

Product Specifications

Industrial 1-port RS232/422/485 Modbus Gateway Series

IMG-2100T/IMG-2105AT

IMG-2102T/IMG-2102TS

Version 1.1

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Change History:

Revision	Date	Author	Change List
1.0	2020/3/3	Angeline	Initial release
1.1	2020/9/8	Angeline	Add IMG-2102T(S)

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

1. PRODUCT DESCRIPTION

Standard 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 1-port RS232/422/485 Modbus Gateway, IMG-210xT 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 IP40 metal housing.

A Conversion Bridge for Flexible Network Deployment

The IMG-210xT 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-210xT 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-210xT 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 connection requests.

Remote Management

The IMG-210xT 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** or **100BASE-FX** Ethernet port. It provides a remote web management and telnet Interface for efficient remote network management. The IMG-210xT 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-210xT series.

Modbus Serial Port State Monitoring

The IMG-210xT 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-210xT series via the single RS232/422/485 serial interface.

Stable Performance in Hardened Environment Design

The IMG-210xT 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-210xT series to be placed in almost any difficult environment.

The IMG-210xT series is equipped with a compact IP30-rated metal case that allows wall mounting for efficient use of cabinet space. The IMG-210xT series also provides an integrated power supply source with wide-ranging voltages (9 to 48V DC / 24V AC) ideally suitable for worldwide operation with high availability applications.

Dual Power Input for High Availability Network System

The IMG-210xT series features a strong dual power input system with wide-ranging voltages (9V~48V DC / 24V AC) 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-210xT series via Power Supply 2 without any break of operation.

2. PRODUCT FEATURES

▶ **Serial Interface**

- One DB9 interface that supports RS232,
- One terminal block interface that supports 2-wire RS485 and 4-wire RS422/RS485 operation
- Asynchronous serial data rates up to 921600bps

▶ **Ethernet Interface**

- One 10/100BASE-TX RJ45 interface with auto MDI/MDI-X function (IMG-2100T)
- Choice of fiber connectors: SC/LC connector or multi-mode/single mode fiber connector (IMG-2105AT/IMG-2102T/IMG-2102TS)

▶ **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 connection requests.
- 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**

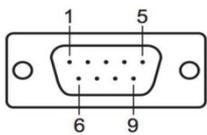
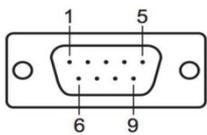
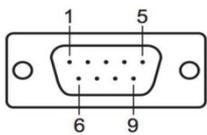
- IP30 metal case
- DIN-rail and wall-mount designs
- Redundant power design
 - 9 to 48V DC / 24V AC, redundant power with reverse polarity protection
- Supports 6000 VDC Ethernet ESD protection.
- Free fall, shock-proof and vibration-proof for industries
- Supports extensive LED indicators for network diagnosis.
- -40 to 75 degrees C operating temperature
- Reset button for resetting to factory default

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	IP101GR	x 1
Flash Size	32M bytes	x 1
DRAM Size	64M bytes	x 1

3.2 FUNCTION SPECIFICATIONS

Product	IMG-2100T	IMG-2105AT	IMG-2102T	IMG-2102TS																																										
Serial Interface																																														
Serial Ports	1 x DB9 male for RS232 1 x 4-pin terminal block for RS422/RS485																																													
Serial Standards	RS232 / 4-wire RS422 or RS485/2-wire RS485																																													
Baud Rate (Data Rate)	50bps to 921Kbps																																													
Data Bits	5, 6, 7, 8																																													
Stop Bit	1, 1.5, 2																																													
Parity Type	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	Serial Port <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Male DB9</th> <th>Pin</th> <th>RS232</th> <th>RS422 RS485-4W</th> <th>RS485-2W</th> </tr> </thead> <tbody> <tr> <td rowspan="9">  </td> <td>1</td> <td>DCD</td> <td>TxD+</td> <td>--</td> </tr> <tr> <td>2</td> <td>RxD</td> <td>TxD-</td> <td>--</td> </tr> <tr> <td>3</td> <td>TxD</td> <td>RxD-</td> <td>Data-</td> </tr> <tr> <td>4</td> <td>DTR</td> <td>RxD+</td> <td>Data+</td> </tr> <tr> <td>5</td> <td>GND</td> <td>GND</td> <td>GND</td> </tr> <tr> <td>6</td> <td>DSR</td> <td>--</td> <td>--</td> </tr> <tr> <td>7</td> <td>RTS</td> <td>--</td> <td>--</td> </tr> <tr> <td>8</td> <td>CTS</td> <td>--</td> <td>--</td> </tr> <tr> <td>9</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table> 4-pin Terminal Block				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	--	--	--
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	--	--	--																																										

	Terminal Block			
	Pin	RS-422 RS-485-4W	RS-485-2W	
	<input type="checkbox"/> 1	1	TxD+(A)	--
	<input type="checkbox"/> 2	2	TxD-(B)	--
	<input type="checkbox"/> 3	3	RxD-(B)	Data-(B)
	<input type="checkbox"/> 4	4	RxD+(A)	Data+(A)
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.			
Ethernet Interface				
Ethernet Ports	1 x RJ45	1 x SFP	1 x Duplex SC	1 x Duplex SC
Standard	10/100BASE-TX	100BASE-FX	100BASE-FX	100BASE-FX
Connector	RJ45	LC	Duplex SC	Duplex SC
Fiber Mode	-	Single mode or multi modes (may vary on SFP module)	Multi modes	Single mode
Distance	100m	2km to 120km (may vary on SFP module)	2km	30km
Cable	Twisted-pair	50 or 62.5/125µm multi-mode fiber cable 9/125µm single-mode cable	50/125µm or 62.5/125µm multi-mode fiber cable	9/125µm single-mode cable
ESD Protection	6KV			
Surge Protection	2KV			
Hardware				
Installation	DIN-rail kit and wall-mount ear			
Enclosure	IP 30 metal			
Dimensions (W x D x H)	32 x 87.8 x 135 mm			
Weight	392g	390g	387g	392g
LED Indicators	System: Power 1, Power 2, Fault, SYS TP/SFP Port: Link/Active Serial Port: Tx and Rx			
Power Requirements	9~48V DC / 24V AC, redundant power with reverse polarity protection			
Power Consumption	Full Loading 9VDC: 0.35A (3.15 watts) 12VDC: 0.28A (3.36 watts) 24VDC: 0.12A	Full Loading 9VDC: 0.44A (3.96 watts) 12VDC: 0.33A (4 watts) 24VDC: 0.17A	Full Loading 12VDC: 0.42A (5 watts) 24VDC: 0.22A (5.3 watts) 48VDC: 0.3A	Full Loading 12VDC: 0.43A (5.1 watts) 24VDC: 0.23A (5.5 watts) 48VDC: 0.3A

	(3 watts) 48VDC: 0.08A (3.84 watts)	(4.08 watts) 48VDC: 0.1A (4.8 watts)	(6 watts)	(6 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			
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 MB VCOM Utility management SNMPv1, v2c / SNMP Trap UNI-NMS monitoring PLANET Smart Discovery Utility			
IP Version	IPv4			
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/100BASE-FX			

	<p>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</p>
Regulatory Approval	RoHS
Environment	
Operating Temperature	-40 ~ 75 degrees C
Storage Temperature	-40 ~ 85 degrees C
Humidity	5 ~ 95% (non-condensing)

3.3 PHYSICAL SPECIFICATIONS:

Dimensions:

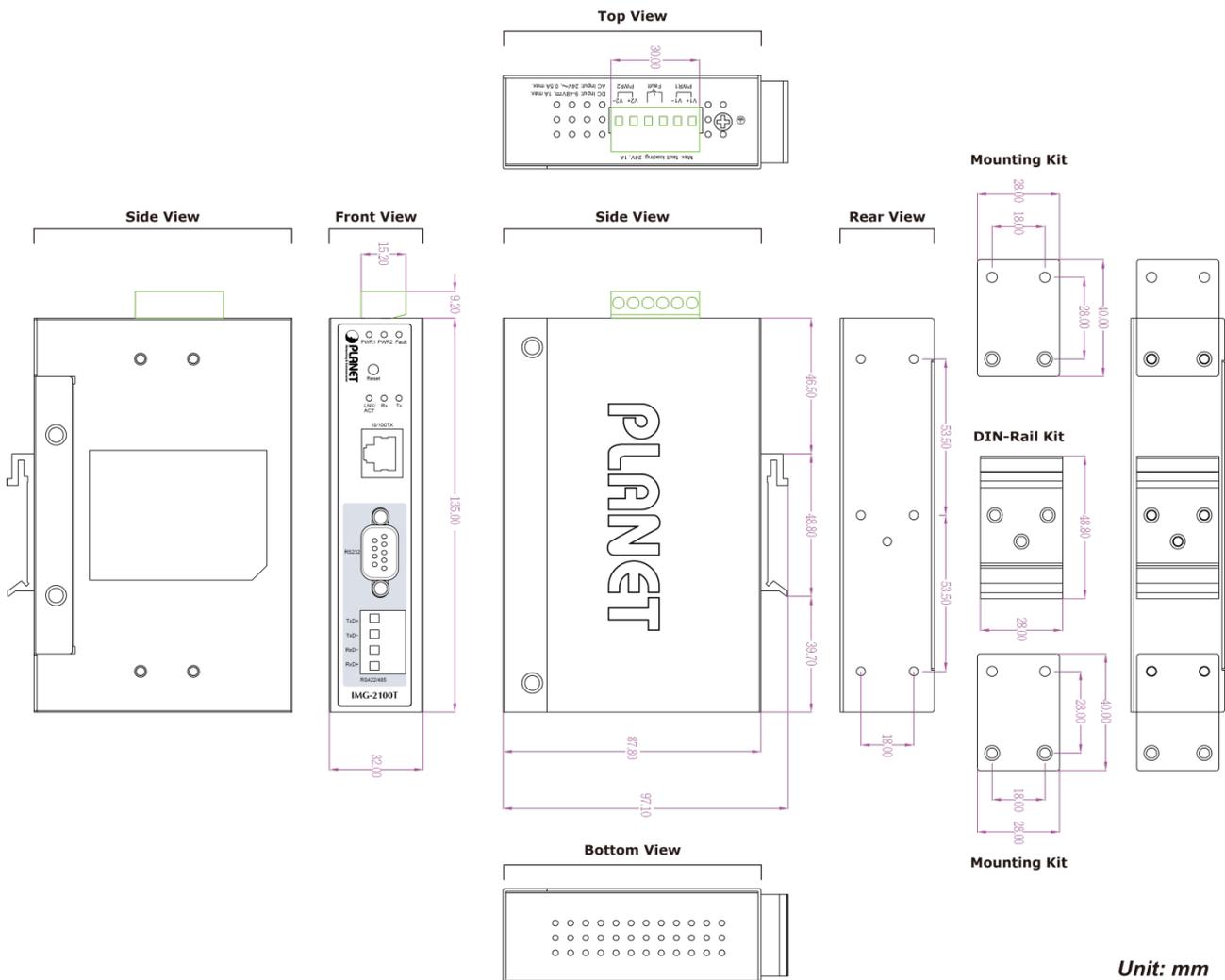
- 32 x 87 x 135 mm (W x D x H)

Weight:

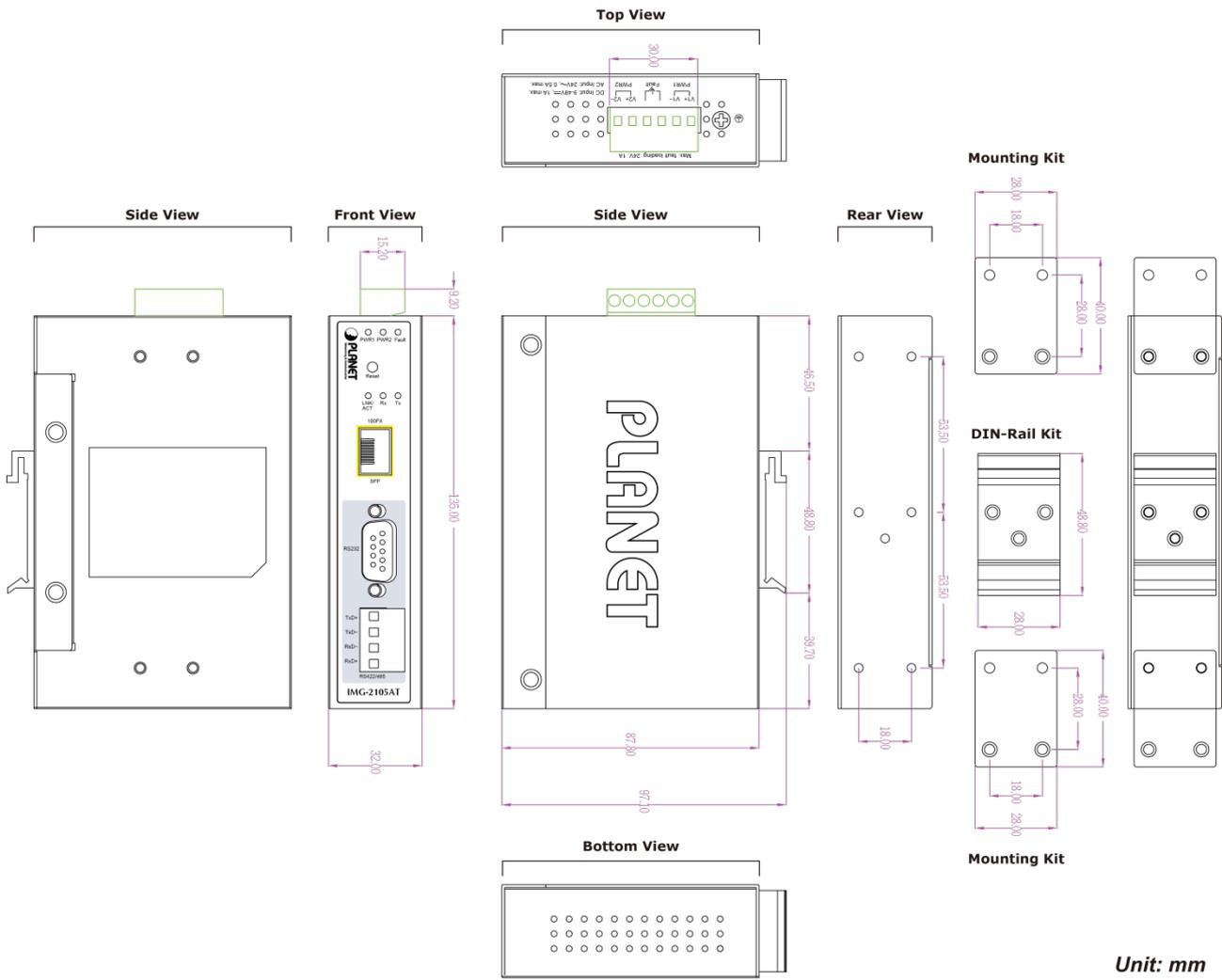
- **IMG-2100T**: 392g
- **IMG-2105AT**: 390 g
- **IMG-2102T**: 387g
- **IMG-2102TS**: 392g

Dimensions:

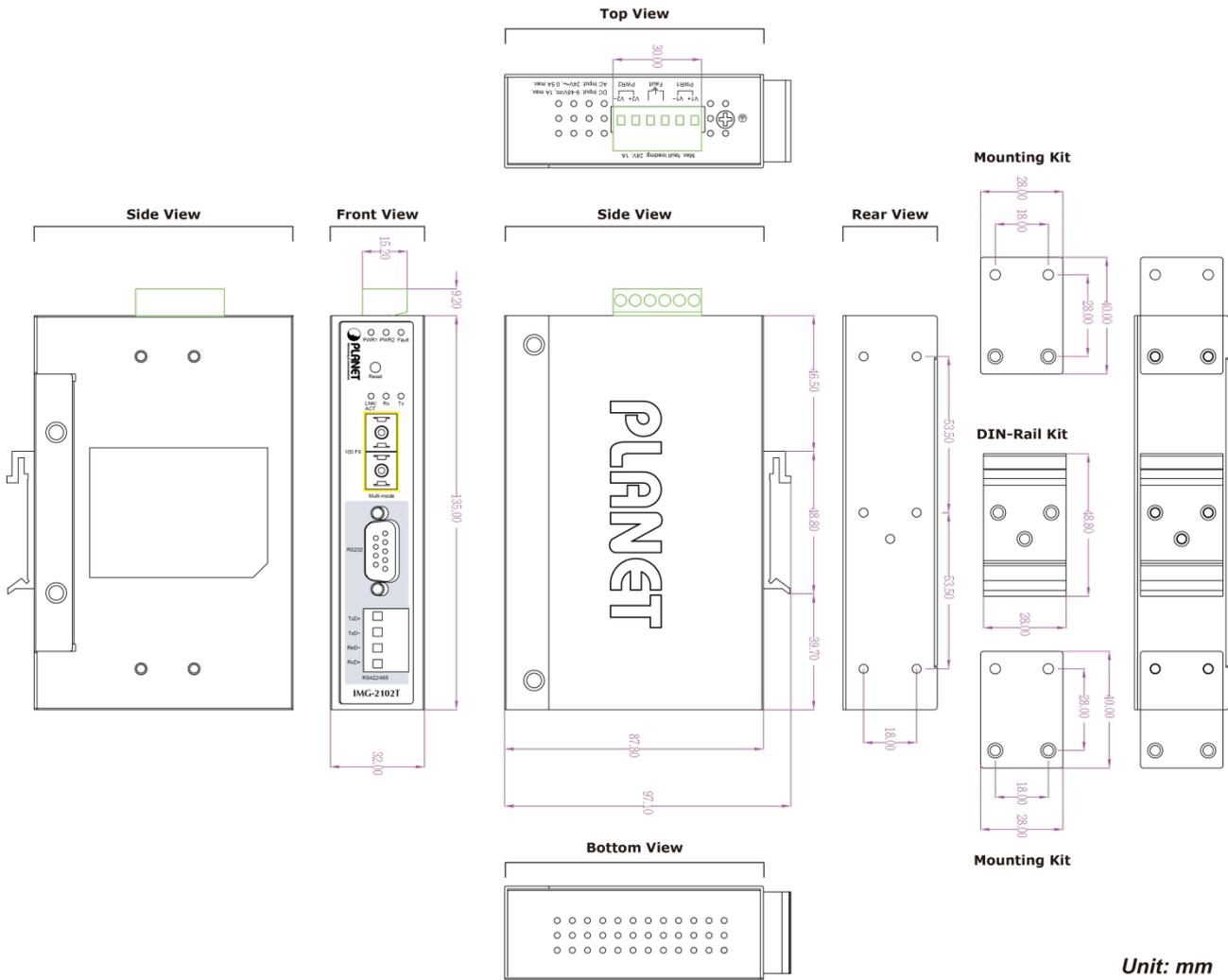
- **IMG-2100T**:



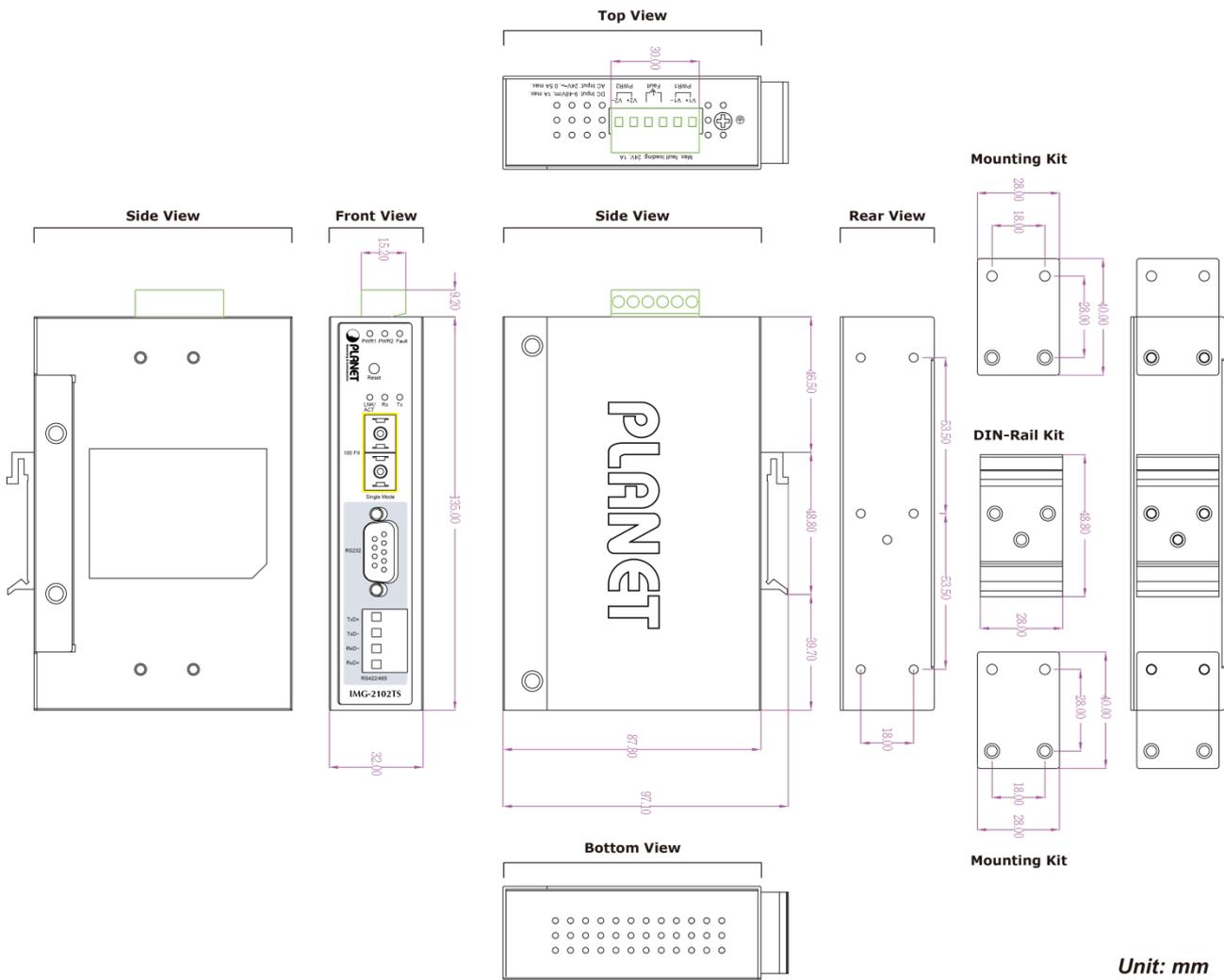
■ **IMG-2105AT:**



■ **IMG-2102T:**

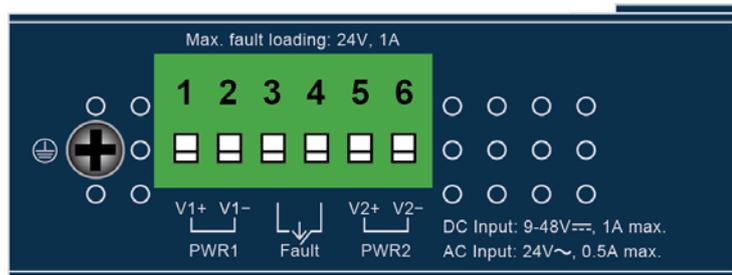


■ **IMG-2102TS:**



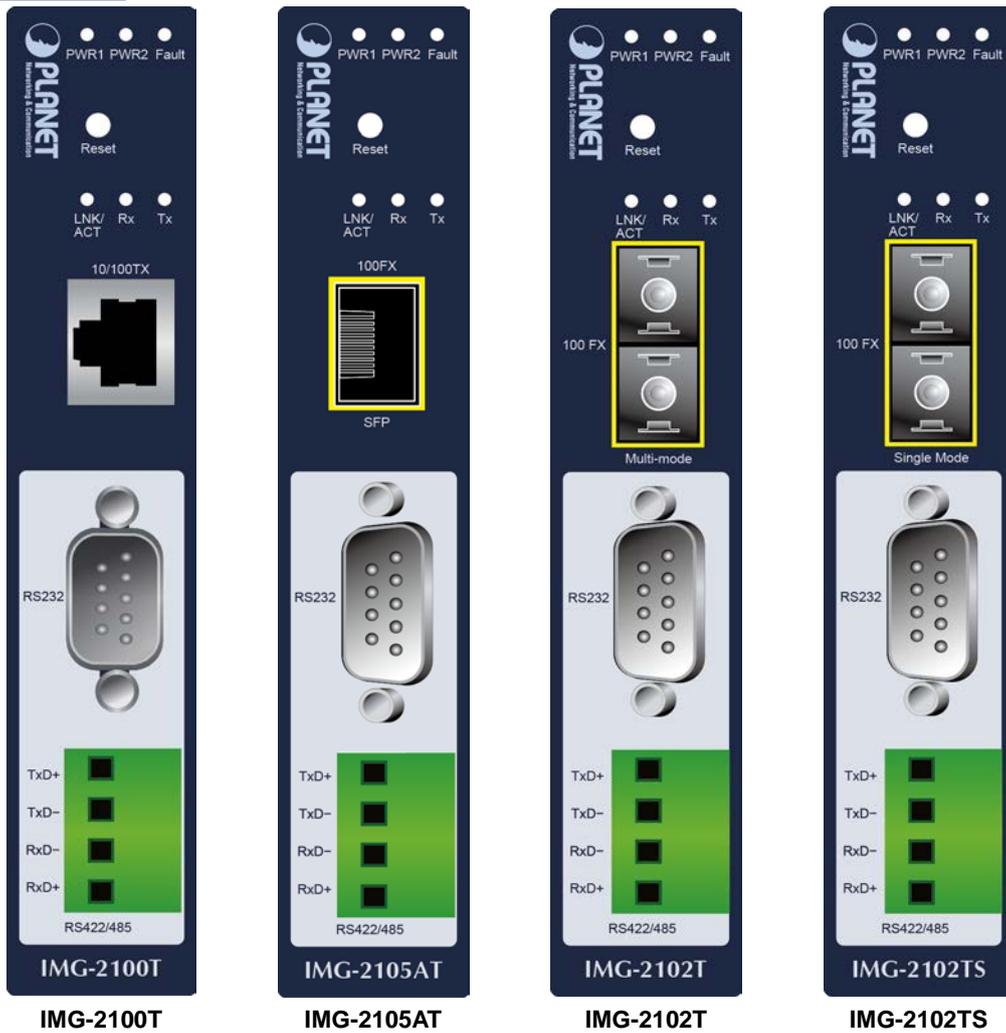
3.4 Panel View:

■ **Top view:**



IMG-2100T/IMG-2105AT/IMG-2102T/IMG-2102TS Top Panel

■ **Front Panel:**



■ **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	--	--	--

■ **4-pin Terminal Block PIN Assignment**

Terminal Block	Pin	RS-422 RS-485-4W	RS-485-2W
	1	TxD+(A)	--
	2	TxD-(B)	--
	3	RxD-(B)	Data-(B)
	4	RxD+(A)	Data+(A)

LED Definition:

LED	Color	Function	
PWR1	Green	Light	To indicate power 1 has power
PWR2	Green	Light	To indicate power 2 has power
Fault	Red	Light	To indicate either power 1 or power 2 has no power
LNK/ACT	Green	Light	To indicate that the Fast Ethernet port is successfully connecting to the network at 100Mbps
		Blink	To indicate 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

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:

9-48V DC / 24V AC, redundant power with reverse polarity protection

Power Consumption:

LOADING DC INPUT	IMG-2100T Full Loading	IMG-2105AT Full Loading	IMG-2102T Full Loading	IMG-2102TS Full Loading
9V	3.15 watts	3.96 watts	-	-
12V	3.36 watts	4 watts	5 watts	5 watts
24V	3 watts	4.08 watts	5.3 watts	5.5 watts
48V	3.84 watts	4.8 watts	6 watts	6 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

- The Industrial Modbus Gateway x 1
- Quick Installation Guide x 1
- DIN-rail Kit x 1
- Wall Mounting Kit x 1
- Dust Cap (RJ45 or SFP) x 1

3.10 PACKING INFORMATION

	IMG-2100T	IMG-2105AT	IMG-2102T	IMG-2102TS
Box Dimensions (W x D x H):	205 x 144 x 46 mm			
Gross Weight:	556 g			
Carton Dimensions (W x D x H):	435 x 325 x 280 mm			
Total Weight:	11.7 kg			
Quantity:	20pcs in one carton			