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Product Specifications

Industrial 2-/4-port RS232/422/485 Modbus Gateway

IMG-2200T / IMG-2400T

Version 1.0

Change History:

Revision	Date	Author	Change List
1.0	2020/3/31	Angeline	Initial release

| Author	Angeline	Editor:	Angeline
Reviewed by:		Approved by:	Kent Kang

1. PRODUCT DESCRIPTION

Economical Solution for Industrial Modbus TCP/RTU/ASCII Network Integration

PLANET has added the Industrial Modbus TCP/IP Protocol to its easily-integrated industrial management level products that come with SCADA/HMI system and other data acquisition systems on factory floors. Moreover, the industrial IT SNMP network is upgraded to the industrial automation Modbus TCP/IP network. PLANET industrial management level products with the Modbus TCP/IP Protocol offer flexible network connectivity solutions for the industrial automation environment.

To complete the industrial automation environment application solution, PLANET has announced a first industrial level 2-/4-port RS232/422/485 Modbus Gateway, IMG-2x00T Series, a bridge that converts between Modbus TCP/IP Protocol and Modbus RTU/ASCII Protocol. It features a wide operating temperature range from -40 to 75 degrees C and a compact but rugged IP30/IP40 metal housing.

A Conversion Bridge for Flexible Network Deployment

The IMG-2x00T Series can be a conversion bridge between the equipment with the Modbus RTU/ASCII Protocol and the administrator workstations that run the Modbus TCP/IP Protocol. The RS232/422/485 serial interface of the IMG-2x00T Series provides the Modbus RTU/ASCII operation mode and various baud rate options to meet the demand of integration between the Modbus TCP/IP Protocol, Modbus RTU Master/Slave Protocol and Modbus ASCII Master/Slave Protocol.
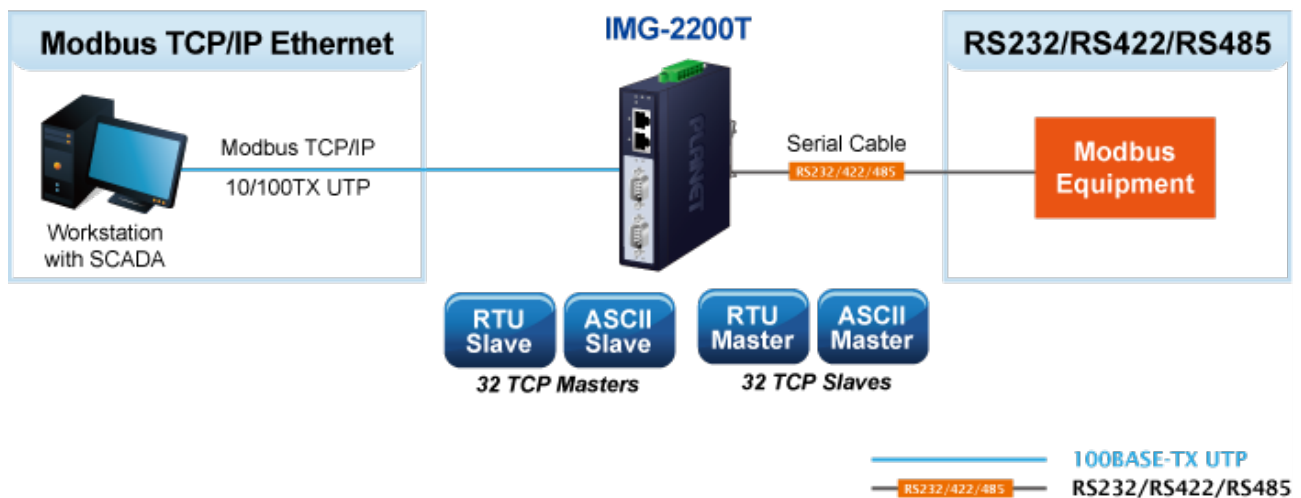
The advantage of having the IMG-2X00T Series is to assist users to build an industrial environment between the Modbus TCP/IP Protocol and the Modbus RTU/ASCII Protocol easily, thus offering an application solution to the industrial control equipment without Ethernet ports and the industrial control equipment can only control through an industrial PC workstation or industrial control panel.

In addition, the effective integration solution of Modbus Ethernet devices, Modbus serial equipment or multi Modbus master/slave in an industrial hybrid network brings the following:

- ■ Master mode supports up to 32 TCP slave connection requests
- ■ Slave mode supports up to 32 TCP master connections

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Remote Management

The IMG-2x00T Series makes the connected industrial Modbus RTU/ASCII equipment become IP-based facilities and is able to connect to the Modbus TCP/IP network via its RS232/422/485 serial interface and **10/100BASE-TX RJ45** Ethernet port. It provides a remote web management and telnet interface for efficient remote network management. The IMG-2x00T Series also provides PLANET Modbus Gateway utility tool and supports PLANET Smart Discovery utility to help network administrator to easily get the current IP subnet address information or change the IP subnet address setting of the IMG-2x00T Series.

Modbus Serial Port State Monitoring

The IMG-2x00T Series shows the details of the total bytes transmitted and received on the RS232/422/485 serial interface, and the detailed total number of frames transmitted and received on the remote web/telnet management interface. This function allows network administrator to check the status and statistics of the IMG-2x00T Series via the single RS232/422/485 serial interface.

Stable Performance in Hardened Environment Design

The IMG-2x00T Series provides 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. Its operating temperature ranging from -40 to 75 degrees C allows the IMG-2x00T Series to be placed in almost any difficult environment.

The IMG-2x00T Series is equipped with a compact IP30/40-rated metal case that allows wall mounting for efficient use of cabinet space. The IMG-2x00T Series also provides an integrated power supply source with wide-ranging voltages (12 to 48V DC) ideally suitable for worldwide operation with high availability applications.

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Effective Alarm Alert for Better Protection

The IMG-2x00T series comes with a Fault Alarm feature which can alert the users when there is something wrong with the Serial Device Server. With this ideal feature, the users would not have to waste time finding where the problem is. It will help to save time and human resource. The IMG-2x00T Series provides event alert function to help to diagnose the abnormal device owing to whether or not there is a break of the network connection, or the rebooting response.

Dual Power Input for High Availability Network System

The IMG-2x00T Series features a strong dual power input system with wide-ranging voltages (12V~48V DC) incorporated into customer's automation network to enhance system reliability and uptime. In the example below, when Power Supply 1 fails to work, the hardware failover function will be activated automatically to keep powering the IMG-2x00T Series via Power Supply 2 without any break of operation.

Non-stop Ethernet Service with Dual Power Input & Auto Failover
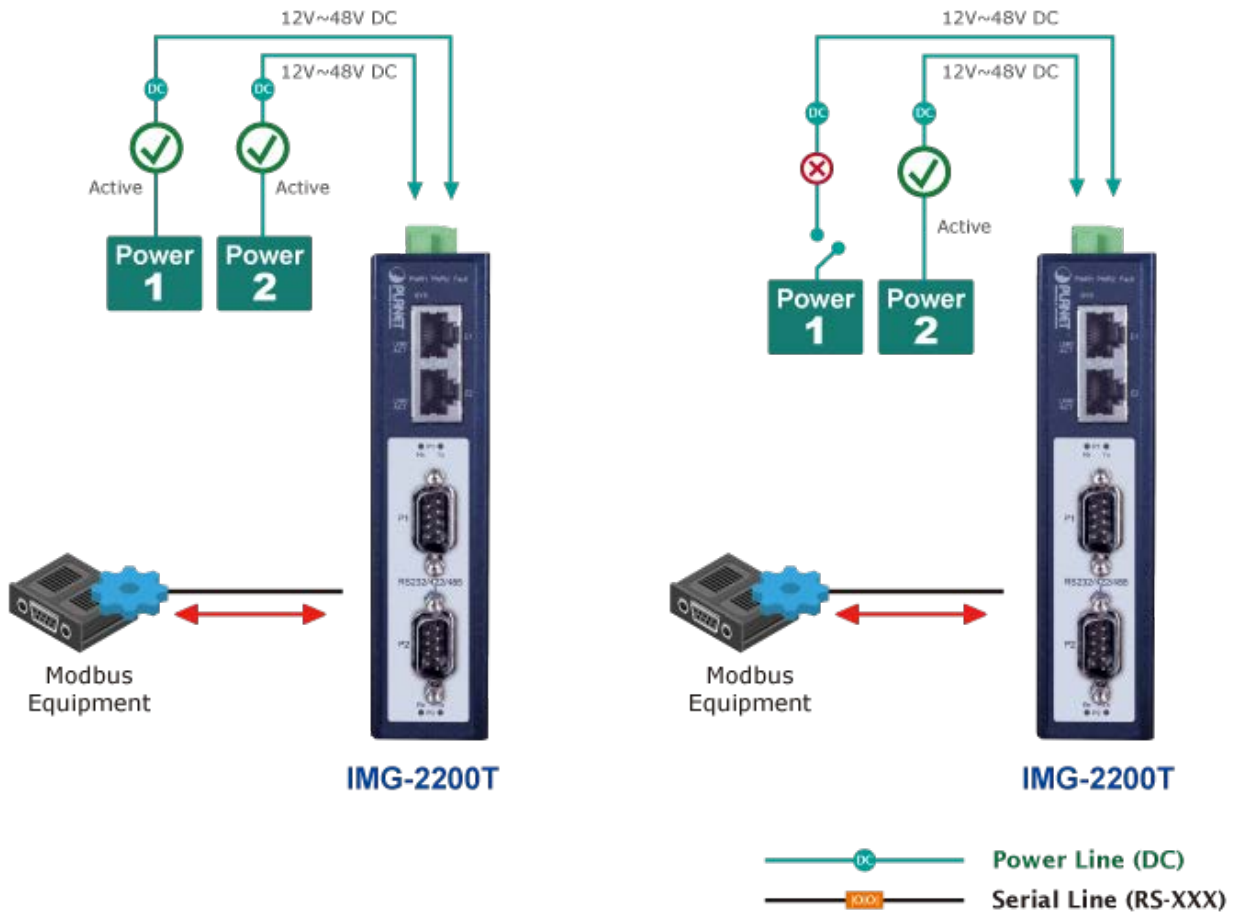
Digital Input and Digital Output for External Alarm (only 2400T)

With digital input and digital output on its front panel, an external alarm can help users via the digital input to detect and log external device status (such as door intrusion detector), and then immediately send an event alarm to the administrator. The digital output can be used to alarm the administrator if the IMG-2400T serial port shows DCD, changed DSR or power failure.

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2. PRODUCT FEATURES

▶ **Serial Interface**
- Two/four DB9 interfaces support RS232, 2-wire RS485, 4-wire RS485 and RS422 operation
- Asynchronous serial data rates up to 921600bps

▶ **Ethernet Interface**
- 2-port 10/100BASE-TX RJ45 with auto MDI/MDI-X function
- Complies with IEEE 802.3, IEEE 802.3u 10/100BASE-TX standard
- Supports 10/100BASE-TX RJ45 port with distance up to 100m

▶ **Management Function**
- Built-in IP-based Web interface and telnet interface for remote management
- Software Protocol supports Modbus TCP, Modbus RTU, Modbus ASCII, IP, ARP, DHCP and DNS
- Supports RTU Master, RTU Slave, ASCII Master, and ASCII Slave four serial operation modes via management interface
- Master mode supports 32 TCP slave connection requests
- Slave mode supports 32 TCP master connections
- PLANET Modbus Gateway utility for finding client device on the network.
- PLANET Smart Discovery utility automatically finds the client devices on the network
- Firmware upgrade/configuration backup and restore via HTTP protocol

▶ **Industrial Case and Installation**
- IP30/IP40 metal case
- DIN-rail and wall-mount designs
- Redundant power design
    - 12 to 48V DC, redundant power with reverse polarity protection
- Supports 6000 VDC Ethernet ESD protection
- Free fall, shock-proof and vibration-proof for industries
- Supports extensive LED indicators for network diagnosis
- -40 to 75 degrees C operating temperature
- Reset button for resetting to factory default

▶ **Digital Input and Digital Output (IMG-2400T)**
- 2 Digital Input (DI)
- 2 Digital Output (DO)
- Integrate sensors into auto alarm system
- Transfer alarm to IP network via email and SNMP trap
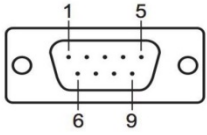
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3. PRODUCT SPECIFICATIONS

3.1 MAIN COMPONENTS

Serial Port Server Controller	Confidential information	x 1
CPU	Embedded 32-bit CPU, 150MHz	x 1
RS232 Line Driver	ZT3243E	x 1
RS422/RS485 Line Driver	AZRS3078	x 2
Ethernet Switch Controller	IP178GI	x 1
Flash Size	32M bytes	x 1
DRAM Size	64M bytes	x 1

3.2 FUNCTION SPECIFICATIONS

Product	IMG-2200T	IMG-2400T
Serial Interface		
Serial Ports	2 x DB9 male	4 x DB9 male
Serial Standards	RS232 / 4-wire RS422 or RS485 / 2-wire RS485	
Baud Rate (Data Rate)	50bps to 921Kbps	
Data Bits	5, 6, 7, 8	
Parity Type	1, 1.5, 2	
Stop Bit	Odd, Even, None, Space, Mark	
Flow Control	RTS/CTS and DTR/DSR (RS232 only) XON/XOFF	
Signals	RS232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND RS422: Tx+, Tx-, Rx+, Rx-, GND 4-wire RS485: Tx+, Tx-, Rx+, Rx-, GND 2-wire RS485: Data A (+), Data B (-), GND	
Pin Assignment		
Operation Mode	RTU Master/RTU Slave/ASCII Master/ASCII Slave Master mode: Supports up to 32 TCP slave connection requests Slave mode: Supports up to 32 TCP master connection requests	
Serial Line Protection	2KV isolation protection 1KV (level 2) surge protection 15KV ESD protection	

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Ethernet Interface	
Ethernet Ports	2 x RJ45
Standard	10/100BASE-TX
Distance	100m
Switch Architecture	Store-and-Forward-
Address Table	1K
ESD Protection	6KV
Surge Protection	2KV

Hardware		
Installation	DIN-rail kit and wall-mount ear	
Enclosure	IP30/40 metal	IP40 metal
Dimensions (W x D x H)	32 x 97 x 135 mm	56 x 87 x 135 mm
Weight	392g	625 g
LED Indicators	System: Power 1, Power 2, Fault, SYS TP Port: Link/ Active Serial Port: Tx and Rx	System: Power 1, Power 2, Fault, SYS,I/O TP Port: Link/ Active Serial Port: Tx and Rx
Power Requirements	12~48V DC, redundant power with polarity reverse protection function	
Power Consumption	Full Loading 12VDC: 0.326A (3.8 watts) 24VDC: 0.176A (4.2 watts) 48VDC: 0.114A (5.4 watts)	Full Loading 12VDC: 0.419A (5.1 watts) 24VDC: 0.227A (5.4 watts) 48VDC: 0.136A (6.5 watts)
Connector	Removable 6-pin terminal block for power input Pin 1/2 for Power 1, Pin 3/4 for fault alarm, Pin 5/6 for Power 2	
DI and DO	N/A	2 Digital Input (DI): Level 0: -24V~2.1V (±0.1V) Level 1: 2.1V~24V (±0.1V) Input Load to 24V DC, 10mA max. 2 Digital Output (DO): Open collector to 24V DC, 100mA max.
Alarm	Provides one relay output for power failure Alarm relay current carry ability: 1A @ DC 24V	
Reset Button	< 5 sec: System reboot > 5 sec: Factory default	

Management	
Management Interfaces	Web management Telnet Console management Windows-based VCOM Utility management SNMPv1, v2c / SNMP Trap UNI-NMS monitoring PLANET Smart Discovery Utility

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IP Version	IPv4 and IPv6
Operation Mode	RTU Master
	RTU Slave
	ASCII Master
	ASCII Slave
Virtual COM Utility Platform Supports	Windows-based only:
	Windows XP
	Windows Server 2003
	Windows 7
	Windows Server 2008
	Windows 8 (Must install the latest version of WinPcap)
	Windows Server 2012 (Must install the latest version of WinPcap)
	Windows 10
Fault Alarm	Record: System log / SNMP trap
Time	NTP
Security	Allow max. 4 accessible IP address hosts/ranges
SNMP MIBs	RFC1213 MIB-II
	RFC1317 RS232-like MIB
Standards Conformances	
Regulatory Compliance	FCC Part 15 Class A,
	CE Certification Class A
Stability Testing	IEC60068-2-32 (Free fall)
	IEC60068-2-27 (Shock)
	IEC60068-2-6 (Vibration)
Standards	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
	RFC 768 UDP
	RFC 793 TFTP
	RFC 791 IP
	RFC 792 ICMP
	RFC 854 Telnet
	RFC 958 NTP
	RFC 1591 DNS (client only)
	RFC 1908 SNMPv2c
	RFC 2068 HTTP
	RFC 2131 DHCP Client
	RFC 2732 Format for Literal IPv6 Addresses in URL's
	RFC 3315 DHCPv6 Client
	RFC 3513 IPv6 Addressing Architecture
	RFC 3596 DNSv6
	RFC 4443 ICMPv6
	EIA/TIA RS232/422/485
Regulatory Approval	RoHS
Environment	

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Operating Temperature	-40 ~ 75 degrees C
Storage Temperature	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)

3.3 PHYSICAL SPECIFICATIONS:

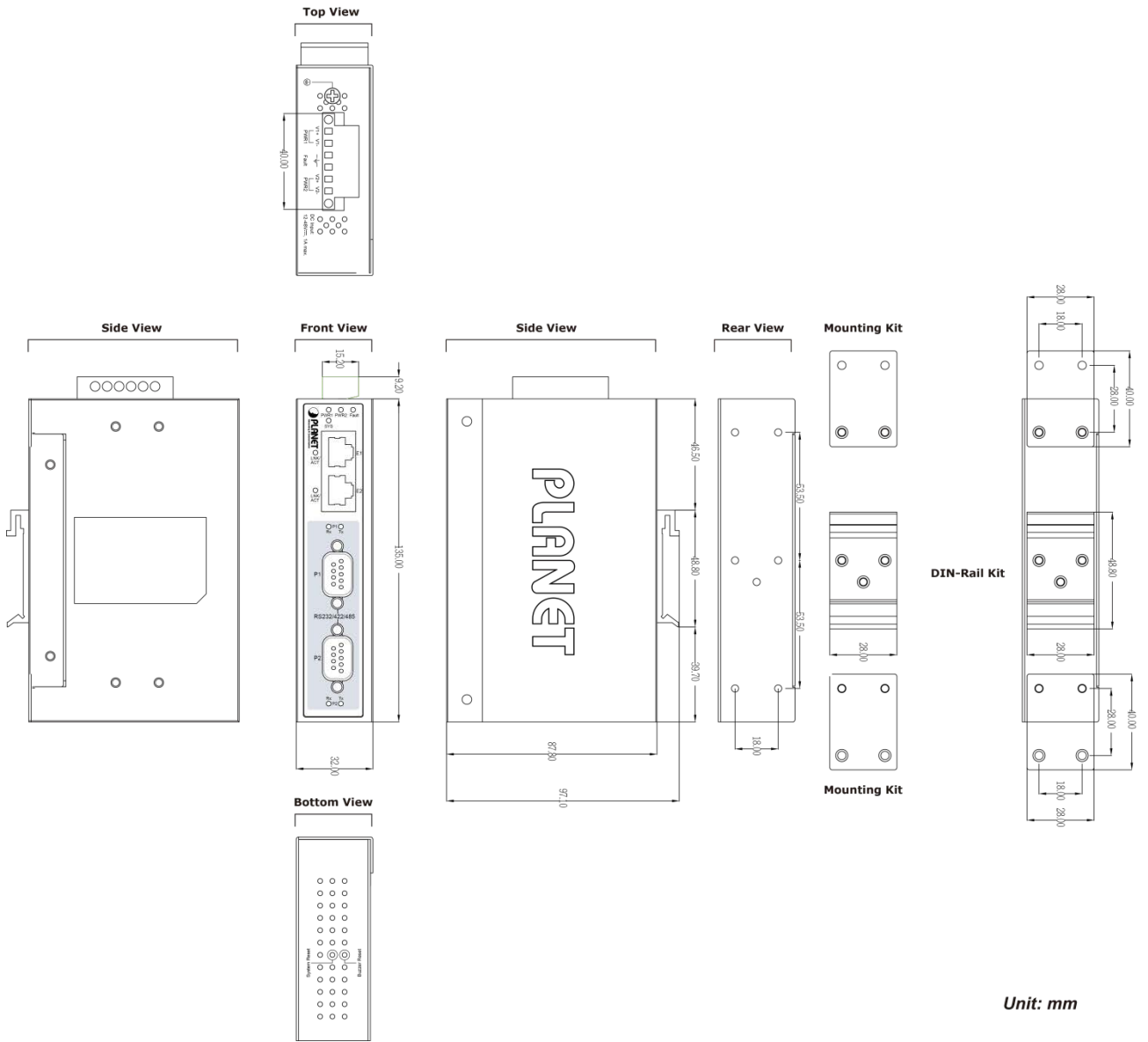**Dimensions** (W x D x H)**:**

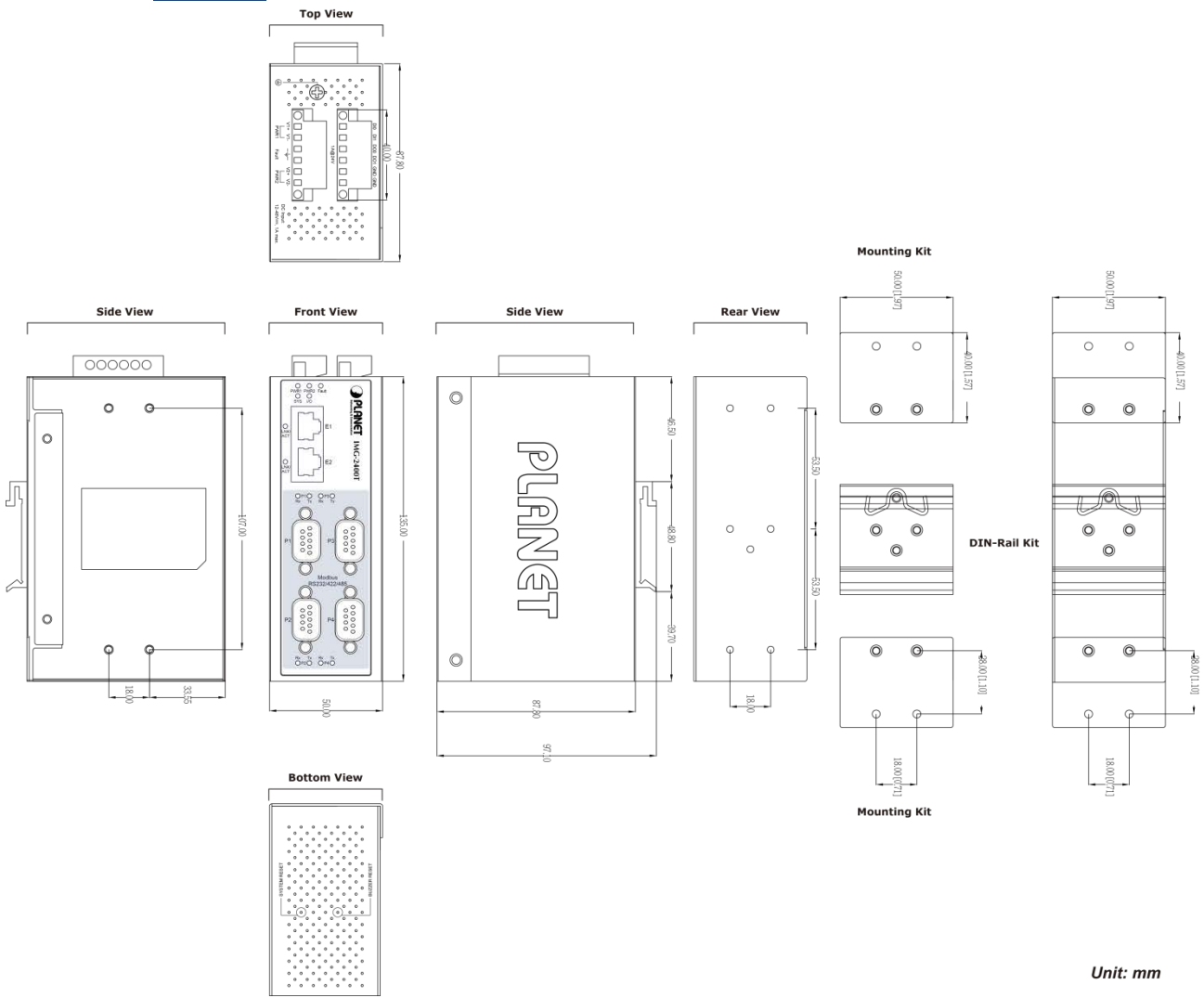- 32 x 97 x 135 mm (IMG-2200T)
- 56 x 87 x 135 mm (IMG-2200T)

Weight:

- **IMG-2200T**: 392g
- **IMG-2400T**: 625g

Block Diagrams:

■　IMG-2200T:

Top View

Side View　Front View　Side View　Rear View　Mounting Kit

DIN-Rail Kit

Mounting Kit

Bottom View

Unit: mm

■ **IMG-2400T**:

Top View

Side View   Front View   Side View   Rear View

Mounting Kit

DIN-Rail Kit

Mounting Kit

Bottom View

Unit: mm

3.4 Panel view:

- **Front Panels**

| IMG-2200T | IMG-2400T |

- **Serial Port Pin Assignment**

Male DB9	Pin	RS232	RS422 RS485-4W	RS485-2W
	1	DCD	TxD+	--
	2	RxD	TxD-	--
	3	TxD	RxD-	Data-
	4	DTR	RxD+	Data+
	5	GND	GND	GND
	6	DSR	--	--
	7	RTS	--	--
	8	CTS	--	--
	9	--	--	--

LED Definition:

| LED	Color		Function
PWR1	Green	Light	Indicates power 1 has power.
PWR2	Green	Light	Indicates power 2 has power.
Fault	Red	Light	Indicates either power 1 or power 2 has no power.
DI/DO	Red	Blinks	Indicates DI and DO events.
		Off	No event
LNK/ACT	Green	Light	Indicates the Fast Ethernet port is successfully connecting to the network at 10Mbps or 100Mbps.
		Blinks	Indicates the Fast Ethernet Port is receiving or sending data.
Tx	Green	Light	Serial port is transmitting data.
Rx	Amber	Light	Serial port is receiving data.

■ **Top and Bottom Views**:
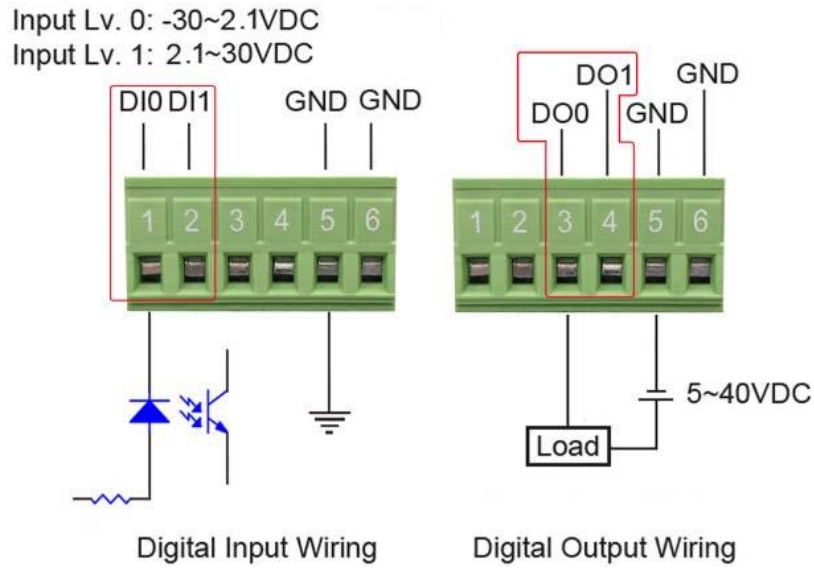
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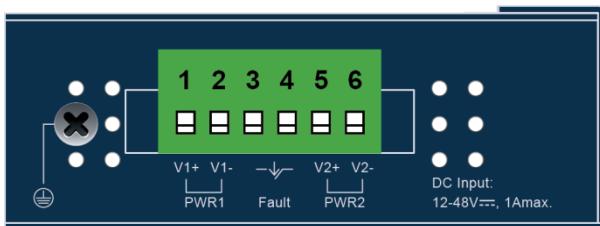
IMG-2200T Upper Panel
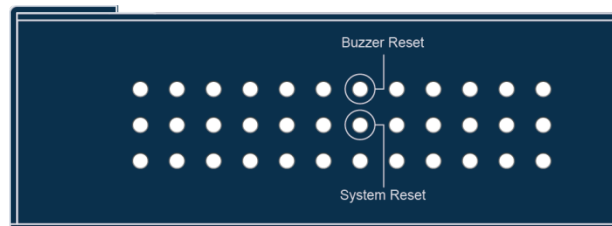
IMG-2200T Bottom View
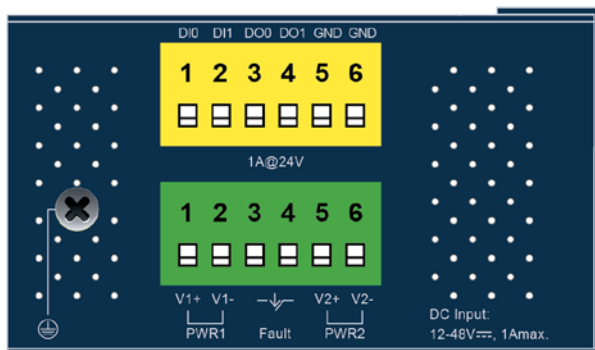
IMG-2400T Upper Panel
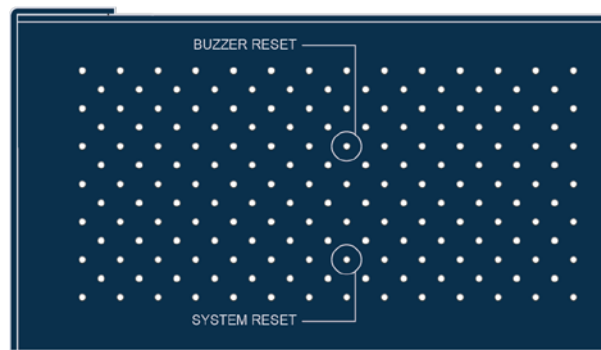
IMG-2400T Bottom View

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DI/DO Connector of IMG-2400T:

3.5 ENVIRONMENTAL SPECIFICATIONS

Operating:

Temperature: -40 ~75 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

Storage:

Temperature: -40 ~85 degrees C

Relative Humidity: 5% ~ 95% (non-condensing)

3.6 ELECTRICAL SPECIFICATIONS

Power Requirements:

12-48V DC, redundant power with reverse polarity protection

Power Consumption:

LOADING / DC INPUT	IMG-2200T Full Loading	IMG-2400T Full Loading
12V	3.8 watts	5.4 watts
24V	4.2 watts	5.4 watts
48V	5.4 watts	6.5 watts

3.7 REGULATORY COMPLIANCE

FCC Part 15 Class A, CE

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

3.8 RELIABILITY

MTBF > 100,000hrs @ 25 degrees C

3.9 BASIC PACKAGING

Models	IMG-2200T	IMG-2400T
☑ The Serial Server	x 1	x 1
☑ Quick Installation Guide	x 1	x 1
☑ DIN-rail Kit	x 1	x 1
☑ Wall Mounting Kit	x 1	x 1
☑ Dust Cap (RJ45)	X 2	x 2

3.10 PACKING INFORMATION

	IMG-2200T	IMG-2400T
Box Dimensions (W x D x H):	205 x 144 x 46 mm	202 x 140 x 94mm
Gross Weight:	612 g	790 g
Carton Dimensions (W x D x H):	435 x 325 x 280 mm	600 x 239 x 332 mm
Total Weight:	13.0 kg	10.2 kg
Quantity:	20pcs in one carton	12pcs in one carton