



AVCOMM®

8010GX2-L3

Datasheet

Aiming to create better and safer working environments and life experiences through the products we deliver.



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Layer 3 Switch with Cyber Security and Enhanced ERPS v2 for Critical Applications

8010GX2-L3

Industrial 10-port Full Gigabit Managed Ethernet Switch, 8GT+2GSFP

The 8010GX2-L3 is the first full Gigabit Managed Switch with Layer 3 routing functions. It gives you more flexibility in planning your large-scale IP network. 8010GX2-L3 supports various routing protocols such as IP/VLAN routing, RIP, OSPF, VRRP router redundancy, which are fully compatible with your backbone network. The 8010GX2-L3 provides 10-port full-gigabit Ethernet including 8-port Gigabit RJ45 and 2-port 100M/1G SFP, the switch provides reliable IP network with high performance. Advanced Cyber Security and redundancy features of 8010GX2-L3 guarantee the fastest network recovery, zero packet loss data transmission, and high level of network protection against the hackers' attacks.



Full Gigabit Switching and Ultra-high Throughput

- 10-port Full Gigabit Ethernet with 8-port RJ-45 and 2-port SFP
- 16K MAC address table
- 1.5MByte packet buffer memory for H.264 burst
- 9K bytes jumbo frame
- Store-and-forward with non-blocking switch fabric

Dynamic Routing with Redundancy Protection

- RIPv1&v2, OSPFv1&v2 for intra-domain routing within an autonomous system
- Efficient unicast/multicast static routing
- VRRP guarantees sustainable routing in a single point of failure

ITU-T G.8032 v1/v2 ERPS Ring Redundancy

- An ITU standard Ring redundancy Protocol
- Provide sub-50ms protection and recovery switching for Ethernet traffic
- Interoperate with 3rd party industrial switch and still remain fast recovery time
- Interoperate with commercial switch instead of STP/RSTP
- Efficient network interconnection and topology with ERPS Chain, multiple chains

IEC62443-4-2 Level 3 / 4 Cyber Security*

- L2-L7 IPv4/IPv6 Access Control List (ACL)
- DHCP Snooping, IP Source Guard, Dynamic ARP Inspection
- 802.1Q VLAN, Private VLAN, Advanced Port Security
- Multi-Level user passwords
- HTTPS/SSH/SFTP, 256-bit encryption
- 802.1X MAB for non-802.1X compliant end devices
- RADIUS/TACACS+ centralized password authentication

Rugged Design for Wayside Surveillance

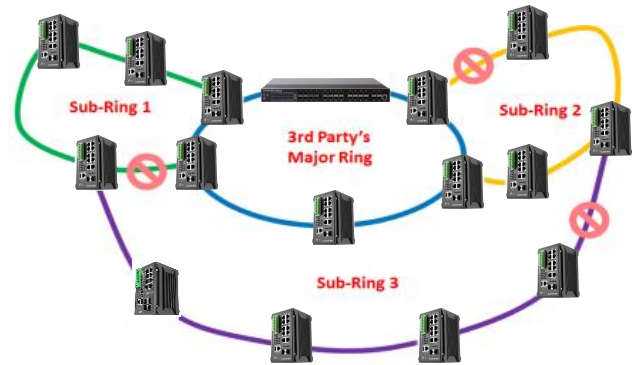
- EN50121-4 for railway trackside applications
- Top level EMC protection and excellent heat dissipation design for operating in -40°C~75°C environment
- IEC 61000-6-2/4 Heavy Industrial Environment

L3+ Management Features

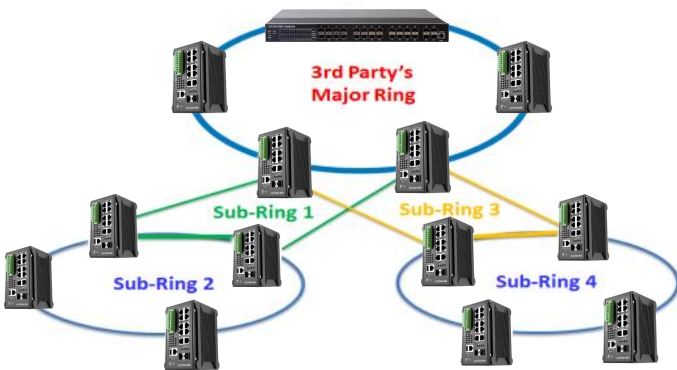
- Various configuration paths, including WebGUI, CLI, SNMP and RMON
- IEEE 1588v1/v2 PTP time management
- LLDP topology control
- Software utility interface for LAN devices management
- NMS for individual component monitoring

✓ **ITU-T G.8032 ERPSv2 gives ultimate Inter-Operability, Flexibility, and Scalability**

G.8032 v.2 ERPS is becoming the most common standard for redundancy on industrial networks and replacing proprietary ring redundancy and standard Ethernet Ring Switching, as it provides stable protection of the entire Ethernet Ring from any loops and open standard for 3rd party devices. The ITU-T G.8032 v2 ERPS recovers the network break within less than 20ms recovery time thus significantly increases network reliability for critical IIoT applications, such as heavy industrial automation (power substation and oil and gas vertical markets), ITS (traffic control, public transportation), railway networks, and other smart city applications concerning public safety.



G.8032 v1 only supports single ring topology, whilst G.8032 version 2 additionally features recovery switching for Ethernet traffic in Multiple Ring (ladder) of conjoined Ethernet Rings by one or more interconnections which saves deployment costs by providing wide-area multipoint connectivity with reduced number of links. Deploying switches with support of G.8032 v2 ERPS ensures highly resilient Ethernet infrastructure whilst simultaneously saving costs, as they can interoperate with third-party switches and still guarantee fast network recovery time without any data loss.

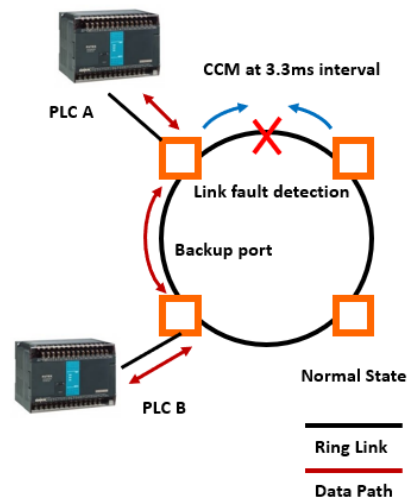
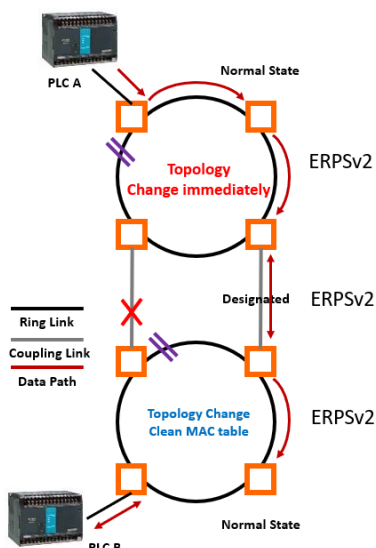


✓ **ITU ERPS v2 PLUS Technology – Fast Giga Copper Recovery Time**

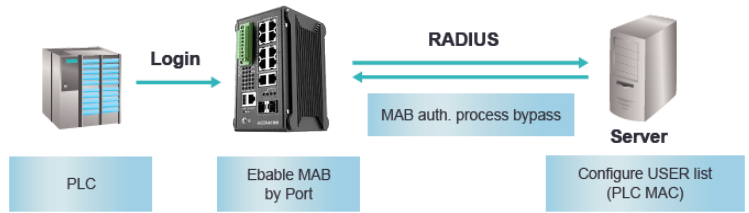
✓ **ITU-T G.8032 ERPSv2 reduces coupling Ring failure recovery time**

The G.8032 ERPS v2 technology effectively saves the recovery time for coupling ring link breakdown from 300 sec to less than 20ms by immediately change the topology of both major ring and sub ring.

The adaption of Broadcom® CFM Technology can reduce CFM Transmission for link failure within 3.3ms, thus to detect the ring link fault within 11.55ms (3.5 times the CFM Interval) for ERPSv2 mechanism to respond. Once the ring port fails, the ERPS RPL-Owner will forward the backup port and recover the GbE copper within 20ms under the condition that 250pcs nodes in one ring.

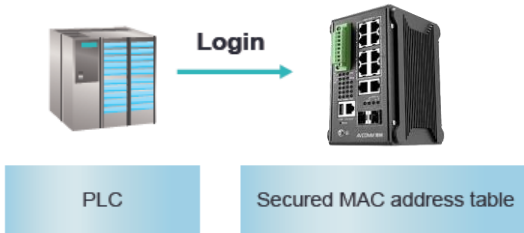


MAB enables port-based access control by bypassing the MAC address authentication process to TACACS+/Radius Server. Prior to MAB, the endpoint's (ex. PLC) identity is unknown and all traffic is blocked. The switch examines a single packet to learn and authenticate the source MAC address. After MAB succeeds, the endpoint's identity is known and all traffic from that endpoint is allowed. The switch performs source MAC address filtering to help ensure that only the MAB-authenticated endpoint is allowed to send traffic.



In addition to MAB, the authentication can also be done by the pre-configured static or auto-learn MAC address table in the switch.

- MAC address Auto Learning enables the switch to be programmed to learn (and to authorize) a preconfigured number of the first source MAC addresses encountered on a secure port. This enables the capture of the appropriate secure addresses when first configuring MAC address-based authorization on a port. Those MAC addresses are automatically inserted into the Static MAC Address Table and remained there until explicitly removed by the user.
- The port security is further enhanced by Sticky MAC setting. If Sticky MAC address is activated, the MACs/Devices authorized on the port 'sticks' to the port and the switch will not allow them to move to a different port.
- Port Shutdown Time allows users to specify for the time period to auto shutdown the port if a security violation event occurs.



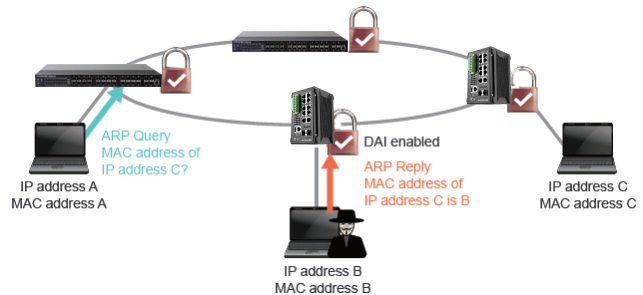
✓ DHCP Snooping

DHCP snooping acts like a firewall between untrusted hosts and trusted DHCP servers. It performs the following activities:

- Validates DHCP messages received from untrusted sources and filters out invalid messages.
- Rate-limits DHCP traffic from trusted and untrusted sources.
- Builds and maintains the DHCP snooping binding database, which contains information about untrusted hosts with leased IP addresses.
- Utilizes the DHCP snooping binding database to validate subsequent requests from untrusted hosts.

DHCP snooping is enabled on a per-VLAN basis. By default, the feature is inactive on all VLANs. You can enable the feature on a single VLAN or a range of VLANs.

✓ Dynamic ARP Inspection (DAI)

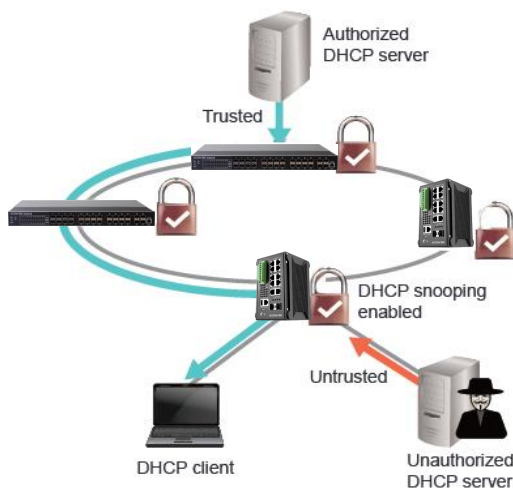


DAI validates the ARP packets in a network. DAI intercepts, logs, and discards ARP packets with invalid IP-to-MAC address bindings. This capability protects the network from some man-in-the-middle attacks.

DAI ensures that only valid ARP requests and responses are relayed. The switch performs these activities:

- Intercepts all ARP requests and responses on untrusted ports
- Verifies that each of these intercepted packets has a valid IP-to-MAC address binding before updating the local ARP cache or before forwarding the packet to the appropriate destination
- Drops invalid ARP packets.

DAI determines the validity of an ARP packet based on valid IP-to-MAC address bindings stored in a trusted database, the DHCP snooping binding database. This database is built by DHCP snooping if DHCP snooping is enabled on the VLANs and on the switch. If the ARP packet is received on a trusted interface, the switch forwards the packet without any checks. On untrusted interfaces, the switch forwards the packet only if it is valid.



IP source guard provides source IP address filtering on a Layer 2 port to prevent a malicious host from impersonating a legitimate host by assuming the legitimate host's IP address. The feature uses dynamic DHCP snooping and static IP source binding to match IP addresses to hosts on untrusted Layer 2 access ports.

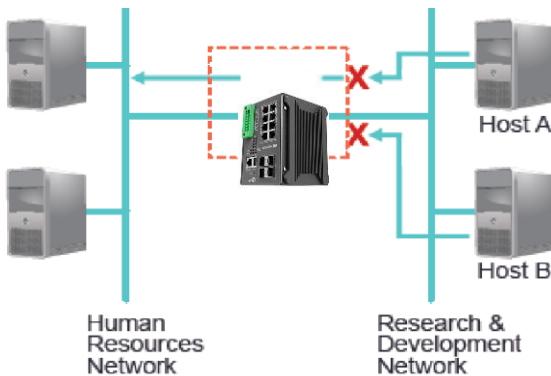
Initially, all IP traffic on the protected port is blocked except for DHCP packets. After a client receives an IP address from the DHCP server, or after static IP source binding is configured by the administrator, all traffic with that IP source address is permitted from that client.

Traffic from other hosts is denied. This filtering limits a host's ability to attack the network by claiming a neighbor host's IP address.

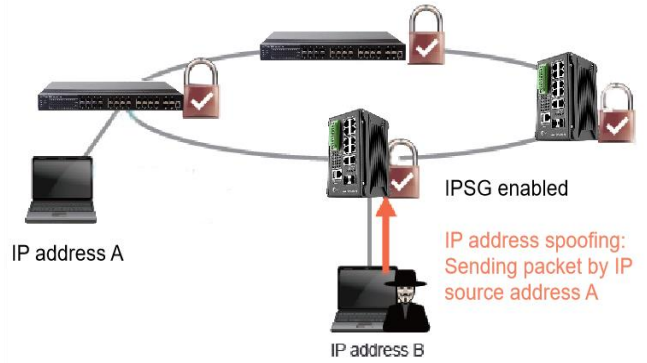
✓ IPv4/v6 Access Control List (ACL)

Packet filtering limits network traffic and restricts network use by certain users or devices. ACLs filter traffic as it passes through a switch and permits or denies packets crossing specified interfaces. An ACL is a sequential collection of permit and deny conditions that apply to packets. When a packet is received on an interface, the switch compares the fields in the packet against any applied ACLs to verify that the packet has the required permissions to be forwarded, based on the criteria specified in the access lists.

The Switch supports L2-L7 ACLs, parsing up to 128 bytes/packet and L2-L7 packet classification and filtering IPv4/IPv6 traffic, including TCP, User Datagram Protocol (UDP), Internet Group Management Protocol (IGMP), and Internet Control Message Protocol (ICMP).

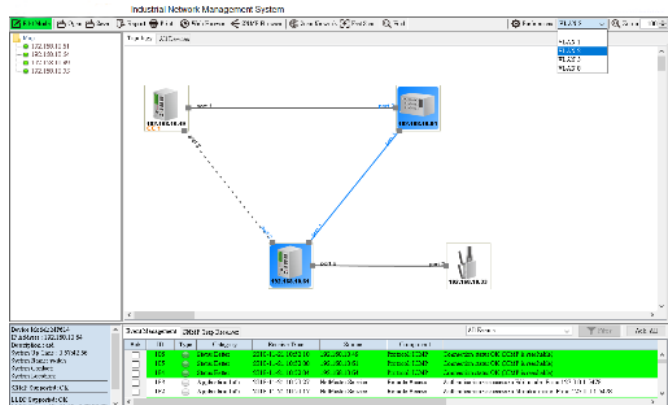
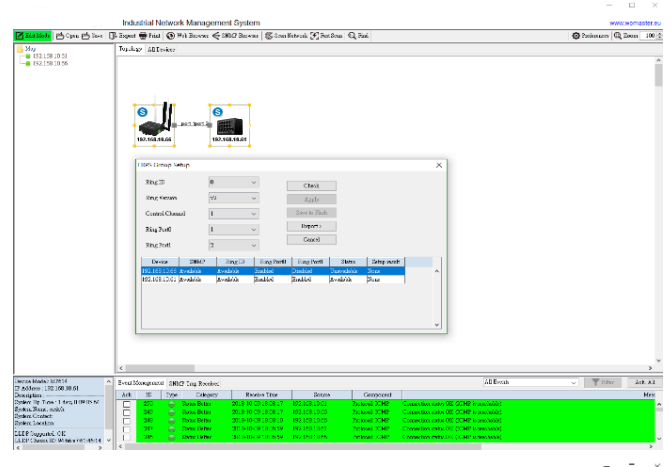


X = ACL denying traffic from Host B and permitting traffic from Host A
← = Packet



✓ NMS ANMS Made Easy Deploy and Visualize Large Scale of ERPS Ring and VLAN

It is very time consuming and technical to set up a large group of ERPS v2 ring. However, ANMS NMS provides a smart way to configure a group of ERPS ring and visualize ERPS major/sub ring in purple/yellow color. With VLAN visualization, devices, ports, and links with the VLAN ID will be colored-coded.



✓ Multi-Level User Passwords

Different centralized authentication server is supported such as RADIUS and TACACS+. Using a central authentication server simplifies account administration, in particular when you have more than one switches in the network.

Authentication Chain is also supported. An authentication chain is an ordered list of authentication methods to handle more advanced authentication scenarios. For example, you can create an authentication chain which first contacts a RADIUS server, and then looks in a local database if the RADIUS server does not respond.





Ordering Information

Model Name	Description
8010GX2-L3	10-Port Layer3 Fully Managed Industrial Ethernet Switch, 8 RJ45 Ports 10/100/1000Base-T(X), 2 SFP Slots 1000BaseSFP+, DIN-Rail, Dual Power Input 12-48VDC, -40°C-75°C
8010GX2-L3-PS	8010GX2-L3, w/ 1 APS-30-24
8010GX2-L3-2SX	8010GX2-L3, w/ 2 AVC-SFP-SX
8010GX2-L3-2SX-PS	8010GX2-L3, w/ 1 APS-30-24 and 2 AVC-SFP-SX
8010GX2-L3-2LX-10	8010GX2-L3, w/ 2 AVC-SFP-LX-10
8010GX2-L3-2LX-10-PS	8010GX2-L3, w/ 1 APS-30-24 and 2 AVC-SFP-LX-10
8010GX2-L3-2LX-40	8010GX2-L3, w/ 2 AVC-SFP-LX-40
8010GX2-L3-2LX-40-PS	8010GX2-L3, w/ 1 APS-30-24 and 2 AVC-SFP-LX-40

Technology	
Standard	IEEE 802.3 10Base-T Ethernet
	IEEE 802.3u 100Base-TX Fast Ethernet
	IEEE 802.3u 100Base-FX Fast Ethernet Fiber
	IEEE 802.3ab 1000Base-T Gigabit Ethernet Copper
	IEEE 802.3z Gigabit Ethernet Fiber
	IEEE 802.3x Flow Control and back-pressure
	IEEE 802.1p Class of Service (CoS)
	IEEE 802.1Q VLAN and GVRP
	IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
	IEEE 802.1D-2004 Rapid Spanning Tree Protocol (RSTP)
	IEEE 802.1Q-2005 Multiple Spanning Tree Protocol (MSTP)
	IEEE 802.3ad Link Aggregation Control Protocol (LACP)
	IEEE 802.1x Port based Network Access Protocol
	IEEE 1588 Precision Time Protocol v1/v2
	ITU-T G.8032 Ethernet ring protection switching(ERPS)
Performance	
Switch Technology	Store and Forward Technology with non-blocking Switch Fabric
Number of MAC Address	16k
Packet Buffer Memory	1.5MBytes
Jumbo Frame	9216 Bytes
Transfer performance	10Base-TX: 14,880pps, 100Base-TX/FX: 148,800pps, 1000Base-TX/FX: 1,488,100pps
VLAN	256 VLANs
VLAN ID	1~4094
Class of Service	8 Priority Queues per Port
Watchdog	Hardware-based 10 seconds timer
Interface	
Ethernet Port	8010GX2-L3: 8 x 100/1000Base-T RJ45, Auto Negotiation, 2 x 100/1000M SFP, DDM
System LED	2 x Power: Green On, 1 x DO/Alarm: Red On
Ethernet Port LED	Link (Green On), Active (Green Blinking), Speed 1000M(Amber On), Speed 100M(Off)
SFP LED	Link (Green On), Active (Green Blinking), Speed 1000M(Amber On), Speed 100M(Off)
Reset	System Reboot(2-6 Seconds)/Default Settings Reset(over 7 Seconds)
Console	1 x RS232 in RJ45 for System Configuration. Baud Rate:115200.n.8.1
Power Input, Digital Input, Digital Output	8-Pin Removable Terminal Block Connector 4 Pins for Redundant Power 4 Pins for DI, DO (Relay Alarm) 1x Digital Output: Dry Relay Output with 0.5A /24V DC 1x Digital Input: DI with Photo-Coupler Isolation High: DC 11~30V Low: DC 0~10V

Power Requirement	
Input Voltage	24VDC (12~48VDC)
Reverse Polarity Protect	Yes
Input Current	0.67A @ 24V
Power Consumption	Max 16.08W@24VDC full traffic, suggest to reserve 15% tolerance
Software	
Management Interface	CGI WebGUI, Command Line Interface (CLI), Telnet, SNMP
Time Management	NTP, IEEE 1588 Precision Time Protocol v1/v2
Network Management	IPv4/IPv6, SNMP v1/v2c/v3/Trap, MIBs, RMON, LLDP, DHCP server/client/Option 82, TFTP, System Log, SMTP
Traffic Management	Flow Control, Port Trunk/802.3ad LACP, VLAN, Private VLAN, GVRP, GMRP, QinQ, QoS, IGMP Snooping v1/v2/v3, Rate Control, Storm Control, Port Mirror
Security	IEEE 802.1X/RADIUS, Private VLAN, ACL(MAC/IP filter), HTTPs/SSH secure login
Redundancy	Rapid Spanning Tree Protocol (RSTP)/Multiple Spanning Tree Protocol (MSTP) ITU-T G.8032 v1/v2 Ethernet Ring Protection Switching (ERPS) Virtual Router Redundancy Protocol (VRRP)
L3 Routing	Static/Dynamic IP Routing, VLAN Routing, RIP v1/v2(64 entries), OSPF v1/v2, IGMP and Multicast Routing (64 entries)
Mechanical	
Installation	DIN Rail
Enclosure Material	Steel Metal Additional Aluminum Side Heat Sink
Dimension	78 mm x155 mm x125 mm (W x H x D) / without DIN Rail Clip
Ingress Protection	IP41
Weight	~1285g without package
Environmental	
Operating Temperature	-40°C~75°C
Humidity	0%~95% Non- Condensing
Storage Temperature	-40°C~85°C
Hi-Pot Insulation	AC 1.5 KV
MTBF	>2,000,000 hours
Warranty	5 years
Standard	
Safety	IEC60950-1 Compliance
EMC	EN61000-6-2/EN61000-6-4
EMI	CISPR 22, FCC part 15B Class A
EMS	EN61000-4-2 ESD, EN61000-4-3 RS, EN61000-4-4 EFT, EN61000-4-5, EN61000-4-6 CS, EN61000-4-8 Magnetic Field
Railway	EN50121-4

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Function interface

System LED

- 2 x Power
- 1 x DO Alarm

DIN Clip

Integrated Power Connector

- 1 x 8-pin terminal block
- 4 pin for redundant power input
- 2 pin DI
- 2 pin DO
- Easy installation

Gigabit Fiber Ethernet

- 2-port 100/1000M SFP

Gigabit Ethernet

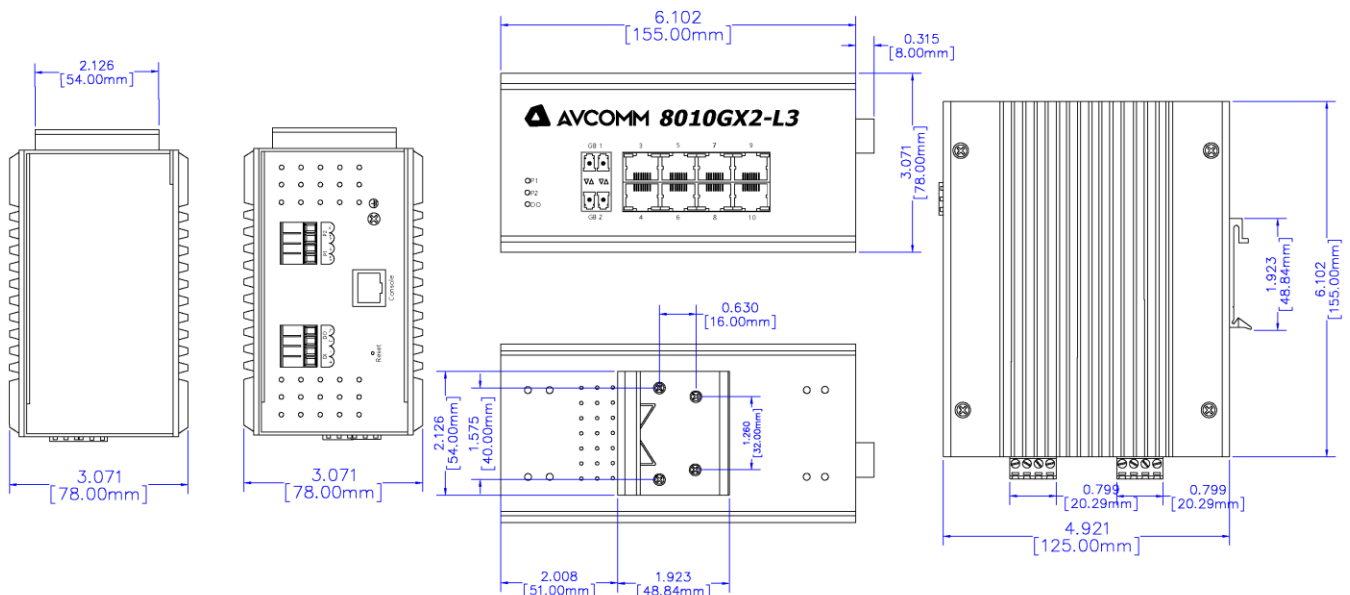
- 8-port 10/100/1000M RJ45

Easy System Management

- RS232 console

Installation dimensions

Unit: mm



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