage Short interruptions) 10ms 100%

Safety
- EN60950-1

Machinery
- IEC61373 (Vibration and Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

Aquam5-5T-LV-LV	5 x 10/100BASE-T(X) M12 port, 24VAC/DC(9-60VDC/18-30 VAC), redundant power inputs, IP65 protection class
Aquam5-H-8T-LV-LV	5 x 10/100BASE-T(X) M12 port, 24VAC/DC(9-60VDC/18-30 VAC), redundant power inputs, IP67 protection class

Accessories

Accessory Model	Description	Note
M12-A-4P-F	Female cable connector with M12, A-Coding, 4 Pin	Power Interface Connector
M12-D-4P-M	Male cable connector with M12, D-Coding, 4 Pin	10/100/1000Base-TX interface Connector
DT-XL-PWR-M12-XXX-3m	3m connecting line with M12 connector for power ports (from M12 to the exposed end)	Power cable with M12 connector

Aquam8

8 Port Unmanaged EN50155 Industrial Ethernet Switches

- Supports a maximum of 8 10/100Base-TX ports
- Supports M12 connectors
- Supports panel mounting
- Supports redundant power input
- Complies with the requirements of EN50155 and EN50121 industrial standards
- IP65/67 protection class

Overview

Aquam8 as IP65/67 and unmanaged Ethernet Switch, supports 8 Fast Ethernet interfaces of with M12 connector to ensure the tightness and the firmness of the connection and ensure reliable operation, especially suitable for application that are subject to high vibration and shock. Aquam5 supports panel mounting, supports IP65/67 protection class to meet the requirements of dustproof and waterproof performance, supports a wide range of operation temperature(-40°C to 75°C), and meets EN50155, EN50121, EN55022 Class A&B and FCC CFR47 Part 15 standard requirements, making the product is suitable for the industrial field of various harsh environment, especially rail transportation and automation industry with strict requirements on reliability.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- IEEE 802.3x(Flow control)

Switch Properties

MAC Table	2K
Packet Buffer	1Mbit
Packet Forwarding Rate	1.2Mpps
Switching Delay	<10us

Interface

Fast Ethernet Port	10/100Base-T(X),M12 connector

LED

LEDs on Front Panel
- Power LED: PWR1,PWR
- Interface LED: Link/ACT

Power Requirements

Power Input	24VAC/DC (12-48VDC/18-30 VAC)
Power Terminal	M12
Power Consumption	< 4.6W
Overload Protection	Support
Reverse Connection Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Nature cooling,fanless
Protection Class	IP65/67
Dimensions	74mm×220mm×38mm(W×H×D)
Weight	<1.5Kg
Mounting	DIN-Rail or panel mounting

Environmental Limits

Operating Temperature	-40 to +75°C
Storage Temperature	-40 to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	≥300,000 hrs
Warranty	5 years

Approvals

CE FCC UL61010 EN50155 EN50121

Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

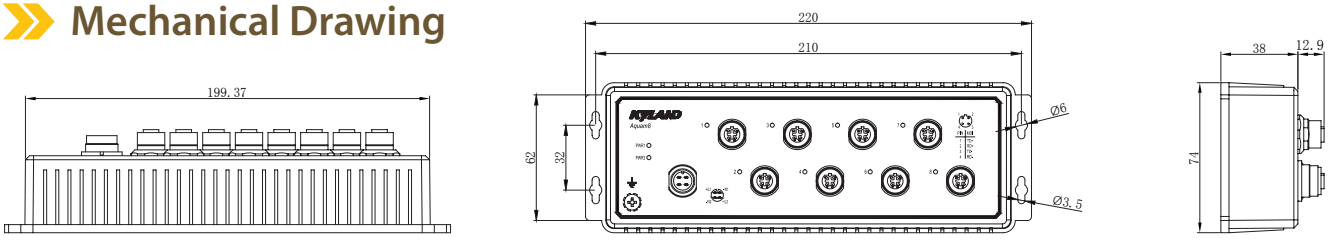
EMS
- IEC61000-4-2 (ESD) ±6kV (contact), ±8kV (air)
- IEC61000-4-3 (RS) 20V/m (80MHz-2GHz)
- IEC61000-4-4 (EFT) Power Port: ±2kV; Data Port: ±2kV

- IEC61000-4-5 (Surge) Power Port: ±1kV/DM, ±2kV/CM
- IEC61000-4-6 (CS) 10V (150kHz-80MHz)
- IEC61000-4-8(Power frequency magnetic field)50Hz 100A/m
- IEC61000-4-9(Pulsed magnetic field)300A/m
- IEC61000-4-29 (Voltage Short interruptions) 10ms 100%

Safety
- EN60950-1

Machinery
- IEC61373 (Vibration and Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing



Ordering Information

Aquam8-8T-LV-LV	8 X 10/100BASE-T(X) M12 port, 24VAC/DC(9-60VDC/18-30 VAC), redundant power inputs, IP65 protection class
Aquam8-H-8T-LV-LV	8 X 10/100BASE-T(X) M12 port, 24VAC/DC(9-60VDC/18-30 VAC), redundant power inputs, IP67 protection class
Aquam8-N-8T-LV-LV	8 X 10/100BASE-T(X) M12 port, 24VAC/DC(9-60VDC/18-30 VAC), redundant power inputs, IP65 protection class, neutral appearance (without Kyland logo)
Aquam8-NH-8T-LV-LV	8 X 10/100BASE-T(X) M12 port, 24VAC/DC(9-60VDC/18-30 VAC), redundant power inputs, IP67 protection class, neutral appearance (without Kyland logo)

Accessories

Accessory Model	Description	Note
M12-A-4P-F	Female cable connector with M12, A-Coding, 4 Pin	Power Interface Connector
M12-D-4P-M	Male cable connector with M12, D-Coding, 4 Pin	10/100/1000Base-TX interface Connector,
DT-XL-PWR-M12-XXX-3m	3m connecting line with M12 connector for power ports (from M12 to the exposed end)	Power cable with M12 connector

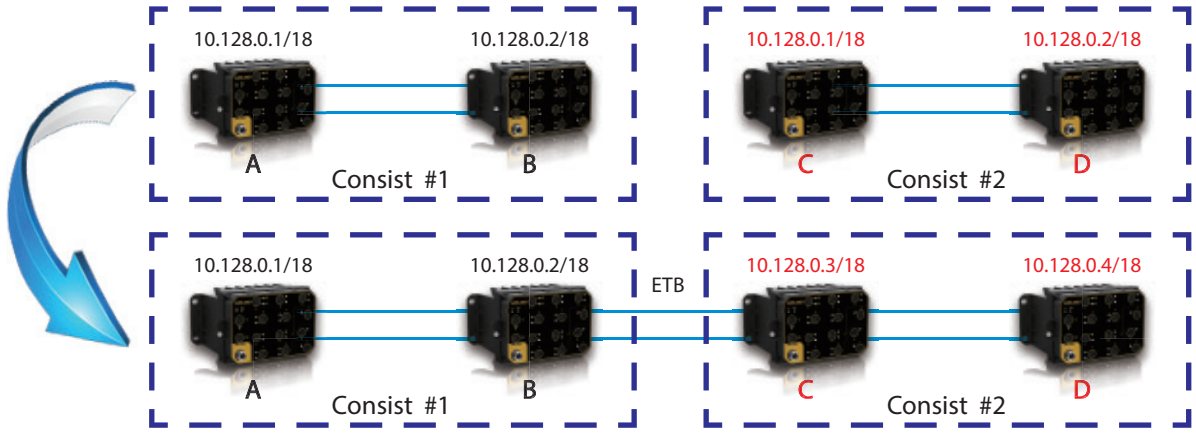
Ethernet based IEC61375 for Train Communication Networks

Ethernet technology has been widely deployed for train communication networks (TCN) and also onboard EDs (End Devices). The international IEC standard has structured the Ethernet based TCN into a hierarchical way with ETB (Ethernet Train Backbone, referred to IEC61375-2-5) and ECN (Ethernet Consist Network, referred to IEC61375-3-4). The ETB solution takes care of the interconnection and interoperability between train consists, while the ECN solution looks after the communications of end devices within each consist.

Since the train borne network is different from the typical communication network with fixed locations, especially in the train set coupling and decoupling scenarios, ETB has to be adaptive to the topology change and also react for layer 3 routing. TTDP, R-NAT, and also other features are defined in IEC61375 to build an Ethernet based TCN for TCMS (Train Control and Management System)

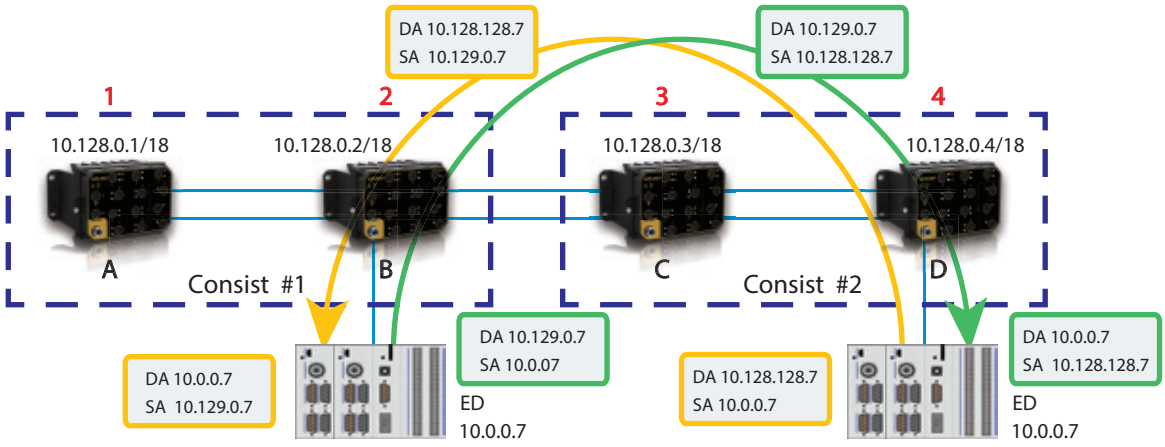
TTDP, Train Topology Discovery Protocol

All ETBNs (ETB Nodes) has to support TTDP for train network inauguration and topology resilience. In the following diagram, when Consist #2 is coupled with Consist #1, TTDP helps ETBNs renew the topology along with new IP assignment, so that there will not be any IP conflicts or mismatching.



R-NAT, Railway-Network Address Translation

In order to keep identical configuration as well as network scheme of each ECN but still allows the communications between EDs across different consists, R-NAT is introduced for IP address mapping and translation between different subnets. As shown in the diagram, the EDs are assigned with the same IP in different consists. When EDs have to communicate with each other, the upper level ETBN will help translate and forward the packets towards the destination.

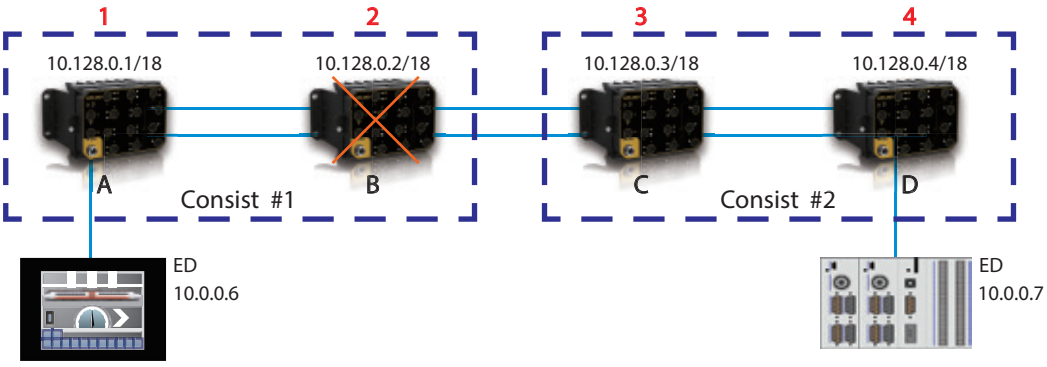


DHCP

To simplify the IP assignment and to reduce the configuration time & efforts of EDs, the ETBN has to support DHCP sever, so that the EDs can obtain proper IP addresses through DHCP client automatically.

Bypass

Since the communications of TCMS is crucial for train operation, high Availability of train network is critical. In case one single consist failure, the network should remain uninterrupted regardless of one ETBN malfunction. In the following diagram, the bypass function of ETBN_B ensures the communications between ED on ETBN_A and ED on ETBN_D even when ETBN_B is down.



Recommended Products

Aquam8512A

- 9T+3G or 8T+4G Ports Layer 3 Gigabit Managed DIN-Rail or Panel mounting EN50155 Industrial Ethernet Switch
- Compliant with IEC61375-2-5 ETB functions, including TTDP (Train Topology Discovery Protocol), DHCP server/option 82, R-NAT, power failure Bypass functions
- Supports DT-Ring, STP/RSTP/MSTP, IEC62439-6(DRP)
- Supports max. 9 PoE ports with IEEE802.3af and IEEE802.3at compliance
- Compliant with EN50155 and EN50121-4

Aquam8012A

- 9T+3G or 8T+4G Ports Layer 2 Managed EN50155 Industrial Ethernet Switch
- Supports STP/RSTP/DRP
- Supports DHCP server/option 82
- Supports power failure Bypass function
- Supports max. 9 PoE ports with IEEE802.3af and IEEE802.3at compliance
- Compliant with EN50155 and EN50121-4
- In-built wide range power module for 24-110VDC input

SICOM3170

7+3G Port Layer 2 Managed Traffic Ethernet Switches

- 2 Gigabit SFP slots, one 10/100/1000Base-TX port and seven 10/100Base-TX ports
- Supports DT-Ring , RSTP for network redundancy
- Rear panel provides PCB Golden Finger for power connection
- EMC performance reaches industrial level 4
- CE, FCC certification

Overview

SICOM3170 is an ultra low power consumption (less than 8 Watts), Managed Industrial Ethernet switch. This dual slot Ethernet switch is designed to slide into an open Detector Chassis Slot of any Signal cabinet. This Managed Industrial Ethernet Switch is widely deployed in SCADA and OSS networks around world. This proven ultra low power consumption switch (Green Product - RoHS) features 2 SFP Gigabit ports, Seven 10/100 RJ45 Ports and One 10/100/1000 RJ45 Port. The SICOM3170 Industrial Signal Control switch is the first of a series of Traffic Ethernet Switches Series from Kyland and a continuation of our "Green Ethernet" product line.

Software Functions

Switching Function

Supports VLAN and PVLAN
Supports port aggregation
Supports flow control
Support port rate limit
Supports broadcast storm suppression

Redundancy Protocol

Supports DT-Ring, DT-Ring+, and the recovery time<50 ms
Supports STP/RSTP

Multicast Protocol

Supports IGMP snooping
Supports static multicast

Network Security

Supports IEEE 802.1x
Supports HTTPS/SSL
Supports SSH
Supports RADIUS
Supports TACACS+
Supports user grading
Supports Manage VLAN
Supports port security

Service Quality Management

Supports SP and WRR queuing

Management & Maintenance

Supports Console, Telnet, and Web management methods
Supports SNMPv1/v2c/v3, Kyvision centralized management
Supports software update and file transfer over FTP/SFTP
Supports port alarm and ring alarm
Supports RMON
Supports port mirroring
Supports Syslog
Supports LLDP
Supports Link-check

IP Address Management

Supports DHCP server/client

Clock Management

Supports SNTP client

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)
- IEEE 802.3ab (1000Base-T)
- IEEE 802.3ad (port aggregation)
- IEEE 802.3z (1000Base-SX/LX)
- IEEE 802.3x (flow control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1d (STP)
- IEEE 802.1w (RSTP)
- IEEE 802.1x

Switch Properties

Priority queue	4
Number of VLANs	256
VLAN ID	1–4093
Number of multicast groups	256
MAC table	8K
Packet buffer	4Mbit
Packet forwarding rate	5.5Mpps
Switching delay	<10μs

Interface

Gigabit ports
- 1000Base-X, SFP port
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet ports	10/100Base-T(X), RJ45 port
Console port	RS232,RJ45

LED

LED on front panel
- Running LED: Run
- Power LED: PWR
- Port LED: Link/ACT,LINK,ACT
- Port speed LED: Speed

Power Requirements

Power input	12-24VDC(9-36VDC),
Power terminal	PCB Golden Finger
Power consumption	<8W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Not support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40
Dimensions(WxHxD)	
▼ 58mm×114mm×205mm (2.28×4.49×8.07 in.)	
Weight	<0.8Kg (1.764 pound)
Mounting slots	Inserted into a rack through rail

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	370,000 hrs
Warranty	5 years

Approvals

CE, FCC

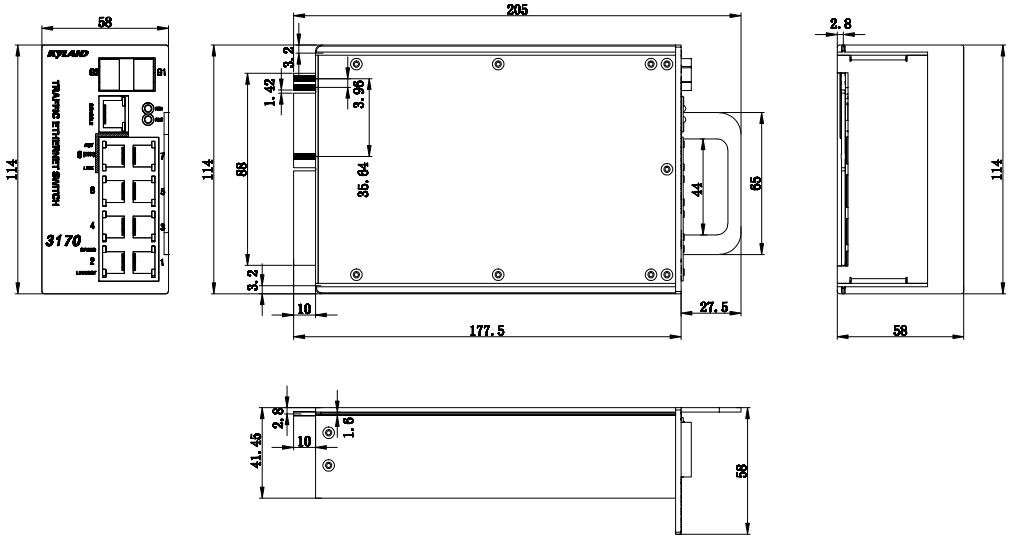
Industry Standard

EMI
- FCC CFR47 Part 15,EN55022 Class A&B

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-1GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-8(power frequency magnetic field) 100A/m(cont.),1000A/m(1s-3s)
- IEC61000-4-9(pulsed magnetic field) 1000A/m
- IEC61000-4-10(damped oscillation) 30A/m
- IEC61000-4-12(oscillatory wave) 2.5kV/CM,1kV/DM
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

	SICOM3170-Ports-PS
Ports	
2GX1GE7T	2x1000Base-X, 10/100/1000Base-T(X) SFP port;1x10/100/1000Base-T(X) RJ45 port; 7x10/100Base-T(X) RJ45 port
PS	
L5	12-24VDC(9-36VDC)

SICOM3171

5 Port Managed Traffic Serial Device Server

- 1 10/100Base-TX port, 4 RS232/422/485 serial ports
- Green Ethernet solution with low power consumption design
- Rear panel provides PCB Golden Finger for power connection
- IP40 protection class

Overview

SICOM3171 is an ultra low power consumption (less than 3.5Watts), Managed Traffic Ethernet Serial Device Server. This single slot serial server is designed to slide into an open Detector Chassis Slot of any signal cabinet. This Traffic Serial Server is widely deployed in SCADA and OSS networks around world. This proven ultra low power consumption serial server(Green Product-RoHS) features one 10/100Base-TX Ethernet port, and four serial ports being selectable for RS232, RS422 and RS485 serial connectivity. The SICOM3171 Managed Traffic Ethernet Serial Server is the second of a series of Traffic Ethernet Switches Series form Kyland and a continuation of our "Green Ethernet" product line.

Software Functions

Serial Port Function

Supports RS232/422/485 mode.
Supports flow control.
Support TCP/UDP protocols

Management & Maintenance

Supports Console, Telnet, and Web management methods.
Supports SNMPv1/v2c, Kyvision centralized management.
Supports software update over FTP.
Supports LLDP.

Network Security

Supports SSH

Clock Management

Supports SNTP client.

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)
- IEEE 802.3x (flow control)

Interface

Fast Ethernet ports	10/100Base-T(X), RJ45 port
Serial ports	RS232/RS485/RS422, RJ45 port

LED

LED on front panel
- Running LED: Run
- Power LED: PWR
- Port LED: Link/ACT

Button

Reset:System reset

Power Requirements

Power input	12-24VDC(9-36VDC),
Power terminal	PCB Golden Finger
Power consumption	<3.5W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Not support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless

Protection Class	IP40
Dimensions(WxHxD)	
▼ 30mm×114mm×205mm(1.18×4.49×8.07 in.)	
Weight	<0.35Kg (0.77pound)
Mounting	
▼ Inserted into a rack through rail slots	

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	306,600 hrs
Warranty	5 years

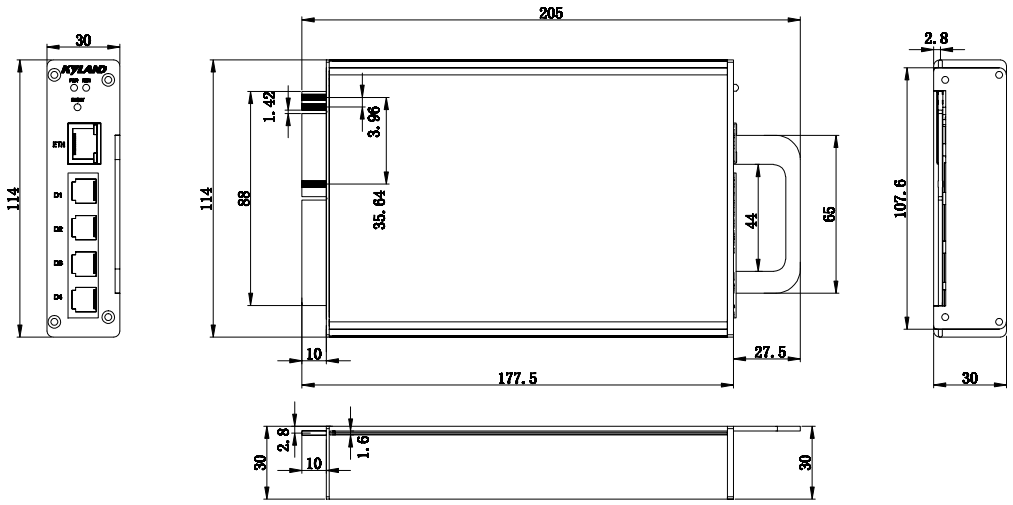
Industry Standard

EMI
- ▼ FCC Part 15, Class A&B

EMS
- ▼ IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- ▼ IEC61000-4-3(RS) 10V/m(80MHz-1GHz)
- ▼ IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- ▼ IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- ▼ IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- ▼ IEC61000-4-8(power frequency magnetic field) 100A/m(cont.),1000A/m(1s-3s)
- ▼ IEC61000-4-9(pulsed magnetic field) 1000A/m
- ▼ IEC61000-4-10(damped oscillation) 30A/m
- ▼ IEC61000-4-12(oscillatory wave) 2.5kV/CM,1kV/DM
- ▼ IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
IEC60068-2-6 (vibration),
IEC60068-2-27 (shock),
IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

	SICOM3171-Ports-PS
Ports	
1T4D	1x10/100Base-T(X) RJ45 port; 4xRS232/485/422 serial port
PS	
L5	12-24VDC(9-36VDC)

SICOM3172

EoVDSL2 & Serial Device Server Integrated Traffic Industrial Ethernet Switches

Preliminary

- 2 EoVDSL2 ports, 4 10/100Base-TX RJ45 ports and 2 RS232/ RS485 serial ports
- Supports DT-Ring , RSTP for network redundancy
- Supports many security functions
- Rear panel provides PCB Golden Finger for power connection
- EMC performance reaches industrial level 4

Overview

SICOM3172 is an ultra low power consumption (less than 10 Watts), managed EoVDSL2 & serial device server integrated traffic industrial Ethernet switch. This dual slot Ethernet switch is designed to slide into an open Detector Chassis Slot of any signal cabinet. This Traffic Ethernet Switch is widely deployed in SCADA and OSS networks around world. This proven ultra low power consumption device features two EoVDSL2 ports with RJ11 connector, four 10/100Base-TX Ethernet port, and two serial ports being selectable for RS232, RS422 and RS485 serial connectivity. The SICOM3172 Managed Traffic Ethernet Serial Server is the third of a series of Traffic Ethernet Switches Series form Kyland and a continuation of our green energy efficiency product line.

Software Functions

Switching Function

Supports VLAN and PVLAN
Supports port aggregation
Supports flow control
Support port rate limit
Supports broadcast storm suppression

Redundancy Protocol

Supports DT-Ring, DT-Ring+, and the recovery time<50 ms
Supports STP/RSTP

Multicast Protocol

Supports IGMP snooping
Supports static multicast

Network Security

Supports IEEE 802.1x
Supports HTTPS/SSL
Supports SSH
Supports RADIUS
Supports TACACS+
Supports user grading
Supports Manage VLAN
Supports port security

Service Quality Management

Supports SP and WRR queuing

Management & Maintenance

Supports Console, Telnet, and Web management methods
Supports SNMPv1/v2c/v3, Kyvision centralized management.
Supports software update and file transfer over FTP/SFTP
Supports port alarm and ring alarm
Supports RMON
Supports port mirroring
Supports Syslog
Supports LLDP
Supports Link-check

IP Address Management

Supports DHCP server/client

Clock Management

Supports SNTP client

Serial Port Function

Supports RS232/422/485 mode
Supports flow control
Support TCP/UDP protocols

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T)
- IEEE 802.3ad (port aggregation)
- IEEE 802.3x (flow control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1d (STP)
- IEEE 802.1w (RSTP)
- IEEE 802.1x

Switch Properties

Priority queue	4
Number of VLANs	256
VLAN ID	1–4093
Number of multicast groups	256
MAC table	8K
Packet buffer	1Mbit
Packet forwarding rate	0.9Mpps
Switching delay	<10μs

Interface

Fast Ethernet ports	10/100Base-T(X), RJ45 port
EoVDSL2 ports	2/3/5/15/20/25/55/100Mbps, RJ11
Serial ports	RS232/485/422, RJ45
Console port	RS232,RJ45

LED

LED on front panel
- Running LED: Run
- Power LED: PWR
- Ring LED: Ring
- EoVDSL2 port data receiving/sending LED: V1, V2
- EoVDSL2 port role LED: CO1, CO2
- Serial port data receiving/sending LED:TX,RX
- Port LED: Link/ACT
- Port speed LED: Speed

Power Requirements

Power input	12-24VDC(9-36VDC),
Power terminal	PCB Golden Finger
Power consumption	<10W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Not support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP30
Dimensions(WxHxD)	
▼ 58mm×114mm×205mm (2.28×4.49×8.07 in.)	
Weight	<0.8Kg (1.764 pound)
Mounting	Inserted into a rack through rail slots

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F to 185°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5% - 95% (non-condensing)

Quality Assurance

MTBF	307,699 hrs
Warranty	5 years

Approvals

For the latest dynamics of the product, visit the website of Kyland.

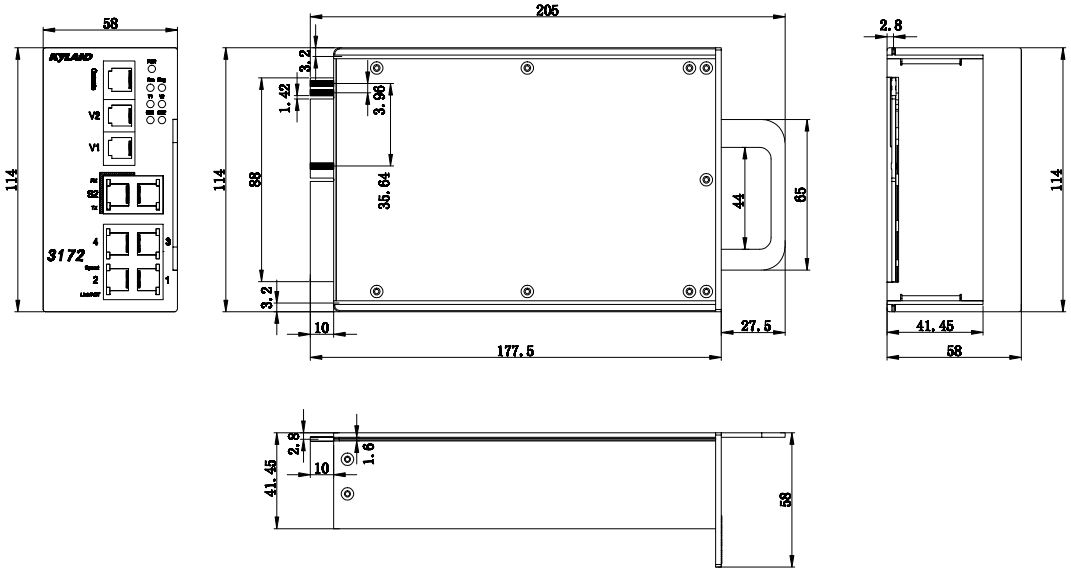
Industry standard

EMI
- FCC Part 15 Class A&B

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)
- IEC61000-4-8(power frequency magnetic field) 100A/m(cont.),1000A/m(1s-3s)
- IEC61000-4-9(pulsed magnetic field) 1000A/m
- IEC61000-4-10(damped oscillation) 30A/m
- IEC61000-4-12(oscillatory wave) 2.5kV/CM,1kV/DM
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

	SICOM3172-Ports-PS
Ports	
1EoVDSL2-RJ11-4T	4x10/100Base-T(X) RJ45 port; 1xVDSL port
1EoVDSL2-RJ11-4T-2D	4x10/100Base-T(X) RJ45 port; 1xVDSL port;2xRS232/485/422 serial port
2EoVDSL2-RJ11-4T	4x10/100Base-T(X) RJ45 port;2xVDSL port
2EoVDSL2-RJ11-4T-2D	4x10/100Base-T(X) RJ45 port; 2xVDSL port;2xRS232/485/422 serial port
PS	
L5	12-24VDC(9-36VDC)

SICOM3307S

7+3G Port Layer 2 Managed DIN-Rail PoE Switches

- 2 Gigabit Combo ports, 7 10/100Base-T(X) PoE ports compliant with 802.3af/atSupport PD detection and PD classification
- Support PoE power limit, PD fault detection, PoE status display
- Supports DT-Ring, DRP and RSTP protocols
- Supports one-key recovery
- Provides Mini USB Console port
- Support cable check

Overview

SICOM3307S is Kyland Din-Rail Managed PoE switch and is equipped with 3 combo 1000M SFP or 10/100/1000Base-TX RJ45 ports and 7 10/100Base-TX PoE ports compliant with IEEE802.3af/at. While transmitting data over the cable, each PoE port can output up to 30 watts to PoE terminals directly, eliminating the need for additional wiring. The SICOM3307S is specifically designed to operate reliably in a variety of industrial applications such as automation, transportation and traffic video surveillance systems, relying on -40°C to 85°C wide temperature range, EMC level 4, IP40 protection class, strong vibration-resistent mounting clip for DIN-Rail installation. It supports DRP (recovery time<20ms), DT-Ring (recovery time<50ms), RSTP, VLAN, QoS, SNMPv1/v2c/v3, IEEE802.1X, SSH, SSL abundant redundant and security features.

Software Functions

Switching

Support VLAN, PVLAN
Support GVRP
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-ring, DT-ring+, DT-VLAN with the recovery time<50ms
Support DRP with the recovery time<20ms
Support STP/RSTP

Multicast

Support IGMP Snooping,
Support GMRP
Support static multicast

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support IEEE802.1X
Support MAC address binding with switch ports

Service Quality

Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP/TFTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support cable check
Support Syslog
Support LLDP
Support Link-check

IP Management

Support DHCP server/snooping/client, DHCP Option 82

Clock Management

Support SNTP Client

PoE Management

Support POE port setting and PD detection

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-X)
- IEEE 802.3x(Flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1w(RSTP)
- IEEE802.1X
- IEEE802.3at (PoE Plus)

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	5.6 Mpps
Switching Delay	<10μs

Interface

Gigabit Port
- 1000Base-X, SFP slot
- 10/100/1000Base-T(X), RJ45 port

Fast Ethernet Port 10/100Base-T(X), RJ45 port

802.3at PoE Port
- Each PoE port provide max 30W feed power
- V+ for pin 1, 2 and V- for pin 3, 6 (End-Span PSE)

Console Port Mini USB

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block,250VAC/220VDC Max,2A Max

LED

LEDs on Front Panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1,PWR2
- Ring LED: Ring
- Interface LED: Link/ACT,Speed (RJ45 port); Link/ACT(Fiber port)
- PoE LED: 1-7

Button

Reset: Reboot and restore default configuration

Power Requirements

Power Input
- 51-57VDC (802.3at)
- 48VDC (45-57VDC) (802.3af)

Power Terminal 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption
- <11W (no PD),
- <225W (full PD)

PoE Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	88mm×135mm×137mm(W×H×D)
Weight	1.25Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5 - 95% (non-condensing)

Warranty

MTBF	323,350 hrs
Warranty	5 years

Industry Standard

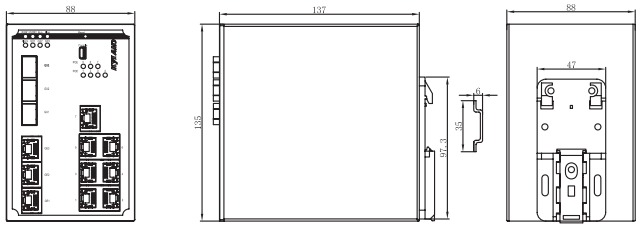
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz– 2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV
- IEC61000-4-5(Surge) Power Port: ±2kV/DM, ±4kV/CM
- IEC61000-4-6(CS) 10V(150kHz– 80MHz)

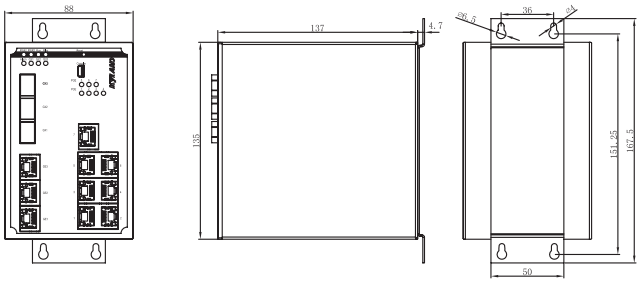
Machinery
- IEC60068-2-6 (Vibration)
- IEC60068-2-27 (Shock)
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	SICOM3307S-Ports-PS
Ports	
3G7P	3 × 1000Base-X, 10/100/1000Base-T(X) Combo ports; 7×10/100BASE-T(X) RJ45 PoE ports
PS	
L10-L10	51-57VDC (802.3at), redundant power inputs 48VDC(45-57VDC) (802.3af), redundant power inputs

Accessories

Accessory Model	Description
Gigabit SFP Module	Please refer to the Gigabit SFP module ordering table
DT-BGAZ-02	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port
DT-XL-Mini USB -USB-2m	Mini USB to USB cable for Console management, 2m

KIEN1005S

5 Port Unmanaged DIN-Rail PoE Switches

- 1 Fast Ethernet fiber/RJ45 optional port and 4 10/100Base-TX PoE ports compliant with 802.3af
- Support PD detection and PD classification
- Operating temperature is -40℃ to 85℃
- IP40 protection class

Overview

KIEN1005S series are Kyland produced unmanaged 5-port PoE switches, providing 1 fast Ethernet fiber/RJ45 optional port and 4 10/100Base-TX PoE ports compliant with IEEE802.3af. While transmitting data over the cable, each PoE port can output 15.4 watts to PoE terminals directly, eliminating the need for additional wiring. KIEN1005S supports wide operating temperature range from -40°C to 85°C, metal housing with IP40 protection class and redundant power inputs, becoming an economical and harsh-environment-resistant solution for the ITS, video surveillance and other automation applications.

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE802.3af (PoE)

Switch Properties

MAC Table	2K
Packet Buffer	1Mbit
Packet Forwarding Rate	0.8Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector

10/100Base-T(X), RJ45port

802.3af PoE Port
- Each PoE port provides max 15.4W feed power
- V+ for pin 1, 2 and V- for pin 3, 6 (End-Span PSE)

LED

LEDs on Front Panel
- Power LED:PWR1,PWR2
- Interface LED:Link/ACT
- PoE Status LED: POE

Power Requirements

Power Input	48VDC (45-57VDC)

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<3W (no PD), <65W (full PD)
PoE overload protection	Support
Reverse protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural convection, fanless
Protection Class	IP40

Dimension
- 30mm×115mm×91.5mm (W×H×D)

Weight	0.46Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% (non-condensing)

Warranty

MTBF	338,100 hrs
Warranty	5 years

Approvals

Inquire Kyland websize for the newest dynamic.

Industry Standard

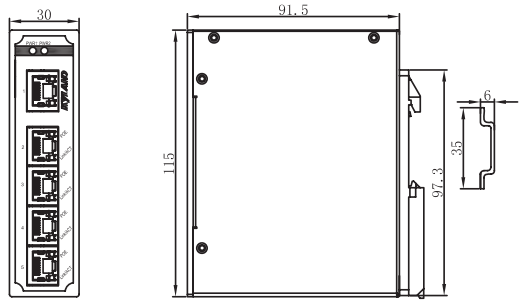
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±6KV(contact):±8KV(air)
- IEC61000-4-3(RS) 10V/m(80MHz– 2GHz)
- IEC61000-4-4(EFT) Power Port:±2KV
- IEC61000-4-5(Surge) Power Port:±1KV/DM, ±2KV/CM;
- IEC61000-4-6(CS) 10V(150kHZ–80MHz)

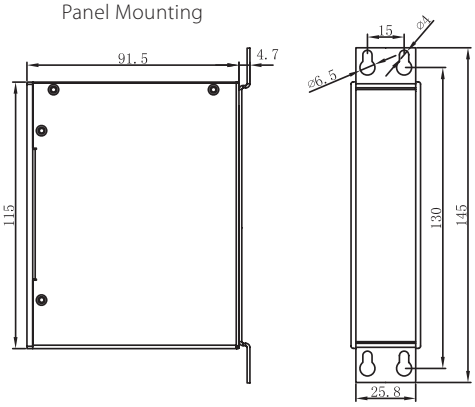
Machinery
- IEC60068-2-27 (Vibration)
- IEC60068-2-32 (Shock)
- IEC60068-2-6 (Free Fall)

Mechanical Drawing

DIN-Rail Mounting



Panel Mounting



Ordering Information

	KIEN1005S-Ports-Connector-PS1-PS2
Ports	
1S4P	1×100Base-FX, single mode fiber port;4×10/100Base-T(X) RJ45 PoE ports
1M4P	1×100Base-FX, multi mode fiber port;4×10/100Base-T(X) RJ45 PoE ports
1T4P	1×10/100Base-T(X) RJ45 port;4×10/100Base-T(X) RJ45 PoE ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
None	No 100M fiber port
PS	
L10-L10	48VDC (45-57VDC), redundant power inputs

Accessories

Accessory Model	Description
DT-BGAZ-01	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

PoE (Power over Ethernet) Technology

Introduction

PoE (Power over Ethernet) technology allows a single LAN cable to transmit both data and electrical power to terminal devices such as wireless access points or IP cameras at the same time, thus solves the difficulties that large number of IP devices can hardly obtain the power in the field. It extends the application fields of Ethernet technologies.

The PoE technology was standardized by IEEE802.3af and IEEE802.3at. The IEEE 802.3af-2003 PoE standard limit the max feeding power to15.4 W, while the updated IEEE 802.3at-2009 PoE standard also known as PoE+ or PoE plus, extends it to 30W, greatly widened the application prospect of Power over Ethernet technology.

Two groups of devices are defined in PoE standards: PSE and PD. Power Sourcing Equipment (PSE) is a device that provides power via the Ethernet cable, such as a switch. Powered Device (PD) is a device powered by a PSE and thus consumes energy, such as wireless access points, IP Phones, and IP Cameras. PSE can be divided into Endspan and Midspan. Endspan, the PSE is integrated in the switch; Midspan, for easy upgrading existing network, it is integrated into a non-POE network and allows it offer power to the terminal devices.

There are two feeding modes: Mode A and Mode B. Mode A delivers power on the data pairs of 100BASE-TX or 10BASE-T. Mode B delivers power on the spare pairs. PoE can also be used on 1000BASE-T Ethernet, in which case there are no spare pairs and all power is delivered using the phantom technique.

POE Power Supply Parameters

Standard PoE parameters and comparison		
Property	802.3af (802.3at Type 1)	802.3at Type 2
Power available at PD	12.95 W	25.50 W
Maximum power delivered by PSE	15.40 W	30.0 W
Voltage range (at PSE)	44.0-57.0 V	50.0-57.0 V
Voltage range (at PD)	37.0-57.0 V	42.5-57.0 V
Maximum current	350 mA	600 mA per mode
Power Class	0-3	0-4

Feeding Process

After the connection between PSE and PD is initiated, PSE will finish following steps:

PD Detection

- PSE outputs the detection voltages in the range of 2.7–10.1V
- PSE measures the current at two different detection voltages and calculate the differential input resistance of the PD to detect whether there is a PD connection.

PD Classification

- Once the PSE detects a PD, it applies a voltage in the range of 14.5–20.5V to the PD and measure the current.
- PSE determines the power class of the connected PD according to the measured current.

Start Power Supply

- After power classification, PSE start to feed the power
- PSE monitors the power supply status of each Ethernet port and provides under–voltage and over–current protection.

Stop Power Supply

- While the PD is disconnected from the PSE, PSE will stop power feeding immediately
- Then PSE will go back to the step of PD detection

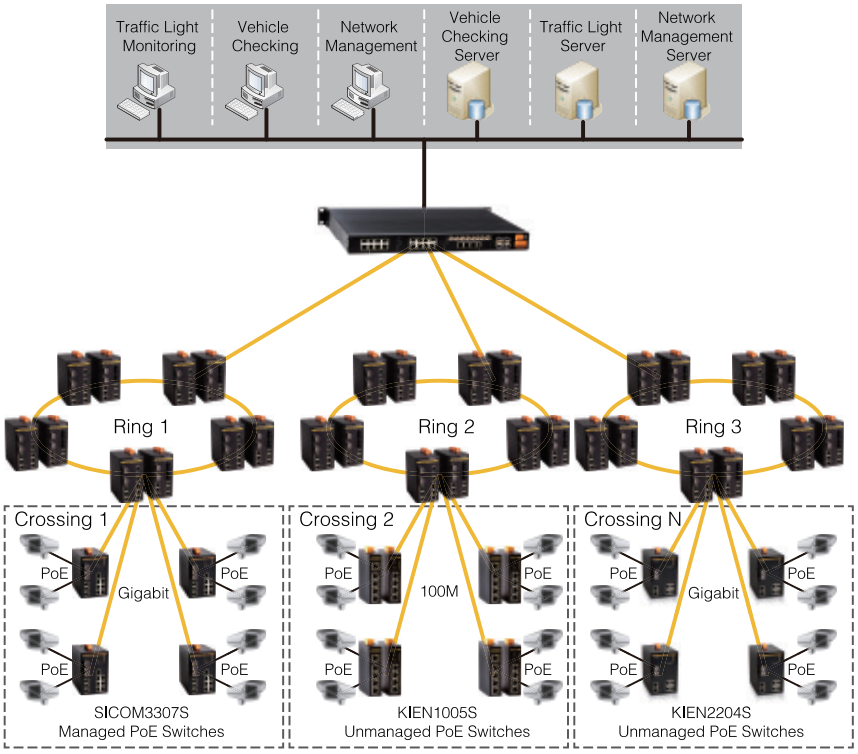
Power Classes

The power classification feature ensures a PSE can supply power to as many PDs as possible at the same time. According to IEEE802.3af standard, PD is divided to 4 classes: Class 0-3. (Class 0 represents no power classification). IEEE802.3at standard has added the Class 4. Due to the power losses on the cable, the PD obtained power is less than the PSE output power.

Power Class	PSE Output Power Consumption	Power Consumption PD Obtained
0	15.4W	12.95W
1	4.0W	3.84W
2	7.0W	6.49W
3	15.4W	12.95W
4	30.0W	25.50W

PoE Typical Application

High resolution IP cameras are more and more frequently used in video surveillance applications in recent years. Generally speaking, in the traffic blocks in the city, a number of IP cameras will be deployed to capture, record, and monitor the traffic status. By using PoE technology, industrial Ethernet switches can directly supply power to the IP cameras while transferring the data at the same time. Kyland provides both managed and unmanaged PoE switches with both RJ45 and M12 interface for different applications. Users can manage the PoE function of the PoE switches through command line or web interface. Management functions include enable or disable PoE power supply, configure the power output of each Ethernet port, configure the power feeding priorities of each Ethernet port (Critical>High>Low). And all power supply status will be displayed on the web interface.



Products

SICOM3307S

- 3 Gigabit Combo ports, 7 PoE Ethernet electrical ports comply with 802.3at
- Each PoE port provides max 30W feed power
- Support DRP, DT-Ring, RSTP ring protocols

Aquam8012A

- Support max 3 Gigabit M12 copper ports and 9 fast Ethernet 802.3af/at PoE M12 ports
- Support 24-110VDC wide range power inputs
- Support PoE power feeding status display and port priority settings
- Support STP/RSTP/DRP
- Compliant with EN50155 and EN50121-4

KIEN005S

- Unmanaged POE switch
- Supports 1 Copper/Fiber port, 4 10/100 Base-TX POE ports
- Each POE port supports maximum 15.4W power output

SICOM3016BA

12+4G Port Layer 2 Managed Switches

- Comply with explosive atmospheres standard IEC60079-11(GB3836.4)
- 3 or 4 Gigabit SFP slots, 6 Fast Ethernet fiber/RJ45 optional ports and 6 100Base-FX ports
- Support ring protocol such as DT-Ring,STP,support auto topology
- Support Panel Mounting or non-housing

Overview

SICOM3016BA serial are switches with low consumption, high integration density, comply with explosive atmospheres standard. Which have advanced insulation performance,damp proofing and support multiple redundant protocol, auto topology,remote monitoring ,link check, etc., Excellently apply to explosive atmospheres such as factory automation,coal mine , chemical factory and so on.

Software Functions

Switching

Support VLAN,PVLAN
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control
Support ACL

Redundancy

Support DT-Ring, DT-Ring+ with the recovery time<50ms
STP/RSTP

Multicast

Support IGMP Snooping
Support GMRP
Support static multicast

Sevice Quality

Support SP, WRR queue scheduling

Management and Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c, Kyvision centralized management
Support software upgrade by FTP
Support Power,port and ring alarm
Support RMON
Support port mirroring
Support LLDP
Support Link-check

IP Management

Support DHCP server

Clock Management

Support SNTP server/client

Technical Specification

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u (100Base-T and 100Base-FX)
- IEEE 802.3ab(1000Base-T)
- IEEE802.3z (1000Base-SX/LX)
- IEEE 802.3x(flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1s(MSTP)

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K

Packet Buffer	2Mbit
Packet Forwarding Rate	7.7Mpps
Switching Delay	<10μs

Interface

GigabitPorts	1000Base-X, SFP slot

Fast Ethernet Port
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port	RS232,RJ45 connector

Alarm contact
- 2 pins used for alarm,input-mode,together with power input pins, 6-pin 5.08mm-spacing plug-in terminal block

LED

LED on Front Panel
- PWR: Power LED
- Run: Running LED
- Alarm: Alarm LED
- 1-12: Fast ethernet LED
- Green: Link/ACTLED
- Yellow: Speed
- G1-G4: Gigabit LED
- Non-housing version support LED interface for user.

Power Requirement

Power Input	12VDC(9-21VDC), 5VDC(4.5-5.5VDC)

Power Terminal
- 6-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<10.6W
Overload Protection	Support
Reverse Protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal,fanless
Cooling	Natural convection, fanless
Protection Class	IP40

Dimension
- 284mm×44mm×140mm (W×H×D)
- 235mm×30mm×130mm(non-housing) (W×H×D)

Weight	1.5Kg, 0.5Kg(non-housing)
Mounting	Panel Mounting

Environmental Limits

Operating Temperature	-40°C to +75°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95%RH

Warranty

MTBF	329032 hours
Warranty	5 years

Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

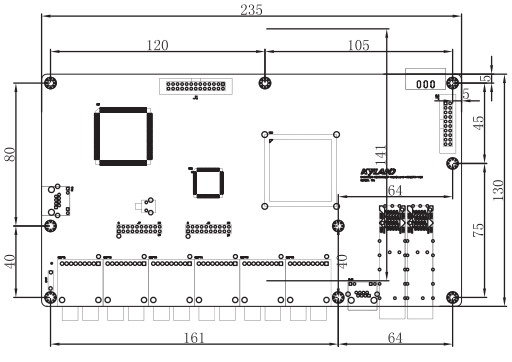
EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz–150kHz);10V(150kHz–80MHz)

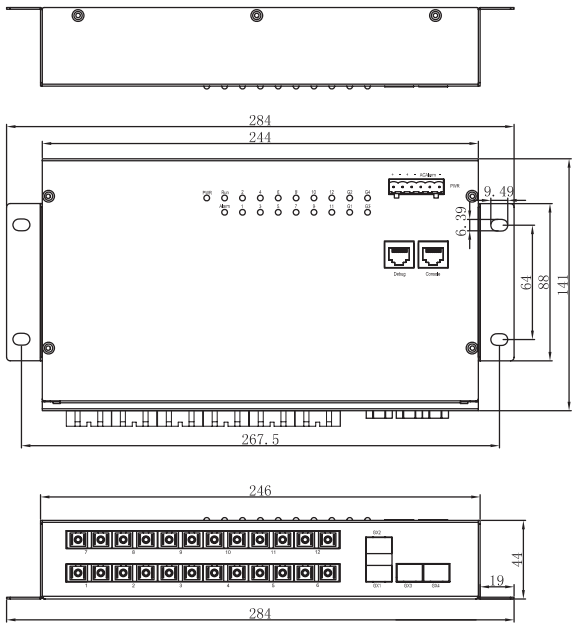
Machinery
- IEC60068-2-6(vibration)
- IEC60068-2-27(shock)
- IEC60068-2-32(free-fall)

General Industrial
- IEC61000-6-2
- IEC61000-6-4

Explosive atmospheres standard
- IEC60079-0(GB/T3836.1),
- IEC60079-1(GB/T3836.2),
- IEC60079-7(GB/T3836.3),
- IEC60079-11(GB/T3836.4)

Mechanical Drawing





Ordering Information

	SICOM3016BA-EC-Ports-Connector-PS1-PS2
	SICOM3016BA-C-Ports-Connector-PS1-PS2
EC	Non-housing and Conformal Coating
C	Conformal Coating
Ports	
4GX12S	4×1000Base-X, SFP slots; 12×100Base-FX, single mode fiber ports;
4GX12M	4×1000Base-X, SFP slots; 12×100Base-FX, multi mode fiber ports;
4GX6S6T	4×1000Base-X, SFP slots; 6×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
4GX6M6T	4×1000Base-X, SFP slots; 6×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
3GX12S	3×1000Base-X, SFP slots; 12×100Base-FX, single mode fiber ports;
3GX12M	3×1000Base-X, SFP slots; 12×100Base-FX, multi mode fiber ports;
3GX6S6T	3×1000Base-X, SFP slots; 6×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
3GX6M6T	3×1000Base-X, SFP slots; 6×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS1-PS2	
L7-L7	5VDC(4.5-5.5VDC), redundant power inputs
L6-L6	12VDC(9-21VDC), redundant power inputs

Accessories

Accessories model	Description
Gigabit SFP Module	Please refer to Gigabit SFP module ordering table
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

SICOM3000BA

6+3G Port Layer 2 Managed DIN-Rail Switches

- 3 Gigabit SFP slots, 6 10/100Base-T(X) RJ45 ports
- Full load power consumption is as low as 5.2W
- Comply with standard IEC60079-11(GB3836.4)
- Dry contact for warning signal,support NO and NC
- Support DIN-Rail,Panel Mounting and non-housing

Overview

SICOM3000BA serial is designed for use in explosive atmosphere areas ,small size, low-power dissipation, comply with intrinsic safety, have advanced insulation performance and damp proofing, support fiber cascade connection, transmitting and forwarding. Support multiple redundant protocol, remote monitoring and self- manage functions. That is suitable for explosive atmospheres, high dust, corrosive conditions, such as coal mine, chemical factory, oil field and so on.

Software Functions

Switching

Support VLAN,PVLAN
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring,DT-Ring+, DT-VLAN with the recovery time<50ms
Support STP/RSTP

Multicast

Support IGMP Snooping
Support static multicast

Network Security

Support SSH
Support TACACS+

Sevice Quality

Support SP, WRR queue scheduling

Management and Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support LLDP
Support Link-check

IP Management

Support DHCP server

Clock Management

Support SNTP Client

Technical specifications

Technical Parameters

Standard
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-T and 100Base-FX)
- IEEE 802.3z (1000Base-SX/LX)
- IEEE 802.3x (Flow control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1w (RSTP)

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1–4093
Number of Multicast Groups	256
MAC table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	5.4Mpps
Switching Delay	<10μs

Interface

Gigabit Port	1000Base-X, SFP slot
Fast Ethernet Port	10/100Base-T(X), RJ45 port
Console Port	RS232,RJ45 connector

Alarm Contact
- Dry contact for warning signal,support NO and NC
- 3-pin 5.08mm-spacing plug-in terminal block(12/18/24VDC)
- 6-pin 5.08mm-spacing plug-in terminal block(5VDC)
- 0.5A at125Vac,2A at 30Vdc

LED

LEDs on Front Panel
- Run2: Running LED
- PWR1,PWR2: Power LED
- GX1-GX3: GX1-GX3 ports LED
- 1-6: 1-6 ports LED
  - Green:Link/ACK status LED
  - Yellow:Speed LED
- Non-housing version support LED connector for users.

Power Requirement

Power Input
- 12-24VDC(9-36VDC),12VDC(9-18VDC),
- 18VDC(9-21VDC), 5VDC(4.5-5.5VDC)

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block(12/18/24VDC)
- 6-pin 5.08mm-spacing plug-in terminal block(5VDC)

Power Consumption	<5.2W
Overload Protection	Support
Reserve Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal, fanless
Protection Class	IP40

Dimension
- 75mm×140mm×123mm(W×H×D)
- 134mm×61.3mm×101mm(Non-housing)(W×H×D)

Weight
- 1.0Kg,
- 0.3Kg(Non-housing)

Mounting
- DIN-Rail or Panel Mounting
- Non-housing version support location holes for users

Environmental Limit

Operating Temperature	-40℃ to +75℃
Storage Temperature	-40℃ to +85℃
Ambient Relative Humidity	5-95% RH

Warranty

MTBF	384,273 hrs
Warranty	5 years

Certification

For the latest dynamics of the product, visit the website of Kyland.

Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz–150kHz);10V(150kHz–80MHz)

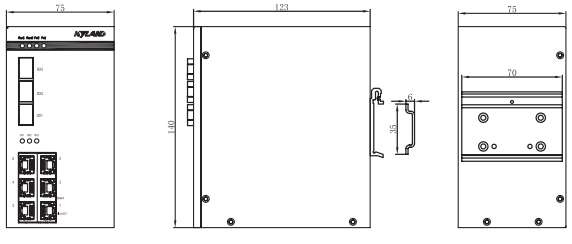
Machinery
- IEC60068-2-6(Vibration)
- IEC60068-2-27(Shock)
- IEC60068-2-32(Free-fall)

General Industrial
- IEC61000-6-2
- IEC61000-6-4

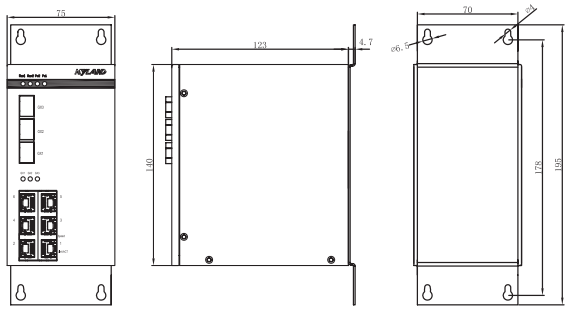
Explosive atmosphere standard
- IEC60079-0(GB/T3836.1),
- IEC60079-1(GB/T3836.2),
- IEC60079-7(GB/T3836.3),
- IEC60079-11(GB/T3836.4)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	SICOM3000BA-EC-Ports-PS1-PS2 SICOM3000BA-C-Ports-PS
EC/C	
EC	Non-housing and Conformal Coating
C	Conformal Coating
Ports	
3GX6T	3GX6T= 3×1000Base-X, SFP slots; 6×10/100Base-T(X) RJ45 ports
2GX6T	2GX6T= 2×1000Base-X, SFP slots; 6×10/100Base-T(X) RJ45 ports
PS1-PS2	
Housing version	
L5-L5	12-24VDC(9-36VDC), Redundant power inputs
L6-L6	12VDC(9-18VDC), Redundant power inputs
Non-housing version	
L4	18VDC(9-21VDC), Single power input
L6-L6	12VDC(9-18VDC), Redundant power inputs
L7	5VDC(4.5-5.5VDC), Single power input

Accessories

Accessory model	Description
Gigabit SFP model	Please refer to Gigabit SFP module ordering table
DT-BGAZ-05	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

SICOM3009BA

9 Port 2 Layer Managed Switches

- 3 100Base-FX ports, 6 10/100Base-T(X) ports with RJ45 connecters.
- Full load power consumption is as low as 3.9W.
- Comply with IEC60079-11(GB3836.4) of explosive atmospheres.
- Dry contact for warning signal,support NO and NC.
- Support one key recovery
- Embedded switch without housing

Overview

SICOM3009BA serial is designed for use in explosive atmospheres environment, low consumption, without housing. Comply with intrinsic safety, have advanced insulation performance, damp proofing, support fiber transmitting and forwarding, multiple redundant topology, remote monitoring, etc. Apply to explosive atmospheres, high dust, corrosive condition, such as coal mine, chemical factory, oil field and so on.

Software Functions

Switching

Support VLAN,PVLAN
Support port trunking
Support port flow control
Support port speed limit
Support broadcast storm control

Redundancy

Support DT-Ring,DT-Ring++, DT-VLAN with the recovery time<50ms
Support STP/RSTP

Multicast

Support IGMP Snooping
Support static multicast

Network security

Support SSH
Support TACACS+

Service Quality

Support SP,WRR queue scheduling

Management and Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP
Support power, port and ring alarm
Support RMON
Support port mirroring
Support LLDP
Support Link-check

IP Management

Support DHCP server

Clock Management

Support SNTP Client

Technical Specifications

Technical Parameters

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u (100Base-T and 100Base-FX)
- IEEE 802.3x(flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1D(STP)
- IEEE 802.1w(RSTP)

Switch Properties

Priority Queues	4
Number of VLANs	256

VLAN ID	1–4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	1Mbit
Packet Forwarding Rate	5.4Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Ports
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console Port
- RS232,RJ45 connector

Alarm Contact
- Dry contact for warning signal,support NO and NC.
- 6-pin 5.08mm-spacing plug-in terminal block, 0.5A at 125Vac,2A at 30Vdc

LED

LED on Front Panel
- Non-housing version support LED interface for user,Dimensions refer to hardware manual

Button

Reset:system reset
Default: system recover default configuration

Power Requirements

Power Input	3.3-5VDC
Power Terminal	
▾ 6pin 5.08mm spacing plug-in termianl block	
Power Consumption	<3.9W, 2.06W in idle
Overload Protection	Support
Inverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Dimension	130mm×35mm×107mm(W×H×D)
Weights	0.3kg
Mounting	support location holes for users

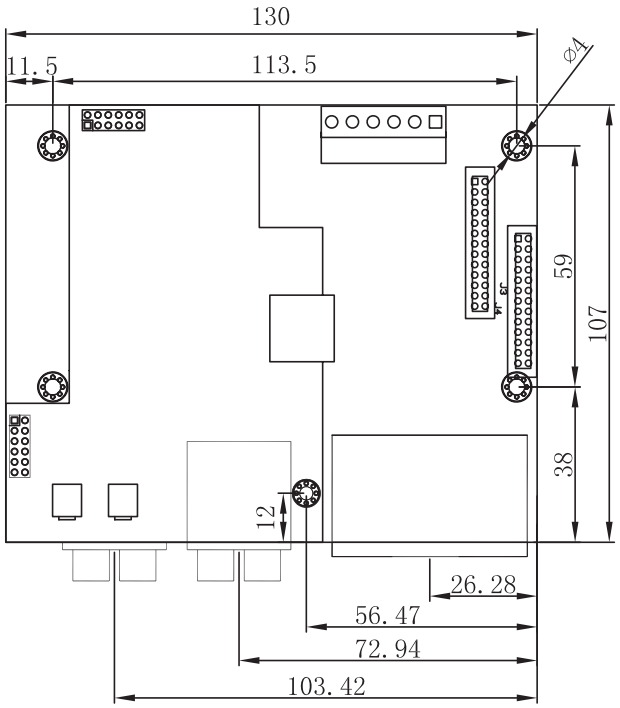
Environmental Limits

Operating Temperature	-40°C to +75°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95%RH.

Warranty

MTBF	376,919 hrs
Warranty	5years

Mechanical Drawing



Ordering Information

	SICOM3009BA-EC-Ports-Connector-PS1-PS2
EC	Non-housing and Conformal Coating
Ports	
3S6T	3×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
3M6T	3×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2S6T	2×100Base-FX, single mode fiber ports; 6×10/100Base-T(X) RJ45 ports
2M6T	2×100Base-FX, multi mode fiber ports; 6×10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS1-PS2	
L9-L9	3-5.5VDC, Redundant Power Inputs

Accessories

Accessory Model	Description
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KIEN1008BA

8 Port Unmanaged Switches

- 8 fast ethernet ports,optical and electrical interface is optional,signal-mode and multi-mode is optical.
- Comply with explosive atmospheres standard IEC60079-11(GB3836.4).
- Dry contact for warning signal,support NO and NC
- Support DIN-Rail and non-housing version,DIN-Rail comply with IP40.
- CE,FCC, EN60950-1, UL508, UL Class I Div 2 (Pending)

Overview

KIEN1008BA is un-managed serial device that comply with explosive atmospheres standard, support 8 fast Ethernet ports, optical and electrical signal is optional. Support remote distance transmitting and forwarding, plug and play, easy for operating, have advanced insulation and damp proofing. Which suitable for use in factory automation, coal mine, high dust conditions, etc.

Technical Specifications

Technical Parameters

Standard
- IEEE 802.3i,
- IEEE 802.3u
- IEEE802.3x (Flow control)

Switching Properties

MAC Table Size	8K
Packet Buffer Size	1Mbit
Packet Forwarding Rate	1.2Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Connector
- 100Base-FX,single-mode or multi-mode,SC/ST/FC connector is optional
- 10/100Base-T(X),auto negotiation,RJ45 connector.

Alarming Contactor
- Dry contact,NO and NC.
- 3X5.08mmspacing plug-in connector;
- 0.5A at 125Vac,2A at 30Vdc;

LED

LED on Front Panel
- Run:Running LED
- PWR1,PWR2: Power LED
- Alarm: Alarming LED
- 1-6:Fiber ports 1-6 LED
- Fast ethernet LED
  - Green:Link/ACTLED
  - Yellow:Speed

Non-housing version support LED interface for users.

Power Requirements

Input Voltage
- 12DC(9-18VDC),Redundancy power
- 24-48VDC(18-72VDC), Redundancy power

Power Connector
- 5x5.08mmspacing plug-in connector

Power	<5.5W
Overload Protection	support
Reserve Protection	support
Redundancy Protection	support

Physical Characteristics

Housing	Metal fanless
IP class	IP40
Dimension	
Weights	0.76Kg
Installation	DIN-Rail or wall-mount

- 53.6mm×135mm×106.5mm(W×H×D)

Environmental Limits

Operating Temperature	-40°C to +75°C
Storage Temperature	-40°C to +85°C
Relative Humidity	5-95%RH (non-condensing)

Warranty

MTBF	385,000 hrs
warranty	5 years

Approvals

CE, FCC,
Inquire Kyland websize for the newest dynamic.

Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;
- Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz–150kHz);10V(150kHz–80MHz)

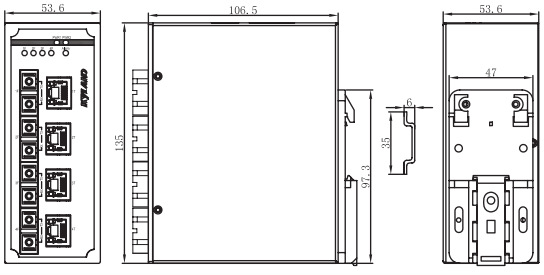
Environmental
- IEC60068-2-6(vibration)
- IEC60068-2-27(shock)
- IEC60068-2-32(free-fall)

General Industrial Standards
- IEC61000-6-2
- IEC61000-6-4

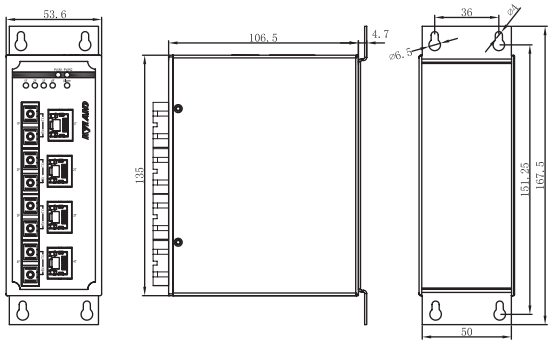
Explosive atmosphere standard
- IEC60079-0(GB/T3836.1),
- IEC60079-1(GB/T3836.2),
- IEC60079-7(GB/T3836.3),
- IEC60079-11(GB/T3836.4)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	KIEN1008BA-EC-Ports-PS1-PS2 KIEN1008BA-C-Ports-PS1-PS2 KIEN1008BA-Ports-PS1-PS2
None	Standard
C	Conformal Coating
EC	non-housing and confortmal coating
Ports	
4S4T	4 100Base-FX single-mode fiber ports; 4 10/100Base-T(X) fast Ethernet ports
4M4T	4 100Base-FX multi-mode fiber ports; 4 10/100Base-T(X) fast Ethernet ports
6S2T	6 100Base-FX single-mode fiber ports; 2 10/100Base-T(X) fast Ethernet ports
6M2T	6 100Base-FX multi-mode fiber ports; 2 10/100Base-T(X) fast Ethernet ports
8S	8 100Base-FX single-mode fiber ports
8M	8 100Base-FX multi-mode fiber ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS	
L2-L2	24-48VDC(18-72VDC),redundant power
L6-L6	12VDC(9-18VDC),redundant power

Accessories

Accessory Model	Description
DT-BGAZ-02	Panel for wall-mount
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

Intrinsic Safety Remarks

Intrinsic Safety

Intrinsic safety (IS) is a protection technique for safe operation of electrical equipment in hazardous areas by limiting the energy available for ignition. In signal and control circuits that can operate with low currents and voltages, the intrinsic safety approach simplifies circuits and reduces installation cost over other protection methods. Areas with dangerous concentrations of flammable gases or dust are found in applications such as petrochemical refineries and mines. As a discipline, it is an application of inherent safety in instrumentation. High-power circuits such as electric motors or lighting cannot use intrinsic safety methods for protection.

Operating and Design Principles

There are multiple ways to make equipment explosion-proof, or safe for use in ex-hazardous(hzardous) areas. Intrinsic Safety is one of a few methods available for ex-hazardous(hazardous) areas. Others include Explosion Proof Enclosures, Venting, Oil Immersion, Powder and Sand Filling, and Hermetic Sealing. For handheld electronics, intrinsic safety is the only realistic method that allows a functional device to be explosion-proof. A device termed intrinsically safe is designed to be incapable of producing heat or spark sufficient to ignite an explosive atmosphere.

The primary concept behind intrinsic safety is the restriction of available electrical and thermal energy in the system so that ignition of a hazardous atmosphere (explosive gas or dust) cannot occur. This is achieved by ensuring that only low voltages and currents enter the hazardous area, and that no significant energy storage is possible. Equipment or instrumentation for use in a hazardous area will be designed to operate with low voltage and current, and will be designed without any large capacitors(capacitors more than 35uf) or inductors that could discharge in a spark. The instrument will be connected, using approved wiring methods, back to a control panel in a non-hazardous(hazardous) area that contains safety barriers. The safety barriers ensure that, no matter what accidental contact occurs between the instrument circuit and outside power sources, no more than the approved voltage or current enters the hazardous area. Kyland intrinsic safety products are developed strictly according to these principles.

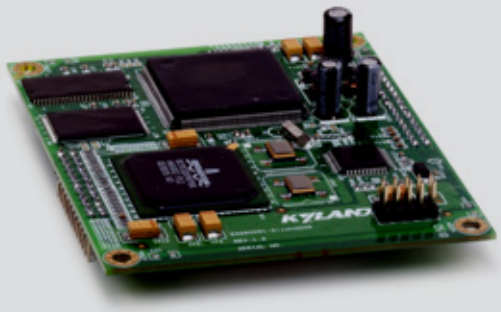
No single field device or wiring is intrinsically safe by itself (except for properly designed battery-operated, self-contained devices), but is intrinsically safe only when employed in a properly designed IS system. Such systems are usually provided with detailed instructions to ensure safe use and maintenance.

Remarks of Kyland Intrinsic Safety Solutions

Kyland developed its full intrinsic safety product line mainly for underground coal mining applications. In the coal mine industry of Chinese market, Safety Certificate of Approval for Coal Mine Products (systems), marked as MA, is mandatory for the usage of any electric products in the coal mine. The requirements of MA includes but not limits to intrinsic safety, and the certification will only be done to the whole system which will be installed in the underground coal mine, but not to any single product or device. Kyland intrinsic safety product line are all certified with MA together with local system integrators as one part of their system. That's why no MA certification for any Kyland product is available. However, considering the international market requirements, certain number of Kyland products have obtained the certificates for hazardous location usage like UL Class I Div 2 and ATEX.

SICOM3006

6 Port Layer 2 Managed Embedded Industrial Ethernet Switches



- 2 10/100Base-T(X) ports, 4 10/100Base-T(X) or 100Base-FX ports
- Embedded mounting and small design simplify integration
- Supports DT-Ring and STP/RSTP

Overview

SICOM3006 is managed embedded Industrial Ethernet Switch. SICOM3006 supports 2 10/100Base-T(X) ports, 4 10/100BaseT(X) or 100Base-FX ports. SICOM3006 provides 3.15-3.45VDC redundant power inputs. It works in wide operating temperature range from -40 to 85°C, and support Console, Telnet, Web management methods, Kyvision centralized management based on SNMPv1/v2c.

Software Functions

Switching Function

Supports VLAN and PVLAN
Supports port trunking
Supports flow control based on port
Supports port speed limit
Supports broadcast storm control

Redundancy

Suppors the DT-Ring, DT-Ring+ protocols, recovery time<50ms
Suppors STP/RSTP

Multicast

Supports IGMP Snooping
Supports GMRP
Supports static multicast

Service Quality Management

Supporting SP and WRR queuing.

Management & Maintenance

Supports Console, Telnet and WEB management methods
Supports SNMPv1/v2c and centralized management through Kyvision
Supports FTP software upgrade
Supporting the IP/MAC address conflict alarm, power failure alarm, power alarm, port alarm, and ring alarm
Supports RMON
Supports port mirroring
Supports LLDP
Supports Link-check

Clock Management

Supports SNTP Server/Client

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (100Base-TX and 100Base-FX)
- IEEE 802.3x (flow control)
- IEEE 802.1p (Class of Service)
- IEEE 802.1Q (VLAN)
- IEEE 802.1D(STP)
- IEEE 802.1w (RSTP)

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1-4093
Number of Multicast Groups	256
MAC Table	8K

Packet Buffer	2Mbit
Packet Forwarding Rate	0.9Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Ports
- 10/100Base-T(X) or 100Base-FX port, 2 connectors with 2×6 pins (J6,J7)
- 10/100Base-T(X) port, 1 connector with 2×16 pins (J5)

Console Port
- RS232(TXD,RXD), 1 connector with 2×16 pins (J5)

LED

Indicators in the connector with 2×16 pins (J5)
- Running LED: Run
- Ring Alarm LED:Alarm1,Alarm2
- Interface LED: Link/ACT,Speed

Button

System reset, 1 connector with 2×16 pins (J5)

Power Requirements

Power Input	3.3VDC(3.15-3.45VDC)
Power Terminal	1 connector with 2×16 pins (J5)
Power Consumption	<10W

Physical Characteristics

Dimensions
- 95mm×25mm×80mm (3.74 in×0.98 in×3.15 in)(W×H×D)

Weight	50g (0.110 lb)
Mounting	Embedded mounting

Environmental Limits

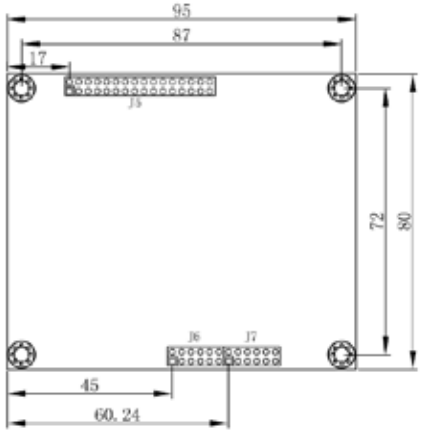
Operating Temperature	-40°C to + 85°C (-40°F to 185°F)
Storage Temperature	-40°C to + 85°C(-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

MTBF	469,065 hrs
Warranty period	5 years

Mechanical Dimensions

SICOM3006



Ordering

Product Model	Product Description
SICOM3006-EM	2 10/100Base-T(X) ports, 4 10/100Base-T(X) or100Base-FX ports, 3.15-3.45VDC redundant power inputs

Kyvision3.0

Network Management Software

- High performance network management software,supports 10 users at the same time and can monitor up to1000 devices
- Auto-detection of devices, and real-time event alerts touser
- Auto-generation of network topology with circular orsquare layout
- Supports record and query of operation and system logs
- Provides Socket and OPC interfaces for user secondary development
- Batch upload and download of configuration files, along with multiple simultaneous software upgrades by built-in FTP server

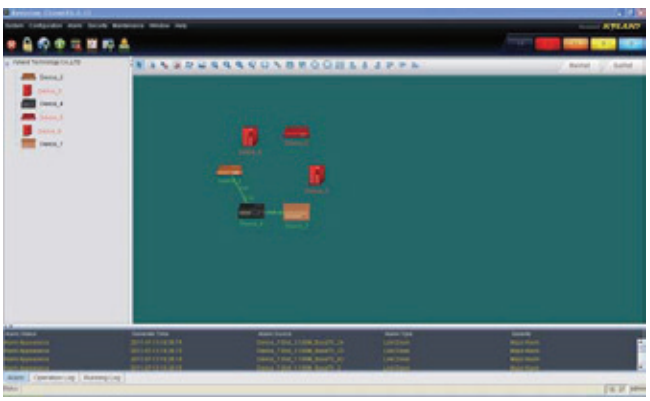
Overview

Kyvision is the network management software designed by Kyland for monitoring, configuring and maintaining industrial Ethernet switches industrial communication network as well as other RFC1213-compliant devices.

Designed according to TMN regulations, its management functions include facility management, alarm management, right management, topology management and configuration management. Meanwhile, Kyvision provides maintenance functions to cope with different access networks such as topology interface, topology connecting display, topology alarm association display, operation diary record and so on, making it more convenient and efficient for users to maintain and update networks.Kyvision is suitable to work on multiple operation platforms such as Windows, Solaris and Linux.

Main Interface

Main menu, Toolbar, Topology toolbar, Chinese-English switching button, Alarm quantity bar, Mainnet and subnet buttons, Network topology area, Alarm display area, Navigation tree



Topology Management

Supports two types of topology: segment topology and designated IP topology

Two-dimensional display of device topology in the topology interface and display of abnormal communication alarms Auto-detection of Kyland and SNMP devices Auto-generation of network topology through LLDP protocol Provides tools for manual drawing a topology

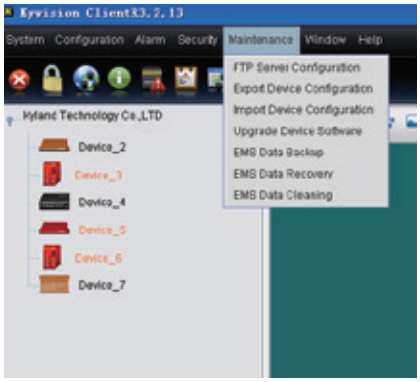
Configuration Management

Remote diagnosis of device status, monitoring port running status Remote control of device parameters configuration

Version: V1.11

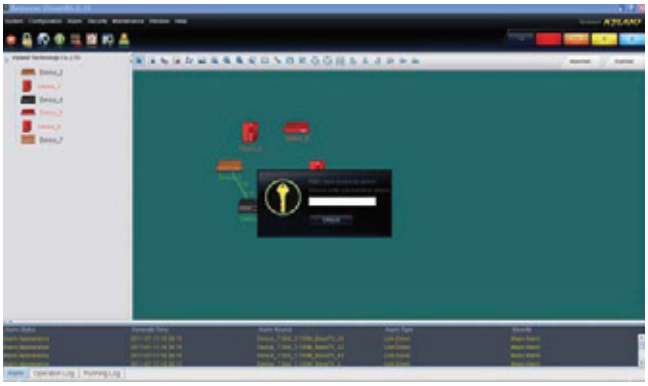
Maintenance Management

Supports software update smoothly
Batch upload and download of configuration files, along with multiple simultaneous software upgrades



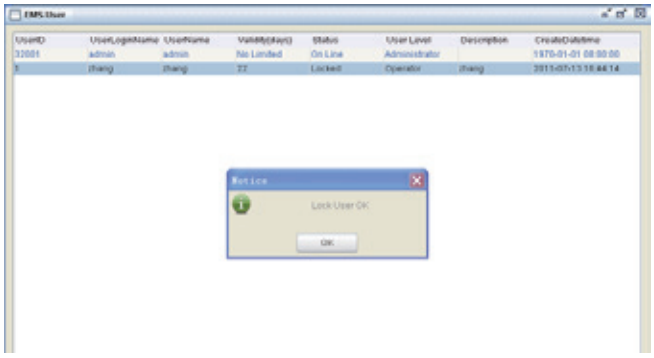
Alarm Management

Alarm ring notification and alarm confirmation mechanism
Supports alarm history query according to subnet, devices, time period
Support alarm data export
Real-time error detection through SNMP or Trap
Emphasizes abnormal devices and connections by particular colors



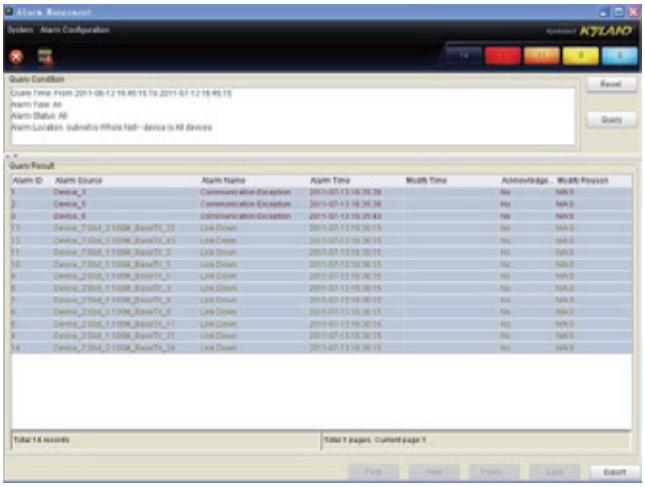
Access Control Management

Supports user rights, subnet rights and operation rights em Requirements locking function
User rights include creating administrator, deleting users and modifying user properties
Subnet rights are to assign manageable subnets to existing users
Operation rights locking is similar to user locking function of Windows to prevent illegal logon.
EMS network management provides operation locking and timing locking functions



System Requirements

CPU: Pentium 4 1.6 GHz
Memory: 1.0G
Available Disk space: 2.0G
Screen: 1024×768
Operation System: Windows XP/WIN 7/WIN2003 Server



Ordering Information

Model	Description
Kyvision3.0	Network management software

SICOM3005A

6 Switching Ports + 4 Serial Ports Managed Serial Device Servers

NEW

- 2 Fast Ethernet fiber/RJ45 optional ports and 4 10/100Base-T(X) ports and 4 serial ports.
- Supports protocol exchange between TCP/UDP and serial protocols such as RS232/RS485/RS422.
- Supports API interface for user program.
- Flow control by software,serial-security,serial-static route
- Support Ethernet security management, ring-redundancy, broadcast protocol.
- Ingress protection class IP40.

Overview

SICOM3005A serial integrated both switching and serial protocol functions. It is ability of interconvert between RS232/485/RS232 and Ethernet protocol. Support multiple serial protocols and switching protocols.
It is smart for use in remote transmission and distribution conditions, such as windpower field, power utilities, intelligent transportation, etc.

Software Functions

Serial Function

Support API base on Linux, allow customer to development privately.
Supports protocol conversion between TCP/UDP and serial protocols such as RS232/RS485/RS422.
UART flow control base on software
Make sure data safety by filtering of access list
Serial ports support mirror, VLAN base on IP layer, static route.
Transmission statistics

Switching

Support VLAN,PVLAN
Support GVRP
Support port trunking
Support port flow control
Support port speed limit

Redundancy

Support DT-Ring, DT-Ring+, DT-VLAN with the recovery time<50ms
Support DRP, DHP with the recovery time<20ms
Support STP/RSTP

Multicast

Support IGMP Snooping
Support GMRP
Support static multicast

Network Security

Support HTTPs/SSL
Support SSH
Support TACACS+
Support IEEE802.1X
Support port security
Support Mac filtering

Service Quality

Support SP, WRR queue scheduling

Management & Maintenance

Support Console, Telnet, WEB management methods
Support SNMPv1/v2c/v3, Kyvision centralized management
Support software upgrade by FTP/TFTP
Support power, port and ring alarm
Support port mirroring
Support LLDP
Support Link-check

IP Management

Support DHCP server/snooping/client

Clock Management

Support SNTP Client

Technical Specification

Technical Parameters

Standard
- RS232/485/422
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3x(flow control)
- IEEE 802.1p(Class of Service)
- IEEE 802.1Q(VLAN)
- IEEE 802.1D(STP)
- IEEE 802.1w(RSTP)

Switch Properties

Priority Queues	4
Number of VLANs	256
VLAN ID	1– 4093
Number of Multicast Groups	256
MAC Table	8K
Packet Buffer	2Mbit
Packet Forwarding Rate	0.9Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Ports
- 100Base-FX, SM/MM, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Serial Port
- RJ50 connector,
- Compatible with RS232,RS85 and RS422 protocols.

Console Port
- RS232,RJ45 connector

Alarm Contact
- 3-pin 5.08mm-spacing plug-in terminal block,
- 5A at 30Vdc,8A at 250Vac

LED

LED on Front Panel
- PWR1,PWR2:power LED;
- Run1:runing LED;
- Run2:serial server running LED;
- ALARM:alarming LED;
- Ring:ring status LED(master or slave)
- 5,6:status of 5,6 ports;
- 1-4:port status of 1-4;
  - Green:connection status;
  - Yellow:speed;
- D1-D4:serial port status LED
  - Green:serial port sending data;
  - Yellow: serial port receiving data;

Button

Reset: Reboot and restore default configuration

Power Requirements

Power Input
- 12-24VDC(9-36VDC),
- 24-48VDC(18-72VDC),
- 100-240VAC/110-220VDC(85-264VAC/77-300VDC)

Power Terminal
- 5 pin 5.08mm-spacing plug-in terminal block

Power Consumption	<10W
Overload Protection	Support
Reverse Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal, fanless
Cooling	Natural convection, fanless
Protection Class	IP40
Dimension	66mm×135mm×107.5mm(W×H×D)
Weights	0.6Kg
Mounting	DIN-Rail or Panel Mounting

Environmental Limit

Operating Temperature	-40°C to +75°C
Storage Temperature	-40°C to +85°C
Ambient Relative Humidity	5-95% RH

Warranty

MTBF	307,699 hrs
Warranty	5 years

Approvals

For the latest dynamics of the product, visit the website of Kyland.

Industry Standard

EMI
- CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz–2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz–150kHz);10V(150kHz–80MHz)

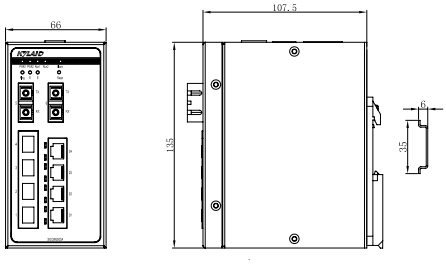
Environmental
- IEC60068-2-6(vibration)
- IEC60068-2-27(shock)
- IEC60068-2-32(free-fall)

General Industrial Standards
- IEC61000-6-2
- IEC61000-6-4

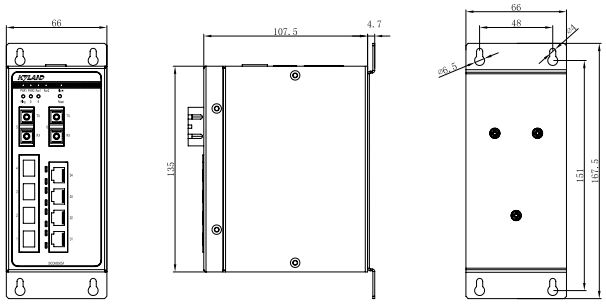
Railway	EN50155,EN50121-4
Traffic	NEMA TS-2

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	SICOM3005A-Ports-Connector-PS1-PS2 SICOM3005A-Ports-Connector-PS1
Ports	
2S4T4D	2×100Base-FX, single mode fiber ports; 4×10/100Base-T(X) RJ45 ports; 4 RS232/RS422/RS485 serial ports;
2M4T4D	2×100Base-FX, multi mode fiber ports; 4×10/100Base-T(X) RJ45 ports; 4 RS232/RS422/RS485 serial ports;
6T4D	6×10/100Base-T(X) RJ45 ports; 4 RS232/RS422/RS485 serial ports;
2S4T	2×100Base-FX, single mode fiber ports; 4×10/100Base-T(X) RJ45 ports;
2M4T	2×100Base-FX, multi mode fiber ports; 4×10/100Base-T(X) RJ45 ports;
6T	6×10/100Base-T(X) RJ45 ports;
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS1-PS2	
L2-L2	24-48VDC(18-72VDC),redundant power inputs;
L5-L5	12-24VDC(9-36VDC),redundant power inputs;
PS1	
HV	220AC/DCW(85-264VAC/77-300VDC),single power input

Accessories

Accessory Model	Description
DT-BGAZ-09	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KPS2204

6 Port Managed Din-Rail Programmable Serial Device Servers

- 2 10/100Base-T(X) RJ45 ports and 4 RS232/422/485 serial ports
- Supports Reset button
- Serial ports have 15KV ESD protection circuit
- Supports secondary development on Linux system
- Interfaces and power cable offer surge protection
- EMC performance reaches industrial level 4
- IP40 protection class

Overview

KPS2204 is a programmable serial server for the network applications of serial devices. KPS2204 combines Ethernet and serial data communication, and offers protocol transition between Ethernet and serial protocol. It supports secondary development on Linux system, and reserved programmable push switch, level detection terminal, programmable LED Indicators for the user's secondary development.

KPS2204 supports 2 10/100Base-T(X) copper ports and 4 RS232/RS422/RS485 serial ports. It provides 18-36VDC or 36-72VDC redundant power inputs, supports DIN-Rail mounting or Panel mounting, and IP40 protection class. It supports Telnet and WEB management methods. KPS2204 is specially designed for harsh and dangerous industrial environments. It has EMC protection properties for power supply over current or over voltage, EMC protection properties for RJ45 ports and RS232/422/485 serial ports.

Software Functions

Security technology

Supports SSH

Management & Maintenance

Supports Telnet and WEB management methods
Supports FTP software upgrade
Supports LLDP

Clock Management

Supports SNTP Client

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3x (flow control)

Interface

Fast Ethernet Ports 10/100Base-T(X) RJ45 port
Serial Ports
- Quantity of serial ports: 4 RS232/RS485/RS422
- Electrical characteristic: compliant with 3-wire RS232, 4-wire RS422 and 2-wire RS485 standards
- Physical interface: DB9, male
- Bit error rate of data transmission:≤10-10
- Baud rate: 50bps-230400bps (Default: 9600)
- Transmission Distance: RS232: 15m, RS422/RS485: 1200m
- Data bits: 5, 6, 7, 8 (Default: 8)
- Stop bits: 1, 2 (Default: 1)
- Parity bit: None, Even, Odd, Space, Mark (Default: None)
- Flow control: XON/XOFF (Default: XOFF)

LED

Indicators in the front panel
- Running LED: Run
- Power LED: PWR1, PWR2
- Interface LED: Link, ACT (RJ45 Ports); T1-T4, R1-R4 (Serial Ports)

Buttons

- Reset: Reset configuration
- Default: Load default configuration

Power Requirements

Power Input	24VDC(18-36VDC), 48VDC(36-72VDC)
Power Terminal	
▼ 5-pin 5.08mm-spacing plug-in terminal block	
Power Consumption	<5W
Overload Protection	Support
Reverse Connection Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Heat Dissipation Mode	Natural cooling, without fans
Protection Class	IP40
Dimensions	
▼ 55.4mm×139mm×119.5 mm (2.18 in×5.47 in×4.70 in) (W×H×D)	
Weight	0.5kg (1.102 lb)
Mounting	
▼ DIN-Rail or Panel mounting	

Environmental Limits

Operating Temperature	-40°C to +85°C(-40 to 185°F)
Storage Temperature	-40°C to +85°C(-40 to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

MTBF	333,755 hrs
Warranty period	5 years

Approvals

For the latest dynamics of the product, visit the website of Kyland.

Industrial Standards

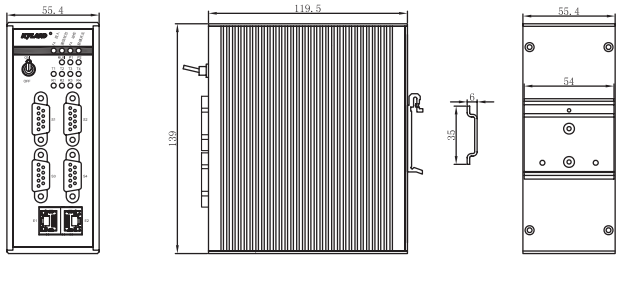
EMI
- ▼ FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- ▼ IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- ▼ IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- ▼ IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- ▼ IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- ▼ IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)

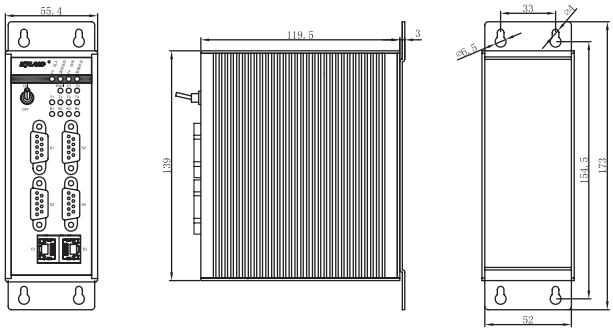
Mechanical standards
- ▼ IEC60068-2-6 (Vibration),
- ▼ IEC60068-2-27 (Shock),
- ▼ IEC60068-2-32 (Free Fall)

Module adaptive table

Din Rail Mounting



Panel Mounting



Ordering Information

	KPS2204-Ports-PS1-PS2
Ports	
2T4D	2 10/100Base-T(X) RJ45 ports, 4 RS232/RS422/RS485 serial ports
PS	
L1-L1	48VDC(36-72VDC), redundant power inputs
L3-L3	24VDC(18-36VDC), redundant power inputs

Accessories

Accessory model	Description
DT-BGAZ-04	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KOM600G

2G Port Din-Rail Copper to Fiber Media Converters

Preliminary

- Green Ethernet solution with ultra low power consumption design, its full load power consumption is as low as 4.5 watts
- 1 1000Base-X SFP port and 1 10/100/1000Base-T(X) RJ45 port
- Supports LFP (Link Fault Pass-Through)
- Redundant power inputs with wide voltage range
- IP40 protection class

Overview

The KOM600G is a ultra low power consumption Green industrial Gigabit media convertor, its full load power consumption is as low as 4.5 watts. The KOM600G supports 1 1000Base-X SFP port and 1 10/100/1000Base-T(X) copper port. The KOM600G provides 9-36VDC or 18-72VDC redundant power inputs, supports DIN-Rail mounting or Panel mounting, and IP40 protection class. It supports LFP (Link Fault Pass-Through).

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 802.3ab(1000Base-T)
- IEEE 802.3z(1000Base-SX/LX)

Interface

Fast Ethernet Ports
- 1000Base-X, SFP port
- 10/100/1000Base-T(X), RJ45 port

LED Indicators

Indicators in the front panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 Ports); Link/ACT(Fiber Ports)

Power Requirements

Power Input	12-24VDC(9-36VDC),24-48VDC(18-72VDC)
Power Terminal	

- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<4.5W
Overload Protection	Support
Reverse Connection Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Heat Dissipation Mode	Natural cooling, without fans
Protection Class	IP40
Dimensions	

- 30mm×115mm×91.5mm (1.18 in×4.53 in×3.60 in) (W×H×D)

Weight	0.46kg (1.014 lb)
Mounting	

- DIN-Rail or Panel mounting

Environmental Limits

Operating Temperature	-40°C to +85°C (-40 to 185°F)
Storage Temperature	-40°C to +85°C (-40 to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

MTBF	546,000 hrs
Warranty period	5 years

Approvals

CE(pending), FCC(pending)

Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±6kV(contact),±8kV(air)

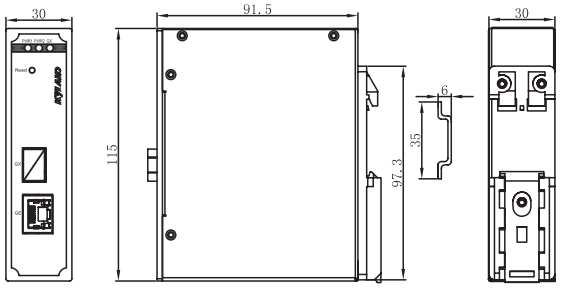
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±2kV;Data Port:±1kV
- IEC61000-4-5(Surge) Power Port:±1kV/DM,±2kV/CM;Data Port:±1kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)

Mechanical standards

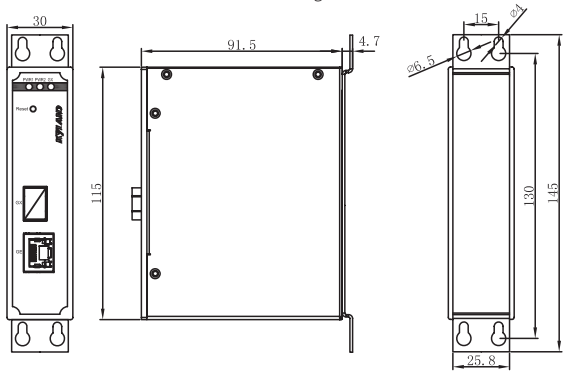
- IEC60068-2-6 (Vibration),
- IEC60068-2-27 (Shock),
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	KOM600G-Ports-PS1-PS2
Ports	
1GX1GE	1 1000Base-X SFP port;1 10/100/1000Base-T(X) RJ45 port
PS	
L2-L2	24-48VDCW(18-72VDC), redundant power inputs
L5-L5	12-24VDCW(9-36VDC), redundant power inputs

KOM600

2 Port Din-Rail Copper to Fiber Media Converters

- Green Ethernet solution with ultra low power consumption design, its full load power consumption is as low as 2 watts
- 1 100Base-FX port and 1 10/100Base-T(X) RJ45 port
- Supports LFP (Link Fault Pass-Through)
- Redundant power inputs with wide voltage range
- IP40 protection class
- CE, FCC certifications
- RoHS compliant

Overview

The KOM600 is a ultra low power consumption Green industrial media convertor, its full load power consumption is as low as 2 watts. The KOM600 supports 1 100Base-FX fiber port and 1 10/100Base-T(X) copper port. The KOM600 provides 9-36VDC or 18-72VDC redundant power inputs, supports DIN-Rail mounting or Panel mounting, and IP40 protection class. It supports LFP (Link Fault Pass-Through).

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)

Interface

Fast Ethernet Ports
- 100Base-FX, SM/MM port, FC/SC/ST connector
- 10/100Base-T(X) RJ45 port, supports auto MDI/MDI-X and Full / Half duplex

LED

Indicators in the front panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 Ports); Link/ACT(Fiber Ports)

Power Requirements

Power Input
- 12-24VDC(9-36VDC), 24-48VDC(18-72VDC),

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<2W
Overload Protection	Support
Reverse Connection Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Heat Dissipation Mode	Natural cooling, without fans
Protection Class	IP40
Dimensions	

- 30mm×115mm×91.5mm (1.18 in×4.53 in×3.60 in) (W×H×D)

Weight	0.46kg (1.014 lb)
Mounting	DIN-Rail or Panel mounting

Environmental Limits

Operating Temperature	-40°C to +85°C (-40 to 185°F)
Storage Temperature	-40°C to +85°C (-40 to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

MTBF	546,000 hrs
Warranty period	5 years

Approvals

CE, FCC

Industry Standard

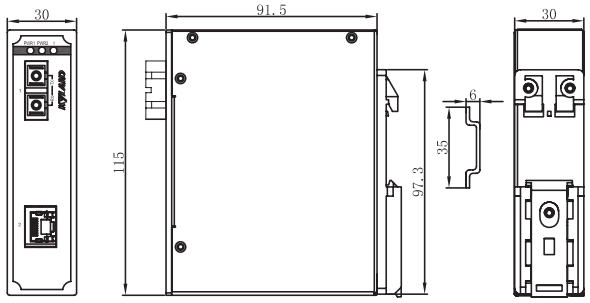
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±6kV(contact),±8kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±2kV;Data Port:±1kV
- IEC61000-4-5(Surge) Power Port:±1kV/DM,±2kV/CM;Data Port:±1kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)

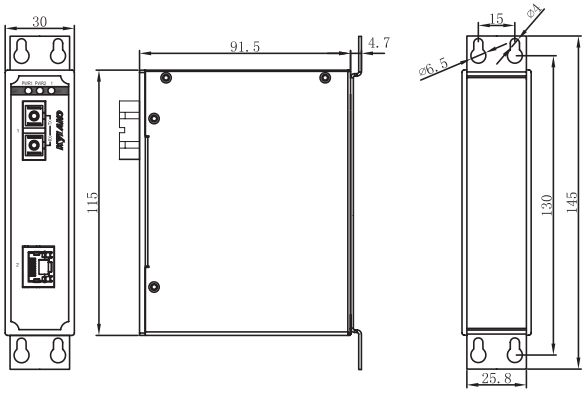
Mechanical standards
- IEC60068-2-6 (Vibration),
- IEC60068-2-27 (Shock),
- IEC60068-2-32 (Free Fall)

Module adaptive table

Din Rail Mounting



Panel Mounting



Ordering Information

	KOM600-Ports-Connector-PS1-PS2
Ports	
1S1T	1 100Base-FX single mode port, 1 10/100Base-T(X) RJ45 port
1M1T	1 100Base-FX multi mode port, 1 10/100Base-T(X) RJ45 port
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS	
L2-L2	24-48VDCW(18-72VDC),redundant power inputs
L5-L5	12-24VDCW(9-36VDC),redundant power inputs

Accessories

Accessory model	Description
DT-BGAZ-01	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KOM300A

3 Port Din-Rail Copper to Fiber Media Converters

- Green Ethernet solution with ultra low power consumption design, its full load power consumption is as low as 2.2 watts
- 1 100Base-FX port and 2 10/100Base-T(X) RJ45 ports
- Redundant power inputs with wide voltage range
- IP40 protection class
- CE, FCC certifications

Overview

The KOM300A is a ultra low power consumption Green industrial media convertor, its full load power consumption is as low as 2.2 watts. The KOM300A supports 1 100Base-FX fiber port and 2 10/100Base-T(X) copper ports. The KOM300A provides 9-36 VDC or 18-72VDC redundant power inputs, or 85-264VAC/77-300VDC single power input, supports DIN-Rail mounting or Panel mounting, and IP40 protection class.

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)

Switch Properties

MAC Table	2K
Packet Buffer	1Mbit
Packet Forwarding Rate	0.8Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Ports
- 100Base-FX, SM/MM port, FC/SC/ST connector
- 10/100Base-T(X) RJ45 port

LED

Indicators in the front panel
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 Ports); Link/ACT(Fiber Ports)

Power Requirements

Power Input
- 12-24VDC(9-36VDC),
- 24-48VDC(18-72VDC),
- 100-240VAC/110-220VDC(85-264VAC/77-300VDC)

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<2.2W
Overload Protection	Support
Reverse Connection Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Heat Dissipation Mode	Natural cooling, without fans
Protection Class	IP40

Dimensions
- 30mm×115mm×91.5mm (1.18 in×4.53 in×3.60 in) (W×H×D)

Weight	0.46kg (1.014 lb)

Mounting
- DIN-Rail or Panel mounting

Environmental Limits

Operating Temperature	-40°C to +85°C (-40 to 185°F)
Storage Temperature	-40°C to +85°C (-40 to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

MTBF	462,741 hrs
Warranty period	5 years

Approvals

CE, FCC

Industry Standard

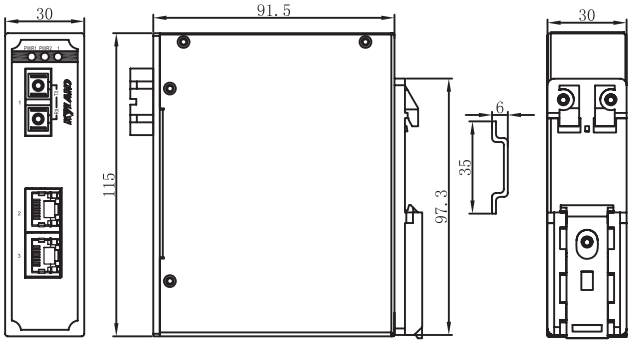
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)

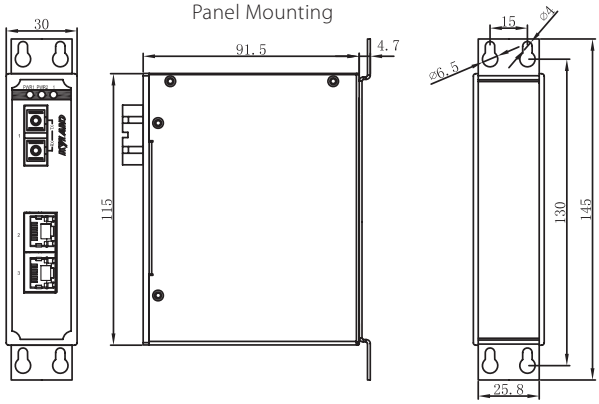
Mechanical standards
- IEC60068-2-6 (Vibration),
- IEC60068-2-27 (Shock),
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	KOM300A-Ports-Connector-PS1-PS2
Ports	
1S2T	1 100Base-FX single mode port, 2 10/100Base-T(X) RJ45 ports
1M2T	1 100Base-FX multi mode port, 2 10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS	
HV	100-240VAC/110-220VDC(85-264VAC/77-300VDC), single power input
L2-L2	24-48VDC(18-72VDC), redundant power inputs
L5-L5	12-24VDC(9-36VDC), redundant power inputs

Accessories

Accessory model	Description
DT-BGAZ-01	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KOM300M

3 Port Managed Din-Rail Copper to Fiber Media Converters

- Green Ethernet solution with ultra low power consumption design, its full load power consumption is as low as 2.7 watts
- 1 100Base-FX port and 2 10/100Base-T(X) RJ45 ports
- Supports remote monitoring of device status
- Redundant power inputs with wide voltage range
- IP40 protection class
- CE, FCC certifications

Overview

The KOM300M is a ultra low power consumption Green industrial media convertor, its full load power consumption is as low as 2.7 watts. The KOM300M supports 1 100Base-FX fiber port and 2 10/100Base-T(X) copper ports. The KOM300M provides 9-36VDC or 18-72VDC redundant power inputs, supports DIN-Rail mounting or Panel mounting, and IP40 protection class. It supports Telnet, WEB, Kyvision management.

Software Functions

Management and Maintenance

Supports Telnet and Web management methods
Supports SNMPv1/v2c and Kyvision centralized management
Supports FTP software upgrade
Supports LLDP

Product Specifiations

Technical Parameters

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)

Switch Properties

MAC Table	2K
Packet Buffer	1Mbit
Packet Forwarding Rate	0.8Mpps
Switching Delay	<10μs

Interface

Fast Ethernet Ports
- 100Base-FX, SM/MM port, FC/SC/ST connector
- 10/100Base-T(X) RJ45 port

LED

Indicators in the front panel
- Running LED: Run
- Power LED: PWR1, PWR2
- Interface LED: Link/ACT, Speed (RJ45 Ports); Link/ACT(Fiber Ports)

Power Requirements

Power Input
- 12-24VDC(9-36VDC)
- 24-48VDC(18-72VDC)

Power Terminal
- 5-pin 5.08mm-spacing plug-in terminal block

Power Consumption	<2.7W
Overload Protection	Support
ReverseConnection Protection	Support
Redundancy Protection	Support

Physical Characteristics

Housing	Metal
Heat Dissipation Mode	Natural cooling, without fans
Protection Class	IP40

Dimensions
- 30mm×115mm×91.5mm (1.18 in×4.53 in×3.60 in) (W×H×D)

Weight	0.46kg (1.014 lb)

Mounting
- DIN-Rail or Panel mounting

Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5 - 95% (non-condensing)

Quality Assurance

MTBF	457,840 hrs
Warranty	5 years

Approvals

CE, FCC

Industry Standard

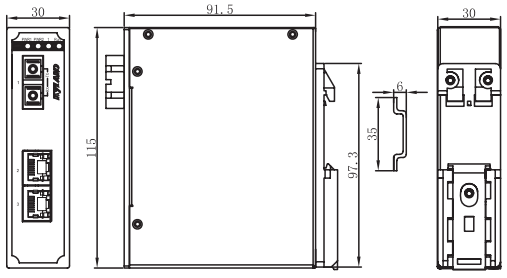
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)

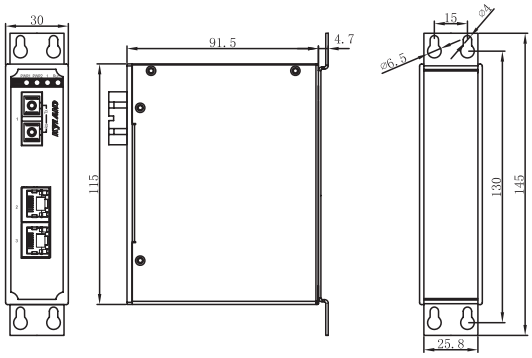
Mechanical standards
- IEC60068-2-6 (Vibration),
- IEC60068-2-27 (Shock),
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	KOM300M-Ports-Connector-PS1-PS2
Ports	
1S2T	1 100Base-FX single mode port, 2 10/100Base-T(X) RJ45 ports
1M2T	1 100Base-FX multi mode port, 2 10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS	
L2-L2	24-48VDC(18-72VDC), redundant power inputs
L5-L5	12-24VDC(9-36VDC), redundant power inputs

Accessories

Accessory model	Description
DT-BGAZ-01	Panel for panel mounting
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port

KOM300F

3 Port Din-Rail Copper to Fiber Media Converters

- 1 100Base-FX port and 2 10/100Base-T(X) RJ45 ports
- Abundant power supply options
- IP30 protection class

Overview

The KOM300F is a industrial media convertor. The KOM300F supports 1 100Base-FX fiber port and 2 10/100Base-T(X) copper ports. The KOM300F provides 9-36VDC or 85-264VAC/120-300VDC single power input, supports DIN-Rail mounting, and IP30 protection class.

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)

Switch Properties

MAC Table	1K
Packet Buffer	512Kbit
Packet Forwarding Rate	0.8Mpps
Switching Delay	< 10 μs

Interface

Fast Ethernet Ports
- 100Base-FX, SM/MM port, FC/SC/ST connector
- 10/100Base-T(X) RJ45 port

LED

Indicators in the front panel
- Running LED: Run
- Interface LED: Link/ACT(Fiber Ports); Link/ACT (RJ45 Ports)

Power Requirements

Power Input
- 12-24VDC(9-36VDC), 24VDC(18-36VDC),
- 100-240VAC/220VDC(85-264VAC/120-300VDC)

Power Terminal
- 3-pin 3.81mm-sapcing plug-in terminal block

Power Consumption	<4.1W
Overload Protection	Support
Reverse Connection Protection	Support

Physical Characteristics

Housing	Metal
Heat Dissipation Mode	Natural cooling, without fans
Protection Class	IP30

Dimensions
- 36mm×100mm×75mm (1.42 in×3.94 in×2.95 in) (W×H×D)

Weight	0.3kg (0.661 lb)
Mounting	DIN-Rail mounting

Environmental Limits

Operating Temperature	-40°C to +85°C (-40 to 185°F)
Storage Temperature	-40°C to +85°C (-40 to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

MTBF	473,846 hrs
Warranty period	5 years

Approvals

For the latest dynamics of the product, visit the website of Kyland.

Industry Standard

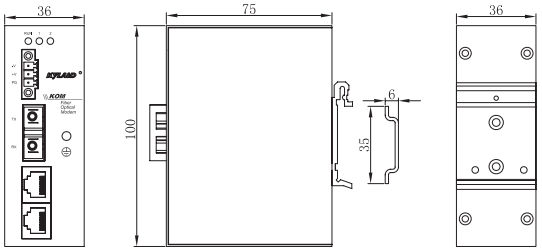
EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±6kV(contact),±8kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±2kV;Data Port:±1kV
- IEC61000-4-5(Surge) Power Port:±1kV/DM,±2kV/CM;Data Port:±1kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)

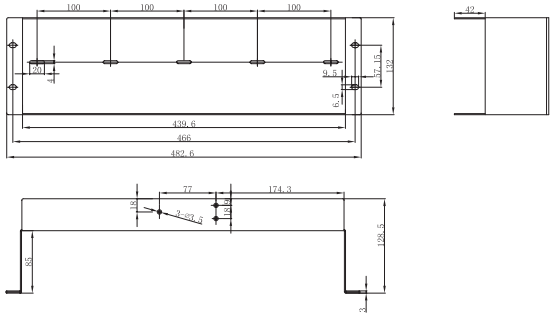
Mechanical standards
- IEC60068-2-6 (Vibration),
- IEC60068-2-27 (Shock),
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	KOM300F-Ports-Connector-PS
Ports	
1S2T	1 100Base-FX single mode port, 2 10/100Base-T(X) RJ45 ports
1M2T	1 100Base-FX multi mode port, 2 10/100Base-T(X) RJ45 ports
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
PS	
H1	100-240VAC/220VDC(85-264VAC/120-300VDC), single power input
L3	24VDC(18-36VDC), single power input
L5	12-24VDCW(9-36VDC), single power input

Accessories

Accessory model	Description
DT-FCZ-RJ45-01	Dustproof cover for RJ45 port
KOMFrm	KOM Panel for rack mounting -482.6mm×132mm×128.5mm

KOM200

Din-Rail Serial to Fiber Media Converters

- One fiber port, three types of serial ports (RS232/RS422/RS485)
- Transparent communication without the need of debugging, plug and play
- Serial ports have 15KV ESD protection circuit
- Serial ports support hot plugging
- Abundant power supply options
- IP30 protection class
- FCC certificates

Overview

KOM200 provides serial to fiber switching for the low-rate signals of RS232, RS485 and RS422. The KOM200 supports 1 fiber port and 3 serial ports. The KOM200 provides 9-36VDC or 85-264VAC/120-300VDC power supply, supports DIN-Rail mounting, and IP30 protection class. Transparent communication without the need of debugging, plug and play.

Product Specifications

Technical Specifications

Standards RS232,RS422,RS485

Interface

Fiber Ports SM/MM fiber port, SC/ST/FC connector

Serial Ports

- Quantity of serial ports:
- 232/422:1 RS232,1 RS422
- 485/232:1 RS485,2 RS232
- 485/232A:1 RS485,2 RS232,The 2nd channel of RS232 and the 3rd channel of RS485 are multiplexing
- Electrical characteristic: compliant with RS232/RS422/RS485 standards, RS485 interface can be connected to 32-128 nodes
- Physical interface: 8-pin 3.81mm-spacing terminal block
- Bit Error Rate: ≤10-10
- Asynchronous rate:
  - RS232:50-115200bps;
  - RS422/RS485:50-9600bps
- Transmission Distance: RS232: 15m; RS422/RS485: 1200m

LED Indicators

Indicators in the front panel

- Running LED: Run
- Interface LED: Link/ACT(Fiber Ports), 1, 2(Serial Ports)

Power Requirements

Power Input

- 12-24VDC(9-36VDC),24VDC(18-36VDC),
- 100-240VAC/220VDC(85-264VAC/120-300VDC)

Power Terminal

- 3-pin 3.81mm-sapcing plug-in terminal block

Power Consumption	<3W
Overload Protection	Support
Reverse Connection Protection	Support

Physical Characteristics

Housing	Metal
Heat Dissipation Mode	Natural cooling, without fans
Protection Class	IP30

Dimensions

- 36mm×100mm×75mm (1.42 in×3.94 in×2.95 in) (W×H×D)

Weight	0.3kg (0.661 lb)

Mounting

- DIN-Rail mounting or Panel mounting

Environmental Limits

Operating Temperature	-40°C to +85°C (-40 to 185°F)
Storage Temperature	-40°C to +85°C (-40 to 185°F)
Ambient Relative Humidity	5- 95% (non-condensing)

Quality Assurance

MTBF	1,162,867 hrs
Warranty period	5 years

Approvals

FCC

Industry Standard

EMI

- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS

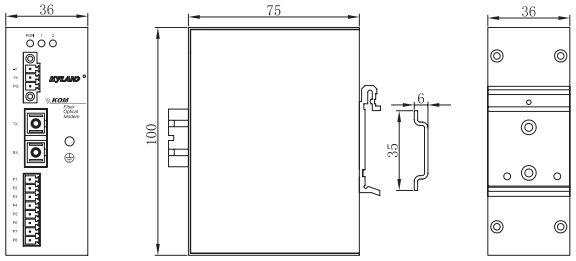
- IEC61000-4-2(ESD) ±6kV(contact),±8kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-1GHz)
- IEC61000-4-4(EFT) Power Port:±2kV;Data Port:±1kV
- IEC61000-4-5(Surge) Power Port:±1kV/DM,±2kV/CM;Data Port:±1kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);10V(150kHz-80MHz)

Mechanical standards

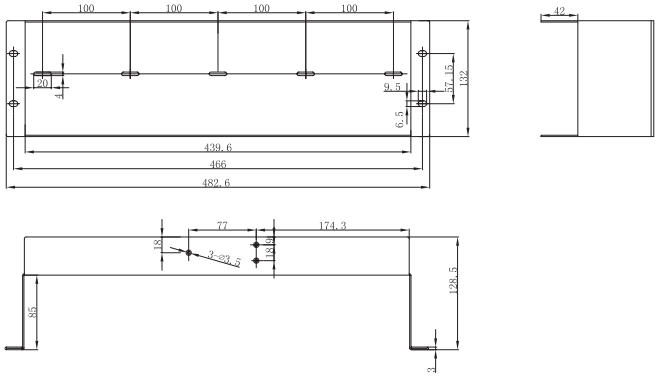
- IEC60068-2-6 (Vibration),
- IEC60068-2-27 (Shock),
- IEC60068-2-32 (Free Fall)

Mechanical Drawing

Din Rail Mounting



Panel Mounting



Ordering Information

	KOM200-Ports-Connector-Serial-PS
Ports	
1S	1 single mode fiber port
1M	1 multi mode fiber port
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
Serial	
232/422	1 RS232 serial port, 1 RS422 serial port
485/232	2 RS232 serial ports, 1 RS485 serial port
485/232A	2 RS232 serial ports, 1 RS485 serial port (The 2nd channel of RS232 and the 3rd channel of RS485 are multiplexing)
PS	
H1	100-240VAC/220VDC(85-264VAC/120-300VDC), single power input
L3	24VDC(18-36VDC), single power input
L5	12-24VDC((9-36VDC), single power input

Accessories

Accessory model	Description
KOMFrm	KOM Panel for rack mounting -482.6mm×132mm×128.5mm

SFP-1G

Industrial Gigabit SFP Optical Transceiver Modules

- Transmission rate is 1.25Gb/s
- Working voltage is 3.3V
- Hot-Pluggable
- Duplex LC connector
- RoHS Compliant

Product Specifications

Technical Specifications

Standards	SFP MSA(INF-8074i), SFP-8472 IEEE802.3z

Interface

LC Connector

Physical Characteristics

Dimensions

- 13.7mm×12.7mm×57.2mm (0.54 in×0.50 in×2.25 in) (W×H×D)

Weight	40g (0.088 lb)

Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

Warranty period	3 years

Approvals

RoHS

Industry Standard

EMI

- FCC Part 15 Class B

EN55022/CISPR22,Class B

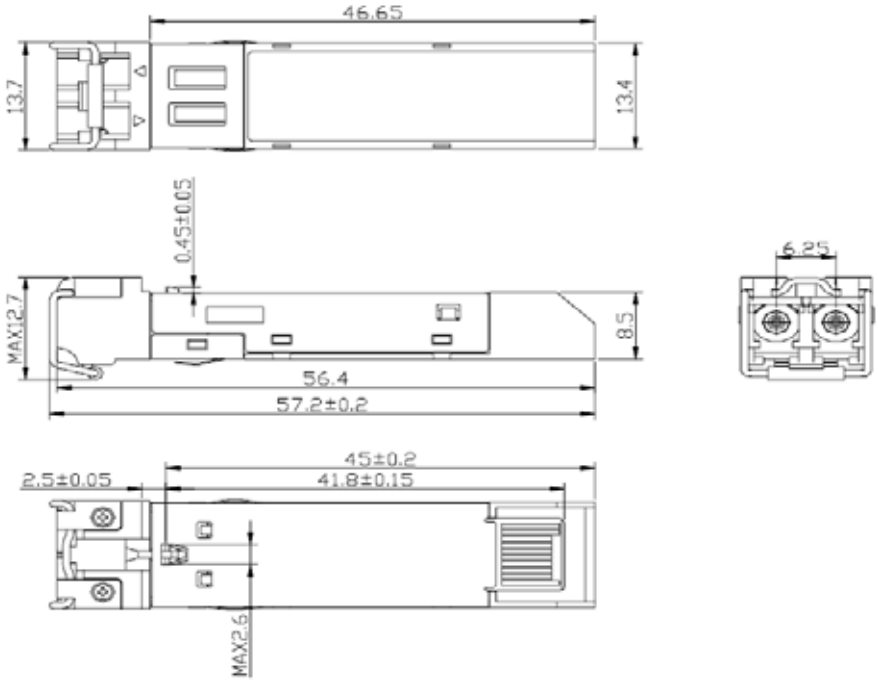
EMS

- IEC61000-4-2
- IEC61000-4-3
- EN(IEC)60825-1,2

Product Specifications

Property		SX	LX	LH	ZX
Type		Multi Mode(M)	Single Mode(S)	Single Mode(S)	Single Mode(S)
Center Wavelength(nm)		850	1310	1310	1550
Transmission Distance(km)		0.55	10	40	80
Application Range of Transmission Distance(km)		0~0.55	0~10	12~40	27~80
Coupled Fiber		62.5/125μm MMF 50/125μm MMF	10/125μm SMF	10/125μm SMF	10/125μm SMF
Average Optical Output Power	Min.(dBm) Max.(dBm)	-9.5 0	-11.5 -3	-2 3	0 5
Receiver Sensitivity (dBm)		-17	-19	-23	-23
Maximum Input Power (dBm)		0	-3	-3	-3

Mechanical Drawing



Ordering Information

Product Model	Product Description Type	Connector	Center Wavelength	Transmission Distance	Coupled Fiber
IGSFP-M-SX-LC-850-0.55	Multi Mode	LC	850nm	0.55km	62.5/125μm MMF 50/125μm MMF
IGSFP-S-LX-LC-1310-10	Single Mode	LC	1310nm	10km	10/125μm SMF
IGSFP-S-LH-LC-1310-40	Single Mode	LC	1310nm	40km	10/125μm SMF
IGSFP-S-ZX-LC-1550-80	Single Mode	LC	1550nm	80km	10/125μm SMF

SFP-1FX

Industrial 100M SFP Optical Transceiver Modules

- Transmission rate is 155Mb/s
- Working voltage is 3.3V
- Hot-Pluggable
- Duplex LC connector
- RoHS Compliant

Product Specifications

Technical Specifications

SFP MSA(INF-8074i),
SFF-8472,
IEEE 802.3ah

Interface

LC Connector

Physical Characteristics

Dimensions
- 13.7mm×12.7mm×57.2mm (0.54 in×0.50 in×2.25 in) (W×H×D)

Weight 40g (0.088 lb)

Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

Warranty period 3 years

Approvals

RoHS

Industry Standard

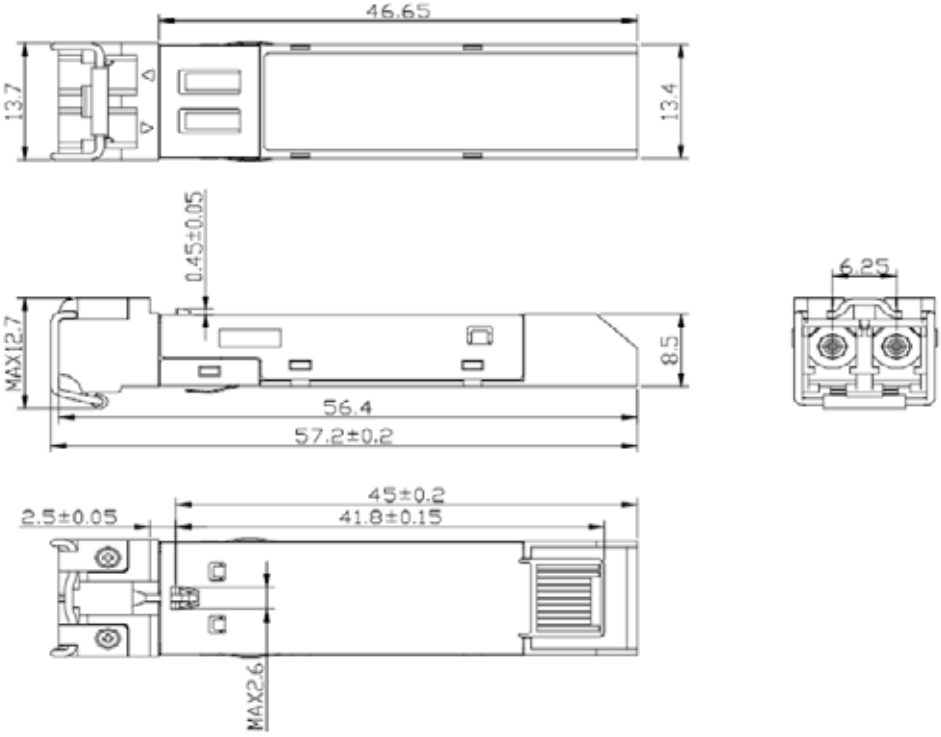
EMI
- FCC Part 15 Class B
- EN55022/CISPR22,Class B

EMS
- IEC61000-4-2
- IEC61000-4-3
- EN(IEC)60825-1,2

100Base-FX SFP (155Mbit/s) Parameter Table

Property		LX	LH
Type		Multi Mode(M)	Single Mode(S)
Center Wavelength(nm)		1310	1310
Transmission Distance(km)		2	40
Application Range of Transmission Distance(km)		0~2	20~40
Coupled Fiber		62.5/125μm MMF 50/125μm MMF	10/125μm SMF
Average Optical Output Power	Min.(dBm)	-20	-12
	Max.(dBm)	-14	-4
Receiver Sensitivity (dBm)		-31	-34
Maximum Input Power (dBm)		-3	-3

Mechanical Drawing



Ordering Information

Product Model	Product Description				
	Type	Connector	Center Wavelength	Transmission Distance	Coupled Fiber
IFSFP-M-LX-LC-1310-2	Multi Mode	LC	1310nm	2km	62.5/125μm MMF 50/125μm MMF
IFSFP-S-LH-LC-1310-40	Single Mode	LC	1310nm	40km	10/125μm SMF

SFP-1FE

Industrial Fase Ethernet SFP Copper Transceiver Modules

- Transmission rate is 125Mb/s
- Working voltage is 3.3V
- Hot-Pluggable
- RJ45 connector
- RoHS Compliant

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- SFP MSA(INF-8074i)

Interface

RJ45 Connector

Physical Characteristics

Dimensions
- 14.84mm×13.8mm×68.6mm(W×H×D)

Weight	40g

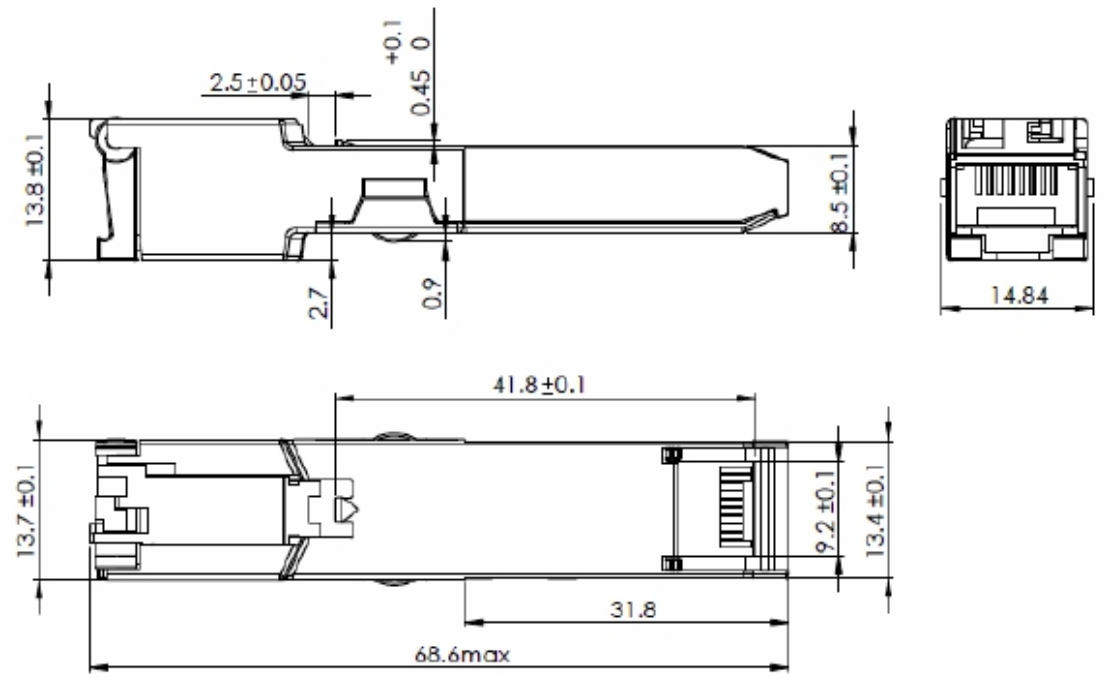
Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

Warranty period	3 years
Approvals	RoHS

Mechanical Drawing



Ordering Information

Product Model	Product Description Connector	Transmission Distance	Cable
IFSFP-10/100BASE-T-RJ45	RJ45	100m	CAT5/CAT5e UTP/STP

SFP-1G to FX

Industrial Gigabit to 100M SFP Optical Transceiver Modules

- Transmission rate is 125Mb/s
- Working voltage is 3.3V
- Hot-Pluggable
- Duplex LC connector
- RoHS Compliant

Product Specifications

Technical Specifications

Standards
- SFP MSA(INF-8074i),
- SFF-8472,
- IEEE 802.3ah

Interface

LC Connector

Physical Characteristics

Dimensions
- 13.7mm×12.7mm×57.2mm (0.54 in×0.50 in×2.25 in) (W×H×D)
- Weight 40g (0.088 lb)

Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

Warranty period	3 years

Approvals

RoHS

Industry Standard

EMI
- FCC Part 15 Class B

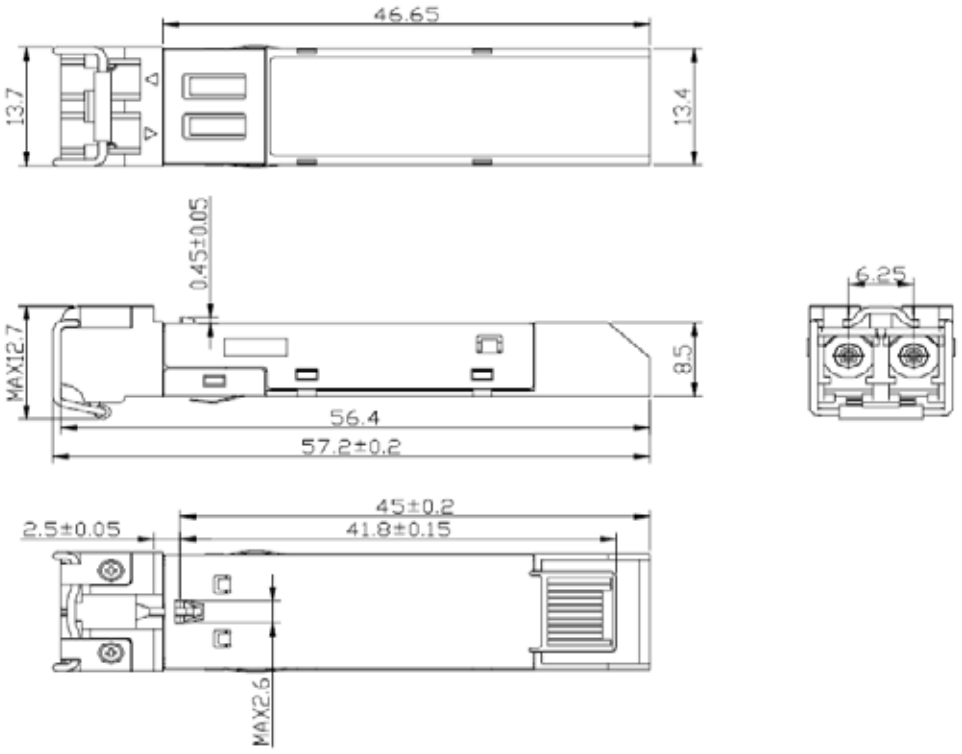
EN55022/CISPR22,Class B

EMS
- IEC61000-4-2
- IEC61000-4-3
- EN(IEC)60825-1,2

1000Base-X to 100Base-FX SFP (125Mbit/s) Parameter Table

Property		LX	LH
Type		Multi Mode(M)	Single Mode(S)
Center Wavelength(nm)		1310	1310
Transmission Distance(km)		2	10
Application Range of Transmission Distance(km)		0~2	0~10
Coupled Fiber		62.5/125μm MMF 50/125μm MMF	10/125μm SMF
Average Optical Output Power	Min.(dBm)	-20	-15
	Max.(dBm)	-14	-8
Receiver Sensitivity (dBm)		-31	-28
Maximum Input Power (dBm)		-8	-8

Mechanical Drawing



Ordering Information

Product Model	Product Description				
	Type	Connector	Center Wavelength	Transmission Distance	Coupled Fiber
IG-FSFP-M-LX-LC-1310-2	Multi Mode	LC	1310nm	2km	62.5/125μm MMF 50/125μm MMF
IG-FSFP-S-LX-LC-1310-10	Single Mode	LC	1310nm	10km	10/125μm SMF

SFP-1G to RJ45

Industrial Gigabit SFP Copper Transceiver Modules

- Transmission rate is 1.25Gb/s
- Working voltage is 3.3V
- Hot-Pluggable
- RJ45 connector
- RoHS Compliant

Product Specifications

Technical Specifications

Standards
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX)
- IEEE 802.3ab(1000Base-T)
- SFP MSA(INF-8074i)

Interface

RJ45 Connector

Physical Characteristics

Dimensions
- 13.61mm×13.9mm×67.96mm (0.54 in×0.55 in×2.68 in) (W×H×D)

Weight	40g (0.088 lb)

Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

Warranty period	3 years

Approvals

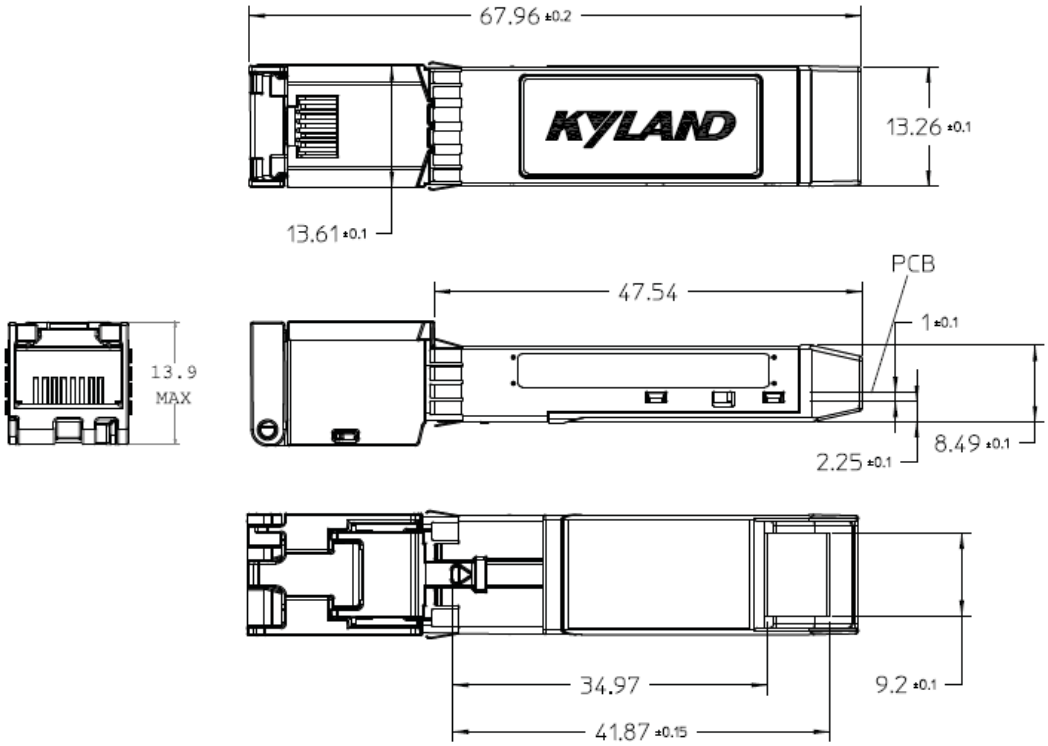
RoHS

Industry Standard

EMI
- FCC Part 15 Class B
- EN55022/CISPR22,Class B

EMS
- IEC61000-4-2
- IEC61000-4-3

Mechanical Drawing



Ordering Information

Product Model	Product Description Connector	Transmission Distance	Cable
IIGSFP-10/100/1000BASE-T-RJ45	RJ45	100m	CAT5/CAT5e UTP/STP

SFP-10G

Industrial 10Gb/s SFP+ Optical Transceiver Modules

- Transmission rate is 10Gb/s
- Working voltage is 3.3V
- Hot-Pluggable
- Duplex LC connector
- RoHS Compliant

Product Specifications

Technical Specifications

Standards SFP MSA(INF-8074i), SFF-8472, SFF-8431, IEEE802.3ae

Interface

LC Connector

Physical Characteristics

Dimensions
- 14.3mm×12.32mm×56.7mm (0.56 in×0.49 in×2.23 in) (W×H×D)

Weight 40g (0.088 lb)

Environmental Limits

Operating Temperature	-40°C to +85°C (-40 to 185°F)
Storage Temperature	-40°C to +85°C (-40 to 185°F)
Ambient Relative Humidity	5 - 95% (non-condensing)

Quality Assurance

Warranty period 3 years

Approvals

RoHS

Industry Standard

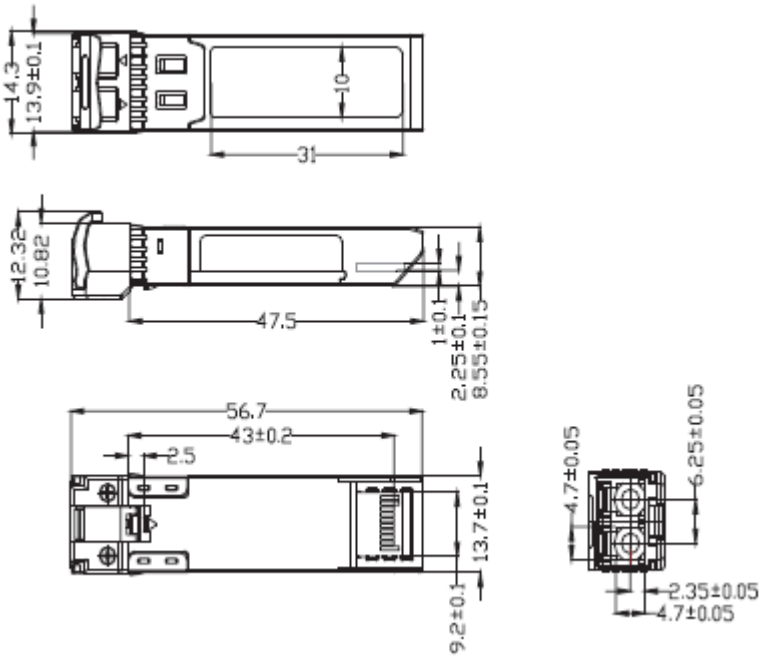
EMI
- FCC Part 15 Class B
- EN55022/CISPR22,Class B

EMS
- IEC61000-4-2
- IEC61000-4-3
- EN(IEC)60825-1,2

10GBASE-LR SFP+ (10Gbit/s) Parameter Table

Property		LR
Type		Single Mode(S)
Center Wavelength(nm)		1310
Transmission Distance(km)		10
Application Range of Transmission Distance(km)		2~10
Fiber Optic Cable		10/125μm SMF
Average Optical Output Power	Min.(dBm)	-8.2
	Max.(dBm)	0.5
Receiver Sensitivity (dBm)		-14.4
Maximum Input Power (dBm)		0.5

Mechanical Drawing



Ordering Information

Product Model	Product Description				
	Type	Connector	Center Wavelength	Transmission Distance	Fiber Optic Cable
IXSFP-S-LR-LC-1310-10	Single Mode	LC	1310nm	10km	10/125μm SMF

M12-A-4P-F

M12 A-Coding 4 Pin Female Screw Clamp Connection Cable Connector

Product Specifications

Electrical Specification

Rated voltage	250 V
Rated impulse voltage	2500 V
Rated current (40 °C)	4 A
Contact resistance	≤ 3 mΩ

Physical Characteristics

Protection class	IP67
Connector locking system	Screw-locking
Connector Type	A-Coding, 4 Pin, female
Contact plating	Au (gold)
Cable Outlet	6-8 mm
Shielding Ring	Support
Mechanical Operation	> 100 mating cycles

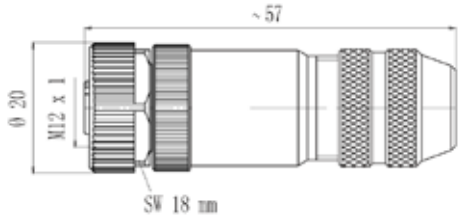
Quality Assurance

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

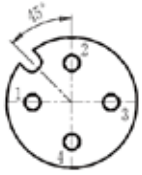
Ordering Information

Warranty period	3 years

Mechanical Drawing



Contact Arrangement



	X	Y
1	- 2, 50	0, 00
2	0, 00	2, 50
3	2, 50	0, 00
4	0, 00	- 2, 50

1 brown
2 white
3 blue
4 black

Ordering

Product Model	Product Description
M12-A-4P-F	Female cable connector with M12, A-Coding, 4 Pin

M12-A-4P-M

M12 A-Coding 4 Pin Male Screw Clamp Connection Cable Connector

Product Specifications

Electrical Specification

Rated voltage	250 V
Rated impulse voltage	2500 V
Rated current (40 °C)	4 A
Contact resistance	≤ 3 mΩ

Physical Characteristics

Protection class	IP67
Connector locking system	Screw-locking
Connector Type	A-Coding, 4 Pin, male
Contact plating	Au (gold)
Cable Outlet	6-8 mm
Shielding Ring	Support
Mechanical Operation	> 100 mating cycles

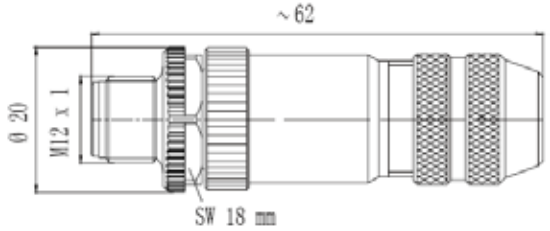
Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

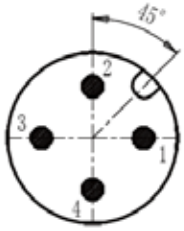
Quality Assurance

Warranty period	3 years

Mechanical Drawing



Contact Arrangement



	X	Y
1	2, 50	0, 00
2	0, 00	2, 50
3	- 2, 50	0, 00
4	0, 00	- 2, 50

1 brown
2 white
3 blue
4 black

Ordering Information

Product Model	Product Description
M12-A-4P-M	Male cable connector with M12, A-Coding, 4 Pin

M12-A-8P-M

M12 A-Coding 8 Pin Male Screw Clamp Connection Cable Connector

Product Specifications

Electrical Specification

Rated voltage	60 V
Rated impulse voltage	800 V
Rated current (40 °C)	2 A
Contact resistance	≤ 3 mΩ

Physical Characteristics

Protection class	IP67
Connector locking system	Screw-locking
Connector Type	A-Coding, 8 Pin, male
Contact plating	Au (gold)
Cable Outlet	6-8 mm
Shielding Ring	Support
Mechanical Operation	> 100 mating cycles

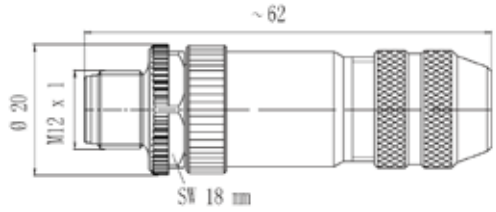
Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

Warranty period	3 years

Mechanical Drawing



Contact Arrangement

	X	Y
1	2.69	0.57
2	0.57	2.69
3	-1.66	2.20
4	-2.75	0.19
5	-1.91	-1.91
6	0.19	-2.71
7	2.20	-1.65
8	0.00	0.00

shielded	not shielded
1 white	1 white
2 brown	2 brown
3 green	3 green
4 green	4 green
5 grey	5 grey
6 grey	6 grey
7 grey	7 grey
8 grey	8 shield
Housing-shield	

Ordering Information

Product Model	Product Description
M12-A-8P-M	Male cable connector with M12, A-Coding, 8 Pin

M12-B-4P-F

M12 B-Coding 4 Pin Female Screw Clamp Connection Cable Connector

Product Specifications

Electrical Specification

Rated voltage	250 V
Rated impulse voltage	2500 V
Rated current (40 °C)	4 A
Contact resistance	≤ 3 mΩ

Physical Characteristics

Protection class	IP67
Connector locking system	Screw-locking
Connector Type	B-Coding, 4 Pin, female
Contact plating	Au (gold)
Cable Outlet	6-8 mm
Shielding Ring	Support
Mechanical Operation	> 100 mating cycles

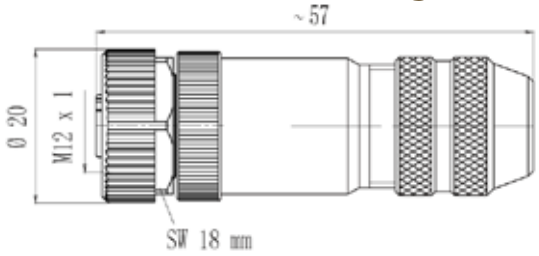
Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

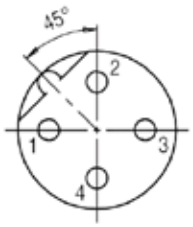
Quality Assurance

Warranty period	3 years

Mechanical Drawing



Contact Arrangement



	X	Y
1	-2,50	0,00
2	0,00	2,50
3	2,50	0,00
4	0,00	-2,50

1 brown
2 white
3 blue
4 black

Ordering Information

Product Model	Product Description
M12-B-4P-F	Female cable connector with M12, B-Coding, 4 Pin

M12-D-4P-M

M12 D-Coding 4 Pin Male Screw Clamp Connection Cable Connector

Product Specifications

Electrical Specification

Rated voltage	250 V
Rated impulse voltage	2500 V
Rated current (40 °C)	4 A
Contact resistance	≤ 3 mΩ

Physical Characteristics

Protection class	IP67
Connector locking system	Screw-locking
Connector Type	D-Coding, 4 Pin, male
Contact plating	Au (gold)
Cable Outlet	6-8 mm
Shielding Ring	Support
Mechanical Operation	> 100 mating cycles

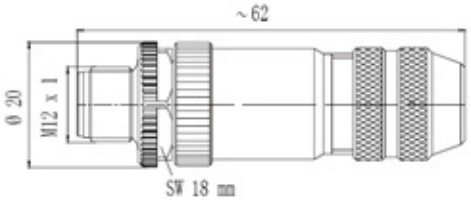
Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

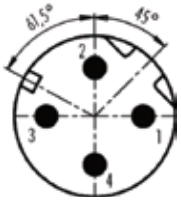
Quality Assurance

Warranty period	3 years

Mechanial Drawing



Contact Arrangement



	X	Y
1	2, 50	0, 00
2	0, 00	2, 50
3	- 2, 50	0, 00
4	0, 00	- 2, 50

1 brown
2 white
3 blue
4 black

Ordering Information

Product Model	Product Description
M12-D-4P-M	Male cable connector with M12, D-Coding, 4 Pin

M12-X-8P-M

M12 X-Coding 8 Pin Male Screw Clamp Connection Cable Connector

Product Specifications

Electrical Specification

Rated voltage	60 V
Rated impulse voltage	800 V
Rated current (40 °C)	0.5A
Contact resistance	≤ 10 mΩ

Physical Characteristics

Protection class	IP67
Connector locking system	Screw-locking
Connector Type	X-Coding, 8 Pin, male
Contact plating	Au (gold)
Cable Outlet	5.5–9 mm
Mechanical Operation	> 100 mating cycles

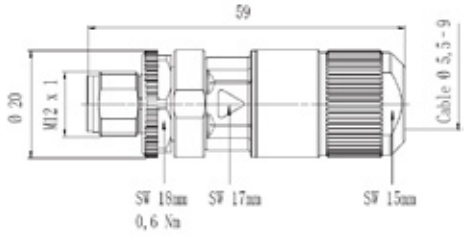
Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

Quality Assurance

Warranty period	3 years

Mechanical Drawing



Contact Arrangement

	X	Y
1	1,40	-2,80
2	2,80	-1,40
3	2,80	1,40
4	1,40	2,80
5	-1,40	2,80
6	-2,80	1,40
7	-2,80	-1,40
8	-1,40	-2,80

1 white-orange
2 orange
3 white-green
4 green
5 white-brown
6 brown
7 white-blue
8 blue

Ordering Information

Product Model	Product Description
M12-X-8P-M	Male cable connector with M12, X-Coding, 8 Pin

M16-A-5P-F

M16 A-Coding 5 Pin Female Screw Clamp Connection Cable Connector

Product Specifications

Electrical Specification

Rated voltage	250 V
Rated impulse voltage	1500 V
Rated current (40 °C)	6 A
Contact resistance	≤ 5 mΩ

Physical Characteristics

Protection class	IP67
Connector locking system	Screw-locking
Connector Type	A-Coding, 5 Pin, female
Contact plating	Ag (silver)
Cable Outlet	6-8 mm
Shielding Ring	Support
Mechanical Operation	> 500 mating cycles

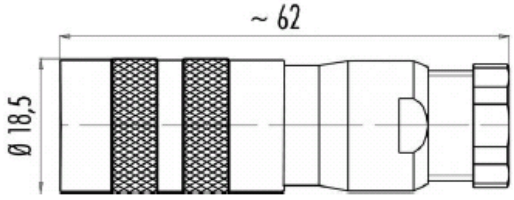
Environmental Limits

Operating Temperature	-40°C to +85°C (-40°F to 185°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Ambient Relative Humidity	5-95% (non-condensing)

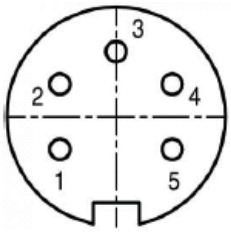
Quality Assurance

Warranty period	3 years

Mechancial Drawing



Contact Arrangement



	X	Y
1	-3,03	-1,75
2	-3,03	1,75
3	0,00	3,50
4	3,03	1,75
5	3,03	-1,75

Ordering Information

Product Model	Product Description
M16-A-5P-F	Female cable connector with M16, A-Coding, 5 Pin

DT-XL-Mini USB-USB-2m

USB Console Cable

- A cable connect between PC and switch.User can update/ download the firmware and backup/restore the configuration file with the cable(The function should depend on the switch's firmware).

Product Specifications

Interface

USB,Mini USB

Length

2m

Physical Characteristics

Protection Class	IP20
Weight	25g (0.055lb)
Connection	Plug in

Environmental Limits

Operating Temperature	-40 to 85°C (-40 to 185°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)

Ordering Information

Product Model	Product Description
DT-XL-Mini USB-USB-2m	USB console cable, Mini USB to USB,2m

PTS Time Server

High-precision Time Servers

- GPS, BDS, GLONASS, IRIG-B, PTP etc., can be used as time source
- TCXO, OCXO or Rubidium features
- Safety and reliable multiple source selection algorithm
- 1PPS/1PPM/1PPH output
- IRIG-B-DC/AC output
- Idle Contact time output
- 1PPS+TOD time output
- RS-232/485 serial port output
- NTP/SNTP output
- PTP V2 output
- Screen display(3U-Touch Screen/1U-LCD Screen)
- Monitoring(IEC61850/IEC60870/DNP/SNMP)
- Alarm contact output
- Dual power supplies

CE

Overview

Time server supports high precision reference clock, which can be synchronized to absolute time such as GPS or BDS (Beidou Satellite System), GLONASS. It also supports OCXO or Rubidium. Time server offers more time signals and interfaces for the system or device which need time scale. At the same time, time server supports time status monitor and time management by IEC 61850, IEC60870, DNP and SNMP.

Software Functions

High Precision Time Accuracy

Multiple time sources automatic selection
Time coding format consistency
No time output signals at initial status
Time adjustment step up to 200ns/s
Leap second indicator and adjustment
Time source bump detection
Monitoring by IEC 61850,104, SNMP
Ethernet port isolation feature
Ethernet port broadcast and multicast storm pressure feature
All kinds of time signals output feature
Long time stability feature
Hold performance feature
Channel delay compensation feature
Industrial grade design for harsh environment

Specifications

Signal, Interface & Accuracy
1PPS: Fiber <=60ns, TTL <=60ns, Differential <=0.5us, Contact <=3us
IRIG-B: Fiber <=60ns, TTL <=60ns, AC(3-12V,3:1-6:1) <=3us, Differential <=0.5us
Serial Signal: RS 232 <=10us, RS 485 <=10us
NTP: Ethernet <=50us
PTP: Ethernet <=50ns

Hardware Features

EMC Level 4
Operating Temperature: -20°C to 75°C (-4 to 158°F)
Storage Temperature: - 40°C to 85°C (-40 to 185°F)
Humidity: 5%-95%, non-condensing
MTBF: 50000hrs
Power Supply: 85-256VAC/DC, dual redundant power supplies

Installation

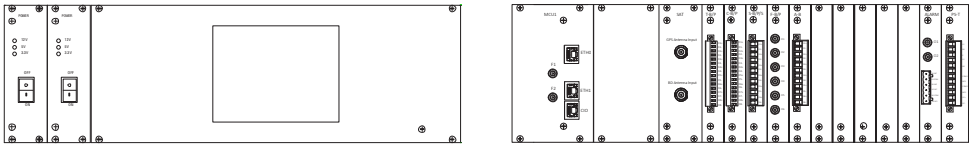
PTS-30
- WxHxD: 483 x 135 x 280mm (19 x 5.31 x 11.02inch)
- Weight: 8kg
- Installation: 3U 19" rack mount

PTS-10
- WxHxD: 483 x 45 x 280mm (19 x 1.77 x 11.02inch)
- Weight: 4.5kg
- Installation: 1U 19" rack-mount

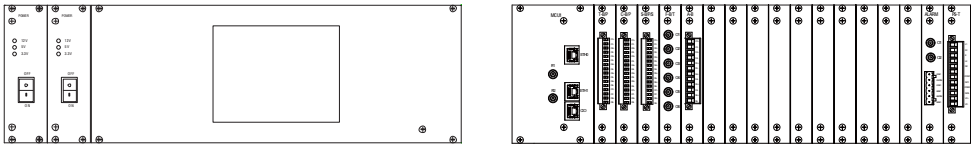
PTS-10A
- WxHxD: 483mm x 45mm x 280mm
- Weight: 4.5kg
- Installation: standard 1U, 19"

Panel View

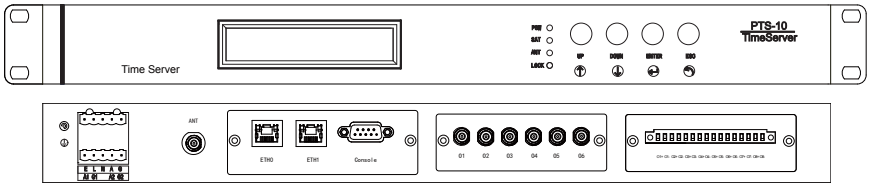
PTS-30M



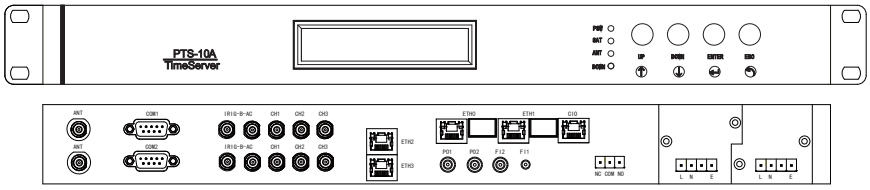
PTS-30E



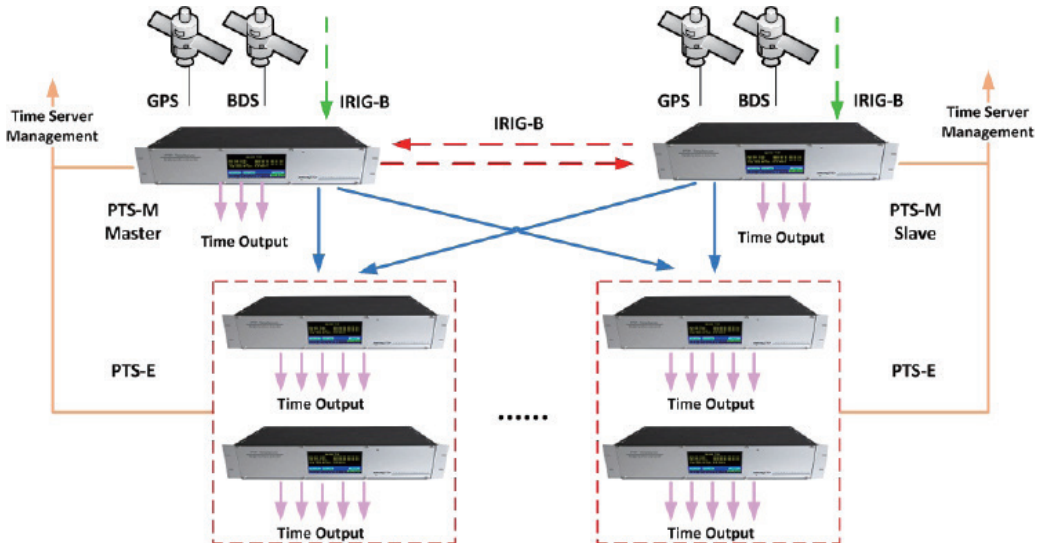
PTS-10



PTS-10A



Typical Application



Ordering Information

PTS-30 Time Server(3U)

P T S - 3 0 M - - X -

POWER	
85~264V AC/DC Single	1
85~264V AC/DC Double	2
48V DC Single	3
48V DC Double	4
OSCILLATOR	
TCXO(<55us/1h)	1
OCXO(<12us/12h)	2
OCXO(<6us/24h)	3
RB.31	4
RB.33	5
ETHERNET	
2*100M C	1
4*100M C	2
2*100/1000 C/F(LC) (without SFP Module)	6
2*100/1000 C/F(LC) (without SFP Module) + 2*100M C	7
SATELLITE	
GPS	1
GPS/BDS(Dual-mode)	2
GPS/GLONASS (Dual-mode)	3
GPS+GPS	4
GPS+BDS	5
GPS+GLONASS	6
PTP	
N/A	0
PTP v2	1
FI	
N/A	0
FI1+FI2(ST 850nm MM)	1
ALARM & FREQ	
2 * Alarms Contact	0 0
2 * Alarms Contact + 50Hz Frequency measurement	0 5
2 * Alarms Contact + 60Hz Frequency measurement	0 6
2 * Alarms Contact + 2xFO(850nm,ST MM)	1 0
OUTPUT (8 SLOTS)	
PPS TTL-TB(eight-channel per module)	
IRIG-B TTL-TB(eight-channel per module)	
PPS TTL-BNC(five-channel per module)	
IRIG-B TTL-BNC(five-channel per module)	
PPS FO(six-channel,per module,ST 850nm MM)	
IRIG-B FO(six-channel,per module,ST 850nm MM)	
IRIG-B AC-TB(six-channel per module)	
SERIAL_TB(eight-channel,RS485 per module)	
SERIAL_TB(six-channel,RS232 or RS485 per module)	
CONTACT_TB(eight-channel, per module)	
FIRMWARE	
N/A	0 0
WEB	1 0
WEB+SNMP	1 1
WEB+IEC60870-104+DNP TCP	1 2
WEB+IEC60870-104+IEC61850 MMS	1 3
WEB+TMS GOOSE Trigger+IEC61850 MMS	1 4

PTS-30E Time Server(3U)

P T S - 3 0 E - - X X X -

POWER		
85~264V AC/DC Single	1	
85~264V AC/DC Double	2	
48V DC Single	3	
48V DC Double	4	
OSCILLATOR		
TCXO(<55us/1h)	1	
OCXO(<12us/12h)	2	
OCXO(<6us/24h)	3	
RB.31	4	
RB.33	5	
ETHERNET		
2*100M C	1	
4*100M C	2	
2*100/1000 C/F(LC) (without SFP Module)	6	
2*100/1000 C/F(LC) (without SFP Module) + 2*100M C	7	
PTP		
N/A	0	
2xPTPv2.0	1	
ALARM & FREQ		
2 * Alarms Contact	0	0
2 * Alarms Contact + 2xFO(850nm,ST MM)	1	0
OUTPUT (15 SLOTS)		
PPS TTL-TB(eight-channel per module)		
IRIG-B TTL-TB(eight-channel per module)		
PPS TTL-BNC(five-channel per module)		
IRIG-B TTL-BNC(five-channel per module)		
PPS FO(six-channel,per module,ST 850nm MM)		
IRIG-B FO(six-channel,per module,ST 850nm MM)		
IRIG-B AC-TB(six-channel per module)		
SERIAL_TB(eight-channel,RS485 per module)		
SERIAL_TB(six-channel,RS232 or RS485 per module)		
CONTACT_TB(eight-channel, per module)		
FIRMWARE		
N/A	0	0
WEB	1	0
WEB+SNMP	1	1
WEB+IEC60870-104+DNP TCP	1	2
WEB+IEC60870-104+IEC61850 MMS	1	3
WEB+TMS GOOSE Trigger+IEC61850 MMS	1	4

PTS-10 Time Server(1U)	P	T	S	-	1	0	X	-		-						X												-		
POWER																														
85~264V AC/DC Single									1																					
48V DC Single									3																					
OSCILLATOR																														
TCXO(<55us/1h)											1																			
OCXO(<12us/12h)											2																			
OCXO(<6us/24h)											3																			
ETHERNET																														
2*100M C												1																		
2*100/1000 C/F(LC) (without SFP Module)												6																		
SATELLITE																														
GPS													1																	
GPS/BDS(Dual-mode)													2																	
GPS/GLONASS (Dual-mode)													3																	
GPS+GPS													4																	
GPS+BDS													5																	
GPS+GLONASS													6																	
PTP																														
N/A														0																
2xPTPv2.0														1																
FI																														
N/A															0															
FI1+FI2(ST 850nm MM)															1															
OUTPUT (2 SLOTS)																														
PPS TTL-TB(eight-channel per module)																														
IRIG-B TTL-TB(eight-channel per module)																														
PPS TTL-BNC(five-channel per module)																														
IRIG-B TTL-BNC(five-channel per module)																														
PPS FO(six-channel,per module,ST 850nm MM)																														
IRIG-B FO(six-channel,per module,ST 850nm MM)																														
IRIG-B AC-TB(six-channel per module)																														
SERIAL_TB(eight-channel,RS485 per module)																														
SERIAL_TB(six-channel,RS232 or RS485 per module)																														
CONTACT_TB(eight-channel, per module)																														
COMBO1(one-BNC IRIG AC, two-BNC IRIG/PPx TTL, one-DB9 RS232)																														
COMBO2(two-BNC IRIG AC, two-BNC IRIG/PPx TTL, one-FO ST 850nm MM)																														
FIRMWARE																														
N/A																													0	0
WEB																													1	0
WEB+SNMP																													1	1
WEB+IEC60870-104+DNP TCP																													1	2
WEB+IEC60870-104+IEC61850 MMS																													1	3
WEB+TMS GOOSE Trigger+IEC61850 MMS																													1	4

PTS-10A Time Server(1U)

P T S - 1 0 A - - X X X X X X X X X X X X -

POWER

85~264V AC/DC Single									1																							
85~264V AC/DC Double									2																							
48V DC Single									3																							
48V DC Double									4																							

OSCILLATOR

TCXO(<55us/1h)											1																					
OCXO(<12us/12h)											2																					
OCXO(<6us/24h)											3																					

ETHERNET

2*100/1000 C/F(LC) (without SFP Module)												6																				
2*100/1000 C/F(LC) (without SFP Module) + 2*100M C												7																				

SATELLITE

GPS													1																			
GPS/BDS(Dual-mode)													2																			
GPS/GLONASS (Dual-mode)													3																			
GPS+GPS													4																			
GPS+BDS													5																			
GPS+GLONASS													6																			

PTP

N/A														0																		
2xPTPv2.0														1																		

FIO

															0																	
N/A															0																	
FI1(ST 850nm MM)+FI2(SMA) + FO1/FO2(ST 850nm MM)															1																	

FIRMWARE

																															0	0
N/A																															0	0
WEB																															1	0
WEB+SNMP																															1	1
WEB+IEC60870-104+DNP TCP																															1	2
WEB+IEC60870-104+IEC61850 MMS																															1	3
WEB+TMS GOOSE Trigger+IEC61850 MMS																															1	4

Accessory All Time Server

P T S - A C C - X - X X X - 0 0

ANTENNA

Coaxial Cable (15 meters)																																
Coaxial Cable (30 meters)																																
Coaxial Cable (50 meters)																																
Coaxial Cable (80 meters)																																
Coaxial Cable (100 meters)																																
HT-GB032CC_T Antenna(GPS/BDS, TNC female conector)																																
HT-GB032CC_N Antenna (GPS/BDS, N female conector)																																
HT-GG032MC_T Antenna(GPS/BDS/GLONASS, TNC female conector)																																
HT-GG032MC_N Antenna (GPS/BDS/GLOANSS, N female conector)																																
Antenna Amplifier																																
AR25B Antenna Lighting Protection (BNC female to male connector)																																

SFP

100M Muliti-mode GTLS-1303-02MIL																																
1000M Muliti-mode GTLS-8512-02I																																
100M Single-mode GTLS-1303-10I																																
1000M Single-mode GTLS-1312-10I																																

FIRMWARE

																															0	0
N/A																															0	0

ePT-100

Precise Time Test Set

- GPS, BDS, GLONASS etc. external time sources
- PTP, IRIG-B, Serial Code etc. external time sources
- Rubidium for hold performances
- PPS, IRIG-B, Serial, NTP, PTP etc. time output
- PPS, IRIG-B(DC/AC) etc. timing test
- NTP, PTP etc. network timing test
- 1PPS+TOD, serial Code etc. timing test
- Pulse frequency, pulse width, SOE etc. timing test
- IRIG-B code and decode monitoring and storage
- IEC61850 SV/GOOSE time performance test
- Switch PTP message resident time test
- Multiple Merge Units time performance test
- Network protocol capturing and storage(PCAP/CSV)
- Idle contact input/output SOE measurement
- Time performance analyzer software
- Digital scope feature
- Screen capture feature
- Built-in battery

Overview

ePT-100 time test set is a portable time test instrument designed to provide PTP, NTP, IRIG-B, PPS, pulse frequency, pulse width, SOE, idle contact timing test and provide PPS, IRIG-B, NTP, PTP(OC/TC/BC, E2E/P2P) time output.

ePT-100 time test set supports IEC 61850 SV/GOOSE message time performance test to get message delay over Ethernet. ePT-100 time test set has high precision measurement reference clock which can be synchronized to absolute time such as GPS, BDS etc. and relevant time such as PTP, IRIG-B, serial time etc. It is equipped with Rubidium for stable hold feature.

ePT-100 time test set provides network protocol capturing and analyzing features for user to solve all kinds of Ethernet communication issues. All captured messages with high precision time tag are saved as standard format files such as PCAP, CSV etc.

ePT-100 time test set with more functions is easy to take because of its small size and light weight. The built-in battery makes it work without external power supply.

ePT-100 time test set is designed for any time synchronization system and IEC 61850 system. It is a useful auxiliary tool to help user do more IEEE 1588 (PTP) and IEC 61850 researches.

ePT-100 time test set has HMI to help user easier to analyze data by trend, histogram etc. It supports internal and external storage. All timing test data are saved into a standard file which are easier to reload and analyze manually. All screens also can be captured manually. All test result statistics can be shown as average, offset value etc.

Software Functions

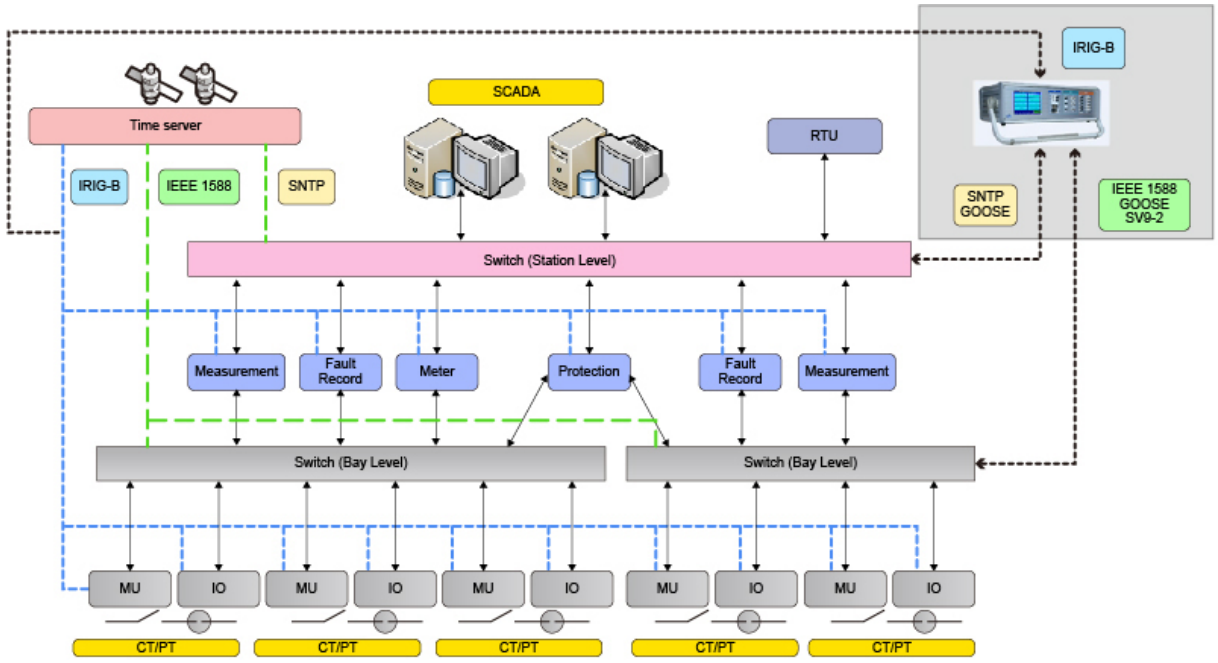
Specification

Internal Satellite synchronization <=30ns(UTC)
Hold performance <=2us/day
1PPS output <=30ns
PPS Timing <=20ns, Resolution: 1ns
Pulse Width Measurement <=20ns, Resolution: 1ns
IRIG-B-DC Timing <=20ns, Resolution: 1ns
IRIG-B-AC Timing <=1us, Resolution: 1ns
1PPS+TOD Timing <=20ns, Resolution: 1ns
Start Bit+Serial Code Timing <=1us, Resolution: 1ns
NTP Timing <=1us, Resolution: 8ns
PTP Timing <=20ns, Resolution: 8ns
SOE <=10us, Resolution: 1ns
IEC61850 SV/GOOSE: 0.1us
Internal Storage >=2G
Screen Snapshot: Yes
Built-in Battery >=4 Hours
Dimensions: 469 x 312 x 150 mm (18.46 x 12.28 x 5.91 inch)

Interface

1PPS+TOD/IRIG-B/Seiral: RS422/RS232, RJ45, 2 Input/Output
1PPS/IRIG-B/Frequency: TTL, BNC, 3 Input/ 4 Output
1PPS/IRIG-B/Frequency: Fiber, ST, 3 Input/ 5 Output
IRIG-B: AC, BNC, 2 Input / 1 Output
NTP/PTP
2 100/1000M RJ45/SFP Combo Ethernet
DI/ DO: Idle Contact, Terminator, 2 Input/Output
Auxiliary Power: 24/48/110/220VDC, Terminator, 4 Sets
Storage Interface: USB2. 0
System Maintenance Interface: RS232 RJ45

Typical Application



Ordering Information

ePT-100 Time Test Set — e P T - 1 0 0 - 1 - X X X X X X X X X X X X X X -

POWER																																
85~264V AC/DC									1																							
OSCILLATOR																																
OCXO										1																						
RB										2																						
ETHERNET																																
1*100M F + 1*1000M C/F											4																					
2*100/1000 C/F(LC) (With SFP Module)											6																					
SATELLITE																																
GPS												1																				
GPS/BDS(Dual-mode)												2																				
GPS/GLONASS (Dual-mode)												3																				
BATTERY																																
N/A													0																			
Backup-Battery													1																			
FIRMWARE																																
N/A																															0	0
PTP Measurement Functions																															0	1
PTP Measurement Functions + IEC61850 Timing Test																															0	2

PTC1000

PTP Clock Converter

- Support IEEE 1588v2, the synchronization accuracy reaches ±100ns.
- Support ITU-T.G.8261/G.8262 SyncE, the synchronization accuracy can reach ±50ns with SyncE enabled.
- Support 1 100Base-FX SC/ST/FC or 1 10/100Base-TX RJ45 IEEE 1588 input.
- Support PPS output, IRIG-B TTL outputs, and IRIG-B AM modulation.
- Supports IRIG-B000,B001,B002,B003,B004,B005,B006,B007,B120,B121,B122,B123,B124,B125,B126,B127.
- Complies with IEC 61850-3 and IEEE1613.
- CE, UL508 certificates.

Overview

PTC1000 Clock Converter realizes the conversion from PTP to IRIG-B and PPS (Pulse Per Second). This allows the industrial devices that are equipped with IRIG-B clock interfaces and PPS interface to conveniently access PTP network. This provides economic solution for evolving legacy network into future-proofing PTP network and achieve high precision synchronization required in industrial control system.

Software Functions

Management & Maintenance

Supports Console, Telnet, and Web management methods.
Supports SNMPv1/v2c and can managed by Kyvision.
Supports software update over FTP.
Supports the power failure alarm, power alarm

Clock Management

Supports PTPv2 (IEEE 1588-2008).
Supports Power profile (C37.238).
Supports Telecom profile (in special version).
Supports synchronous Ethernet (ITU-T.G.8261/G.8262).

Product Specifications

Technical Specifications

Standard
- IEEE 802.3i(10Base-T)
- IEEE 802.3u(100Base-TX and 100Base-FX)
- IEEE 1588-2008(PTPv2)
- ITU-T.G.8261/G.8262 (synchronous Ethernet)

Interface

PTP port
- 100Base-FX, single/multi mode, SC/ST/FC connector
- 10/100Base-T(X), RJ45 port

Console port
- RS232,RJ45

Alarm contact
- 3-pin 5.08mm-spacing plug-in terminal block, 250 VAC/220 VDC Max, 2 A Max, 60 W Max

Clock Signal
- PPS: TTL level +5V, 50Ω, Rising edge based, pulse width 20ms-200ms, stepped by 20ms (configurable in software), BNC connector
- IRIG-B DC:
  - TTL level +5V, 600Ω, Rising edge based, BNC connector or 2-pin 5.08mm-spacing plug-in terminal block
  - RS422, 2-pin 5.08mm-spacing plug-in terminal block
- IRIG-B AM: Vp-p, 3V-10V (configurable in software, default Vp-p: 4.5V), 600Ω, Modulation Ratio 3:1, 4:1, 5:1, 6:1 (optional, default modulation ratio is 3:1), BNC connector or 2-pin 5.08mm-spacing plug-in terminal block

LED

LED on front panel
- Running LED: Run
- Alarm LED: Alarm
- Power LED: PWR1, PWR2
- Port LED: Link/ACT, Speed
- PTP Sync LED: Sync

Power Requirements

Power input
- 24DCW(18-72VDC)
- 110DC(77-154VDC)
- 220AC/DCW(85-264VAC/77-300VDC)

Power terminal
- 5-pin 5.08 mm-spacing plug-in terminal block

Power consumption	<4W
Overload protection	Support
Reverse connection protection	Support
Redundancy protection	Support

Physical Characteristics

Housing	Metal
Cooling	Natural cooling, fanless
Protection Class	IP40

Dimensions(WxHxD)
- 62.4×139×119.5 mm (2.45×5.47×4.70 in.)

Weight	0.75kg (1.653 pound)
Mounting	Vertical or Horizontal Din-Rail

Environmental Limits

Operating temperature	-40°C to +85°C (-40°F-185°F)
Storage temperature	-40°C to +85°C (-40°F-185°F)
Ambient Relative Humidity	5% to 95% (non-condensing)

Quality Assurance

MTBF	332,600 hrs
Warranty	5 years

Approvals

CE, UL508
Please visit www.kyland.com for the latest news

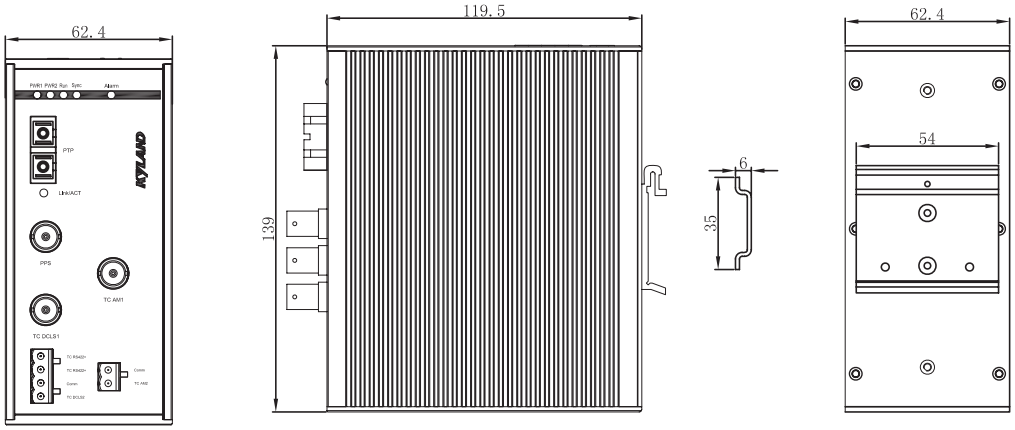
Industry Standard

EMI
- FCC CFR47 Part 15,EN55022/CISPR22,Class A

EMS
- IEC61000-4-2(ESD) ±8kV(contact),±15kV(air)
- IEC61000-4-3(RS) 10V/m(80MHz-2GHz)
- IEC61000-4-4(EFT) Power Port:±4kV;Data Port:±2kV
- IEC61000-4-5(Surge) Power Port:±2kV/DM,±4kV/CM;
- Data Port:±2kV
- IEC61000-4-6(CS) 3V(10kHz-150kHz);
- 10V(150kHz-80MHz)
- IEC61000-4-16(common mode conduction) 30V(cont.),300V(1s)

Machinery
- IEC60068-2-6 (vibration),
- IEC60068-2-27 (shock),
- IEC60068-2-32 (free fall)

Mechanical Drawing



Ordering Information

	PTC1000-Ports-Connector-XX-PS
Ports	
1S	1x100Base-FX, single-mode fiber port;
1M	1x100Base-FX, multi-mode fiber port;
1T	1x10/100Base-T(X) RJ45 port
Connector	**100M fiber port specifications**
SC05	SC connector, multi-mode, 1310nm, 5km
ST05	ST connector, multi-mode, 1310nm, 5km
FC05	FC connector, multi-mode, 1310nm, 5km
SC40	SC connector, single-mode, 1310nm, 40km
ST40	ST connector, single-mode, 1310nm, 40km
FC40	FC connector, single-mode, 1310nm, 40km
SC60	SC connector, single-mode, 1310nm, 60km
SC80	SC connector, single-mode, 1550nm, 80km
XX	**Connector of the second IRIG-B port**
None	The second channel of IRIG-B out is 2-pin 5.08 mm-spacing plug-in terminal block
01	The second channel of IRIG-B out is BNC connector
PS	**Power supply**
HV	220AC/DCW(85-264VAC/77-300VDC),single power input
H2-H2	110DC(77-154VDC), dual redundant power inputs
L2-L2	24DCW(18-72VDC), dual redundant power inputs

Accessories

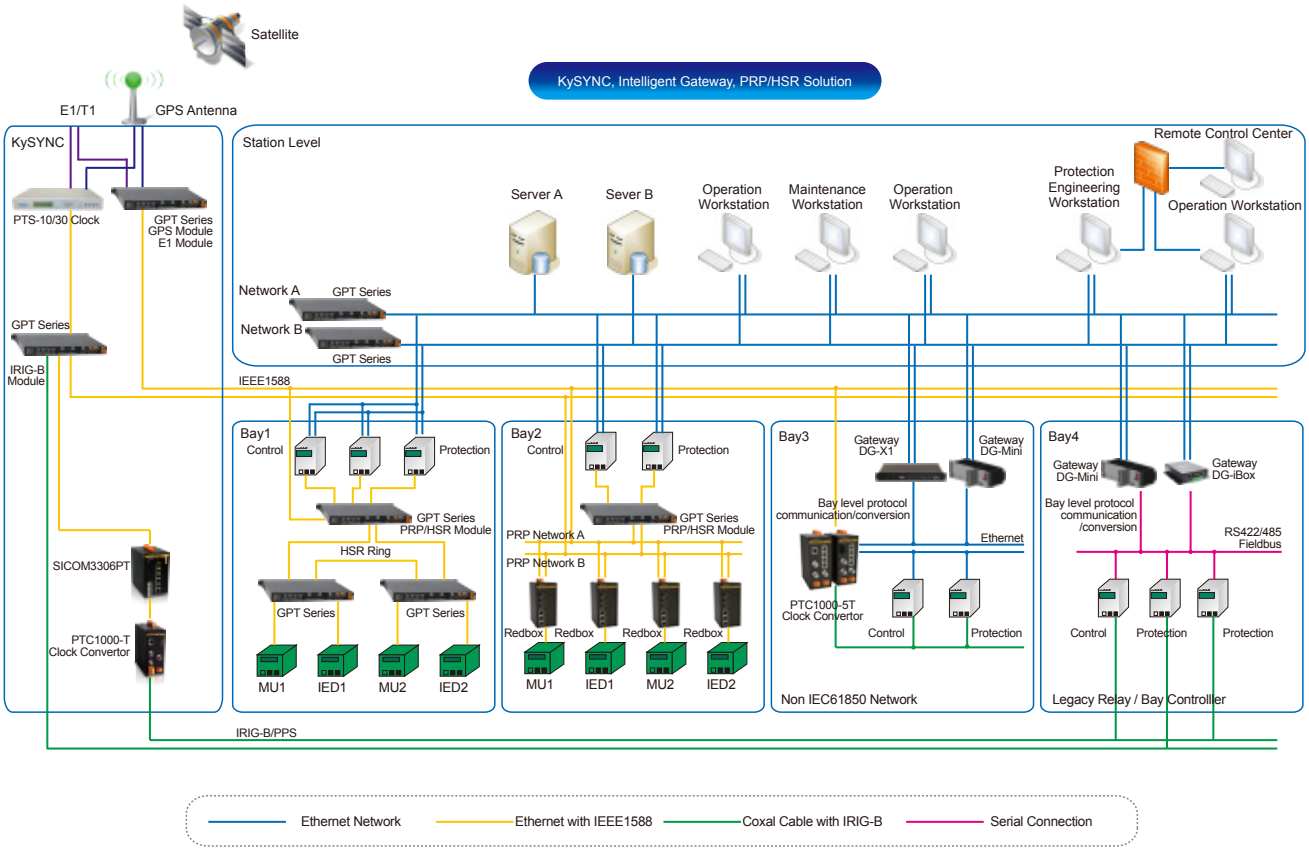
Accessory Model	Description
DT-FCZ-RJ45-01	Single-port RJ45 dust plug

KySYNC,Kyland Precision Clock Synchronization Solutions

Introduction

Precision clock synchronization solutions are using external precise time reference to establish the synchronization with local clocks by delivering all kinds of time signal. The time source provides the time reference, and the time server distributes the timing. While the time source is not available, the time server's time keeping ability will be critical to assure the precision of the time reference. So in a precision clock synchronization network, the precision of time reference, time distribution and time keeping are hook-ups and all plays important role in each time node. In order to ensure all legacy devices which only support IRIG-B format could still be synced, the PTP (Precision Time Protocol) signal will need to be converted into IRIG-B format through clock conversion. IEEE 1588 will also be need to be distributed through all kinds of network including PRP/HSR and also SDH network.

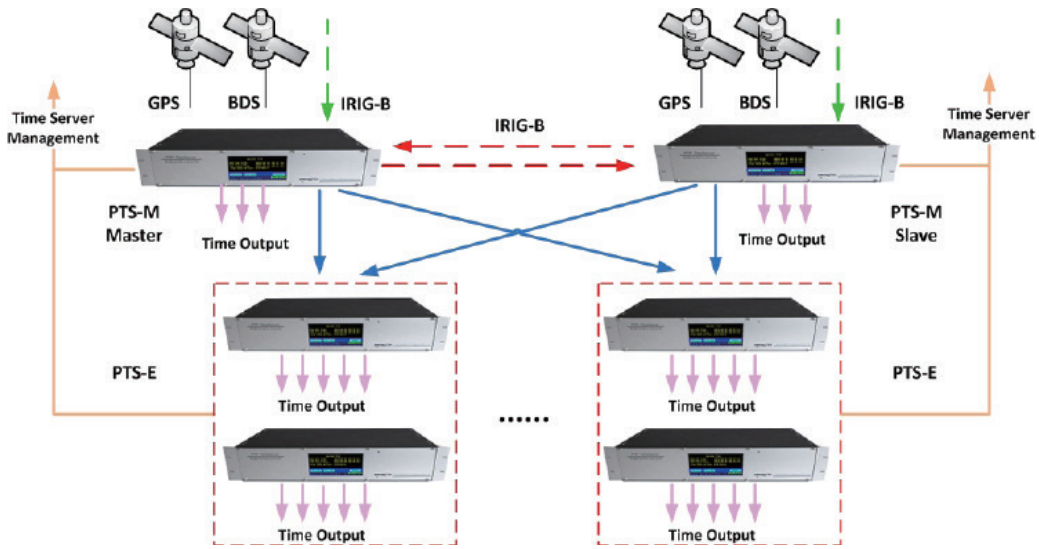
- Kyland provides turnkey timing solution including:
- High-precision time server and IEEE 1588 industrial Ethernet switches supporting IEEE 1588 in both power profile (C37.238) and telecom profile
- PTP to IRIG-B time conversion
- IEEE 1588 over PRP/HSR
- IEEE 1588 over SDH network
- TMS (Time Management System) & Service Management System
- Time tester



High precision time server

Precision synchronization network provided with various options of timing redundancy can be constructed through Kyland time server which include master clock & also extending clock. The whole precision synchronization network ensures a safety & reliable precision time sync service for different kind of industries.

- Key Features:
- High precision time accuracy
- Multiple time sources automatic selection
- Time coding format consistency
- No time output signals at initial status
- Time adjustment step up to 200ns/s
- Leap second indicator and adjustment
- Time source bump detection
- Monitoring by IEC 61850,104, SNMP(Optional)
- Ethernet port isolation feature
- Ethernet port broadcast and multicast storm pressure feature
- All kinds of time signals output feature
- Long time stability feature
- Hold performance feature
- Channel delay compensation feature
- Industrial grade design for harsh environment

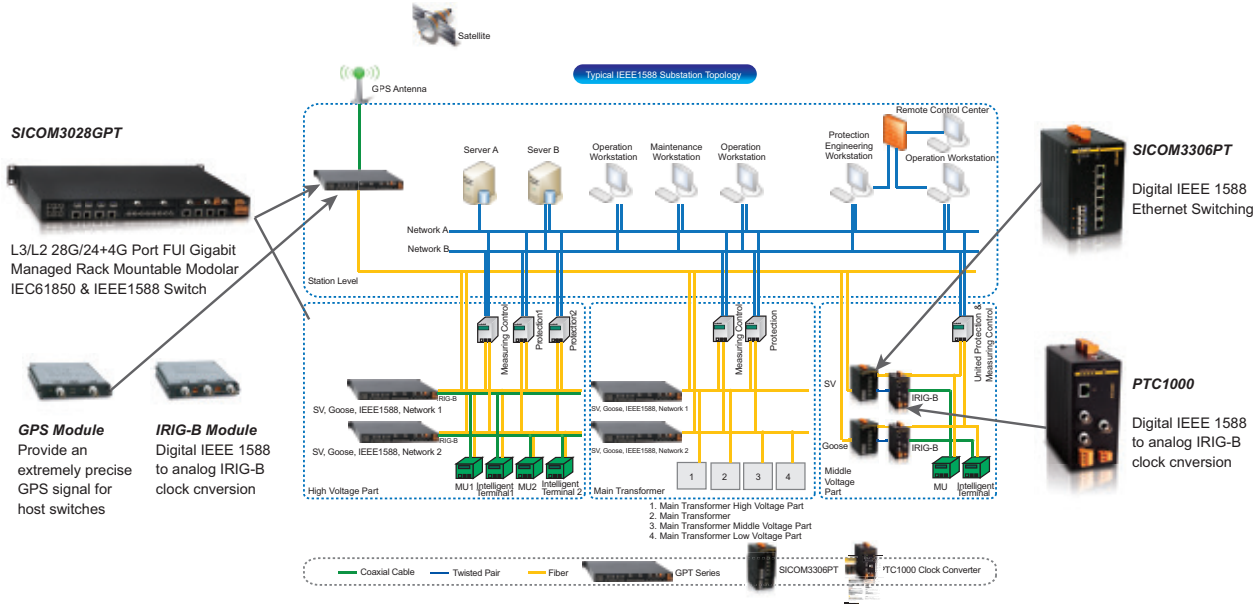


IEEE 1588 Industrial Ethernet Switches

Kyland complete IEEE 1588v2 & SyncE solution includes All-in-One modular intelligent SICOM3028GPT Series, high accuracy GPS module, IRIG-B output module, PTP over E1/T1 module, PRP/HSR module and TMS (time management system) module . The complete solution features both IEEE 1588v2 and SyncE (ITU-T.G.8261/ G.8262) with hardware time stamping allowing 10 nanoseconds time synchronization over the entire network. The high precision clock information can be received by the GPS module with 0.01ppm frequency stability and be carried out to the network edge and converted to IRIG-B for synchronization of existing devices that are not capable of 1588.

Key Features:

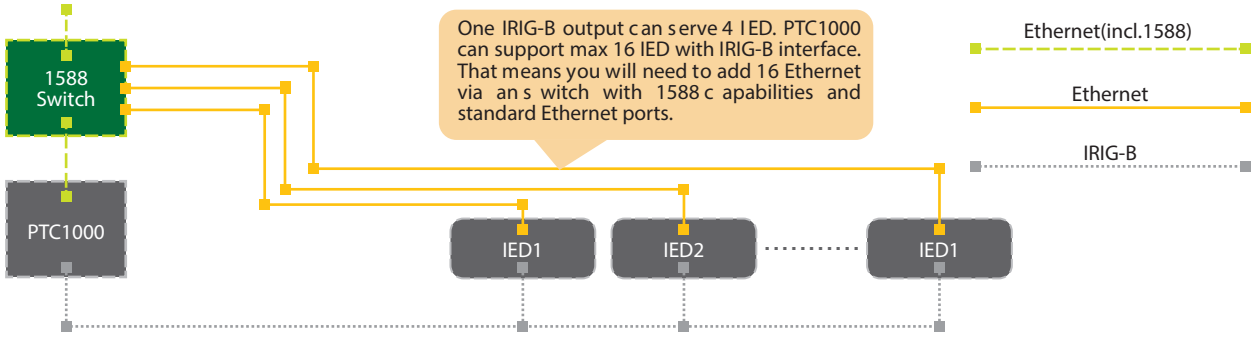
- IEEE 1588v1/v2
- Support both 802.3/UDP packets
- Flawless BMC algorithm
- Boundary Clock/Transparent Clock/Ordinary Clock
- 10ns synchronous accuracy
- Support G.8261 SyncE (Synchronous Ethernet)
- Exception protection



PTP to IRIG-B time conversion

Kyland provides both Din Rail PTP to IRIG-B time convertor and embedded IRIG-B interface module for SICOM3028GPT series.

- Realizes the conversion from PTP to IRIG-B and PPS (Pulse Per Second).
- Allows the industrial devices that are equipped with IRIG-B clock interfaces and PPS interface to conveniently access PTP network.
- Achieves the normalization of network clocks and reaches high precision synchronization in the industrial control system.

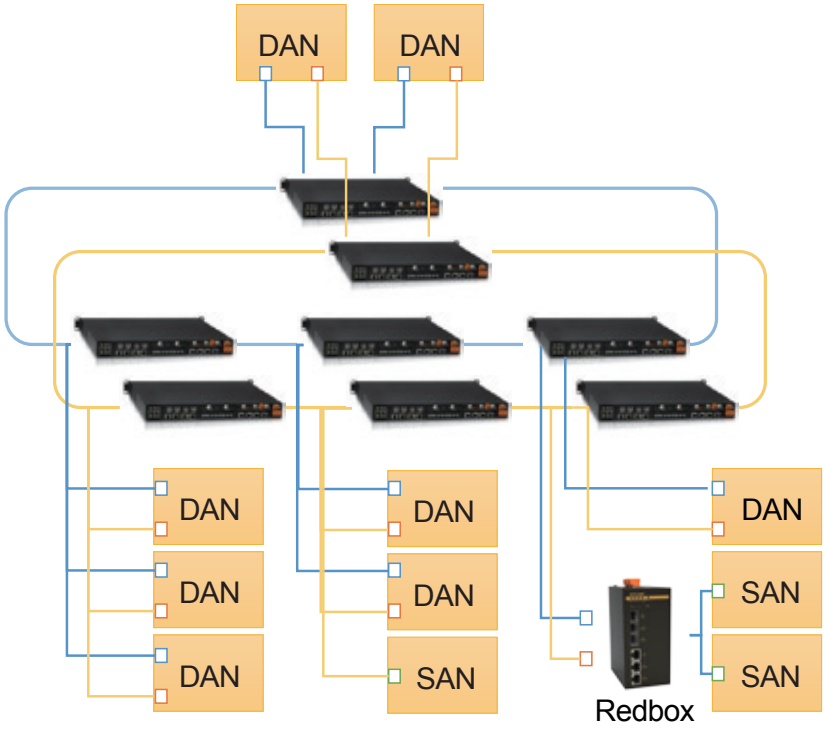


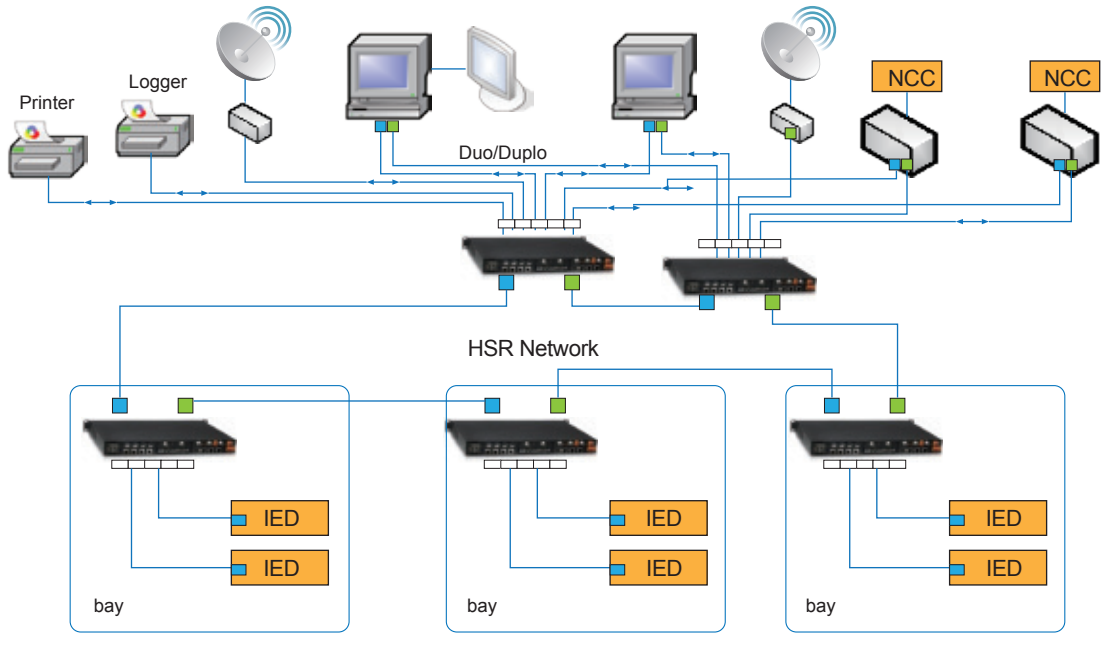
IEEE 1588 over PRP/HSR

Kyland provides HSR/PRP solution supporting IEEE 1588v2

- Support real time Ingress and Egress time stamping
- Support 1-Step Peer to Peer Delay measurement with node awareness
- Packet correction field accounts for switch processing time and propagation delay
- Port awareness

Kyland solution benefits:
Seamless integration with GPT series, Kyland IEEE 1588v2 industrial Ethernet switches, eliminates the needs for another grade of timing process. Kyland solution of IEEE 1588v2 over HSR/PRP provides an ideal solution for IEEE 1588v2 power utility applications.



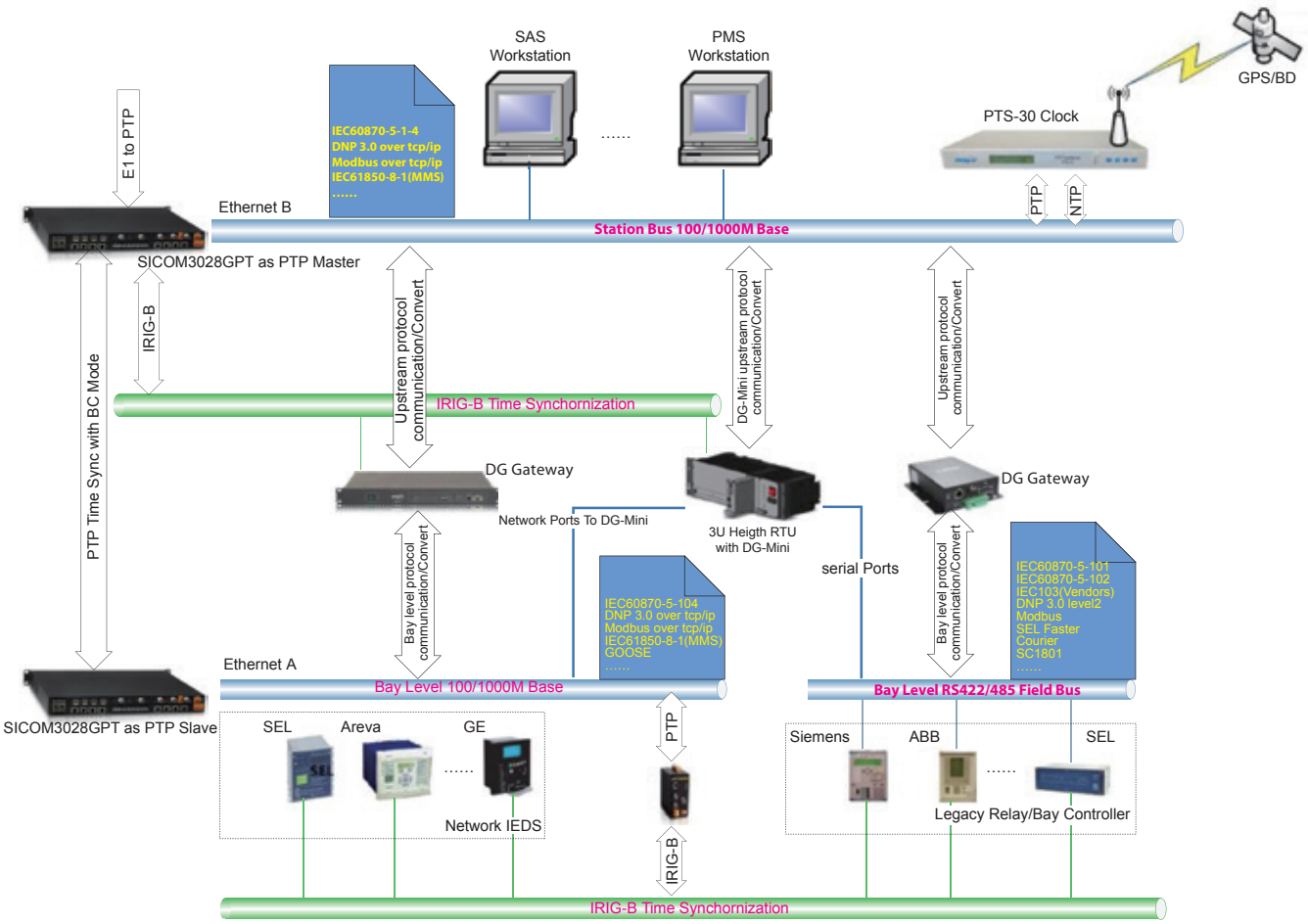


TMS (Time Management System)

TMS card is a specially designed intelligent interface module for Kyland SICOM3028GPT series industrial Ethernet switches. The purpose of this module is to run time critical tasks for time management system(TMS). Besides this, the TMS card is also a value added gateway agent to transfer information of switch to 3rd part master station by specified protocol used in power utility, such as Modbus, IEC60870-5-104, IEC 61850 MMS etc.

Features

- Internal time synchronized as PTP(IEEE-1588v2) slave with accuracy of ±60us average
- IRIG-B Input/Output (demodulated) interface with accuracy of ±1us average
- Optical coupler digital input SOE time resolution < 0.5ms
- Time duration for GOOSE publish by optical coupler DI trigger < 2ms
- Time duration for GOOSE publish by internal precise trigger < 60us
- Time duration for rising edge of digital output by internal precise trigger < 60us
- Configurable automatic pulse output periodically with precise time interval
- Configurable automatic GOOSE publish periodically with precise time interval
- Support MMS(IEC61850-8-1)server application for information report
- Optional support protocol (IEC60870-5-104, DNP 3.0) for information report
- EMC: Interference immunity with class 4 level.
- Low power consumption of only 0.5W normally
- Operating temperature :- 40 ° C~+85° C



Products

Extending the Ethernet

GPS

GPS Clock Synchronization Module

IRIG-B

IRIG-B Output Module

PTP over E1

PTP over E1/T1 Precisie Time Interface Module

PRP/HSR

PRP/HSR Interface Module

Serial

4 Port Serial Device Server Interface Module

TMS

TMS Trigger Interface Module

SICOM3306PT

PTC1000

Ruby3

Accurate Timing Solution & Intelligent Gateway

Time sever

PTS-10/30

TESTER

ePT-100

DG-A2/A4

Industrial DIN Rail Protocol Gateway for Smart Grid

- Special designing based on ARM Cortex-A8 architecture
- High performance yet ultra low power consumption
- Easy IEC 61850 SCL(CID/ICD) import and configuration
- Configurable MMS (IEC 61850-8-1) server & client application
- Support GOOSE publish and subscribe
- Advanced online internal calculating task
- Configurable hardware watchdog
- Full functional NTP for time synchronization
- Dual mode of RS232/RS485 isolated serial ports
- 10/100M IEEE 802.3 Ethernet ports
- Support 3G GPRS wireless communication
- Remote diagnosis or maintenance by network
- Compliant to IEC 61850-3, IEEE 1613 standards

Overview

As the compact protocol gateway for system integrated application, DG-A2/A4 is designed in conformity with the new IEC 61850 standards. It can be anywhere deployed to be a smart unit to transfer data by its RS232/RS485 serial ports and Ethernet ports. By importing any pre-specified IEC 61850 SCL(.icd/.cid) template file and after mapping the data to internal VMD model with the configuration tool - ICE, this unit can be viewed just as the standard IEC 61850 IED from the master station.

With powerful data communication and process function, high reliability, low power consumption, flexible and easy installation advantages, DG-A is the ideal intelligent device choice for all kinds of system integrated applications.

Features & Benefits

Hardware Parameters

Performance: ARMv7 800MHz Core
RAM: 512M DDR2-333
Build-in storage: 512M Nand Flash
Extra storage: 8G/64G Micro SD(Optional)
Ethernet: 10/100Base-T
Serial Ports: RS232/RS485(Isolated)
Wireless Port: 3G GRPS

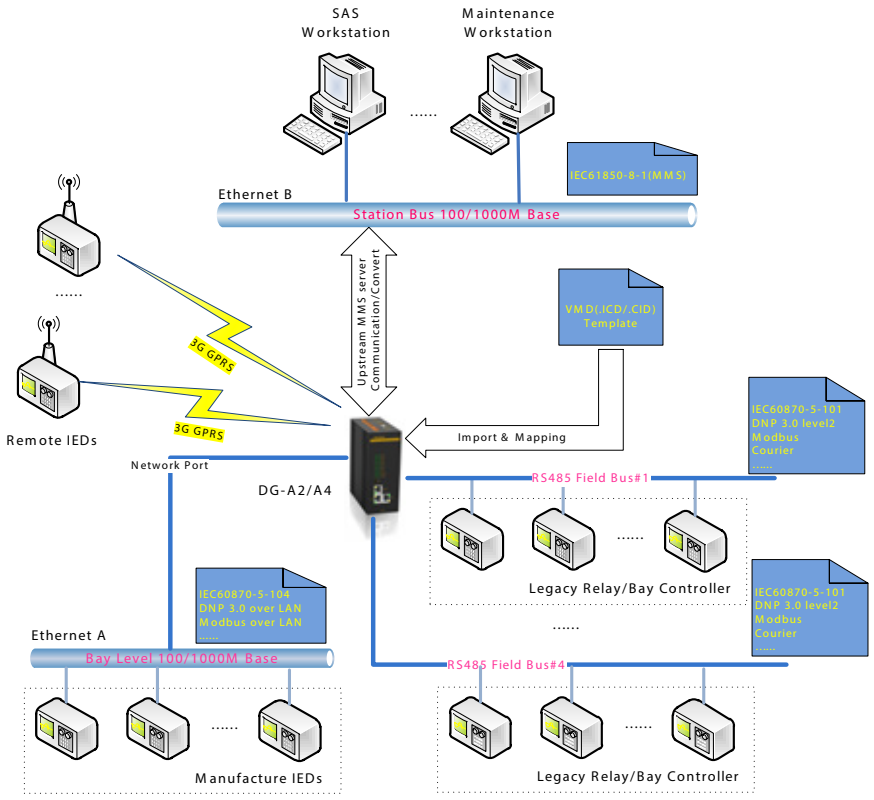
Firmware

DNP 3.0 Level-2 slave/master over serial port or LAN
Modbus(RTU/ASCII)/Modbus slave/master over serial port and LAN
IEC 60870-5-101/104 salve/master
IEC 61850 MMS/GOOSE
Advanced online calculator
Hundred of customization

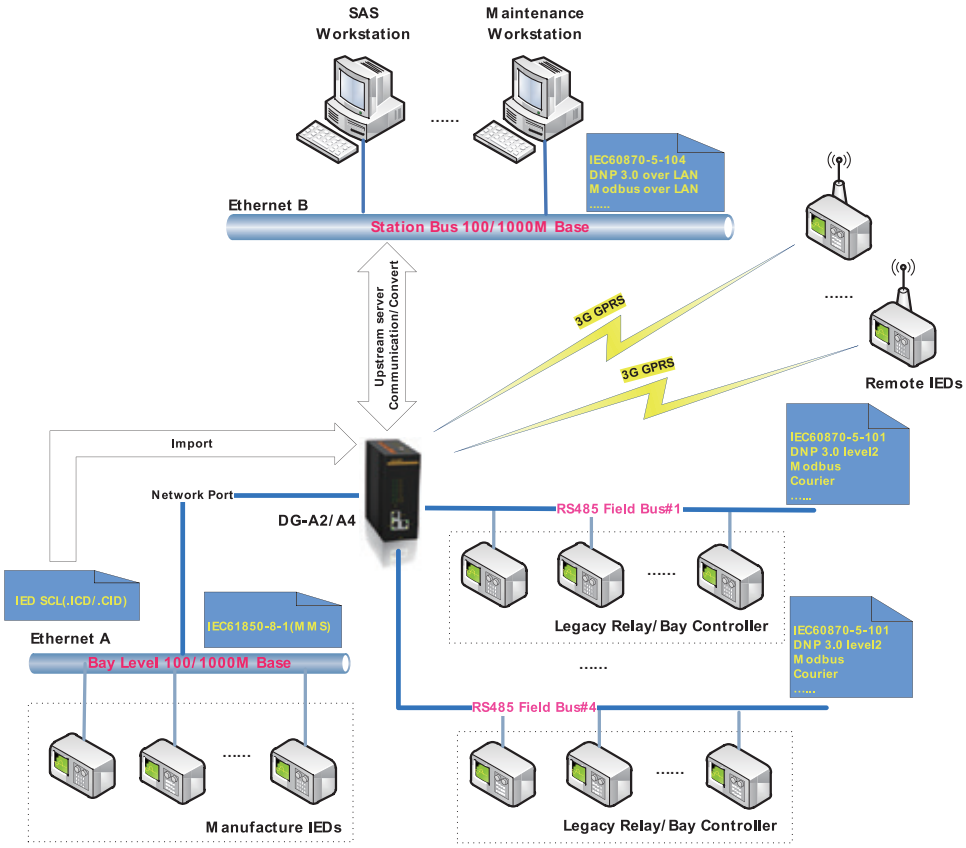
Technical Benefits

Easy framework configurable by all-in one integration tools
Later data binding & mapping technology without needing change SCL modeling file
Advanced data internal processing functionality

Typical Application



Convert traditional data to IEC 61850 MMS Server



Data concentrating with DG-A2/A4 gateway

Technical Parameters

Items	A2	A4
Console port	RS232, RJ45	RS232, RJ45
Serial ports	2 x RS232/RS485(Isolated)	4 x RS232/RS485(Isolated)
Ethernet	1 x 10/100M RJ45	2 x 10/100M RJ45
GPRS Module	1 x 3G Optional	1 x 3G Optional
Build-in storage	512M Nand Flash	512M Nand Flash
Extra storage	N/A	8G/64G Micro SD
Hardware Watchdog	Configurable	Configurable
Time synchronization	NTP	NTP
Power supply	12~24V DC/85~264V AC	12~24V DC/85~264V AC
Power consumption	< 5W	< 5W
Weight	0.5 kg	0.5 kg
Dimensions(W*H*D)	48mmx138mmx86mm	54mmx139mmx118mm
Mounting	DIN rail	DIN rail
Operating Temperature	- 40°C to +85°C	- 40°C to +85°C

Electrical Parameter

- Input: 12~24V DC or 85~264V AC
- Average power consumption: 5W
- Relative humidity : 5%~ 95% (no condensation)
- Electrostatic discharge immunity test: GB/T 17626.2-1998 IEC 61000-4-2-1995 class 4
- Transient immunity: GB/T 17626.4-1998 IEC 61000-4-4-1995 class 4
- Surge immunity: GB/T 17626.5-1998 IEC 61000-4-5-1995 class 4
- Power frequency magnetic fields immunity: GB/T 17626.8-1998 IEC 61000-4-8-1995 class 5
- Ring waves immunity: GB/T 17626.12-1998 IEC 61000-4-12-1995 class 4
- Pulse magnetic field immunity: GB/T17626.9-1998 IEC 61000-4-9-1995 class 5
- Damped oscillatory magnetic field immunity: GB/T17626.10-1998 IEC 61000-4-10-1995 class 4
- Voltage dips and short interruptions and voltage variations immunity: GB/T 15153.1-1998 IEC 61000-4-11 2004 Δ U-100%, Δ t = 0.5s
- Insulation resistance: >5MΩ
- Insulating strength: no breakdown when applying 500V and 1500V to the communication ports and power supply ports respectively
- Dry heat test: GB/T2423.2-2001 IEC 60068-2-2 75°C, 24 hours
- Cold test: GB/T2423.1-2001 IEC 60068-2-1 -25°C, 24 hours
- Damp heat: GB/T2423.3-1993 IEC 60068-2-3 +40°C ± 2°C, 93% ± 3%, insulation
- resistance: >1MΩ

Ordering Information

	TYPE	POWER	ETHERNET	SERIAL PORT	EXTENTION FLASH STORAGE	WIRELESS EXT	F/W	
DGW	-A2X	-C	-1	0	0	D	-E	G
TYPE								
DG-A2(DIN Rail)								
POWER								
85~265V AC /100~375V DC		1						
12 ~ 24V DC		5						
ETHERNET								
1 x 10/100M BASE-T								
SERIAL PORT								
2 x RS232/RS485 SERIAL PORTS								
EXTENTION FLASH STORAGE								
N/A					0			
WIRELESS EXTENTION								
N/A						0		
GPRS						1		
FIRMWARE								
DEFAULT (IEC 101/104/DNP 3.0/Modbus Slave/Master)							0	0
DG-A4(MMS Server)							A	4
DG-A5(MMS Client)							A	5
DG-A6(MMS Client/Server)							A	6

	TYPE	POWER	ETHERNET	SERIAL PORT	EXTENTION FLASH STORAGE	WIRELESS EXT	F/W	
DGW	-A4X	-C	-1	0	D	D	-E	G
TYPE								
DG-A4(DIN Rail)								
POWER								
85~265V AC /100~375V DC		1						
12 ~ 24V DC		5						
ETHERNET								
2 x 10/100M BASE-T								
SERIAL PORT								
4 x RS232/RS485 SERIAL PORTS								
EXTENTION FLASH STORAGE								
N/A					0			
8G BYTES					1			
64G BYTES					3			
WIRELESS EXTENTION								
N/A						0		
GPRS						1		
FIRMWARE								
DEFAULT (IEC 101/104/DNP 3.0/Modbus Slave/Master)							0	0
DG-A4(MMS Server)							A	4
DG-A5(MMS Client)							A	5
DG-A6(MMS Client/Server)							A	6

DG-A8/A16

Industrial Rackmountable Gateway for Smart Grid

- Special designing based on ARM Cortex-A8 architecture
- High performance yet ultra low power consumption
- Easy IEC 61850 SCL(CID/ICD) import and configuration
- Configurable MMS (IEC 61850-8-1) server & client application
- Support GOOSE publish and subscribe
- Advanced online internal calculating task
- Configurable hardware watchdog
- Full functional NTP for time synchronization
- Support IRIG-B DC time synchronization
- Dual mode of RS232/RS485 isolated serial ports
- 10/100M IEEE 802.3 Ethernet ports
- Support CAN bus communication
- Remote diagnosis or maintenance by network
- Compliant to IEC 61850-3, IEEE 1613 standards

Overview

As the 1U, 19 inch standard rack-mount data concentrating unit for system,DG-AX series are designed in conformity with the IEC 61850 standards. It can be deployed to be an intelligent unit to collect data by all its RS232/RS485 serial ports, CAN bus ports and Ethernet ports. By importing any pre-specified IEC 61850 SCL(.icd/.cid) template file and after mapping the data to internal VMD model with the configuration tool - ICE, the unit can be viewed just as the standard IEC 61850 IED from the master station.

With powerful data communication and process function, high reliability, low power consumption, flexible and easy installation advantages, DG-AX series are the ideal intelligent device choice for any kinds of system integrated solutions.

Features & Benefits

Hardware Parameters

Performance: ARMv7 800MHz Core
RAM: 512M DDR2-333
Build-in storage: 512M Nand Flash
Extra storage: 8G/64G Micro SD(Optional)
Ethernet: 10/100Base-T
Serial Ports: RS232/RS485(Isolated)
Field Bus: CAN Ports

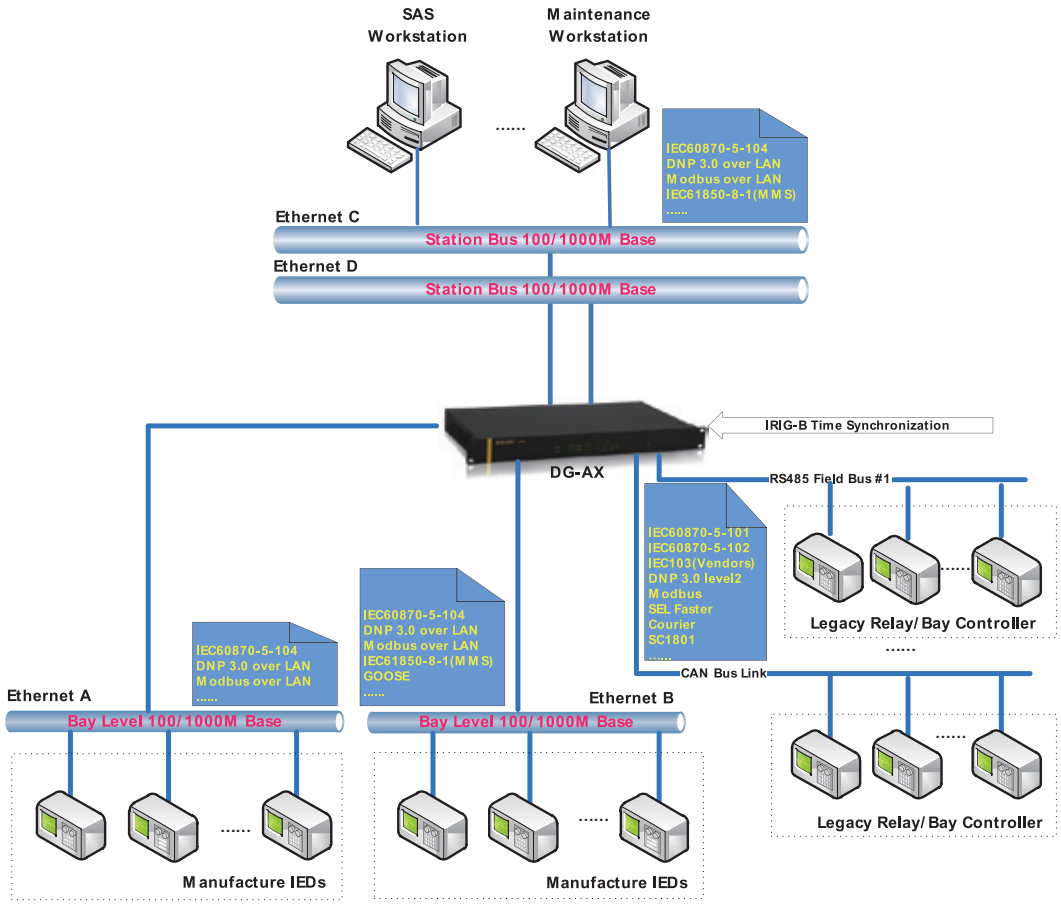
Firmware

DNP 3.0 Level-2 slave/master over serial port or LAN
Modbus(RTU/ASCII)/Modbus slave/master over serial port and LAN
IEC 60870-5-101/104 salve/master
IEC 61850 MMS/GOOSE
Advanced online calculator
Hundred of customization

Technical Benefits

Easy framework configurable by all-in one integration tools
Later data binding & mapping technology without needing change SCL modeling file
Advanced data internal processing functionality

Typical Application



Data concentrating with DG-AX series gateway

Technical Parameters

Item	A8	A16
Console port	RS232, RJ45	RS232, RJ45
Serial ports	8xRS232/RS485(Isolated)	8xRS232/RS485(Isolated)+8xRS485
Ethernet	4 x 10/100M RJ45	4 x 10/100M RJ45
Field Bus	2 x CAN Bus Ports	1 x CAN Bus port
Build-in storage	512M Nand Flash	512M Nand Flash
Extra storage	8G/64G Micro SD	8G/64G Micro SD
Hardware Watchdog	Configurable	Configurable
Time synchronization	NTP	NTP and IRIG-B DC
Power supply	85 ~ 264V AC	85 ~ 264V AC
Power consumption	< 8W	< 8W
Weight	3 kg	3 kg
Dimensions(W*H*D)	483mm x 45mm x 200mm	483mm x 45mm x 200mm
Mounting	1U, 19" rack-mount	1U, 19" rack-mount
Operating Temperature	- 40°C to +85°C	- 40°C to +85°C

Electrical Parameter

Input: 85 ~ 264V AC
Average power consumption: 5W
Relative humidity : 5%~ 95% (no condensation)
Electrostatic discharge immunity test: GB/T 17626.2-1998 IEC 61000-4-2-1995 class 4
Transient immunity: GB/T 17626.4-1998 IEC 61000-4-4-1995 class 4
Surge immunity: GB/T 17626.5-1998 IEC 61000-4-5-1995 class 4
Power frequency magnetic fields immunity: GB/T 17626.8-1998 IEC 61000-4-8-1995 class 5
Ring waves immunity: GB/T 17626.12-1998 IEC 61000-4-12-1995 class 4
Pulse magnetic field immunity: GB/T17626.9-1998 IEC 61000-4-9-1995 class 5
Damped oscillatory magnetic field immunity: GB/T17626.10-1998 IEC 61000-4-10-1995 class 4
Voltage dips and short interruptions and voltage variations immunity: GB/T 15153.1-1998 IEC 61000-4-11 2004 Δ U-100% , Δ t = 0.5s
Insulation resistance: >5MΩ
Insulating strength: no breakdown when applying 500V and 1500V to the communication ports and power supply ports respectively
Dry heat test: GB/T2423.2-2001 IEC 60068-2-2 75°C, 24 hours
Cold test: GB/T2423.1-2001 IEC 60068-2-1 -25°C, 24 hours
Damp heat: GB/T2423.3-1993 IEC 60068-2-3 +40°C ± 2°C, 93% ± 3%, insulation resistance: >1MΩ

Ordering Information

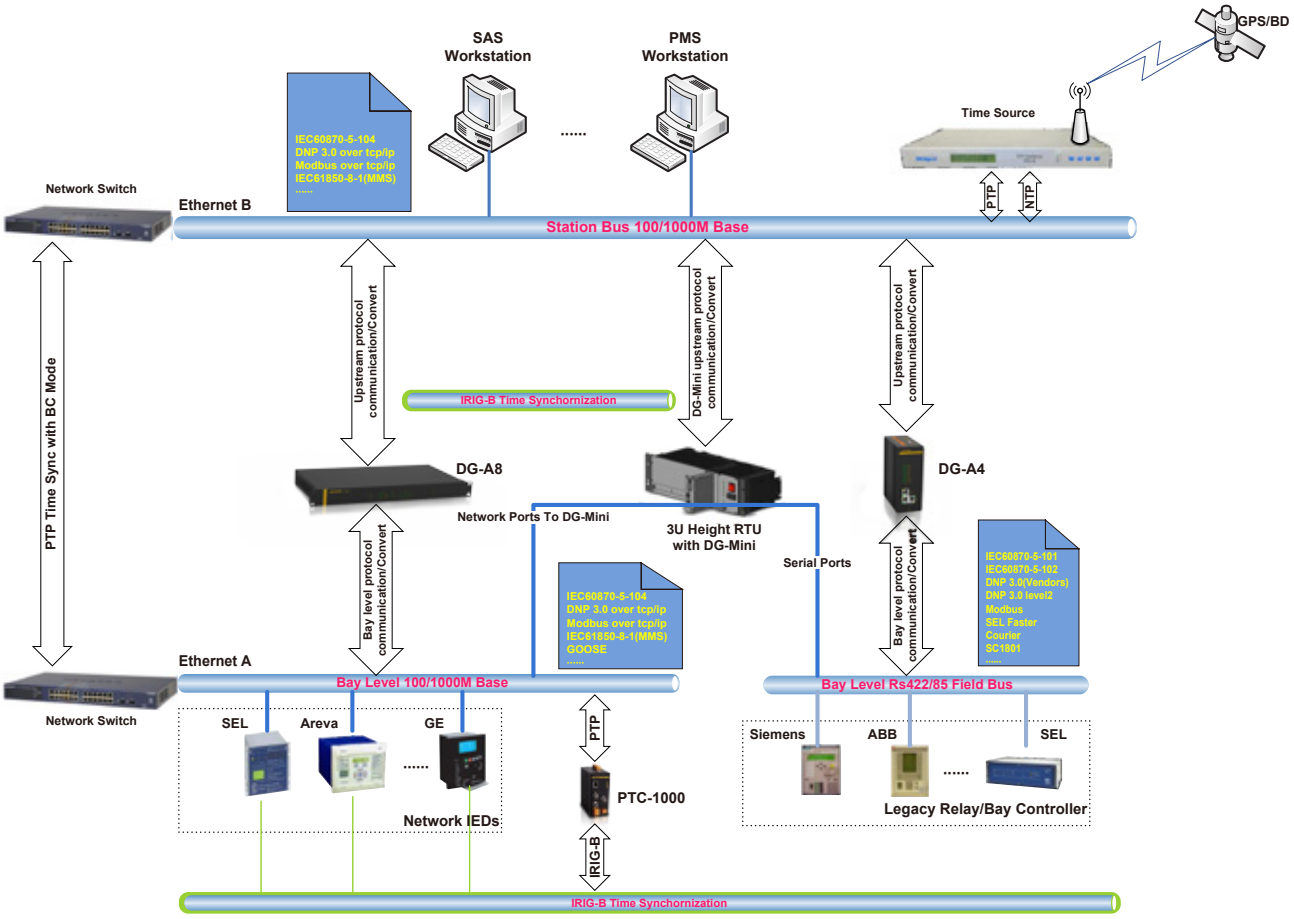
	TYPE	POWER	ETHERNET	SERIAL PORT	EXTENTION FLASH STORAGE	CAN PORTS	F/W	
DGW	-A8X	-1	-1	D	D	1	-E	G
TYPE								
DG-AX(1U,19" Rack Mount)								
POWER								
85~265V AC /100~375V DC								
ETHERNET								
4 x 10/100M BASE-T								
SERIAL PORT								
8 x RS232/RS485 SERIAL PORTS				1				
8 x RS232/RS485 + 8 x RS485 SERIAL PORTS				2				
EXTENTION FLASH STORAGE								
N/A					0			
8G BYTES					1			
64G BYTES					3			
CAN PORT								
1|2 x CAN (DEFAULT)								
FIRMWARE								
DEFAULT (IEC 101/104/DNP 3.0/Modbus Slave/Master)							0	0
DG-A4(MMS Server)							A	4
DG-A5(MMS Client)							A	5
DG-A6(MMS Client/Server)							A	6

Smart Solution in Automation and Integration for Smart Grid

DG series devices is an industrial class yet multipurpose family of communication gateway that integrates modern communication technology and robust embedded design by concern of high reliability, high stability and low power consumption features. It is capable of protocol conversion, data concentration and data processing. It is easy to be managed in any complicated system across the enterprise.

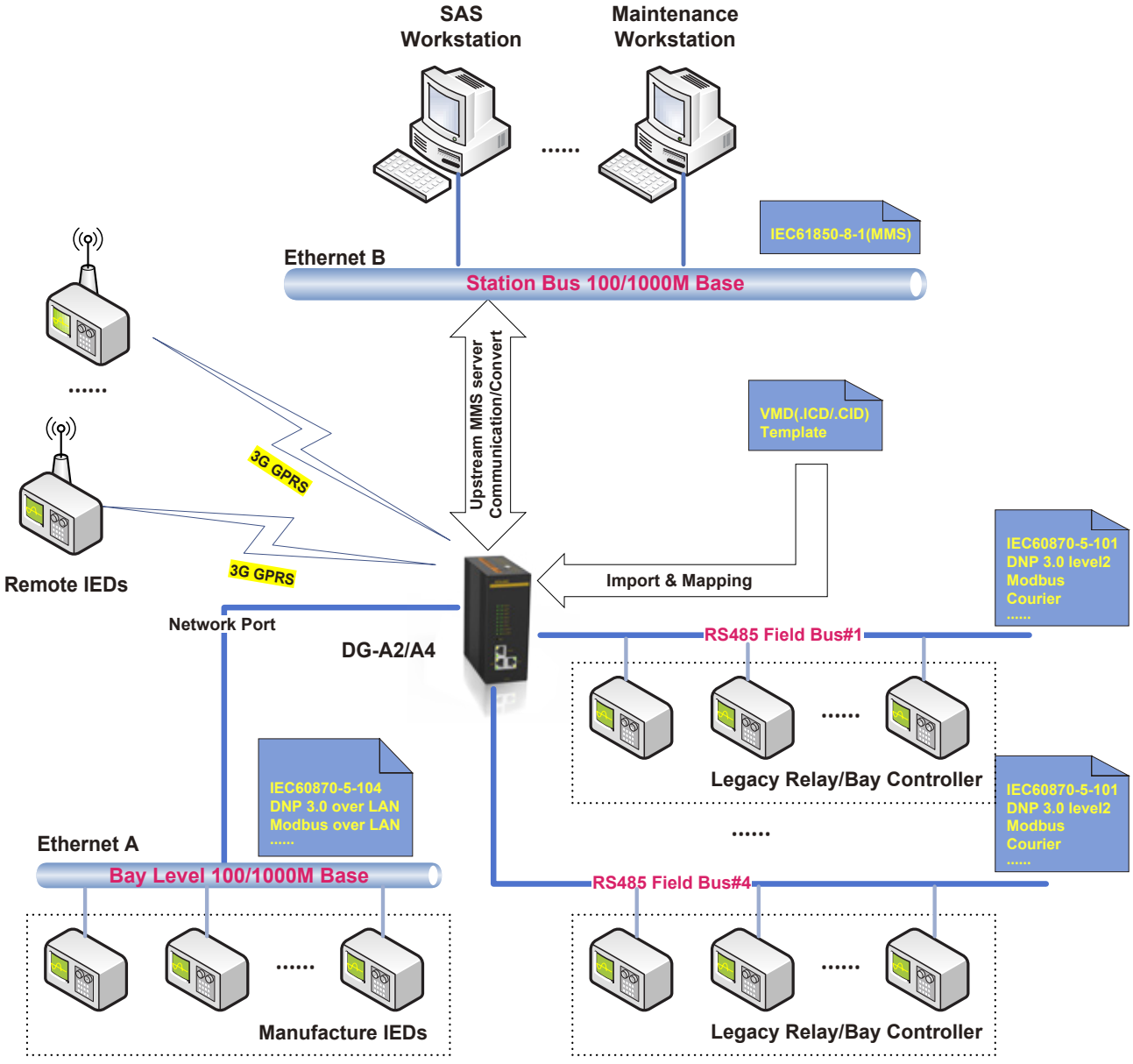
Protocol Convert by Store-And-Deliver

DG gateway can provide the very flexible internal data processing method during protocol communicaiton.



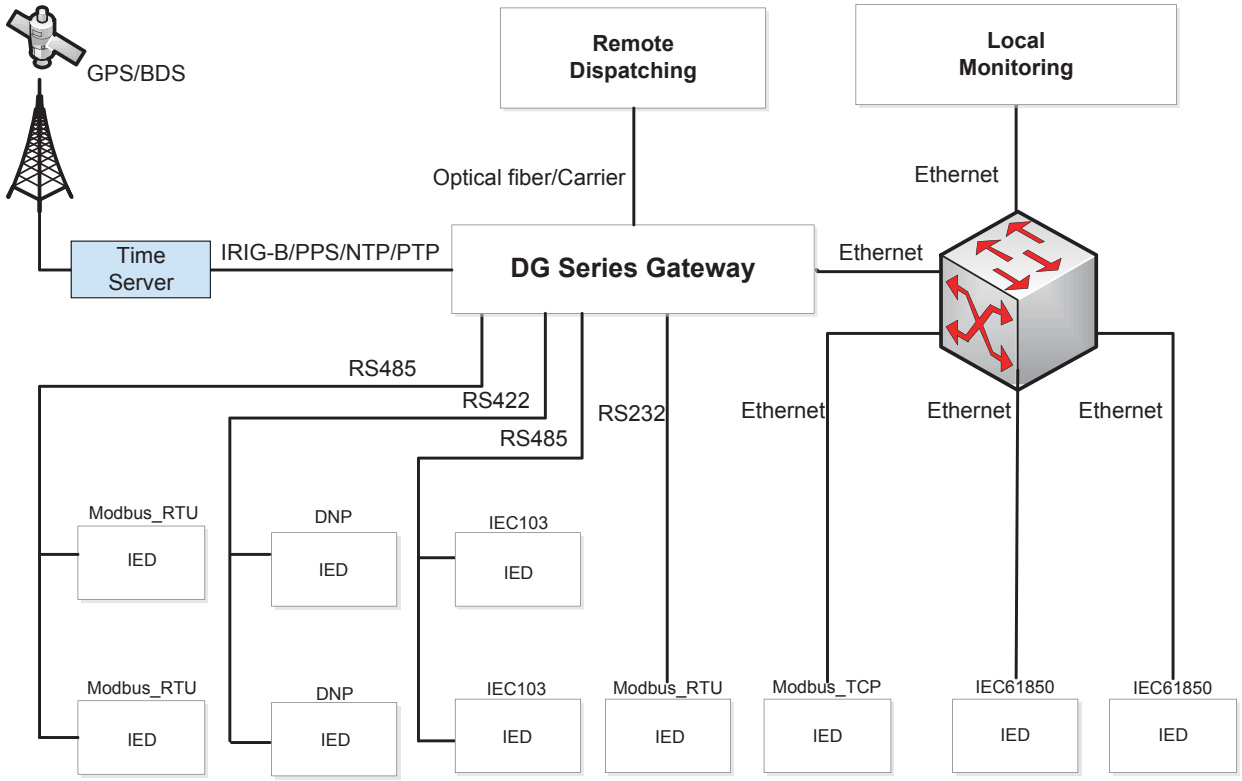
IEC 61850 communication bridge

DG gateway is designed in conformity with the IEC 61850 standards. It can be deployed to be an intelligent proxy unit to collect data by both serial ports and Ethernet ports. By importing any pre-defined IEC 61850 SCL(.icd/.cid) template file and mapping the data to internal VMD model with the configuration tool - ICE, the unit can be viewed just as the standard IEC 61850 virtual IED(eg. Logical IEC 61850 IED) from its master side.



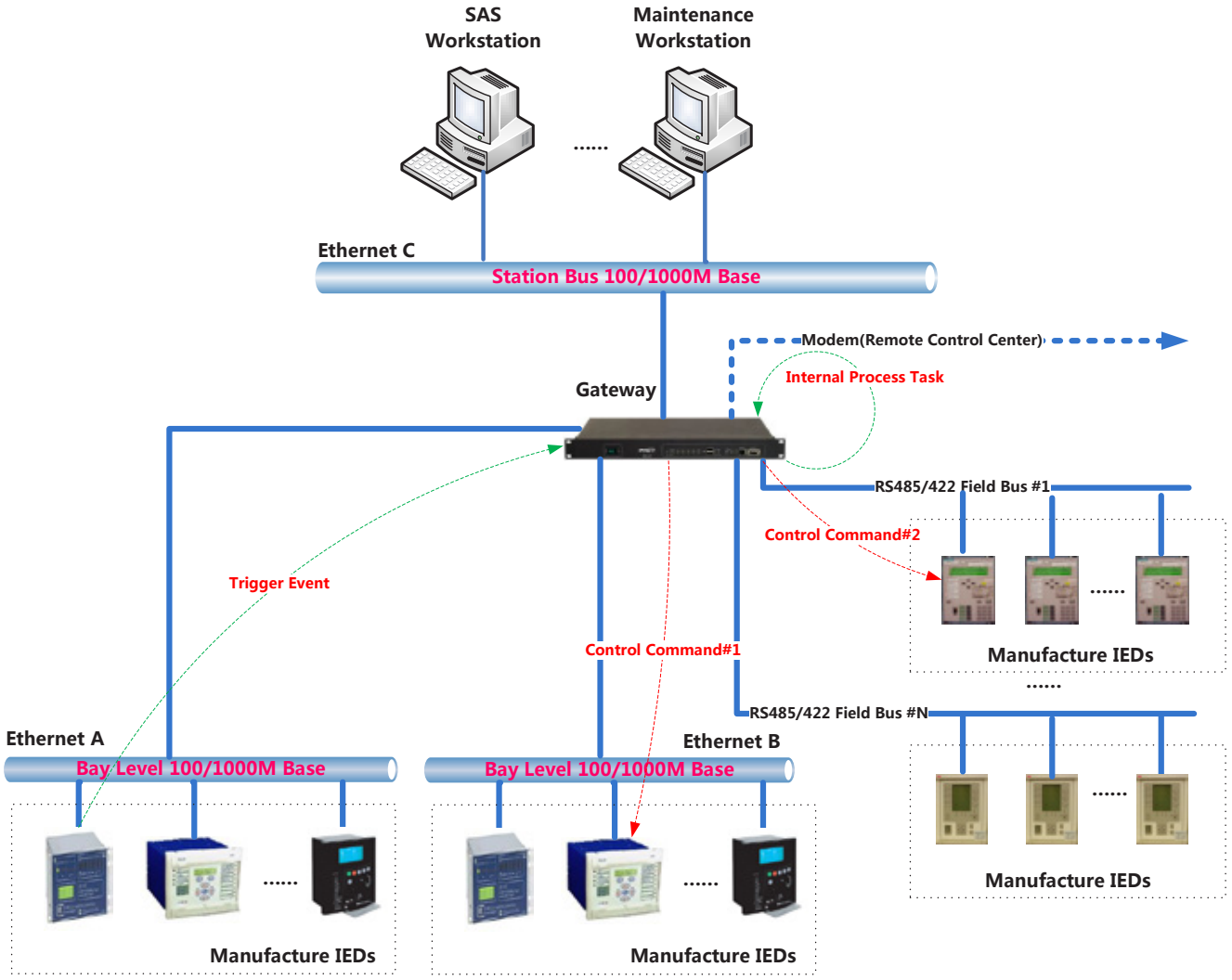
Substation Automation

Not only collect various data from the IEDs, the gateway also can be time synchronized to time server through IRIG-B, NTP etc. Thus will ensure validity for the monitoring real-time data.



Advanced Task

When using advanced task in DG gateway, Engineer can program on-line with E-script language which is provided with the ICE configuration toolset to implement even complex operation. Such as logical calculation, accumulation, strategy control, batch processing control etc.



All detail certification status and the latest product information can be found on www.kyland.com.
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