

# DIREKTRONIK

## Industrial IP67-rated 4-Port 10/100/1000T 802.3at PoE+ 2-Port 10/100/1000T Managed Ethernet Switch



### Suitable for Industrial Environment

PLANET IGS-5227X-4P2T, an Industrial Layer 2+ Managed Ethernet Switch, comes with an IP67-rated industrial case, 4-port 10/100/1000T 802.3at PoE+, 2-port 10/100/1000T, and **static Layer 3 routing**, providing a high level of immunity against electromagnetic interference and heavy electrical surges which are usually found on plant floors or in curb-side traffic control cabinets. The IGS-5227X-4P2T can be easily mounted on a DIN rail or wall taking up less space. Each of the four Gigabit PoE+ ports provides 36 watts of power, which means a total power budget of up to **144 watts** can be utilized simultaneously without considering the different types of PoE applications being employed. It also provides a quick, safe and cost-effective Power over Ethernet network solution to IP security surveillance for small businesses and enterprises.



IP67 Rugged Case

2 x Waterproof and Dustproof Gigabit M12

4 x Waterproof and Dustproof Gigabit PoE+ M12

12-56V DC Waterproof and Dustproof M23 Redundant Power Input



### Physical Port

- **6-port 10/100/1000BASE-T waterproof and dustproof** M12 X-coded female connectors with 4-port IEEE 802.3at/af Power over Ethernet Injector function

### Power over Ethernet

- Complies with IEEE 802.3at Power over Ethernet Plus/end-span PSE
- Up to 4 IEEE 802.3af/802.3at devices powered
- Supports PoE power up to 36 watts for each PoE port (Port 3 to port 6)
- Auto detects powered device (PD)
- Circuit protection prevents power interference between ports
- Remote power feeding up to 100m
- PoE management features
  - PoE admin-mode control
  - PoE management mode selection
  - PoE Legacy mode selection
  - PoE Budget setup option
  - Per port PoE function enable/disable
  - PoE port power feeding priority
  - Per PoE port power limit
  - PoE Port Status monitoring
  - PD classification detection
  - Sequence port PoE
- Intelligent PoE features
  - Temperature threshold control
  - PoE usage threshold control
  - PoE extension
  - PoE schedule
  - PD alive check
  - LLDP PoE Neighbors

### Industrial Protocol

- Modbus TCP for real-time monitoring in the SCADA system
- IEEE 1588v2 PTP (Precision Time Protocol)

### Industrial Case and Installation

- IP67-rated aluminum case
- DIN-rail or wall-mount design
- 12-56V DC, redundant power with reverse polarity protection

### Waterproof and Dustproof M12 Ethernet Connector

The IGS-5227X-4P2T is equipped with a 6-port 10/100/1000BASE-T auto-negotiation dustproof M12 connector with 4-port IEEE 802.3at PoE+ (Port 3 to Port 6); each PoE port provides 36 watts PoE output. The M12 connector provides tight and strong connection, and guarantees stable Ethernet operation performance under high vibration and shock environment. It comes with the industrial protection rating of IP67 capable of withstanding humidity, dirt, dust, shock, vibrations, heat and cold. The IGS-5227X-4P2T is able to operate under the temperature range from **-40 to 75 degrees C**. All these features ensure the highest level of reliability for mission-critical applications in any difficult environment.



### Cybersecurity Network Solution to Minimize Security Risks

The IGS-5227X-4P2T supports SSHv2, TLS and SSL protocols to provide strong protection against advanced threats. It includes a range of cybersecurity features such as **DHCP Snooping**, **IP Source Guard**, **ARP Inspection** Protection, **802.1x port-based** and **MAC-based** network access control, **RADIUS** and **TACACS+** user accounts management, **SNMPv3** authentication, and so on to complement it as an all-security solution.

### Dual Power Input for High Availability Network System

The IGS-5227X-4P2T features a strong dual power input system (**Dual 12V~56V DC**) incorporated into customer's automation network to enhance system reliability and uptime. For example, when DC Power 1 fails to work, the hardware failover function will be activated automatically to keep powering the IGS-5227X-4P2T via DC Power 2 alternatively without any loss of operation.

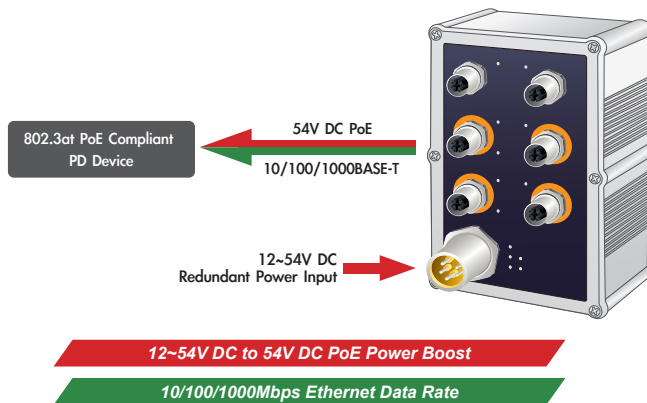
### Convenient and Reliable Power System

To facilitate the 802.3at PoE+ usage with commonly used 12~56V DC power input for transportation and industrial-level applications, the IGS-5227X-4P2T adopts **12~54V DC to 54V power boost technology** to solve power source issue but does not require special power supplies. The IGS-5227X-4P2T provides an integrated power solution with a wide range of voltages (12~56V DC) for worldwide operability. It also provides dual-redundant, reversible polarity 12~56V DC power supply inputs for high availability applications.

- Supports 6KV DC Ethernet ESD protection
- -40 to 75 degrees C operating temperature

### Layer 2 Features

- Prevents packet loss with back pressure (half-duplex) and IEEE 802.3x pause frame flow control (full-duplex)
- High performance of Store-and-Forward architecture, and runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Storm Control support
  - Broadcast/Multicast/Unicast
- Supports **VLAN**
  - IEEE 802.1Q tagged VLAN
  - Up to 4K VLANs groups, out of 4094 VLAN IDs
  - Supports provider bridging (VLAN Q-in-Q, IEEE 802.1ad)
  - Private VLAN Edge (PVE)
  - Port Isolation
  - MAC-based VLAN
  - IP Subnet-based VLAN
  - Protocol-based VLAN
  - VLAN Translation
  - Voice VLAN
  - GVRP
- Supports **Spanning Tree Protocol**
  - IEEE 802.1D Spanning Tree Protocol (STP)
  - IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP), spanning tree by VLAN
  - BPDU Filtering/BPDU Guard
- Supports **Link Aggregation**
  - 802.3ad Link Aggregation Control Protocol (LACP)
  - Cisco ether-channel (static trunk)
  - Maximum 3 trunk groups with 2 ports per trunk group
  - Up to 4Gbps bandwidth (duplex mode)
- Provides port mirror (1-to-1)
- Port mirroring to monitor the incoming or outgoing traffic on a particular port
- Loop protection to avoid broadcast loops
- Supports ERPS (Ethernet Ring Protection Switching)
- Compatible with Cisco Uni-directional link detection (UDLD) that monitors a link between two switches and blocks the ports on both ends of the link if the link fails at any point between the two devices



### Centralized Power Management for Gigabit Ethernet PoE+ Networking

To fulfill the needs of higher power required PoE+ network applications with Gigabit speed transmission, the IGS-5227X-4P2T features high-performance Gigabit IEEE 802.3at PoE+ (up to 36 watts) on PoE+ ports (Port 3 to port 6). It perfectly meets the power requirements of PoE VoIP phone, PoE Wireless AP and all kinds of PoE IP cameras such as IR, PTZ, speed dome cameras and even box type IP cameras with a built-in fan and heater for high power consumption. The IGS-5227X-4P2T's PoE capabilities also help to reduce deployment costs for network devices as a result of freeing from restrictions of power outlet locations. Power and data switching are integrated into one unit, delivered over a single cable and managed centrally. It thus eliminates cost for additional AC wiring and reduces installation time.

### Built-in Unique PoE Functions for Surveillance Management

As an Industrial managed PoE Switch for surveillance network, the IGS-5227X-4P2T features the following intelligent PoE management functions:

- PoE Schedule
- PD Alive Check
- Scheduled Power Recycling
- SMTP/SNMP Trap Event Alert

### PoE Schedule for Energy Saving

Besides being used for IP surveillance, the IGS-5227X-4P2T is certainly applicable to build any PoE network including VoIP and wireless LAN. Under the trend of energy saving worldwide and contributing to the environmental protection on the Earth, the IGS-5227X-4P2T can effectively control the power supply besides its capability of giving high watts power. The "PoE schedule" function helps you to enable or disable PoE power feeding for each PoE port during specified time intervals and it is a powerful function to help SMBs and enterprises save energy and budget.

- Link Layer Discovery Protocol (LLDP)
- Provides ONVIF for co-operating with PLANET video IP surveillances

### Layer 3 IP Routing Features

- Supports maximum 8 static routes and route summarization
- IPv4/IPv6 software static routing

### Quality of Service

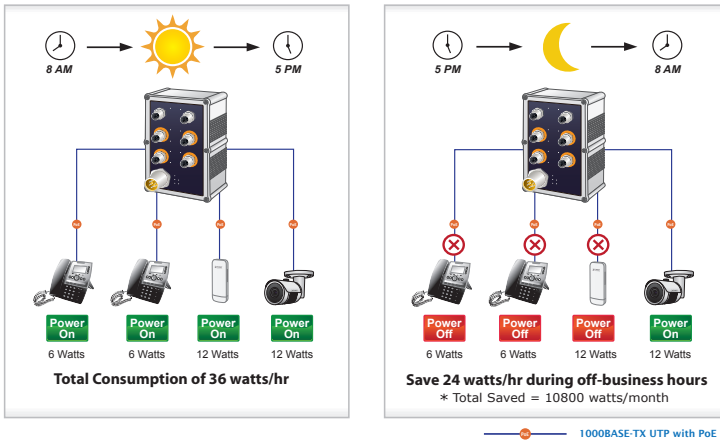
- Ingress Shaper and Egress Rate Limit per port bandwidth control
- 8 priority queues on all switch ports
- Traffic classification
  - IEEE 802.1p CoS
  - IP TOS/DSCP/IP precedence
  - IP TCP/UDP port number
  - Typical network application
- Strict priority and Weighted Round Robin (WRR) CoS policies
- Supports QoS and In/Out bandwidth control on each port
- Traffic-policing on the switch port
- DSCP remarking

### Multicast

- Supports IPv4 IGMP snooping v1, v2 and v3
- Supports IPv6 MLD snooping v1 and v2
- Querier mode support
- IPv4 IGMP snooping port filtering
- IPv6 MLD snooping port filtering
- MVR (Multicast VLAN Registration)

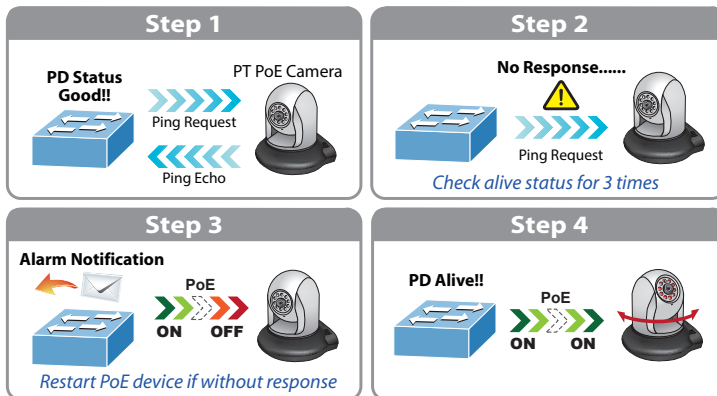
### Security

- Authentication
  - IEEE 802.1x port-based/MAC-based network access authentication
  - Built-in RADIUS client to co-operate with the RADIUS servers
  - TACACS+ login users access authentication
  - RADIUS/TACACS+ users access authentication
- Access Control List
  - IP-based Access Control List (ACL)
  - MAC-based Access Control List
- Source MAC/IP address binding
- **DHCP Snooping** to filter un-trusted DHCP messages
- **Dynamic ARP Inspection** discards ARP packets with invalid MAC address to IP address binding



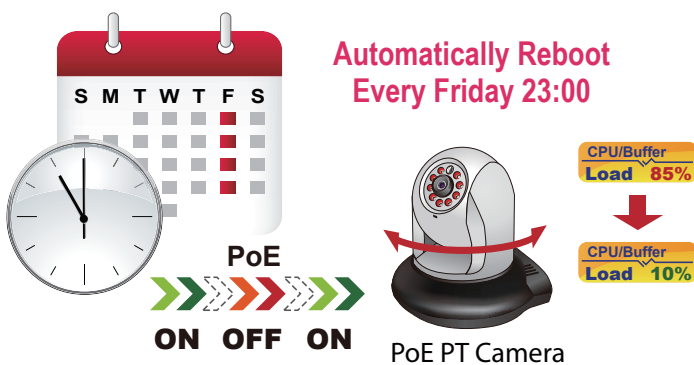
### Intelligent Alive Check for Powered Device

The IGS-5227X-4P2T can be configured to monitor connected PD's status in real time via ping action. Once the PD stops working and responding, the IGS-5227X-4P2T will recycle the PoE port power and bring the PD back to work. It also greatly enhances the reliability in that the PoE port will reset the PD power, thus reducing administrator's management burden.



### Scheduled Power Recycling

The IGS-5227X-4P2T allows each of the connected PoE IP cameras or PoE wireless access points to reboot at a specific time each week. Therefore, it will reduce the chance of IP camera or AP crash resulting from buffer overflow.



- **IP Source Guard** prevents IP spoofing attacks
- IP address access management to prevent unauthorized intruder

### Management

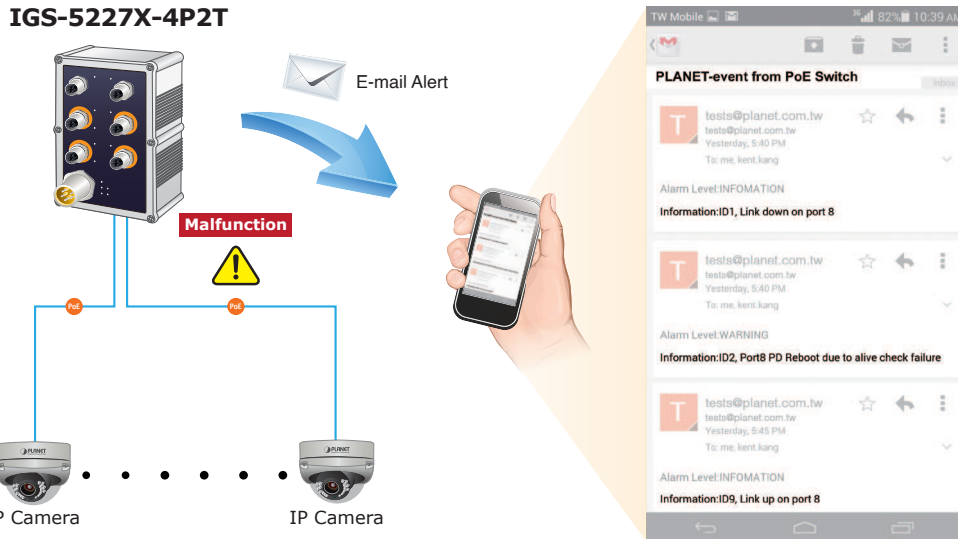
- IPv4 and IPv6 dual stack management
- Switch Management Interfaces
  - Web switch management
  - Telnet Command Line Interface
  - SNMP v1 and v2c switch management
  - SSHv2, TLSv1.2 and SNMP v3 secure access
- **IPv6** IP Address/NTP/DNS management
- Built-in Trivial File Transfer Protocol (TFTP) client
- BOOTP and DHCP for IP address assignment
- System Maintenance
  - Firmware upload/download via HTTP
  - Dual Images
- DHCP Relay
- DHCP Option82
- DHCP Server
- User Privilege levels control
- NTP (Network Time Protocol)
- UPnP
- Link Layer Discovery Protocol (LLDP) and LLDP-MED
- IEEE 802.3ah OAM
- Compatible with Cisco uni-directional link detection(UDLD) that monitors a link between two switches and blocks the ports on both ends of the link if the link fails at any point between the two devices
- Network Diagnostic
  - ICMPv6/ICMPv4 Remote Ping
  - Cable Diagnostic technology provides the mechanism to detect and report potential cabling issues
- SMTP/Syslog remote alarm
- Four RMON groups (history, statistics, alarms and events)
- SNMP trap for interface Linkup and Linkdown notification
- System Log
- PLANET NMS System and Smart Discovery Utility for deployment management



**SMTP/SNMP Trap Event Alert**

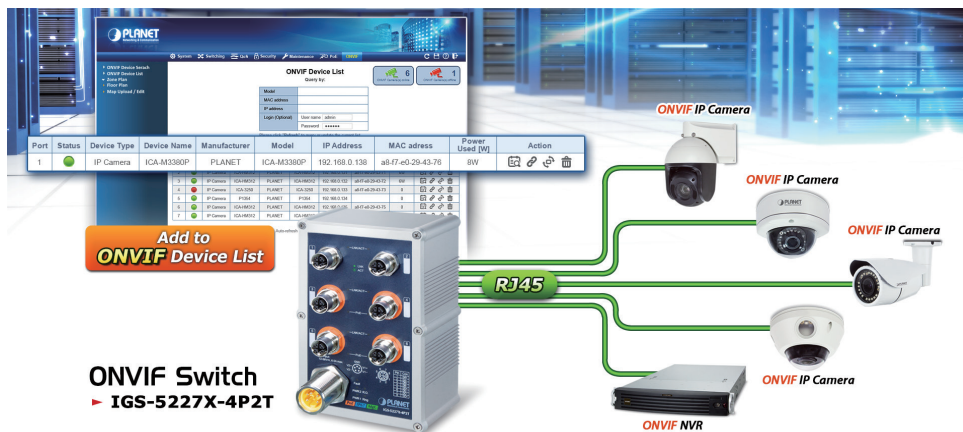
Though most NVR or camera management software offers SMTP email alert function, the IGS-5227X-4P2T further provides event alert function to help to diagnose the abnormal device owing to whether or not there is a break of the network connection, loss of PoE power or the rebooting response by the PD Alive Check process.

**SMTP/SNMP Trap Event Alert**



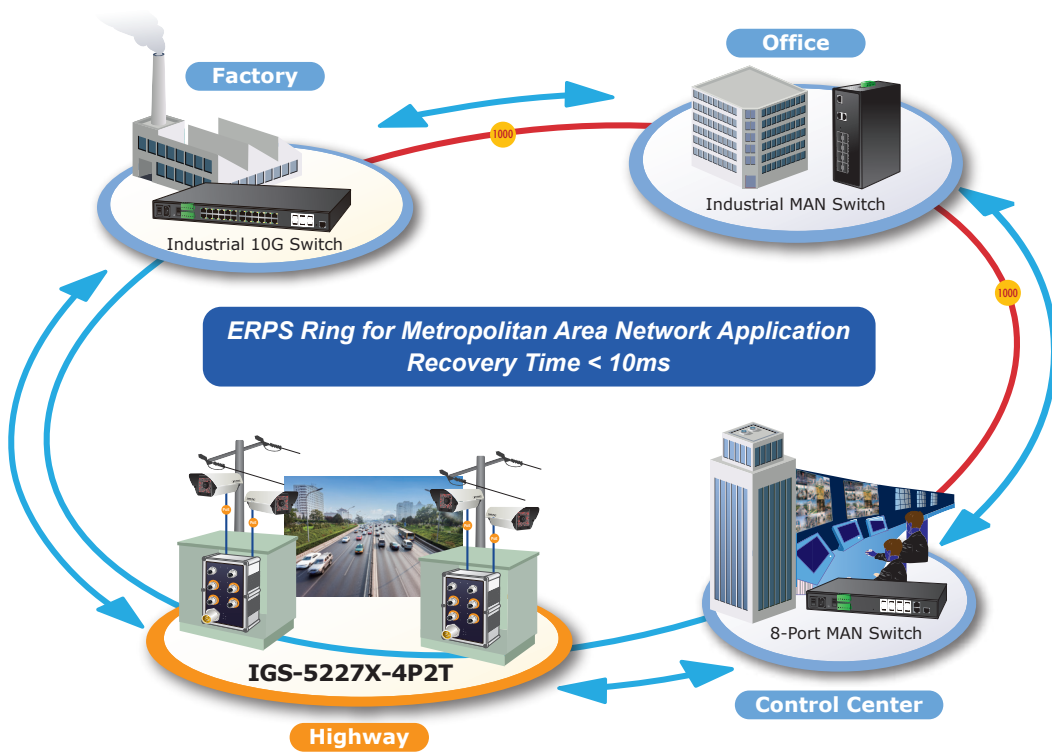
**Convenient and Smart ONVIF Devices with Detection Feature**

PLANET has developed an awesome feature -- ONVIF Support -- which is specifically designed for co-operating with video IP surveillances. From the IGS-5227X-4P2T GUI, clients just need one click to search and show all of the ONVIF devices via network application. In addition, clients can upload floor images to the switch series, making the deployments of surveillance and other devices easy for planning and inspection purposes. Moreover, clients can get real-time surveillance's information and online/offline status; the PoE reboot can be controlled from the GUI.



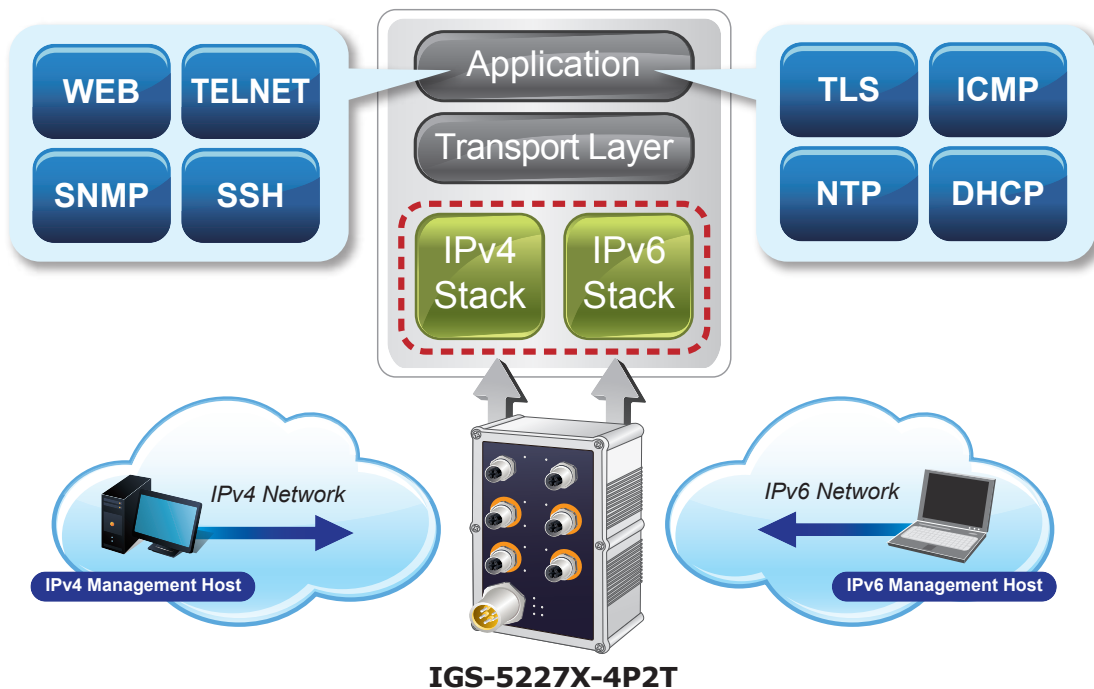
**Redundant Ring, Fast Recovery for Critical Network Applications**

The IGS-5227X-4P2T supports redundant ring technology and features strong, rapid self-recovery capability to prevent interruptions and external intrusions. It incorporates advanced ITU-T G.8032 ERPS (Ethernet Ring Protection Switching) technology, Spanning Tree Protocol (802.1s MSTP), and **redundant power** input system into customer's industrial automation network to enhance system reliability and uptime in harsh factory environments. In a simple Ring network, the recovery time of data link can be as fast as 10ms.



**Solution for IPv6 Networking**

With the support for IPv6/IPv4 protocol, and easy and friendly management interfaces, the IGS-5227X-4P2T is the best choice for IP surveillance, VoIP and wireless service providers to connect with the IPv6 network. It also helps SMBs to step in the IPv6 era with the lowest investment and without having to replace the network facilities even though ISPs establish the IPv6 FTTH edge network.

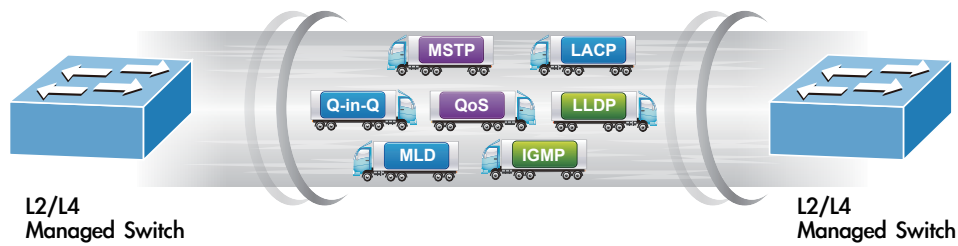


### Layer 3 IPv4 and IPv6 VLAN Routing for Secure and Flexible Management

The IGS-5227X-4P2T not only provides ultra high transmission performance, and excellent Layer 2 and Layer 4 technologies, but also Layer 3 IPv4/IPv6 VLAN routing feature which allows to cross over different VLANs and different IP addresses for the purpose of having a highly-secure, flexibly-managed and simple networking application.

### Robust Layer 2 Features

The IGS-5227X-4P2T can be programmed for advanced switch management functions such as dynamic port link aggregation, Q-in-Q VLAN, private VLAN, Multiple Spanning Tree Protocol (MSTP), Layer 2 to Layer 4 QoS, bandwidth control and IGMP/MLD Snooping. Via the link aggregation of supporting ports, the IGS-5227X-4P2T allows the operation of a high-speed trunk to combine with multiple fiber ports and supports fail-over as well.

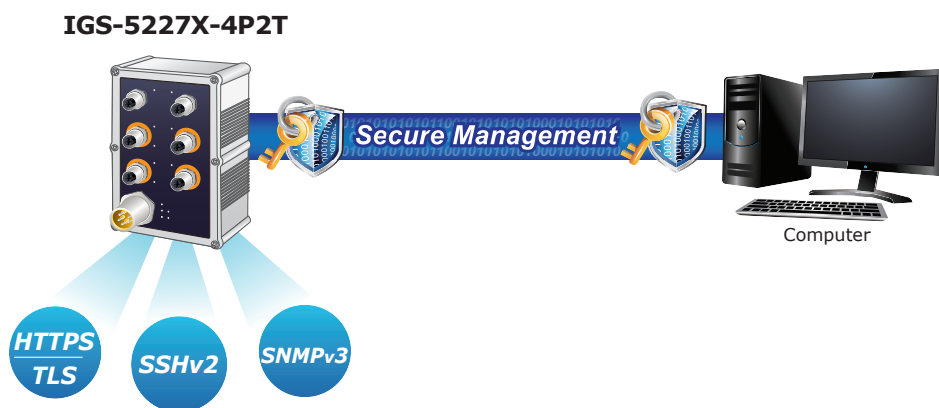


### Excellent Traffic Control

The IGS-5227X-4P2T is loaded with powerful traffic management and QoS features to enhance connection services by telecoms and ISPs. The QoS features include wire-speed Layer 4 traffic classifiers and bandwidth limit that are particularly useful for multi-tenant units, multi-business units, Telco and network service providers' applications. It also empowers the industrial environment to take full advantage of the limited network resources and guarantees the best performance in VoIP and video conferencing transmission.

### Efficient and Secure Management

With built-in Web-based management interface, the IGS-5227X-4P2T L2+ Managed Switch offers an easy-to-use, platform-independent management and configuration facility which includes Web and SNMP management interfaces. The SNMP can be managed via any management software based on the standard of SNMP Protocol. For reducing product learning time, it offers Cisco-like command via Telnet and customer does not need to learn new console command. Moreover, it also offers secure remote management by supporting **SSHv2**, **TLS v1.2** and **SNMP v3** connections which encrypt the packet content at each session.



### 1588 Time Protocol for Industrial Computing Networks

The IGS-5227X-4P2T is ideal for telecom and Carrier Ethernet applications, supporting MEF service delivery and timing over packet solutions for IEEE 1588 and synchronous Ethernet.

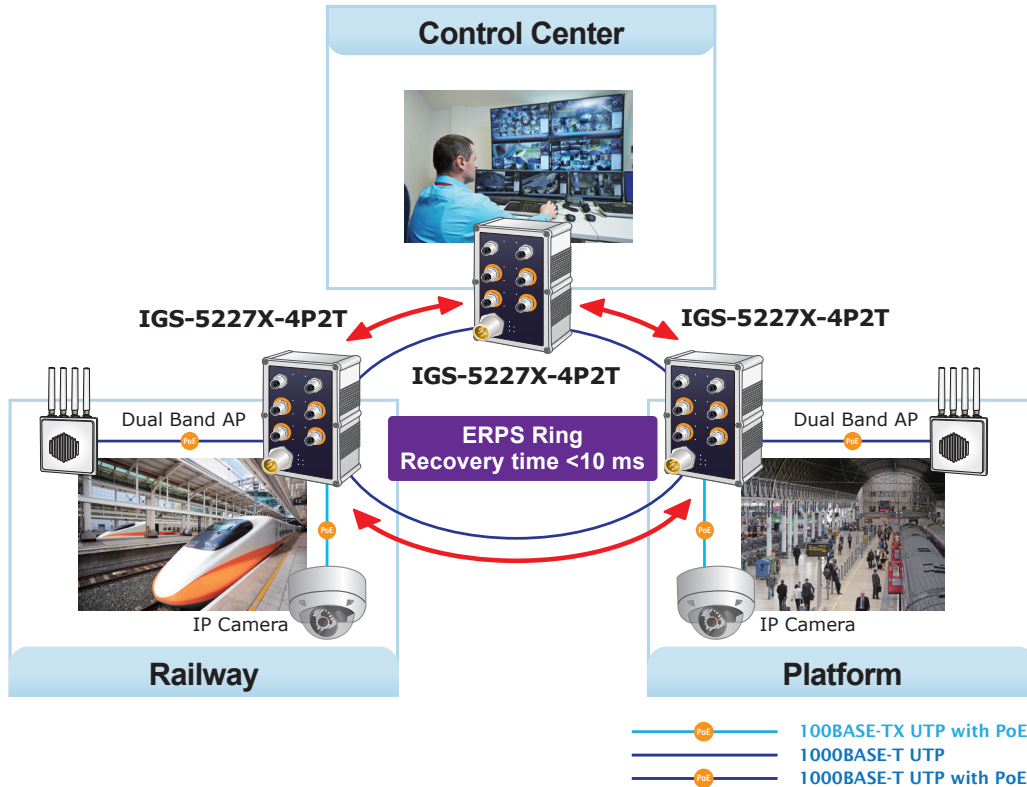
### Modbus TCP provides Flexible Network Connectivity for Factory Automation

With the supported Modbus TCP/IP protocol, the IGS-5227X-4P2T can easily integrate with SCADA systems, HMI systems and other data acquisition systems in factory floors. It enable administrators to remotely monitor the industrial Ethernet switch's operating information, port information and communication status, thus easily achieving enhanced monitoring and maintenance of the entire factory.

## Applications

### High Availability Networking Solution for Surveillance System

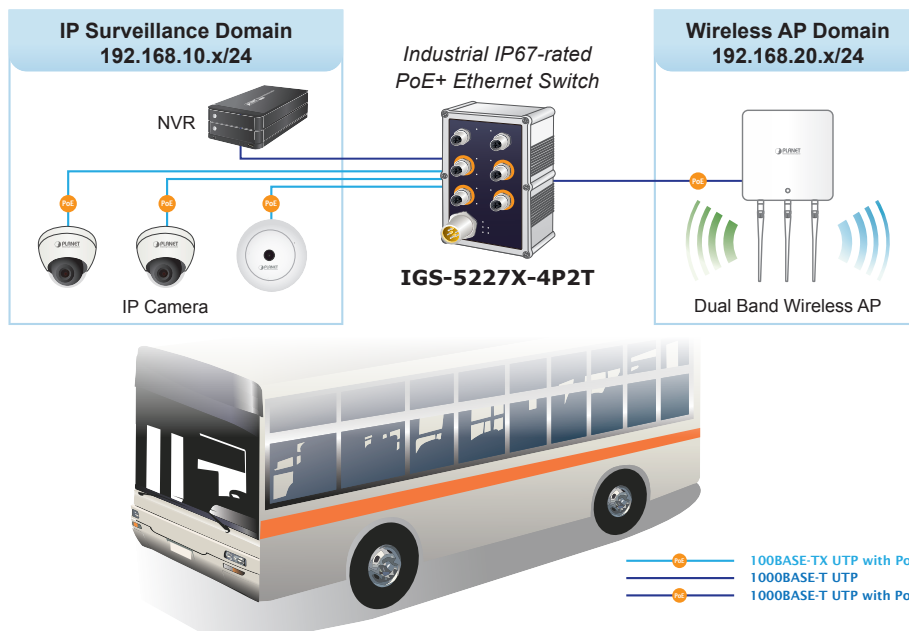
The IGS-5227X-4P2T's strong, rapid, self-recovery capability helps to prevent network interruptions and external intrusions. Customer's automation network is integrated with ITU-T G.8032 ERPS (Ethernet Ring Protection Switching) so as to enhance system reliability and uptime. The IGS-5227X-4P2T is the ideal solution for surveillance system to build redundant connection and establish high bandwidth for the public and railway transmission system.



### Layer 3 VLAN Routing and PoE Application

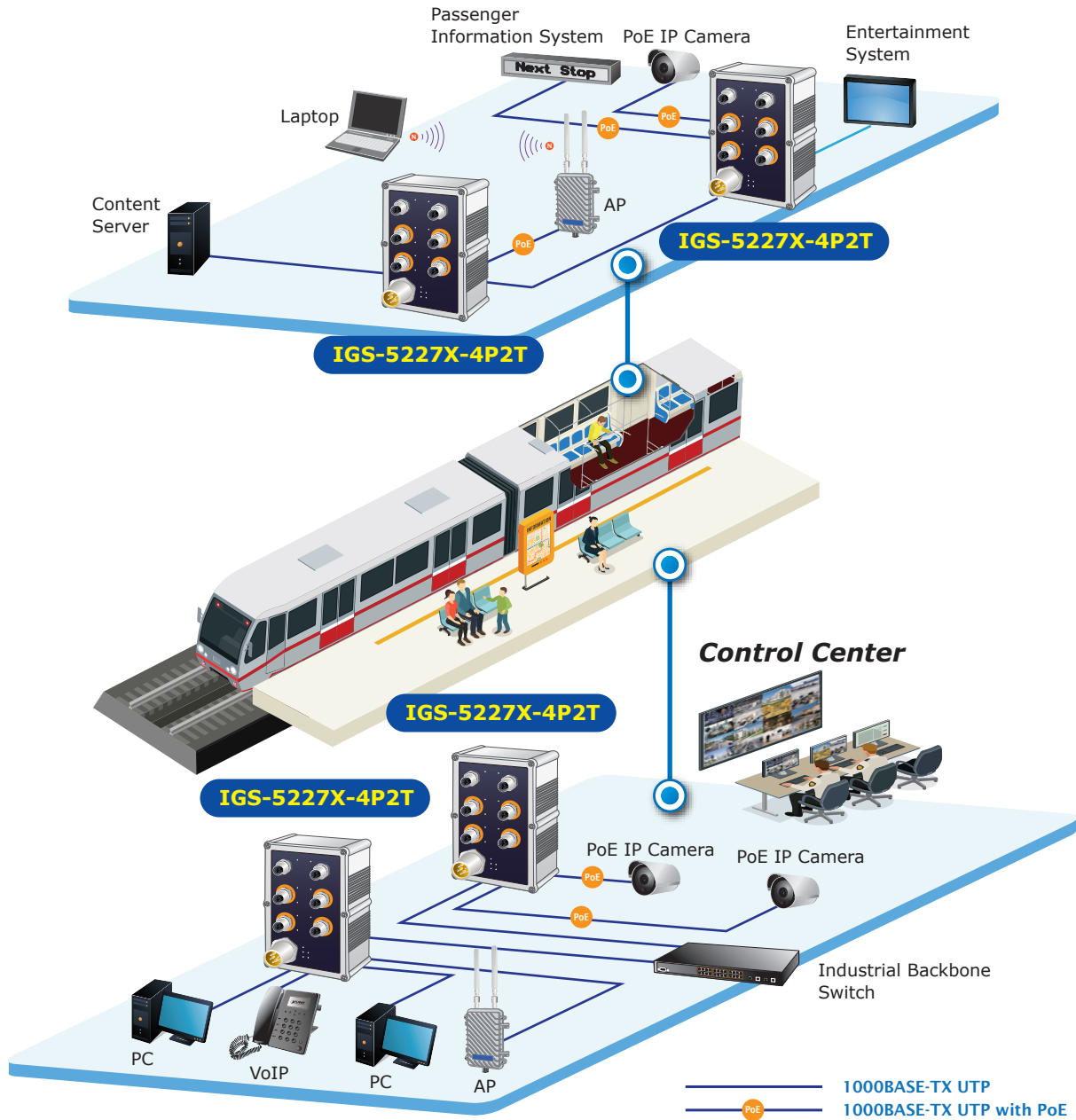
With the built-in, robust Layer 3 routing protocols, the IGS-5227X-4P2T ensures reliable routing between VLANs and network segments. The routing protocols can be applied by VLAN interface with up to 32 routing entries. The IGS-5227X-4P2T, certainly an ideal solution for industries, offers greater security, control and bandwidth conservation, and high-speed uplink.

### Public Transmission System with L3 VLAN Routing and PoE Application





## Railway Transmission System



## Specifications

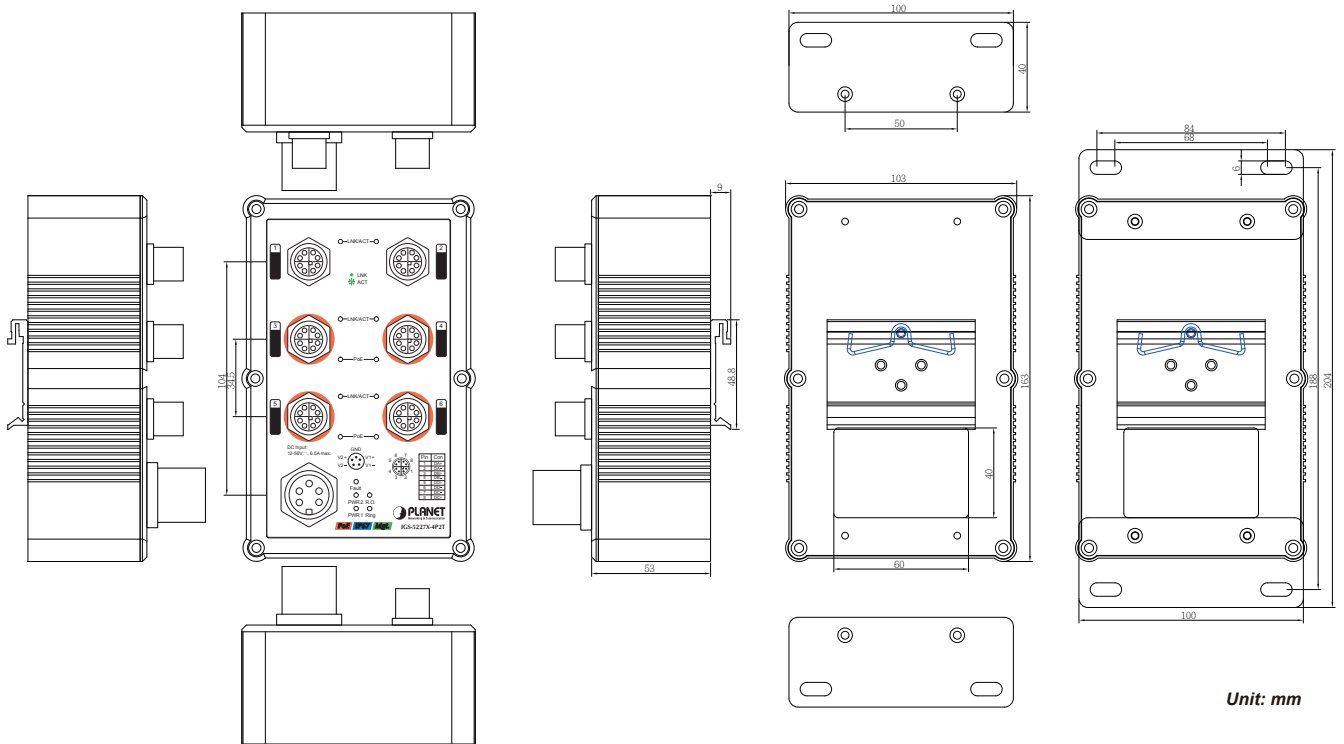
Product	IGS-5227X-4P2T
<b>Hardware Specifications</b>	
Copper Ports	6 x M12, 8-pin X-coded female connector, 10/100/1000BASE-T auto-MDI/MDI-X ports
Power Connector	1 x M23, 5-pin A-coded male connector
Dimensions (W x D x H)	103 x 68.2 x 163 mm
Weight	1151g
Enclosure	IP67 aluminum case
Installation	Wall-mount kit and DIN-rail kit
Power Consumption	<p><b>System on:</b></p> <p>DC 12V:6.7W/22BTU  DC 18V:6.3W/21BTU  DC 56V:6.7W/22BTU</p> <p><b>Full Loading:</b></p> <p>DC 12V:72W/245BTU  DC 18V:98W/334BTU  DC 56V:136W/464BTU</p>
Power Requirements	Dual 12~56V DC
ESD Protection	6KV DC
LED	<p>System:  PWR1 (Green), PWR2 (Green), Fault (Red)  Ring (Green), R.O. (Green)  10/100/1000T RJ45 Interfaces :  LNK/ACT (Green)  PoE-in-Use (Orange) (Port 3 to port 6)</p>
<b>Switching Specifications</b>	
Switch Architecture	Store-and-Forward
Switch Fabric	12Gbps/non-blocking
Throughput	8.9Mpps@64bytes
Address Table	8K entries, automatic source address learning and aging
Shared Data Buffer	4M bits
Flow Control	IEEE 802.3x pause frame for full duplex Back pressure for half duplex
Jumbo Frame	9K bytes
<b>Power over Ethernet</b>	
PoE Standard	IEEE 802.3at/802.3af PoE/PSE
PoE Power Supply Type	End-span
Power Pin Assignment	1/2(+), 3/6(-)
PoE Power Output	Per port 54V DC, 350mA; max. 15.4 watts (IEEE 802.3af) Per port 54V DC, 590mA; max. 36 watts (IEEE 802.3at)
PoE Power Budget	144W@48~56V DC input 90W@18~47V DC input 60W@12~17V DC input
PoE Ability	PD @ 7 watts: 4 units PD @ 15.4 watts: 4 units PD @ 30.8 watts: 4 units
<b>Layer 2 Management Functions</b>	
Port Configuration	Port disable/enable Auto-negotiation 10/100/1000Mbps full and half duplex mode selection Flow control disable/enable Power saving mode control
Port Status	Display each port's speed duplex mode, link status, flow control status, auto negotiation status, trunk status
Port Mirroring	TX/RX/Both Many-to-1 monitor
VLAN	802.1Q tag-based VLAN, up to 4K VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE) MAC-based VLAN Protocol-based VLAN VLAN Translation Voice VLAN MVR (Multicast VLAN Registration) GVRP Up to 4K VLAN groups, out of 4094 VLAN IDs

Link Aggregation	IEEE 802.3ad LACP/static trunk 3 groups with 2 ports per trunk
Spanning Tree Protocol	IEEE 802.1D Spanning Tree Protocol (STP) IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
QoS	Traffic classification based strict priority and WRR 8-level priority for switching: - Port number - 802.1p priority - 802.1Q VLAN tagging - DSCP/ToS field in IP packet
IGMP Snooping	IPv4 IGMP (v1/v2/v3) snooping IPv4 IGMP querier mode support Up to 255 multicast groups
MLD Snooping	IPv6 MLD (v1/v2) snooping IPv6 MLD querier mode support Up to 255 multicast groups
Access Control List	IP-based ACL/MAC-based ACL Up to 256 entries
Bandwidth Control	Per port bandwidth control Ingress: 500Kb~1000Mbps Egress: 500Kb~1000Mbps
<b>Layer 3 Functions</b>	
IP Interfaces	Max. 8 VLAN interfaces
Routing Table	Max. 32 routing entries
Routing Protocols	IPv4 software static routing IPv6 software static routing
<b>Management</b>	
Basic Management Interfaces	Console; Telnet; Web browser; SNMP v1, v2c
Secure Management Interfaces	SSHv2, TLS v1.2, SNMP v3
System Management	Firmware upgrade by HTTP protocol through Ethernet network Configuration upload/download through HTTP Remote syslog System log LLDP protocol NTP PLANET Smart Discovery Utility
Event Management	Remote syslog Local system log SMTP
ONVIF	ONVIF device discovery ONVIF device monitoring Floor Map
SNMP MIBs	RFC 1213 MIB-II RFC 2863 IF-MIB RFC 1493 Bridge MIB RFC 1643 Ethernet MIB RFC 2863 Interface MIB RFC 2665 Ether-Like MIB RFC 2737 Entity MIB RFC 2819 RMON MIB (Groups 1, 2, 3 and 9) RFC 2618 RADIUS Client MIB RFC 3411 SNMP-Frameworks-MIB IEEE 802.1X PAE LLDP MAU-MIB Power over Ethernet MIB
<b>Standards Conformance</b>	
Regulatory Compliance	FCC Part 15 Class A, CE
Stability Testing	IEC 60068-2-32 (free fall) IEC 60068-2-27 (shock) IEC 60068-2-6 (vibration)
Railway Traffic	EN50155

Standards Compliance	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
	IEEE 802.3ab Gigabit 1000T
	IEEE 802.3x flow control and back pressure
	IEEE 802.3ad port trunk with LACP
	IEEE 802.1D Spanning Tree Protocol
	IEEE 802.1w Rapid Spanning Tree Protocol
	IEEE 802.1s Multiple Spanning Tree Protocol
	IEEE 802.1p Class of Service
	IEEE 802.1Q VLAN tagging
	IEEE 802.1ad Q-in-Q VLAN stacking
	IEEE 802.1X Port Authentication Network Control
	IEEE 802.1ab LLDP
	IEEE 802.3af Power over Ethernet
	IEEE 802.3at Power over Ethernet Plus
	IEEE 802.3ah OAM
	IEEE 802.1ag Connectivity Fault Management (CFM)
	IEEE 1588 PTPv2
	RFC 768 UDP
	RFC 793 TFTP
RFC 791 IP	
RFC 792 ICMP	
RFC 2068 HTTP	
RFC 1112 IGMP v1	
RFC 2236 IGMP v2	
RFC 3376 IGMP version 3	
RFC 2710 MLD version 1	
RFC 3810 MLD version 2	
ITU G.8032 ERPS Ring	
<b>Environment</b>	
Operating Temperature	-40 ~ 75 degrees C
Storage Temperature	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)
<b>Standard Accessories</b>	
Stability Testing	Quick Installation Guide x1
	Waterproof/dustproof Power Connector x1
	Waterproof/dustproof RJ45 Connector x6
	2m 8-pin X-coded M12-to-RJ45 UTP Cable x1
	DIN-rail Kit x1
Wall-mount Kit x1	



## Dimensions



Unit: mm

# DIREKTRONIK