

Industrial 2-port RS422/485 *Modbus Gateway*

IMG-120T



Presentation Outlines

- ◆ Product Positioning
- ◆ Product Overview
- ◆ Product Benefits
- ◆ Product Features
- ◆ Applications
- ◆ Comparison

Communication Bridge Between Modbus TCP/IP & Modbus RTU/ASCII Protocol



The diagram illustrates the PLANET Industrial Modbus Gateway (IMG-120T) as a central communication bridge. On the left, a green arrow labeled "Modbus TCP/IP Protocol" points towards the device, with callouts for "10M", "100M", "RS485", and "RS422". On the right, a blue arrow labeled "Modbus RTU/ASCII Protocol" points away from the device, with callouts for "IP Code 40" and a temperature range of "75°C" to "-40°C". The device itself is a black rack-mountable unit with a green terminal block on top and a green terminal block on the bottom. The front panel features the PLANET logo, the text "Industrial Modbus Gateway", and the model number "IMG-120T". Below the text, there are two sets of terminals labeled "COM1" and "COM2", each with "Tx", "Rx", and "GND" pins. A small green terminal block is also visible on top of the device.

Product Positioning



Modes of Application Overview

Factory



Building



Transportation



PLANET Serial Products Family

**Industrial
(-40-75
degrees C)**



IMG-110T
 - 1 x RS422/485 COM port
 - RJ45 Fast Ethernet interface
 - 9-48V DC input

IMG-120T
 - 2 x RS422/485 COM port
 - RJ45 Fast Ethernet interface
 - 9-48V DC input

**Industrial
(-10-60
degrees C)**



ICS-210x Series (ICS-2100/ICS-2102/ICS-2102S15/ICS-2105A)
 - RS232/422/485 over Fast Ethernet
 - RJ45/SC/SFP Fast Ethernet interfaces
 - 12-48V DC/24V AC input

**Standard
(0-50
degrees C)**



ICS-10x Series (ICS-100/ICS-102/ICS-102S15/ICS-105A)
 - RS232/422/485 over Fast Ethernet
 - RJ45/SC/SFP Fast Ethernet interfaces
 - 5V DC input

- Planning
- Developing
- New Phase-in
- Available

Serial over Ethernet Media Converter

Modbus Gateway

Product Overview



Product Overview

◆ About Modbus

Modbus is a serial communications protocol originally published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs). Simple and robust, it has since become a de facto standard communication protocol and is now a commonly available means of connecting industrial electronic devices.

The main reasons for the use of Modbus in the industrial environment are:

- 1: Developed with industrial applications in mind.**
- 2: Openly published and royalty-free.**
- 3: Easy to deploy and maintain.**
- 4: Moves raw bits or words without placing many restrictions on vendors.**

Modbus enables communication among many devices connected to the same network, for example, a system that measures temperature and humidity, and communicates the results to a computer. Modbus is often used to connect a supervisory computer with a Remote Terminal Unit (RTU) in **Supervisory Control And Data Acquisition (SCADA)** systems.

The development and update of Modbus protocols has been managed by the Modbus Organization since April 2004 when Schneider Electric transferred rights to that organization.

The Modbus Organization is an association of users and suppliers of Modbus-compliant devices that seek to drive the adoption and evolution of Modbus.

Product Overview

◆ About Modbus Protocol Versions

Versions of the Modbus protocol exist for serial port, and for Ethernet and other protocols that support the Internet protocol suite . There are many variants of Modbus protocols:

Modbus RTU — This is used in serial communication and makes use of a compact, binary representation of the data for protocol communication.

Modbus ASCII — This is used in serial communication and makes use of ASCII characters for protocol communication.

Modbus TCP/IP or Modbus TCP — This is a Modbus variant used for communications over TCP/IP networks, connecting over Port 502. It does not require a checksum calculation, as lower layers already provide checksum protection.

Modbus over TCP/IP or Modbus over TCP or Modbus RTU/IP — This is a Modbus variant that differs from Modbus TCP in that a checksum is included in the payload as with Modbus RTU.

Product Overview

◆ About Modbus Protocol Versions

Modbus over UDP — Some have experimented with using Modbus over UDP on IP networks, which remove the overheads required for TCP.

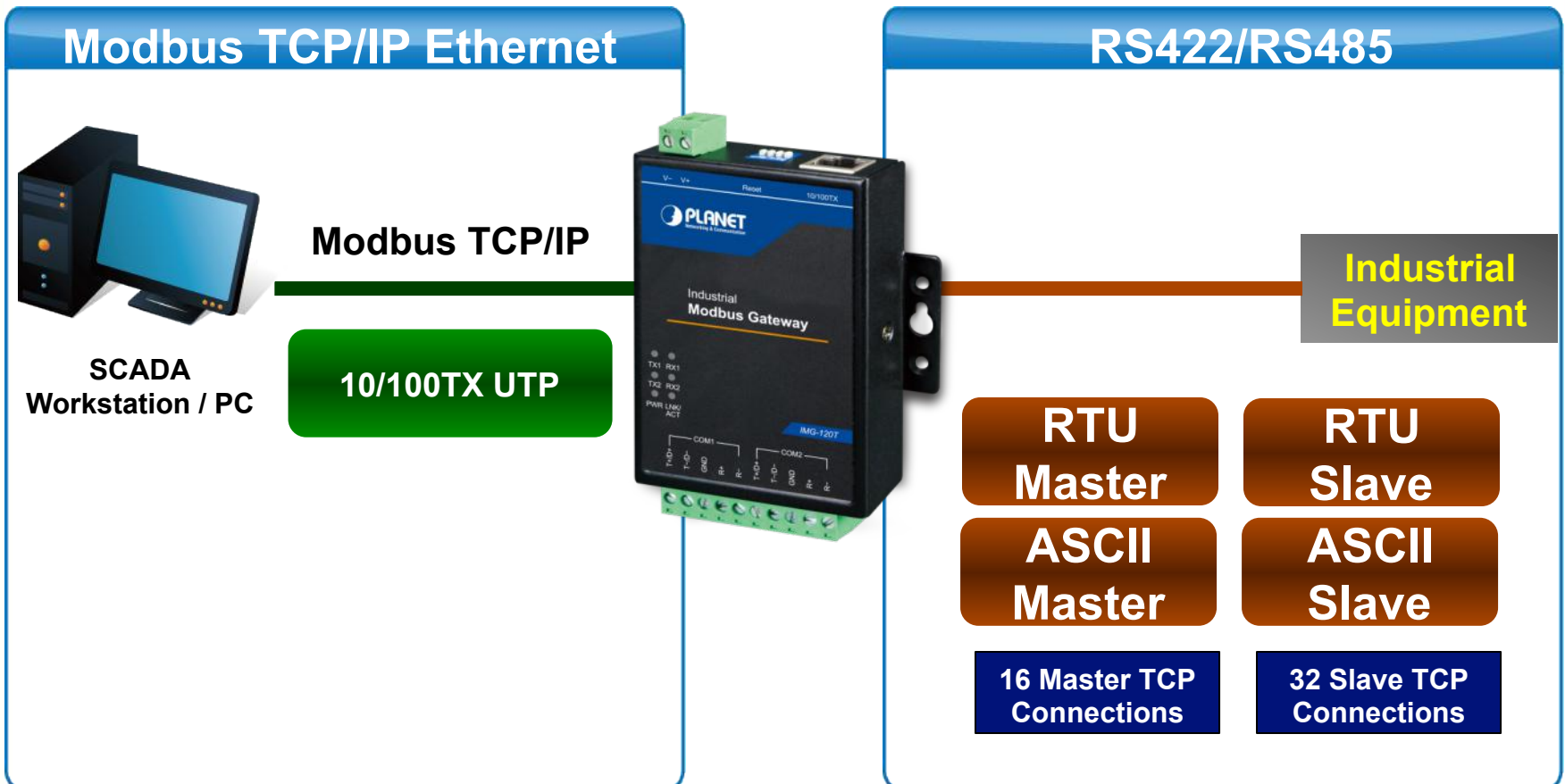
Modbus Plus (Modbus+, MB+ or MBP) — Modbus Plus is proprietary to Schneider Electric and unlike the other variants, it supports peer-to-peer communications between multiple masters.

Pemex Modbus — This is an extension of standard Modbus with support for historical and flow data. It was designed for the Pemex oil and gas company for use in process control and never gained widespread adoption.

Enron Modbus — This is another extension of standard Modbus developed by Enron Corporation with support for 32-bit integer and floating-point variables, and historical and flow data.

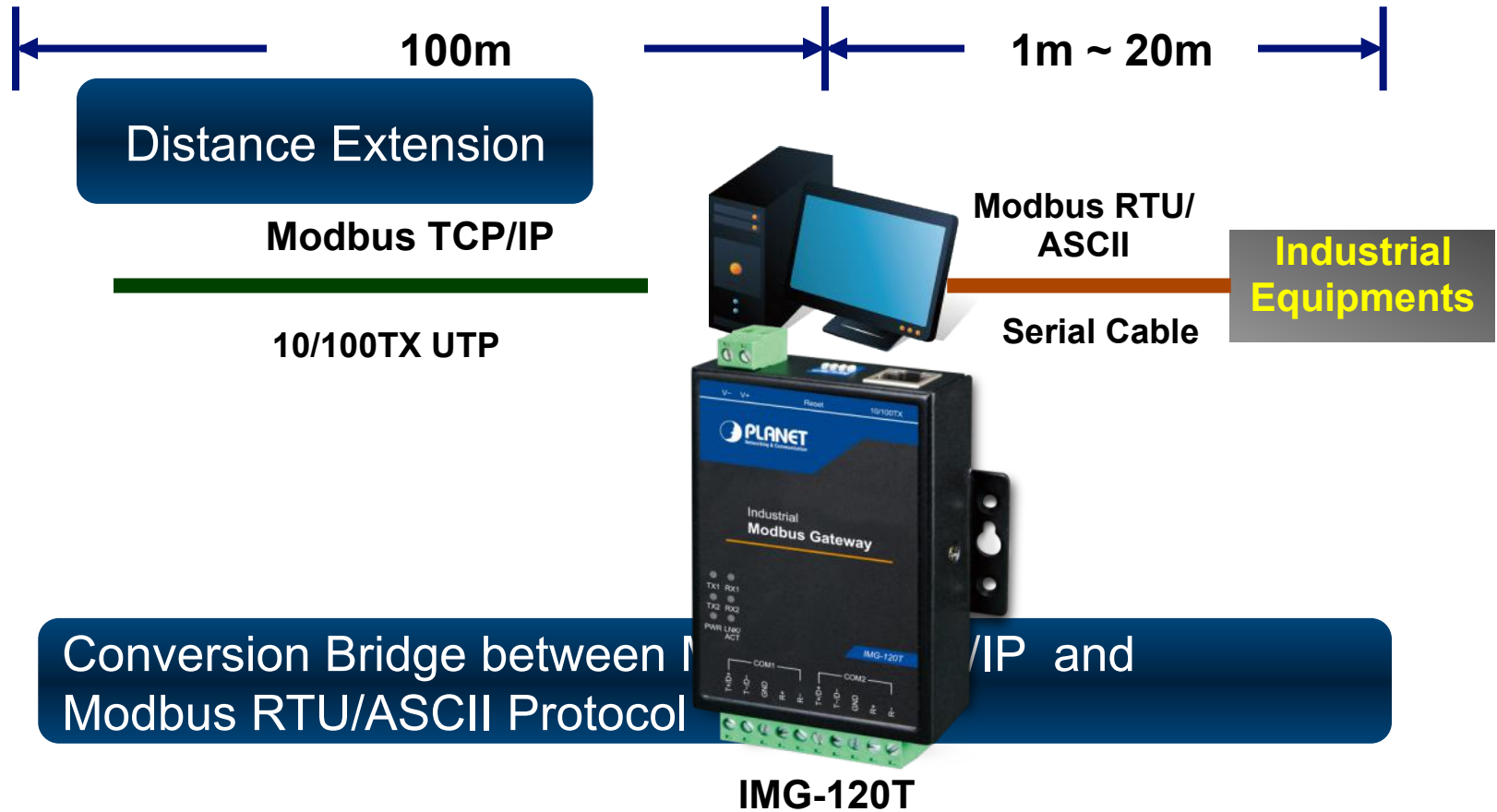
Product Overview

◆ What is Industrial Modbus RTU/ASCII Network Integration?



Product Overview

- ◆ **What is Industrial Modbus RTU/ASCII Network Integration?**



Conversion Bridge between Modbus TCP/IP and Modbus RTU/ASCII Protocol

IMG-120T

Product Overview – Range of Applications



Modbus SCADA



Touch Panel HMI



**Modbus Touch Screen
Room Controller**



**Programmable Logic
Controller (PLC)**

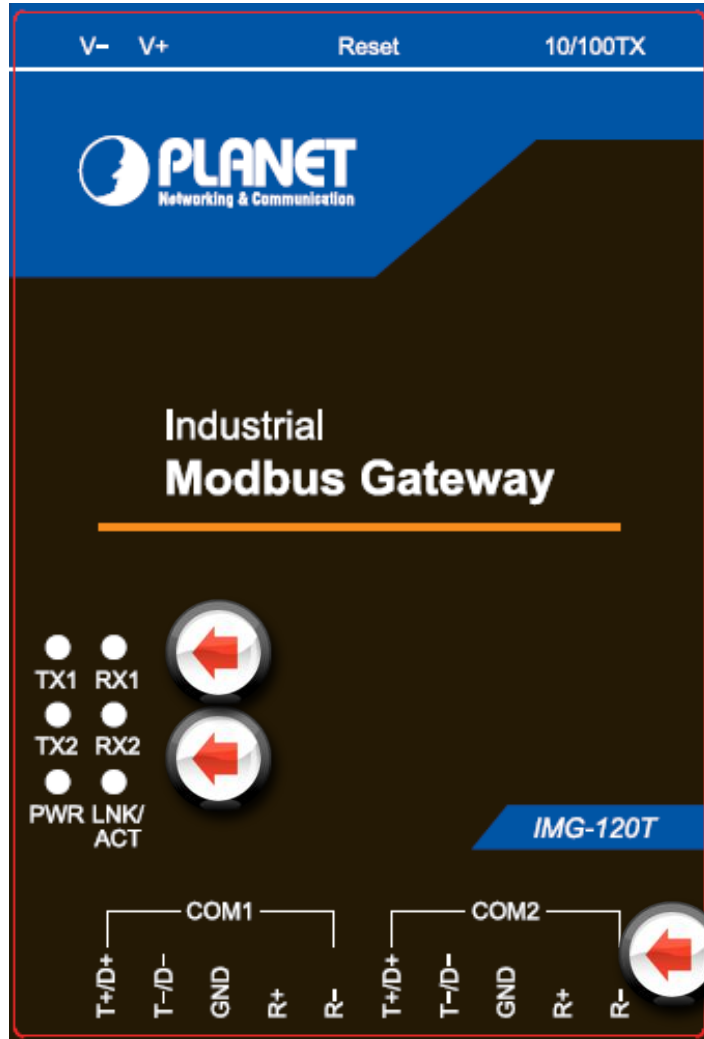


Modbus Electricity Meter



Power Meter

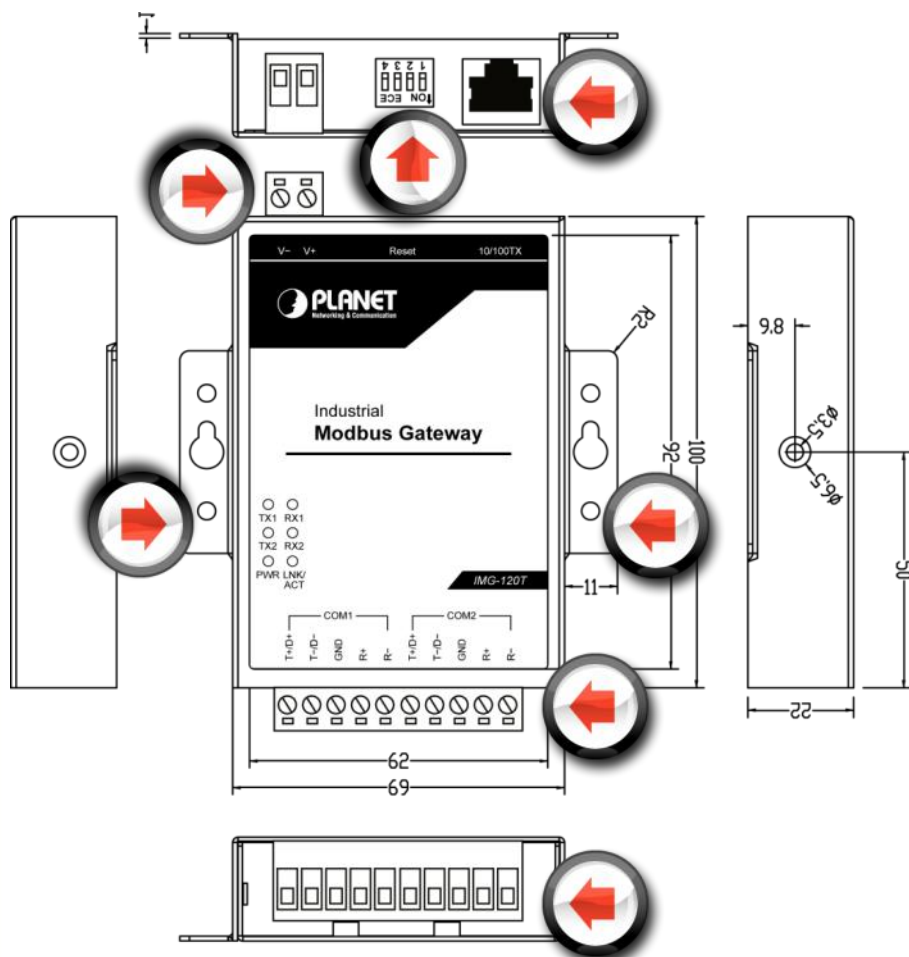
Product Overview



◆ Front Panel

- ✓ LED Indication for the **serial transmit data (TX1/ TX2)**
- ✓ LED Indication for the **serial receive data (RX1/ RX2)**
- ✓ LED Indication for **system power, Fast Ethernet Port LNK/ACT**
- ✓ **PIN Definition for the RS422/RS485 COM Interface**

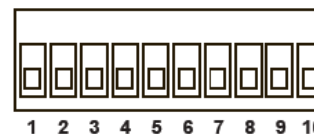
Product Overview



Dimensions (unit = mm)

◆ Mechanical Drawing

- ✓ 2-contact terminal block for the **DC 9-48V power input**
- ✓ DIP switch for **resetting to default**
- ✓ RJ45 port for **10/100BASE-TX**
- ✓ **Wall-mount kit**
- ✓ **10-contact terminal block for the RS422/RS485 COM Interface**



Serial port	PIN	RS485 PIN define	RS422 PIN define
COM1	1	D+	T+
	2	D-	T-
	3	GND	GND
	4	--	R+
	5	--	R-
COM2	6	D+	T+
	7	D-	T-
	8	GND	GND
	9	--	R+
	10	--	R-

Product Benefits



Product Benefits

◆ **As required by customers**

Economical
**RS422/RS485 to
10/100TX**
Integration Solution

Conversion Bridge
between
**Modbus TCP/IP &
Modbus RTU/ASCII**
Protocols

Master Mode for **32** Slave
TCP Connections
Slave Mode for **1**
Master Connections



IMG-120T

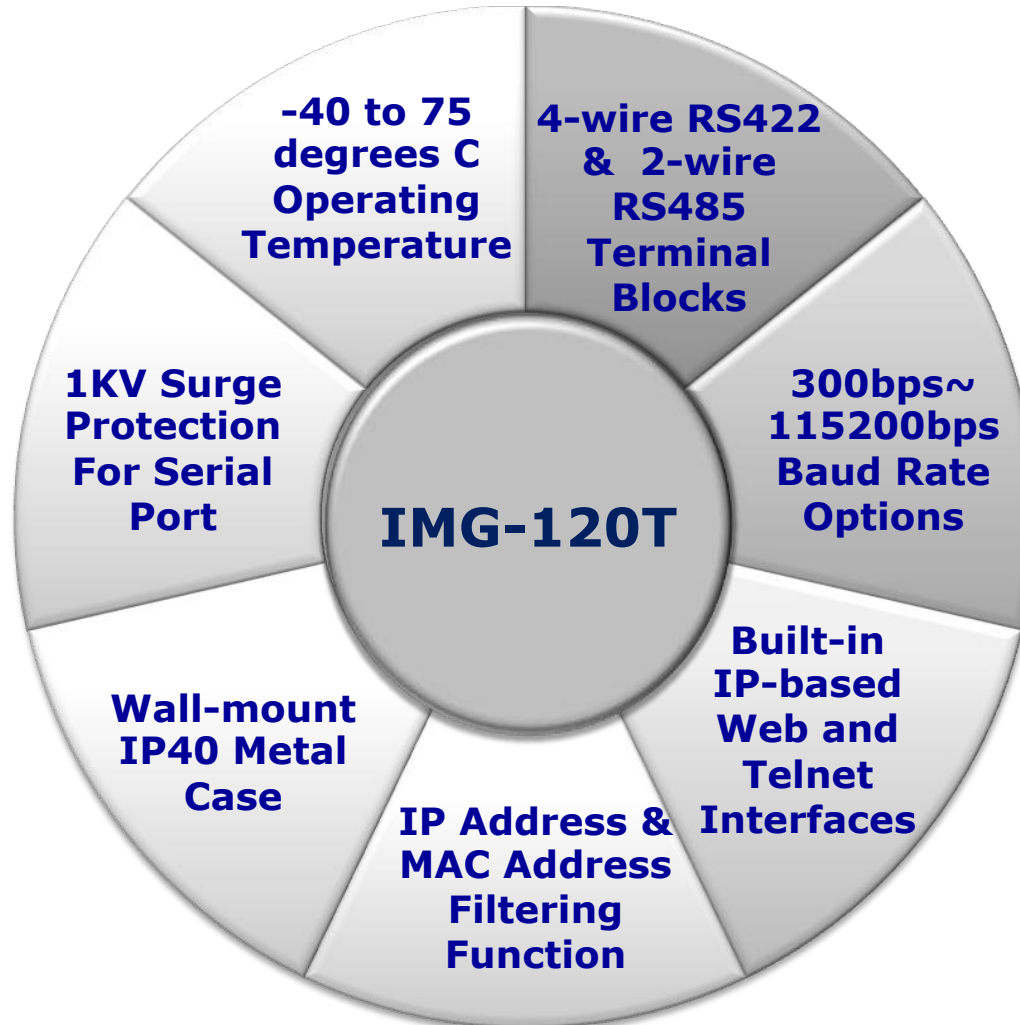
Industrial 4.0

Higher Flexibility
Cost Effectiveness

Product Features



Product Key Features



Product Features

◆ Hardware

- ✓ **2 RS422/RS485 with 5-contact terminal block**
 - **2**-wire RS485.
 - **4**-wire RS422.
- ✓ **1 10/100BASE-TX TP RJ45 interface**
- ✓ **DIP switch** for resetting to default
- ✓ **LED Indicators** for system, network and RS422/RS485 interface diagnostics
- ✓ **Wall-mount type IP40** metal case
- ✓ **FCC Part 15 Class B, CE**
- ✓ **IEEE 802.3/802.3u** Fast Ethernet standard
- ✓ **Dimensions: 69 x 100 x 22 mm (W x D x H)**
- ✓ **Weight: 238g**

Product Features

◆ Hardware

- ✓ **1KV Surge Protection** for RS422/485 serial port
- ✓ **300bps~115200bps** baud rate (data rate)
- ✓ **7 & 8** data bits
- ✓ **Odd/Even/None/Space/Mark** parity type
- ✓ **1 & 2** stop bit
- ✓ **Hardware & None** flow control
- ✓ **Signals:**
 - **2-wire RS485: Data A (+), GND, Data B (-)**
 - **4-wire RS422: Tx+, Tx-, GND, Rx+, Rx-**
- ✓ **Distance: RS422/RS485 for 20m** transfer distance

Product Features

◆ Industrial Conformance

- ✓ **9~48V DC** power input designed with **2-contact terminal block**
- ✓ **-40 to 75** degrees operating temperature
- ✓ **Wall-mount IP40** metal case
- ✓ **Stability tests include:**
 - **IEC60068-2-32** (free fall)
 - **IEC60068-2-27** (shock)
 - **IEC60068-2-6** (vibration)

Product Features

◆ Serial Operation Modes

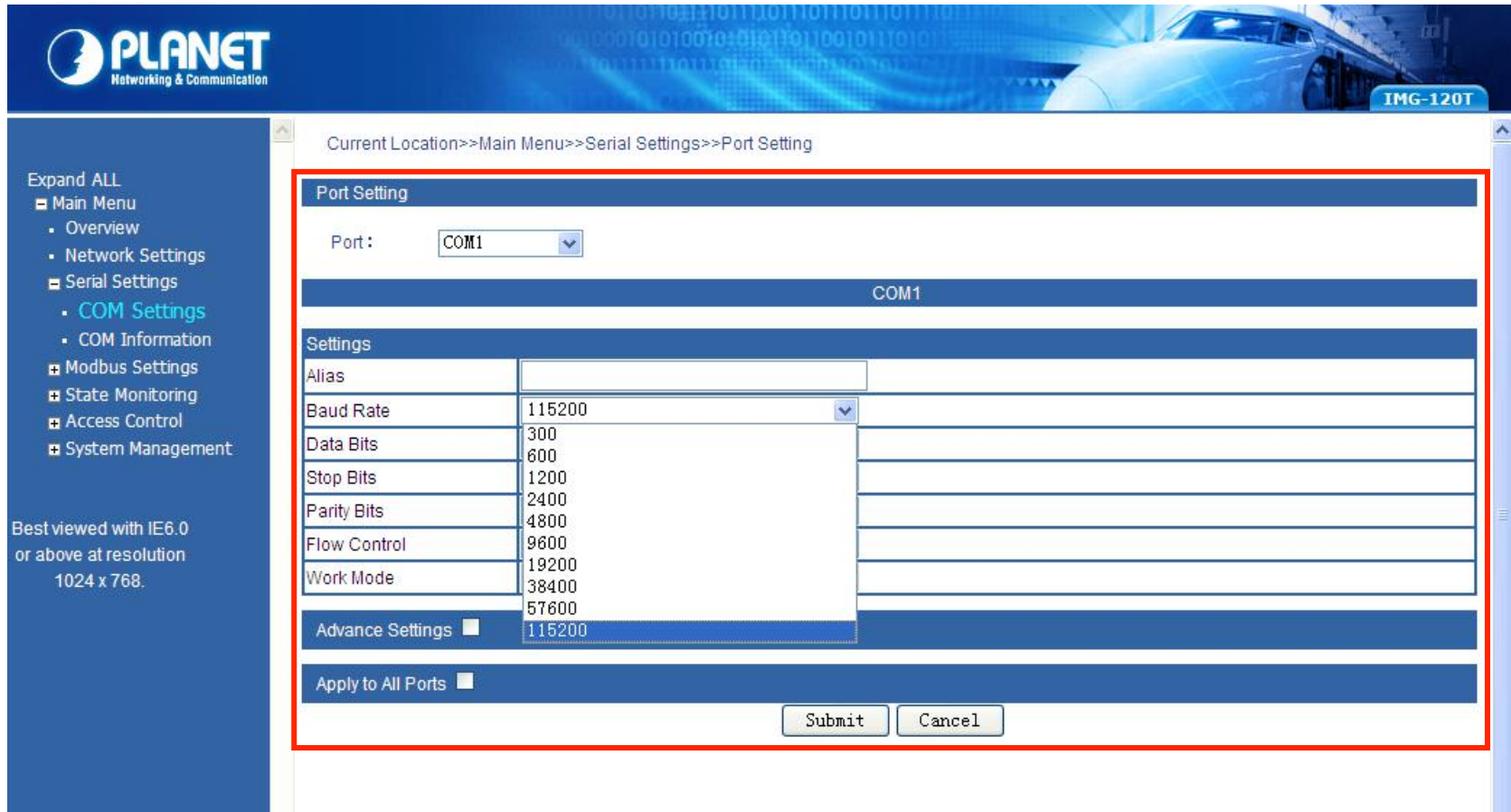
- ✓ **RTU Master and RTU Slave**
- ✓ **ASCII Master and ASCII Slave**
- ✓ **Master mode supports 32 slave TCP connection requests**
- ✓ **Slave mode supports 16 TCP master connections**

◆ Management Functions

- ✓ **Built-in IP-based Web interface and telnet interface for remote management**
- ✓ **Modbus TCP, Modbus RTU, Modbus ASCII, IP, ARP, DHCP and DNS**
- ✓ **Firmware upgrade/configuration backup and restore via HTTP Protocol**

Product Features

- ◆ **User-friendly Web Management Interface -- COM Settings**



PLANET Networking & Communication

Current Location>>Main Menu>>Serial Settings>>Port Setting

Port Setting

Port : COM1

COM1

Settings	
Alias	
Baud Rate	115200
Data Bits	300
Stop Bits	600
Parity Bits	1200
Flow Control	2400
Work Mode	4800
	9600
	19200
	38400
	57600
	115200

Advance Settings

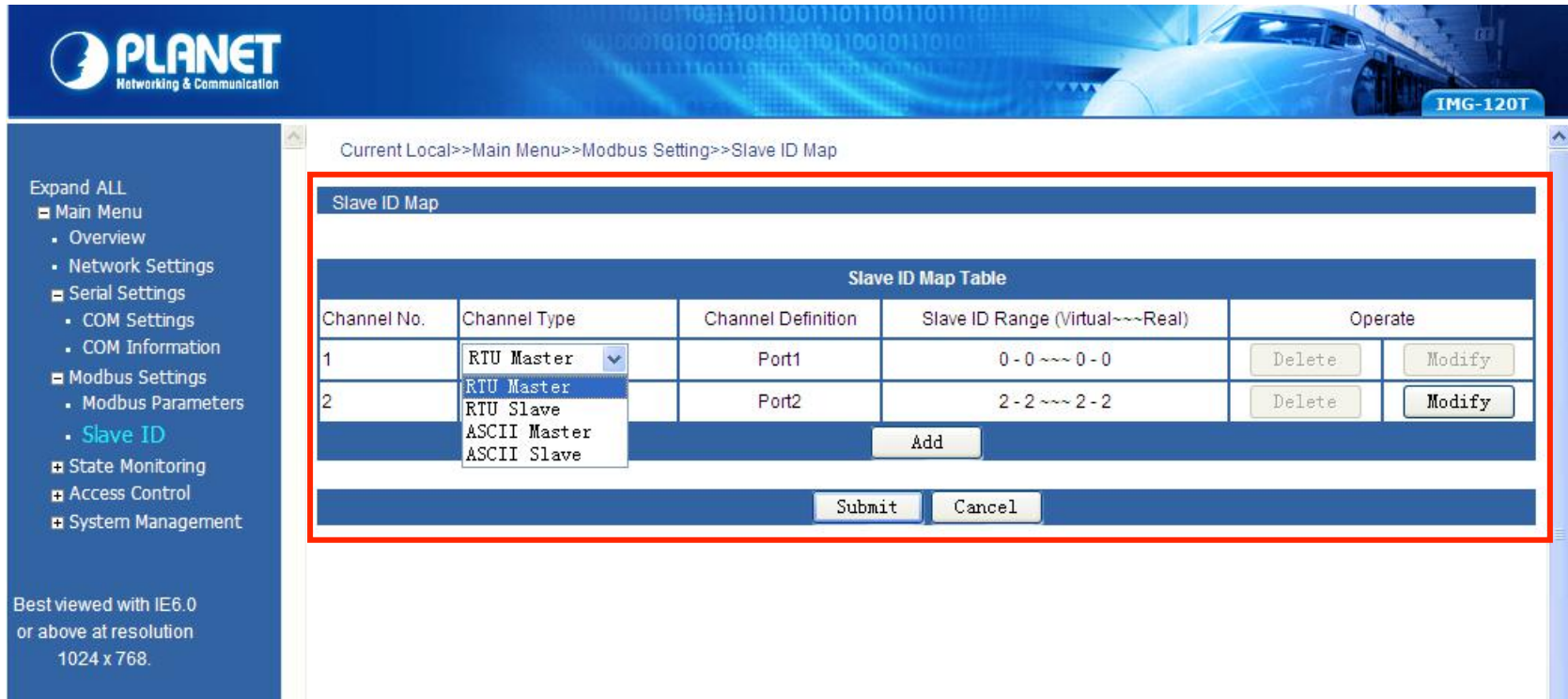
Apply to All Ports

Submit Cancel

Best viewed with IE6.0 or above at resolution 1024 x 768.

Product Features

◆ User-friendly Web Management Interface -- **Slave ID**



Current Local>>Main Menu>>Modbus Setting>>Slave ID Map

Slave ID Map

Slave ID Map Table					
Channel No.	Channel Type	Channel Definition	Slave ID Range (Virtual~~~Real)	Operate	
1	RTU Master	Port1	0 - 0 ~~~ 0 - 0	Delete	Modify
2	RTU Slave	Port2	2 - 2 ~~~ 2 - 2	Delete	Modify

Add

Submit Cancel

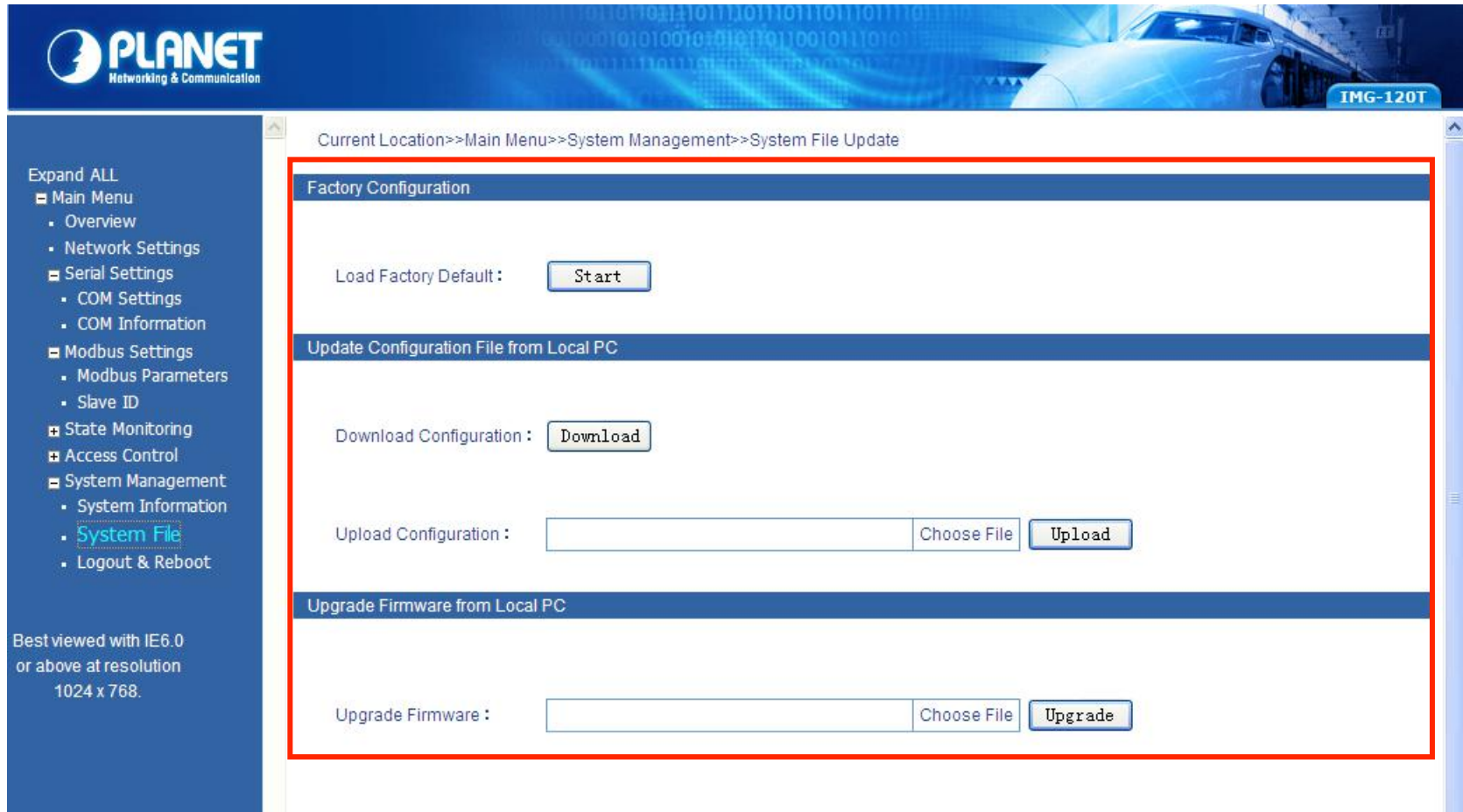
Expand ALL

- Main Menu
 - Overview
 - Network Settings
- Serial Settings
 - COM Settings
 - COM Information
- Modbus Settings
 - Modbus Parameters
 - Slave ID**
- State Monitoring
- Access Control
- System Management

Best viewed with IE6.0 or above at resolution 1024 x 768.

Product Features

- ◆ **User-friendly Web Management Interface -- System File**



The screenshot displays the PLANET web management interface. The top navigation bar shows the current location: "Current Location>>Main Menu>>System Management>>System File Update". The left sidebar contains a menu with the following items: Expand ALL, Main Menu (Overview, Network Settings), Serial Settings (COM Settings, COM Information), Modbus Settings (Modbus Parameters, Slave ID), State Monitoring, Access Control, System Management (System Information, **System File**, Logout & Reboot). The main content area is titled "System File Update" and contains three sections: "Factory Configuration" with a "Load Factory Default : Start" button; "Update Configuration File from Local PC" with a "Download Configuration : Download" button and an "Upload Configuration : [input field] Choose File Upload" form; and "Upgrade Firmware from Local PC" with an "Upgrade Firmware : [input field] Choose File Upgrade" form. A red box highlights the "System File Update" section. The bottom left corner of the interface notes: "Best viewed with IE6.0 or above at resolution 1024 x 768."

Product Features

◆ Access Control

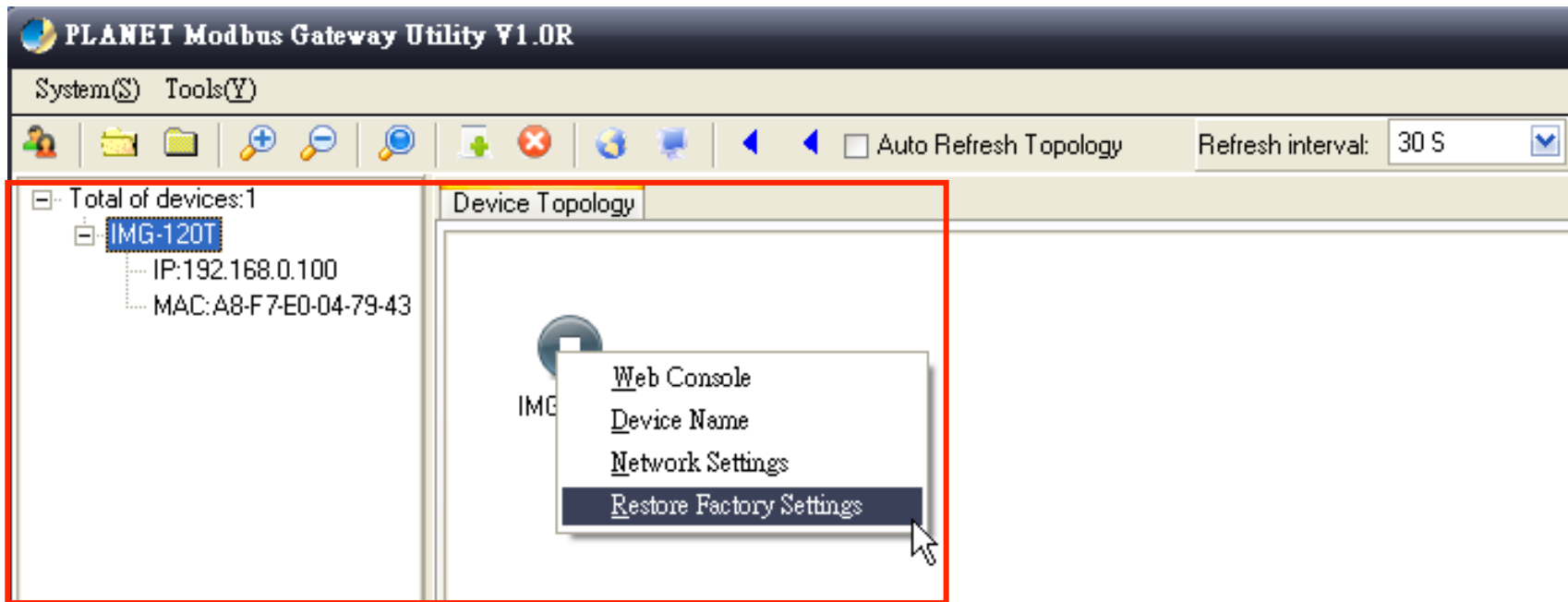
- ✓ IP address and MAC address filtering function
- ✓ Users level management

◆ Management Utilities

- ✓ **PLANET Modbus Gateway utility** for finding client device on the network and related IP subnet address setting to be reset to factory default function
- ✓ **PLANET Smart Discovery utility** automatically finds the client devices on the network

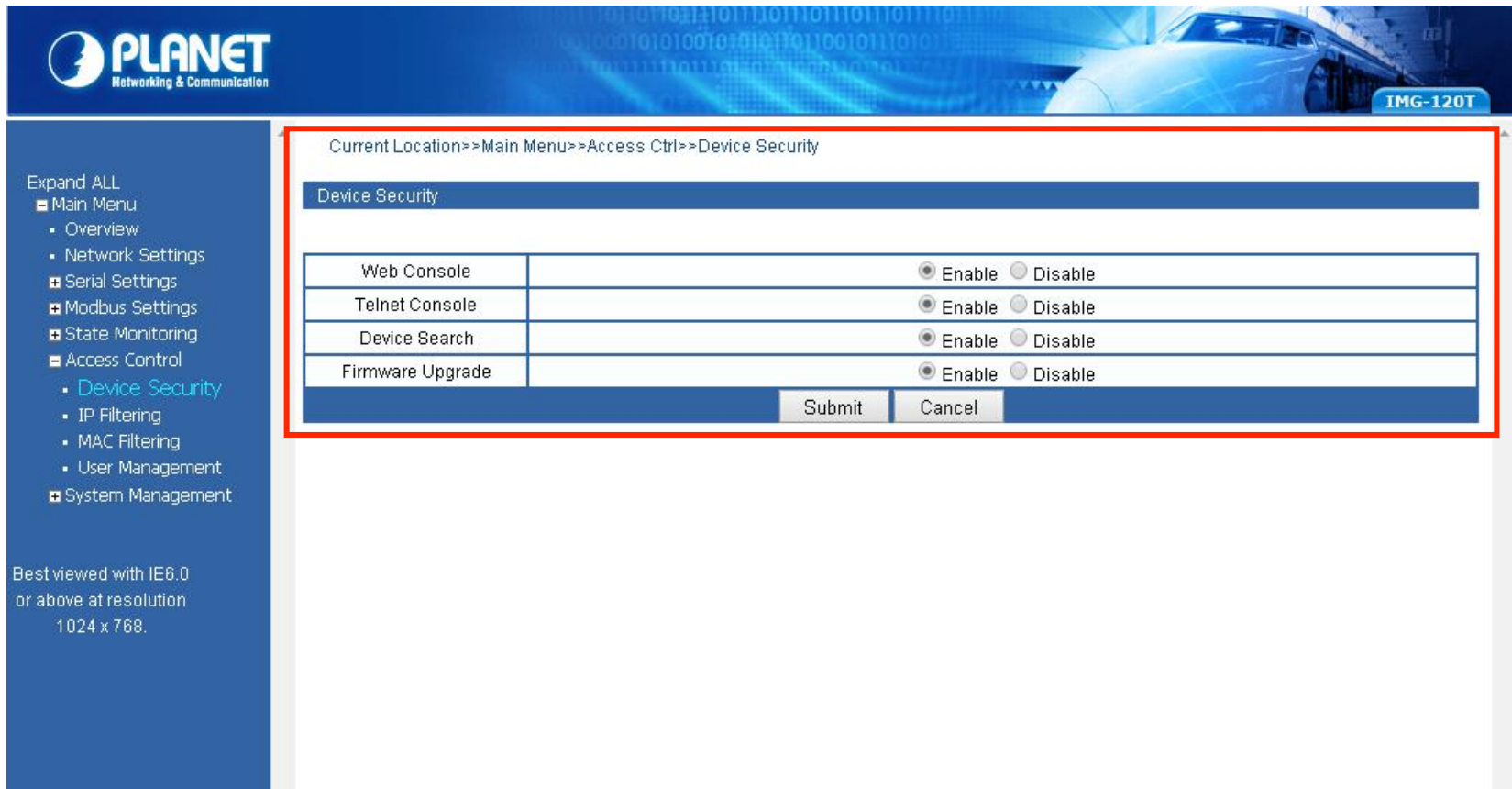
Product Features

◆ PLANET Modbus Gateway Utility



Product Features

- ◆ **User-friendly Web Management Interface -- Device Security**



Current Location>>Main Menu>>Access Ctrl>>Device Security

Device Security

Web Console	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Telnet Console	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Device Search	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Firmware Upgrade	<input checked="" type="radio"/> Enable <input type="radio"/> Disable

Submit Cancel

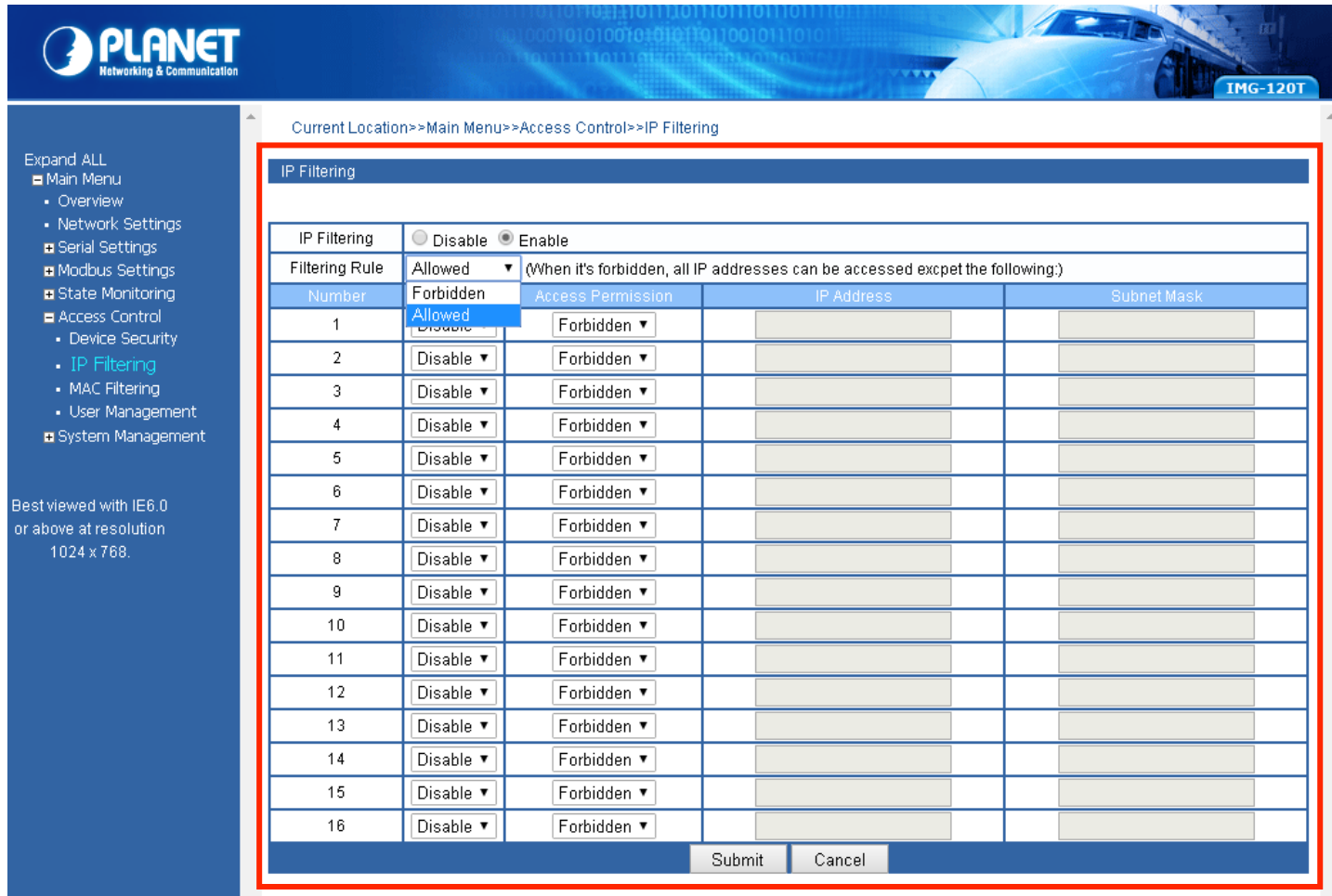
Expand ALL

- ▣ Main Menu
 - Overview
 - Network Settings
 - ▣ Serial Settings
 - ▣ Modbus Settings
 - ▣ State Monitoring
 - ▣ Access Control
 - **Device Security**
 - IP Filtering
 - MAC Filtering
 - User Management
 - ▣ System Management

Best viewed with IE6.0 or above at resolution 1024 x 768.

Product Features

◆ User-friendly Web Management Interface -- IP Filtering



Current Location>>Main Menu>>Access Control>>IP Filtering

IP Filtering

Disable
 Enable

Filtering Rule: Allowed (When it's forbidden, all IP addresses can be accessed except the following:)

Number	Forbidden	Access Permission	IP Address	Subnet Mask
1	Allowed	Forbidden		
2	Disable	Forbidden		
3	Disable	Forbidden		
4	Disable	Forbidden		
5	Disable	Forbidden		
6	Disable	Forbidden		
7	Disable	Forbidden		
8	Disable	Forbidden		
9	Disable	Forbidden		
10	Disable	Forbidden		
11	Disable	Forbidden		
12	Disable	Forbidden		
13	Disable	Forbidden		
14	Disable	Forbidden		
15	Disable	Forbidden		
16	Disable	Forbidden		

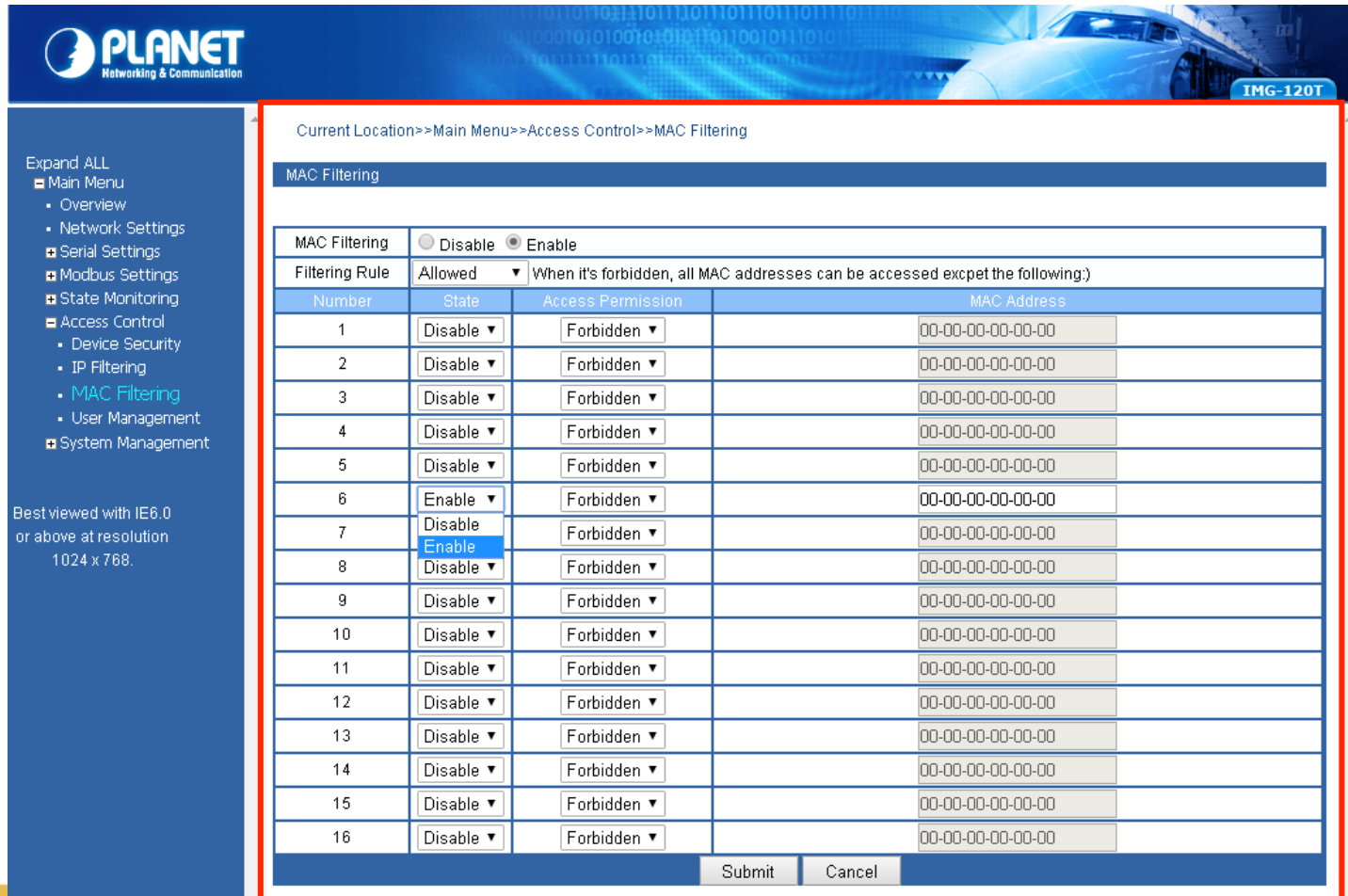
Submit Cancel

- Expand ALL
- ▣ Main Menu
 - Overview
 - Network Settings
 - ▣ Serial Settings
 - ▣ Modbus Settings
 - ▣ State Monitoring
 - ▣ Access Control
 - Device Security
 - IP Filtering
 - MAC Filtering
 - User Management
 - ▣ System Management

Best viewed with IE6.0
or above at resolution
1024 x 768.

Product Features

◆ User-friendly Web Management Interface -- **MAC Filtering**



Current Location>>Main Menu>>Access Control>>MAC Filtering

MAC Filtering

MAC Filtering Disable Enable

Filtering Rule: Allowed (When it's forbidden, all MAC addresses can be accessed except the following:)

Number	State	Access Permission	MAC Address
1	Disable	Forbidden	00-00-00-00-00-00
2	Disable	Forbidden	00-00-00-00-00-00
3	Disable	Forbidden	00-00-00-00-00-00
4	Disable	Forbidden	00-00-00-00-00-00
5	Disable	Forbidden	00-00-00-00-00-00
6	Enable	Forbidden	00-00-00-00-00-00
7	Disable	Forbidden	00-00-00-00-00-00
8	Enable	Forbidden	00-00-00-00-00-00
9	Disable	Forbidden	00-00-00-00-00-00
10	Disable	Forbidden	00-00-00-00-00-00
11	Disable	Forbidden	00-00-00-00-00-00
12	Disable	Forbidden	00-00-00-00-00-00
13	Disable	Forbidden	00-00-00-00-00-00
14	Disable	Forbidden	00-00-00-00-00-00
15	Disable	Forbidden	00-00-00-00-00-00
16	Disable	Forbidden	00-00-00-00-00-00

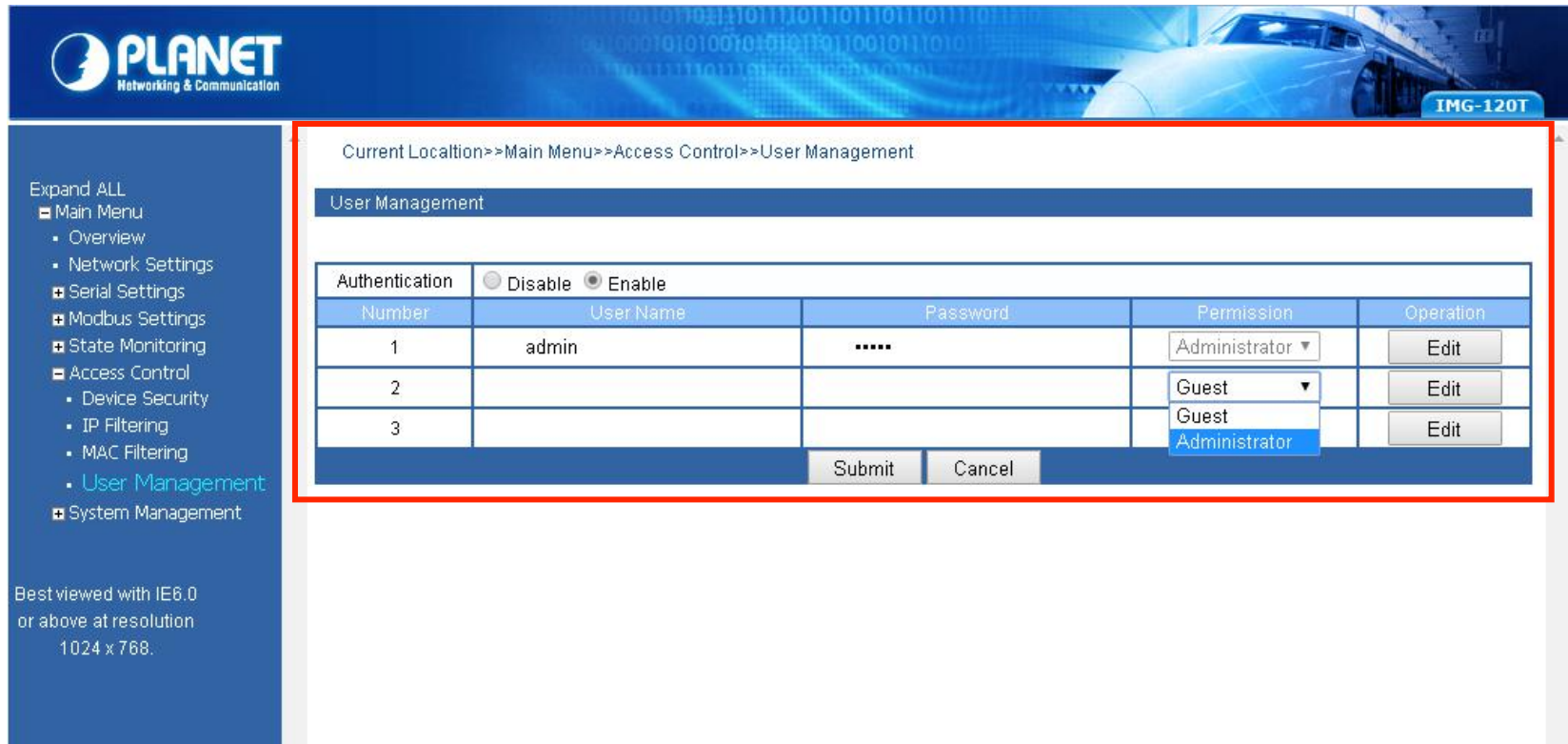
Submit Cancel

- Expand ALL
- ▣ Main Menu
 - Overview
 - Network Settings
 - ▣ Serial Settings
 - ▣ Modbus Settings
 - ▣ State Monitoring
 - ▣ Access Control
 - Device Security
 - IP Filtering
 - **MAC Filtering**
 - User Management
 - ▣ System Management

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or above at resolution
1024 x 768.

Product Features

◆ User-friendly Web Management Interface – **User Management**



Current Location>>Main Menu>>Access Control>>User Management

User Management

Authentication Disable Enable

Number	User Name	Password	Permission	Operation
1	admin	Administrator	Edit
2			Guest	Edit
3			Guest	Edit

Submit Cancel

Expand ALL

- ▣ Main Menu
 - Overview
 - Network Settings
 - ▣ Serial Settings
 - ▣ Modbus Settings
 - ▣ State Monitoring
 - ▣ Access Control
 - Device Security
 - IP Filtering
 - MAC Filtering
 - **User Management**
 - ▣ System Management

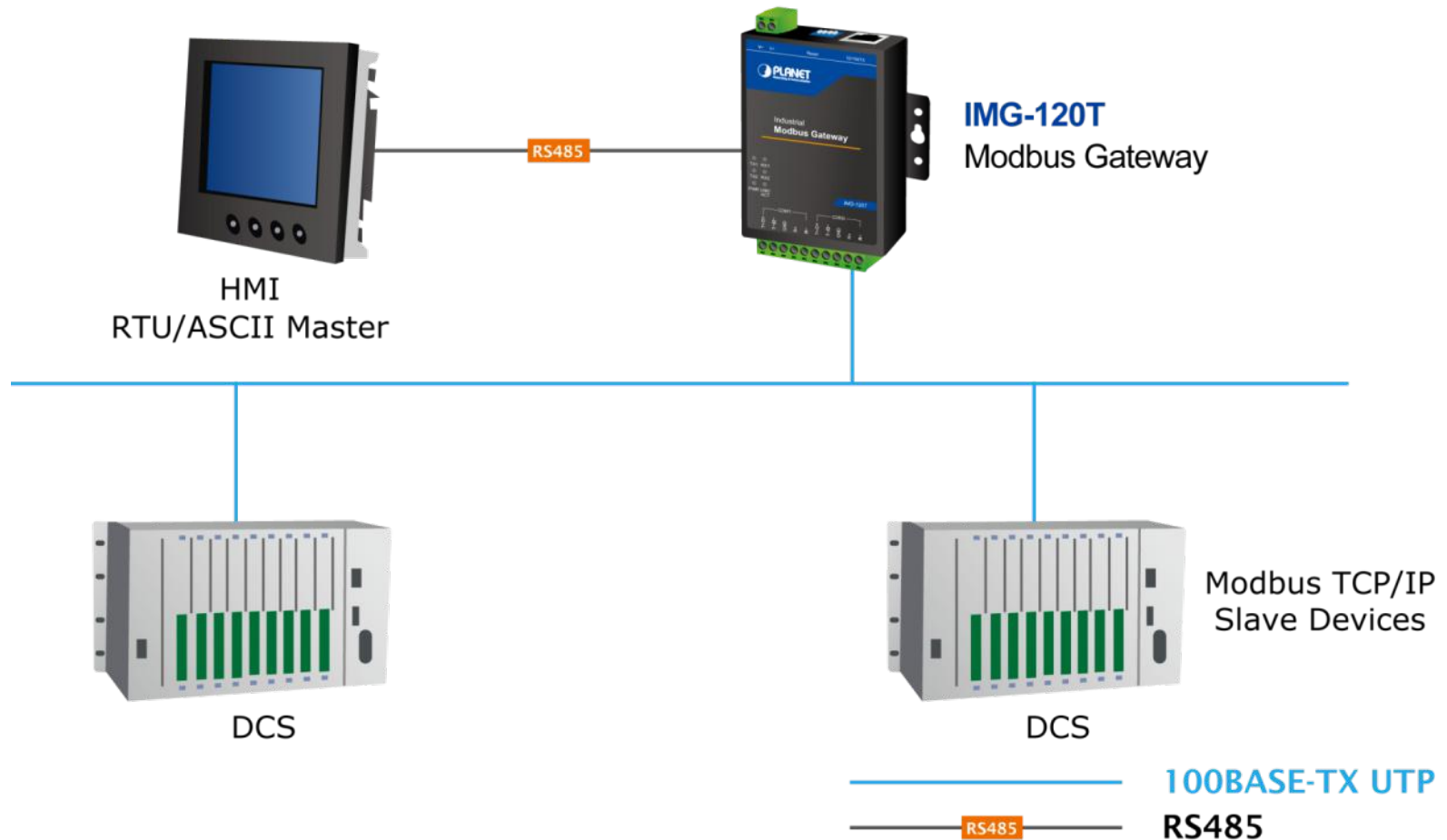
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Applications



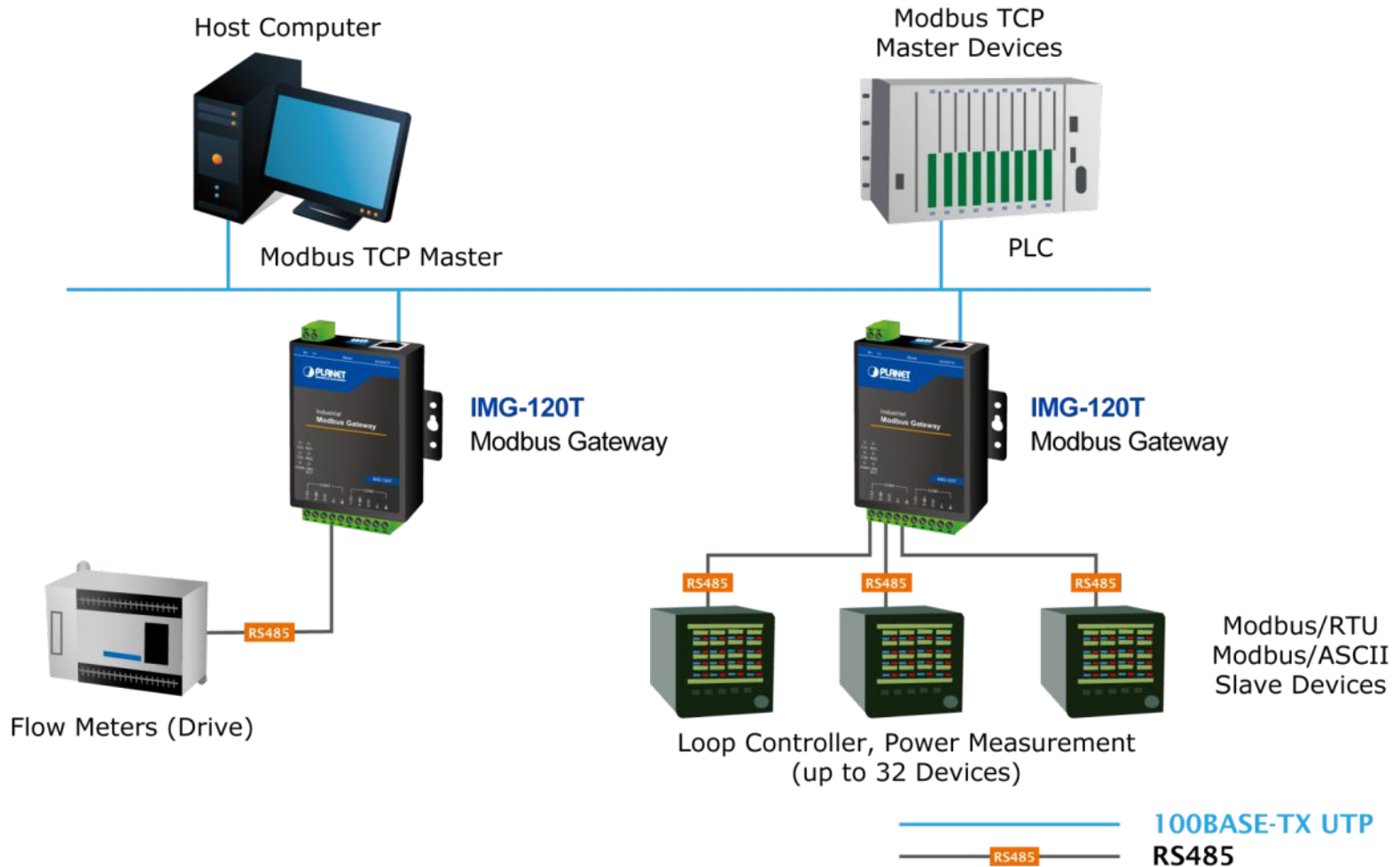
Applications

RTU/ASCII Master to Multi Modbus TCP/IP Slaves

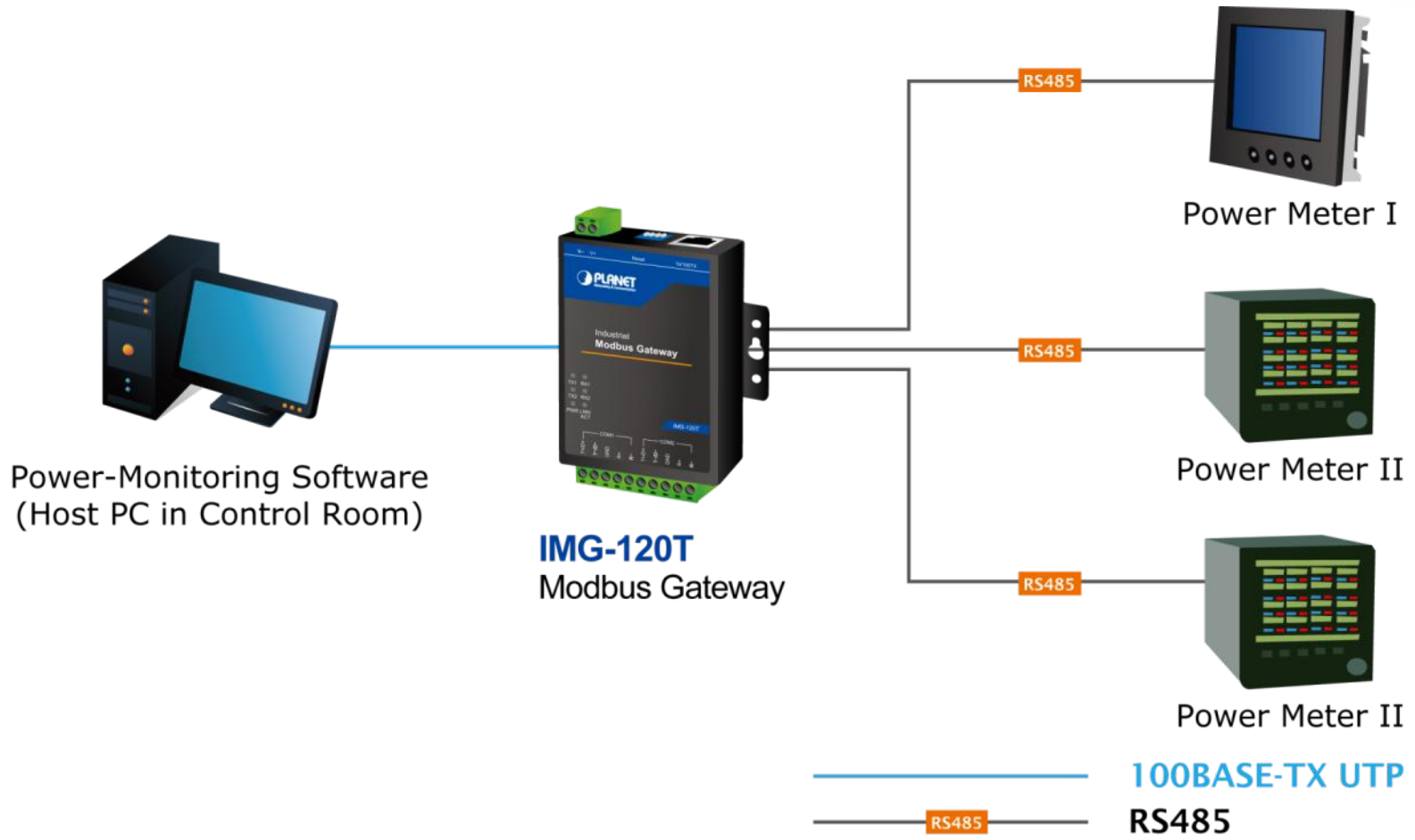


Applications

Multi Modbus TCP/IP Master to RTU/ASCII Slaves



Applications



Comparison



Comparison



Model	PLANET IMG-120T	MOXA Mgate MB3280
Features		
RJ45 Port	One 10/100BASE-TX, auto MDI/MDIX	One 10/100BASE-TX, auto MDI/MDIX
Serial Port	5-contact terminal block RS422/RS485x 2	DB9 male RS232/RS422/RS485 x 2
Baud Rate (Data Rate)	300bps to 115200bps	50bps to 921.6kbps
Operation Mode	Modbus RTU/ASCII Master & Slave	Modbus RTU/ASCII Master & Slave
Management Interface	Remote IP-based Web/Telnet	Remote IP-based Web/Telnet
Utility	Modbus Gateway Utility/Discovery Utility	MGate Management Utility
Power Input Connector	2-contact terminal block (DC 9-48V)	DC jack & terminal block for 12-48V DC
Enclosure & Operating Temperature	IP 40 metal case, -40~75 degrees C	IP 30 metal case, 0~60 degrees C
Price	\$	\$ (349) MSRP