USER'S MANUAL

PH485Wx1P

RS-232/RS-485/RS-422 Serial to Wi-Fi Terminal Server/Client and Modbus ASCII/RTU to Modbus TCP Gateway

IPEX

(IP Electronix)

Doc No: PH485Wx1P-UM-001

CONTENTS

1. INTRODUCTION

IP Electronix PH485Wx1P bidirectional communication terminal server/client is a simple solution for connecting serial devices to a Wi-Fi network which results in having 1 RS-232, RS-485 or RS-422 serial port over Wi-Fi network. This converter uses transparent communicate protocol, so it is not required to understand complex Wi-Fi and TCP/IP protocol, and no modification in serial programs is needed. It operates as a Real COM, TCP Server, TCP Client, UDP Server and UDP Client Full-Duplex converter and supports bidirectional connection.

PH485Wx1P also can be used as Modbus ASCII/RTU Gateway

PH485Wx1P is designed for industrial usage and is useful for connecting any device with a serial interface to a computer via Ethernet supported network like LAN, WAN … and can be used in Industrial Automation, Telecommunications, SCADA Systems, DCS Systems ….

Protection against Surge, ESD and EMI is implemented in its design and there is 3kV isolation in serial side.

2. SPECIFICATIONS

- **Data Modes:** Raw Data, Modbus TCP Gateway, Modbus RTU Gateway;
- **Number of Ports:** #1 RS-232/485/422 Serial Port, #1 Wi-Fi Antenna;
- **Standard:** IEEE 802.11a/b/g/n**;**
- **Working Mode:** Station, Access Point;
- **Network Protocols:** ICMP, IP, TCP, UDP, DHCP, Telnet, DNS, ARP, HTTP;
- **Serial Standard:** Meets or Exceeds the Requirements of TIA/EIA-232-F and ITU v.28 Standards;
- **RS-232 Signal:** TxD, RxD, GND;
- **RS-232 Parity:** Even, Odd, None, Mark and Space;
- **Serial Standard:** Meets or Exceeds the Requirements of RS-485/422 Standards;
- **RS-485 Signal:** Data+, Data-, GND;
- **RS-422 Signal:** TX+, TX-, RX+, RX-, GND;
- **RS-485/422 Parity:** Even, Odd, None, Mark and Space;
- **Maximum Communication Distance:** 2400m (1200m each side);
- **Loading:** RS-485 and RS-422 Side up to 32 Nodes are supported;
- **Wide Range Power Supply:** +9V to +48V DC;
- **Serial Transmission Speed:** Up to 230.4 kbps;
- **Power (Green) LED Indicator;**
- **Transmit (Blue) and Receive (Yellow) LED Indicator;**
- **Isolation Protection:** 3kV Instantaneous, 500V DC Continuous;

- **Surge Protection:** Embedded 1500W Surge Protection;
- **ESD Protection:** Exceeds ±15 kV Using Human-Body Model (HBM);
- **Dimensions:** 26mm x 71.6mm x 122 mm (1.03in x 2.8in x 4.82in);
- **Operating Temperature:** -10°C to +70°C (+14°F to +158°F);
- **1 Year Guarantee** and **5 Years Support.**

3. PACKAGE CHECKLIST

Before installing the PH485Wx1, verify that the package contains the following items:

1) #1 PH485Wx1P

2) #1 Quick Start Guide

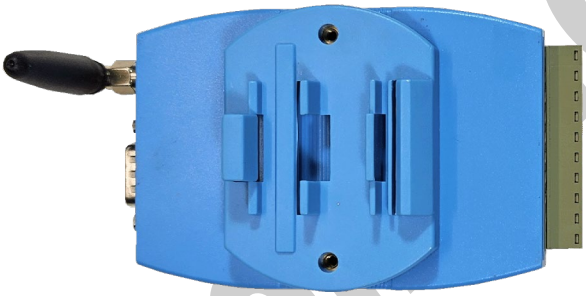
3) #1 Document and Driver CD-ROM

#4 220V AC to 12V DC Adaptor

NOTE: Notify your sales representative if any of the above items is missing or damaged.

4. TOP VIEW

5. BOTTOM VIEW



6. FRONT VIEW

7. BACK VIEW

8. GENERAL INDICATORS

POWER LED (Green): It is turned ON, when the power supply connects to +VDC and GND correctly.

Wi-Fi LED (Green): Blinking this LED shows that the device is trying to connect to Wi-Fi network. If the device connects to a Wi-Fi, this LED turns on continuously.

9. PORT INDICATORS

TCP Server LED (Green): Blinking this LED shows that the TCP Server mode for this port is selected and device is trying to connect in this mode. If the device connects to a client, then this LED turns on continuously.

TCP Client LED (Green): Blinking this LED shows that the TCP Client mode for this port is selected and device is trying to connect in this mode. If the device connects to a server, then this LED turns on continuously.

UDP LED (Green): Blinking this LED shows that the UDP mode for this port is selected and device is trying to connect in this mode. If the network works properly, then this LED turns on continuously.

PE LED (Red): It is blinking if the device detecting a Parity Error in data.

RX LED (Yellow): It is blinking when the device receive data on serial port.

TX LED (Green): It is blinking when data is transmitting from the device serial port.

10. DEVICE POWER SUPPLY

To working properly, you should connect a DC Power Supply to PH485Wx1P. The voltage of the Power Supply should be from +8V to +48V. For example, this device is working with a single +12V, +15V or +24V DC Adaptor as well.

11. How to Setup (Important)

To use the PH485Wx1P, the first step is to set up its Wi-Fi. This device can be set up in two modes: Station and Access Point. The default mode is Station.

To connect the device to the network, you must set the SSID and Password in the device.

For this purpose, we use the device CONSOLE connection. The console connector is actually a standard RS-232 port that works with the following specifications:

Console Baud-Rate: 115200 bps

Console Data length: 8 bits

Console Parity: None

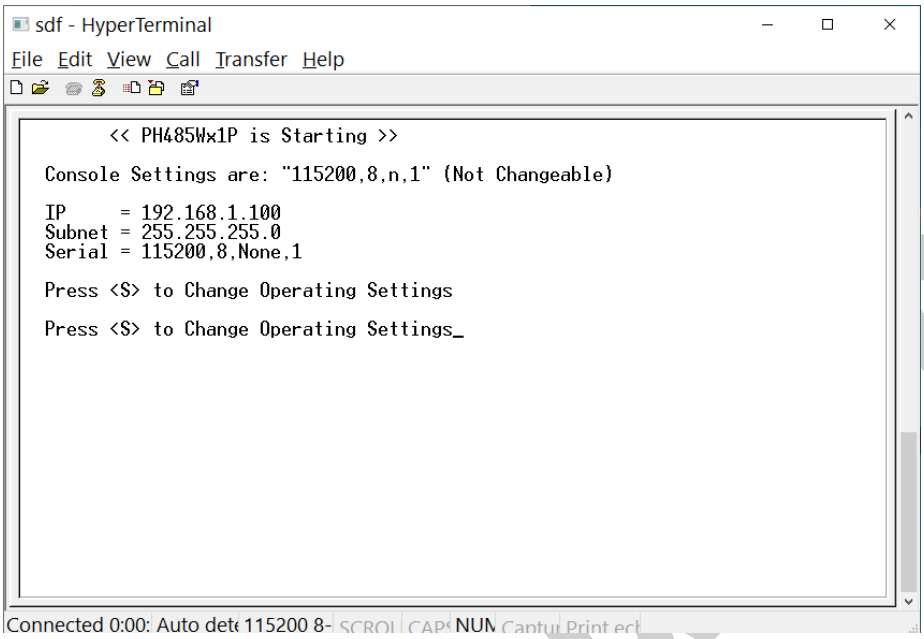
Console Stop bit: 1 bit

These specifications are fixed and do not change with changing the device settings.

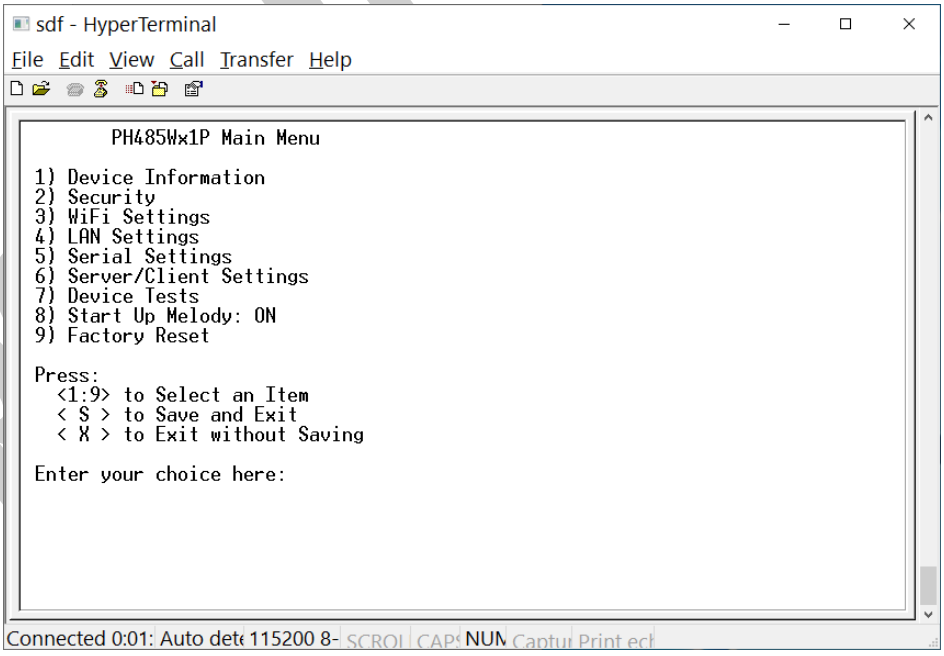
Connect the device to the RS232 port of your computer with a standard RS-232 female to female cable (which is included in the device box).

Run a terminal emulator software such as Microsoft HyperTerminal or Hercules (a copy of which is included in the device CD) on the computer and set it to the COM port connected to the device console.

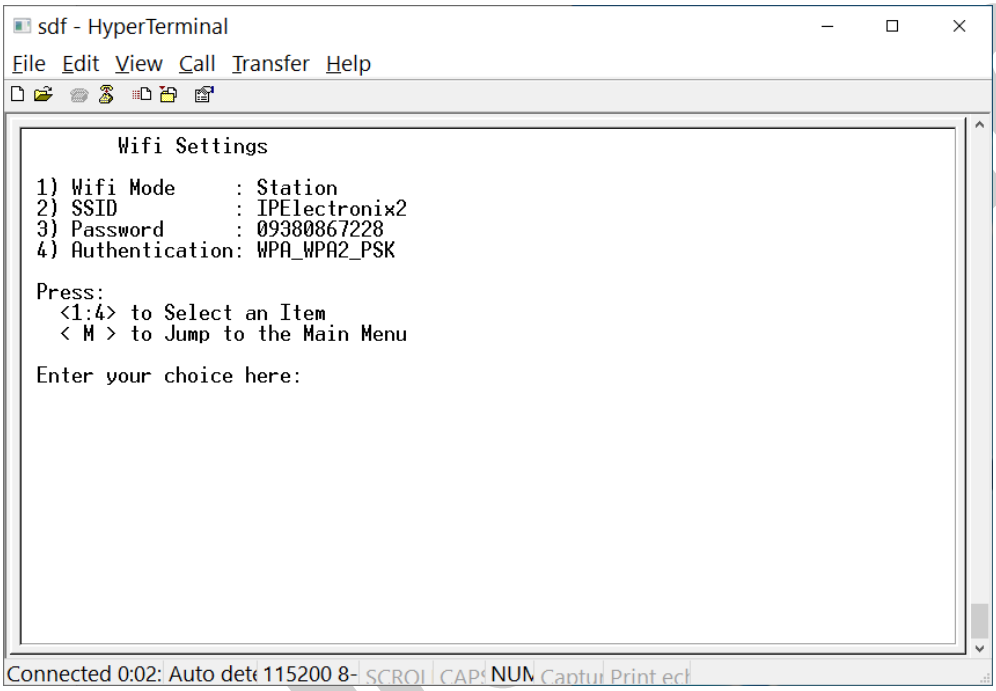
Now, when it turns on, the device asks you to enter the settings section. You can enter the device settings console by pressing the letter 'S' on the computer keyboard.



You can also configure all device settings in the console section, although it is recommended to only set the SSID and Password in this section and perform the remaining settings after connecting to the network via the webpage.



Now to configure Wi-Fi settings, just press the key '3' on your computer keyboard. You will enter the following screen:



By selecting option '2', enter the SSID or name of your Wi-Fi network. Also, by selecting option '3', enter the Password of your network.

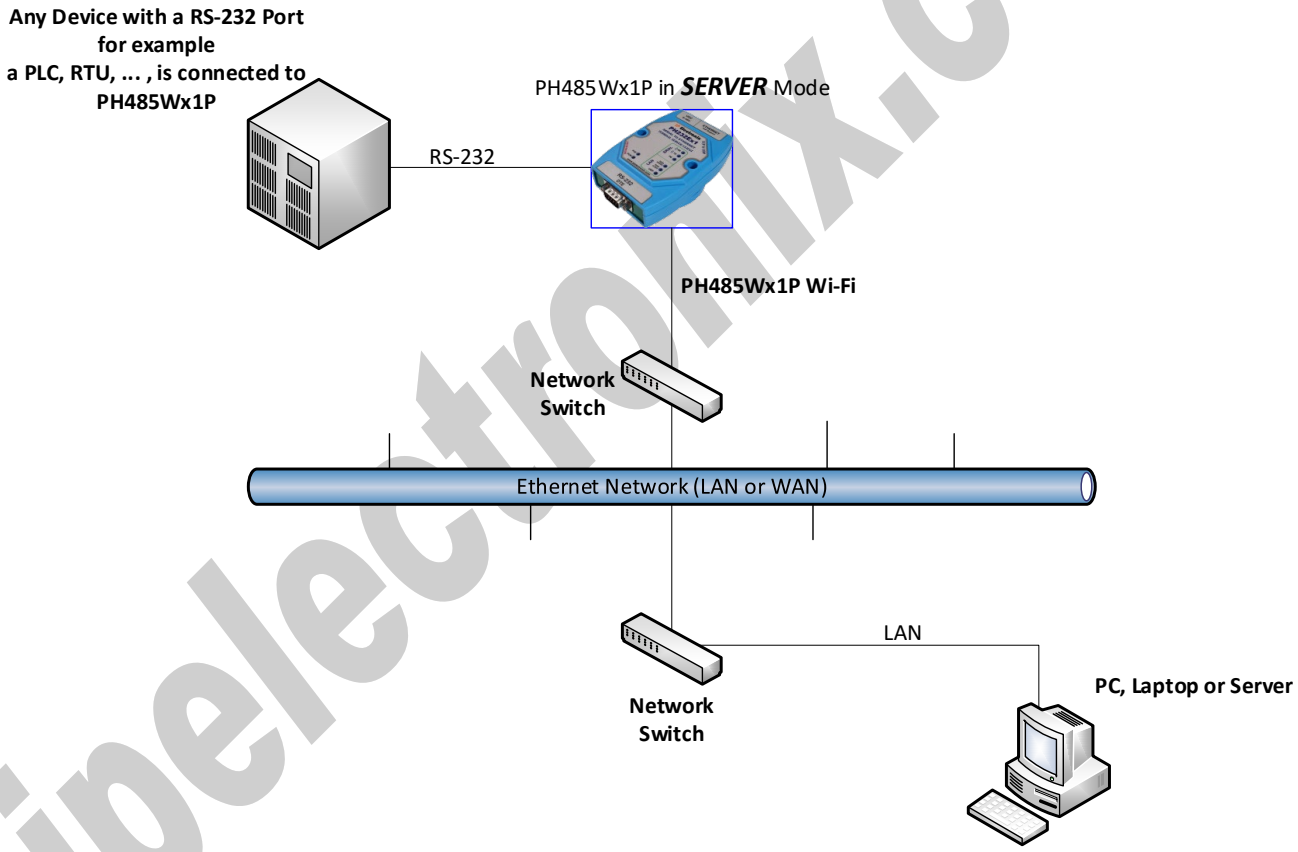
By pressing the letter 'M', return to the main menu and by pressing 'S', save the entered settings and exit the console.

The device boots with the new settings and tries to connect to the introduced Wi-Fi network. Whenever it succeeds in establishing a connection to the network, the Wi-Fi LED changes from blinking to steady.

12. CONNECTION DIAGRAM

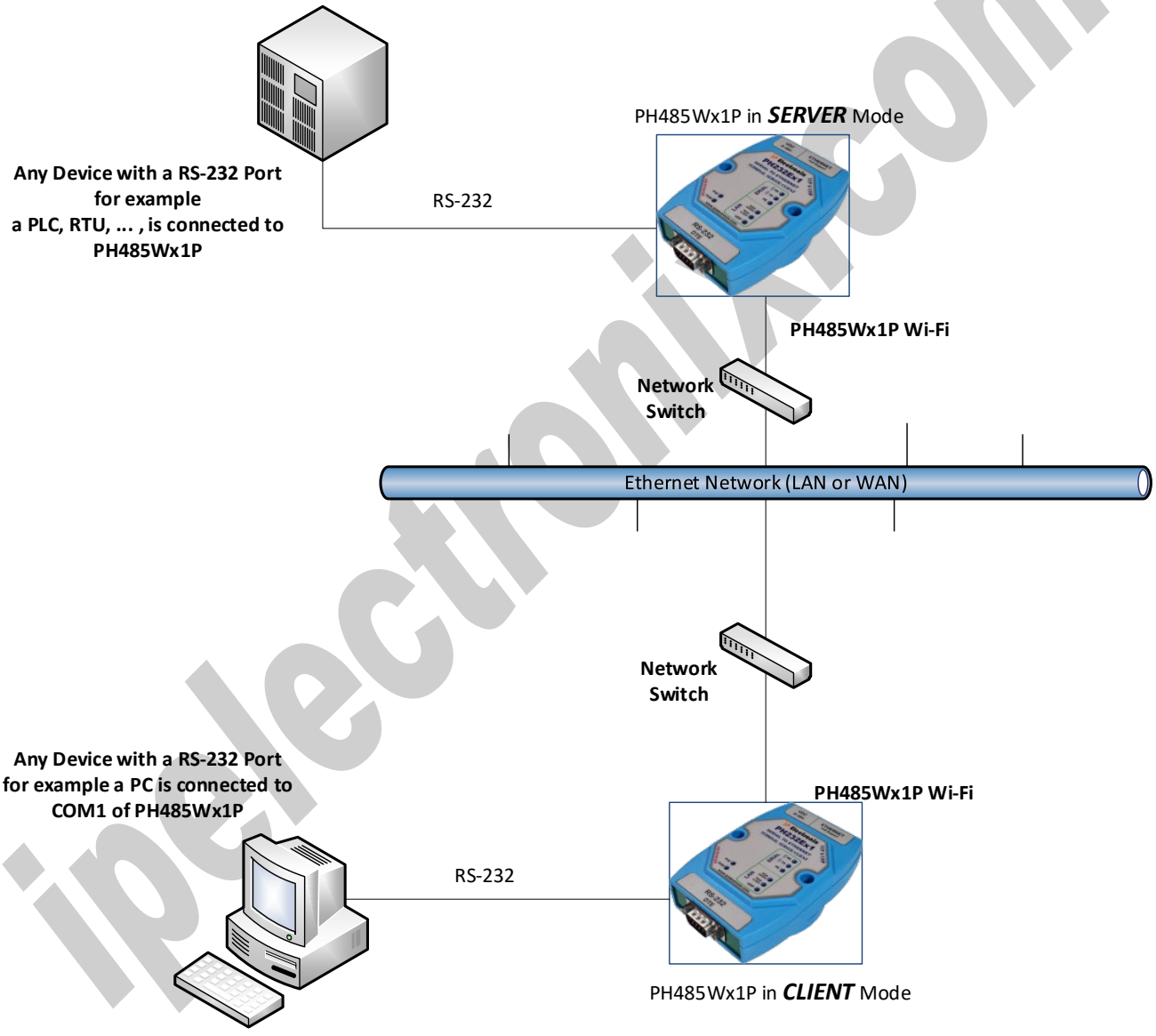
- PH485Wx1P as a Terminal Server

The below diagram is a typical connection configuration of PH485Wx1P. You can connect a device with a RS-232/485/422 serial port to RS-232/48/422 serial port of the PH485Wx1P, then you can connect to the device behind the network by any application software you want by opening a TCP or UDP Socket without need of any auxiliary driver.



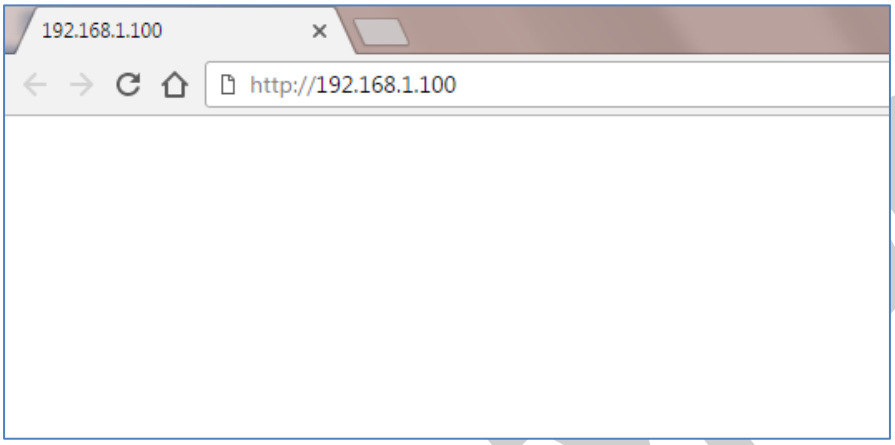
- Client/Server, Peer to Peer Connection

If you want to connect two devices which have only RS-232/485/422 Ports to each other via Ethernet network, you can use this connecting method. Take two PH485Wx1P. Set one PH485Wx1P as Server and another one as Client with adding Remote Server IP and Port Number on it. These two converters are connecting automatically via network to each other, so RS-232/485/422 PORT of Server, connects to RS-232/485/422 PORT of Client via network. Now you can connect your RS-232/485/422 devices to COM Ports as shown in the following diagram.



13. DEVICE CONFIGURATION WEBPAGE

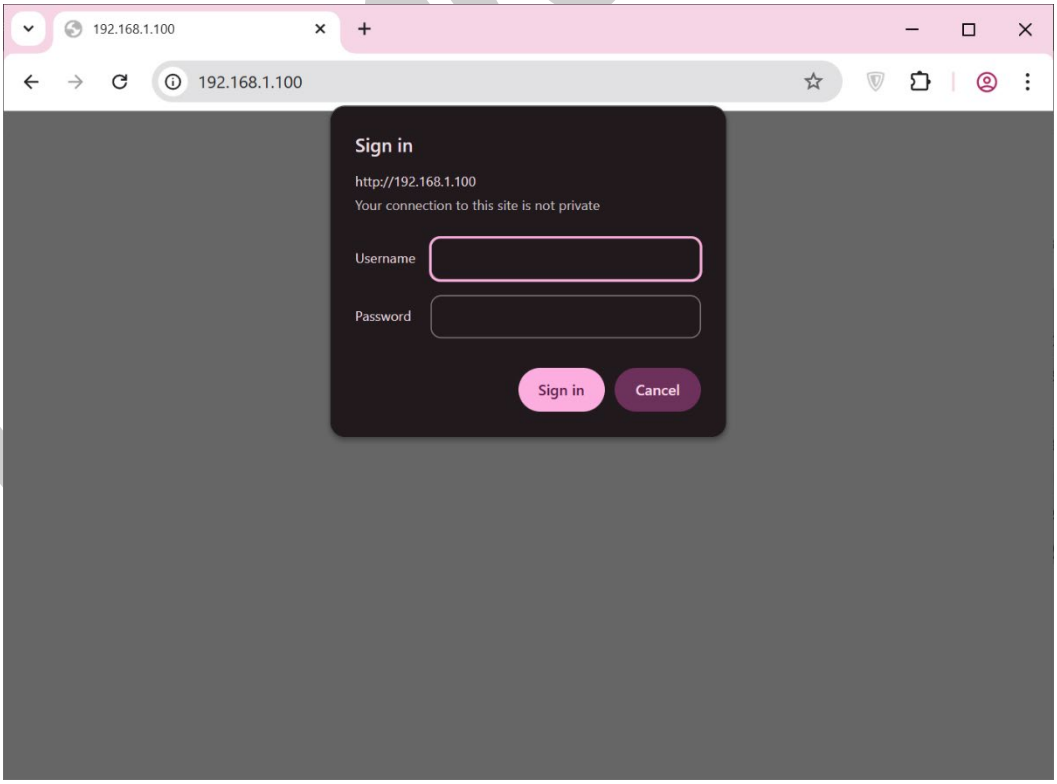
To open device configuration webpage, enter the device IP on your web browser address bar like this figure:



The device Default IP Address is **192.168.1.100** and the default Subnet Mask is: **255.255.255.0**

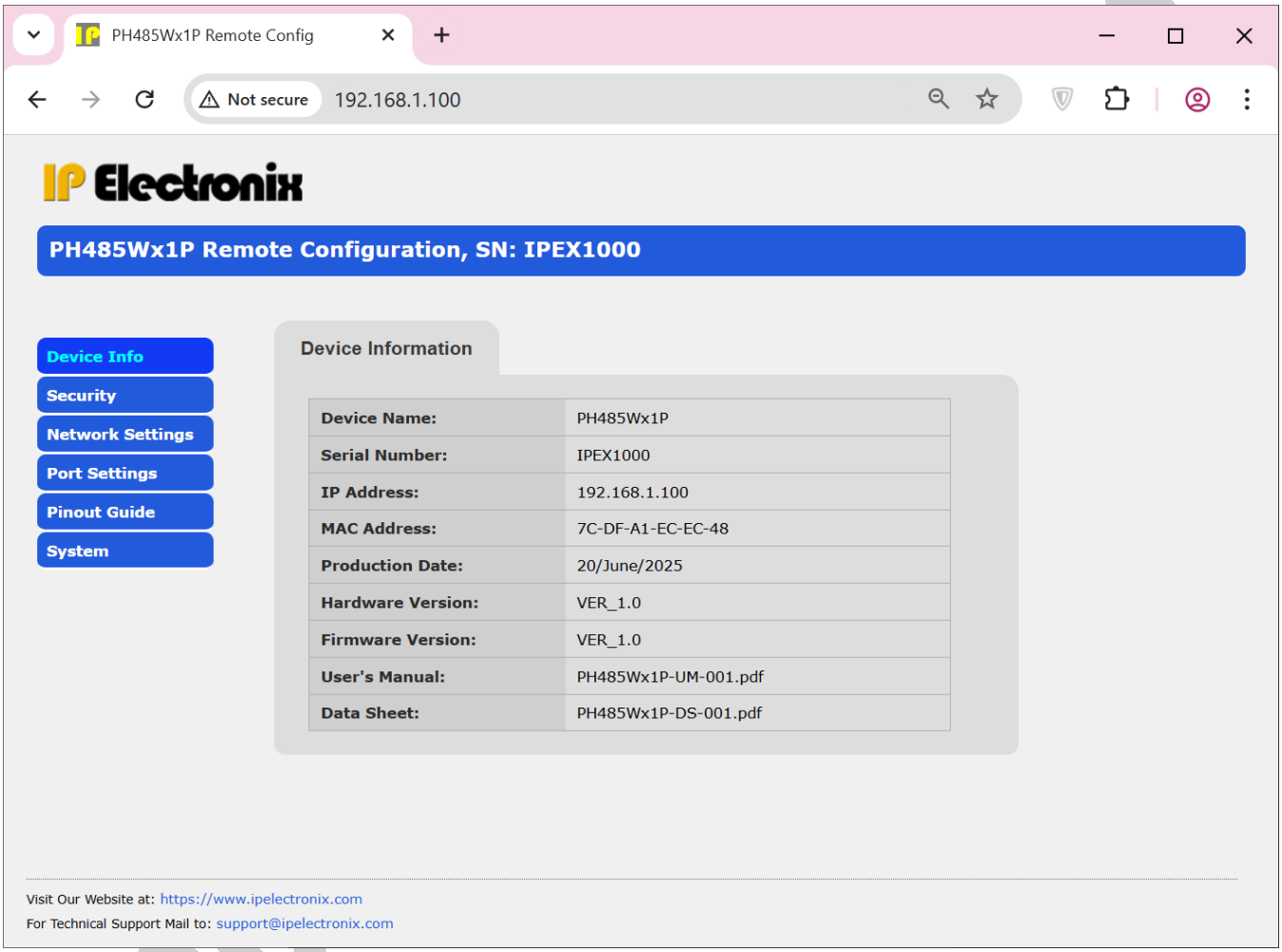
Now enter user name and password to pass the authentication procedure. Default User Name is **admin** and default password is **admin** too.

User Name: **admin** Password: **admin**



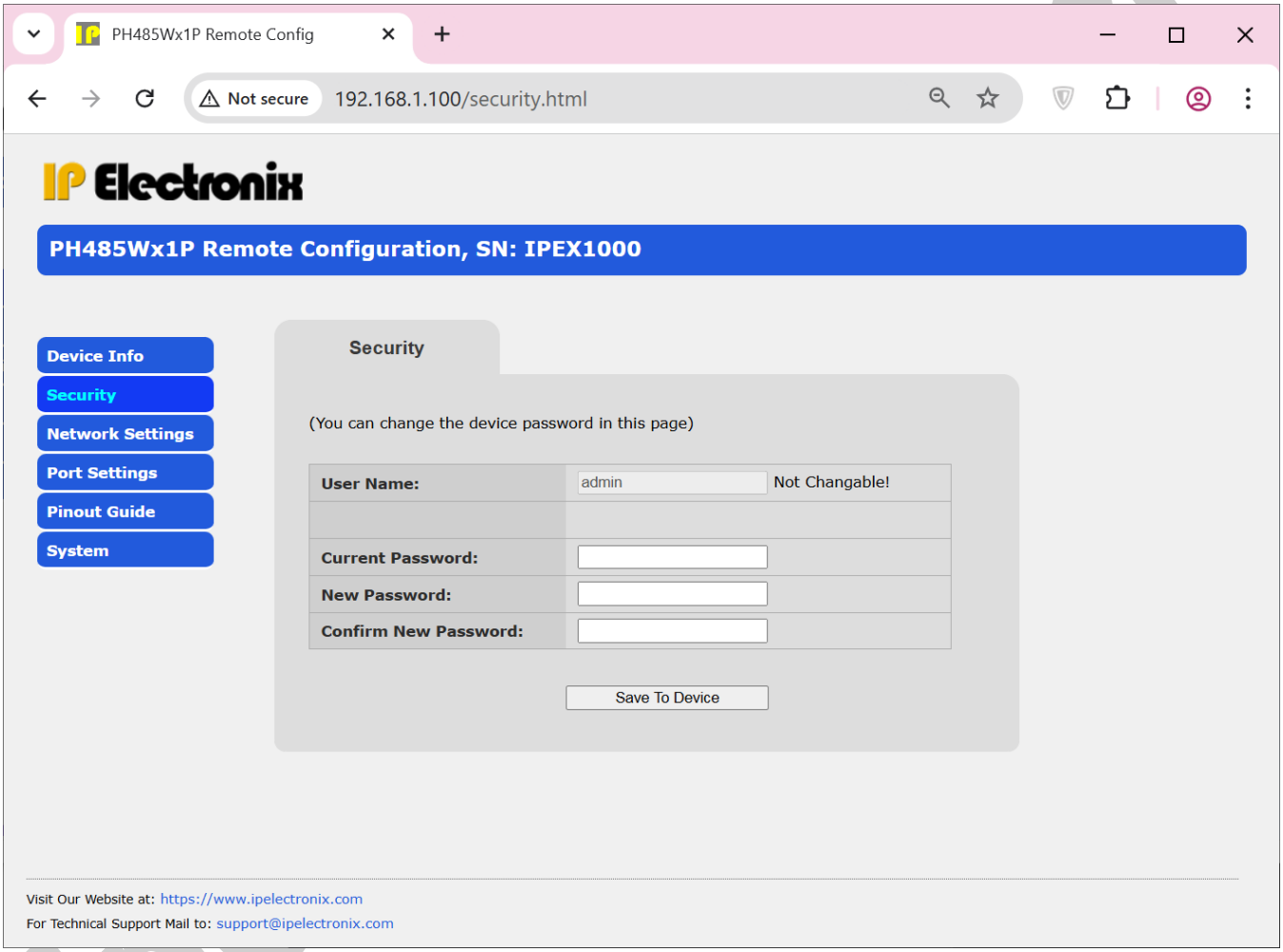
- Device Information Webpage

You can see some general information about the device such as MAC address, Firmware and Hardware version and … in this page.



- Security

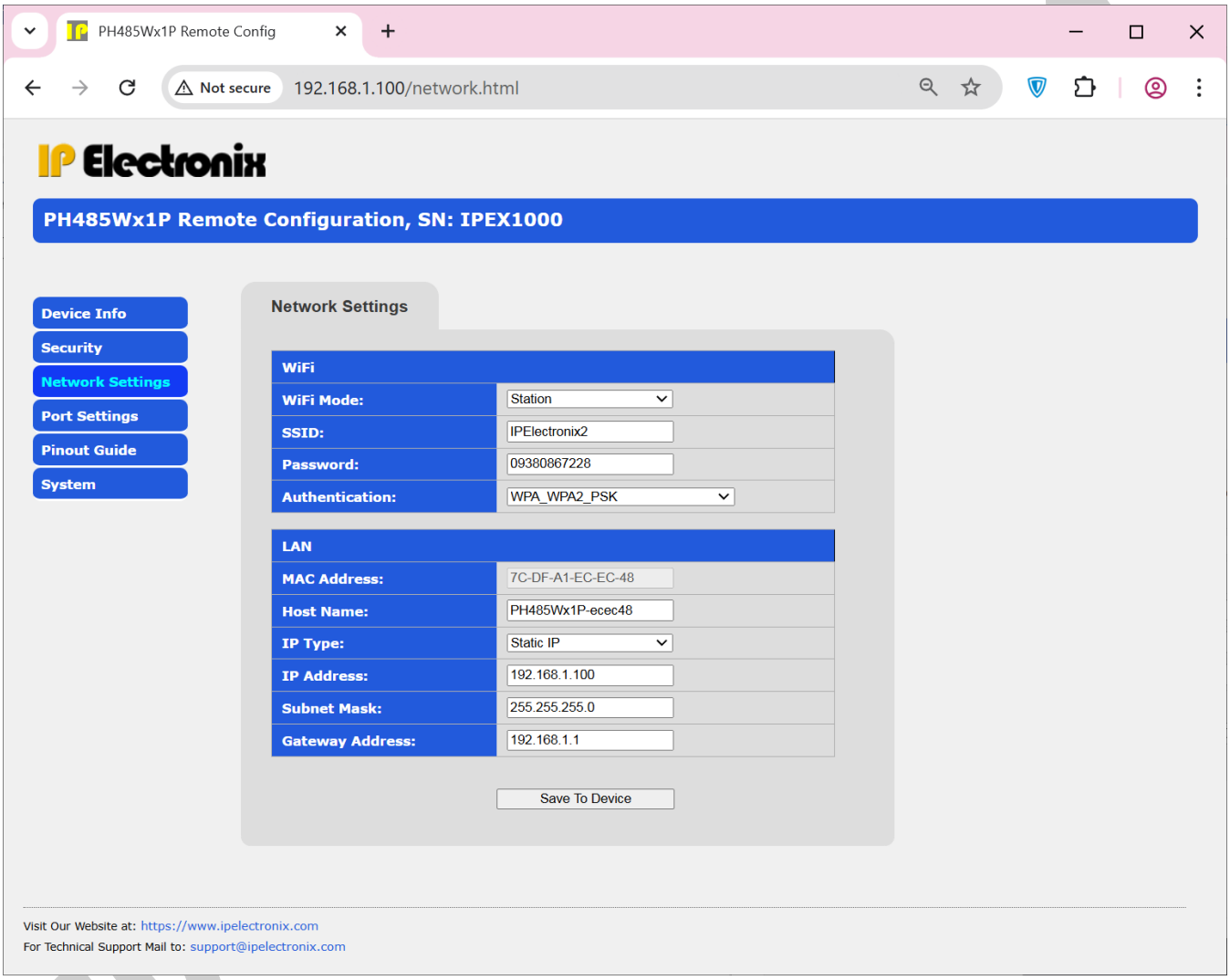
You can change device configuration webpage password in this page.



- Network Settings

You can change all the network settings, such as device IP Address in this page.

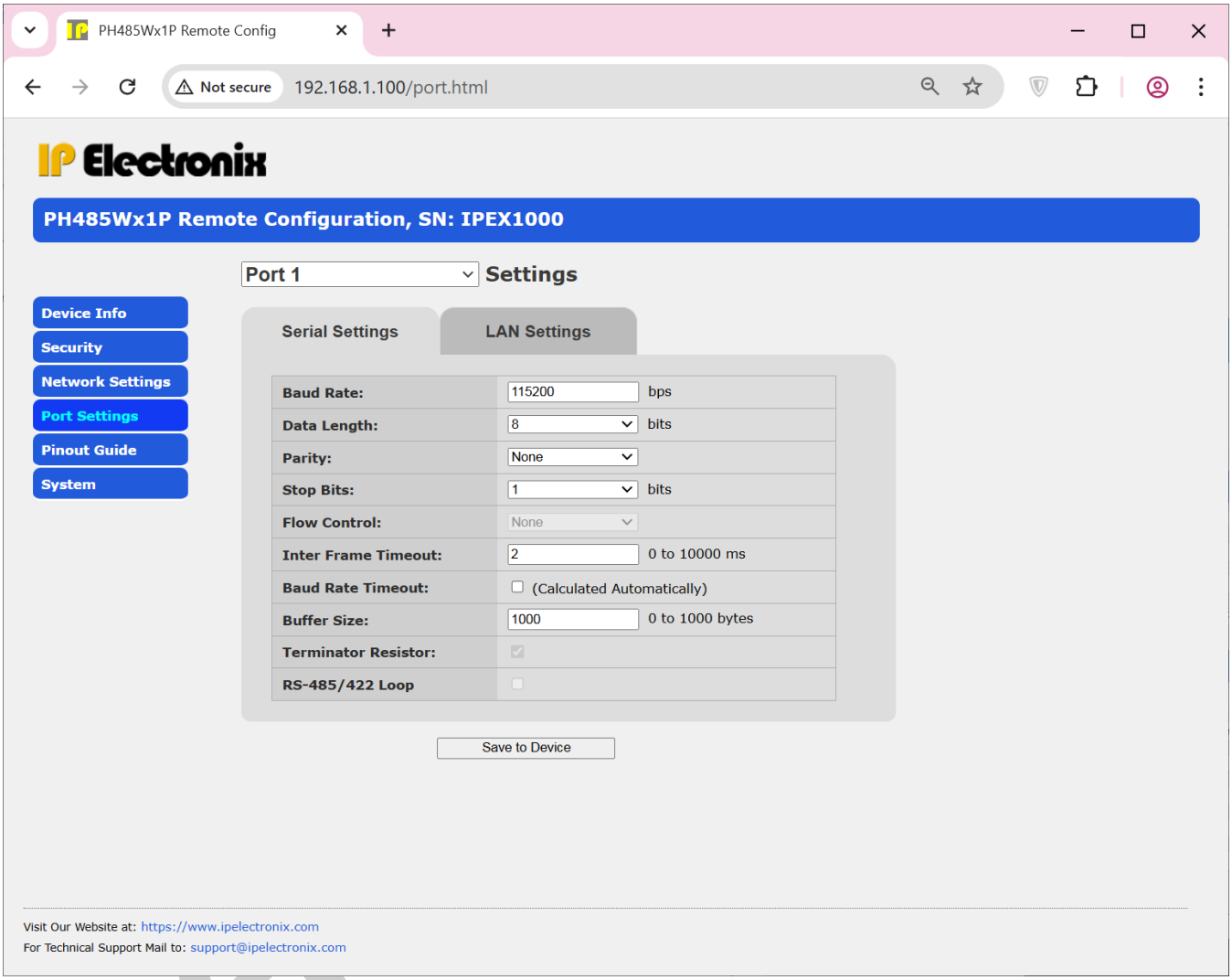
It is important to enter valid data in this section. If you are not sure about your network settings, consult to your network administrator before any changing in these settings.



Notice: when you set the Wi-Fi Mode to Access Point, PH485Wx1P acts as DHCP Server with the following settings:
PH485Wx1P IP: 192.168.1.1 acts as DHCP Server automatically
Subnet Mask: 255.255.255.0
Gateway: 192.168.1.1
DHCP Clients IP Range: from 192.168.1.2 to 192.168.1.4
Maximum 3 DHCP Clients can connect to PH485Wx1

- PORT Settings

You can see and change all the port settings in this page.



- PORT Parameters:

Baud Rate: is the Baud Rate for RS-232, RS-485 and RS-422, can set from 1200 to 230400 bps

Inter Frame Timeout: is the time between serial received bytes, if the space between receiving bytes is more than this parameter, PH485Wx1P sends all input buffer contents to LAN.

Baud Rate Timeout: is really the same Inter Frame Timeout, which is calculated automatically according to Baud-Rate

Buffer Size: is the size of serial receive buffer, if it set to 0, every single byte which received from serial, immediately send to LAN, else, receiving data saved to this buffer and check Inter Frame Timeout for sending.

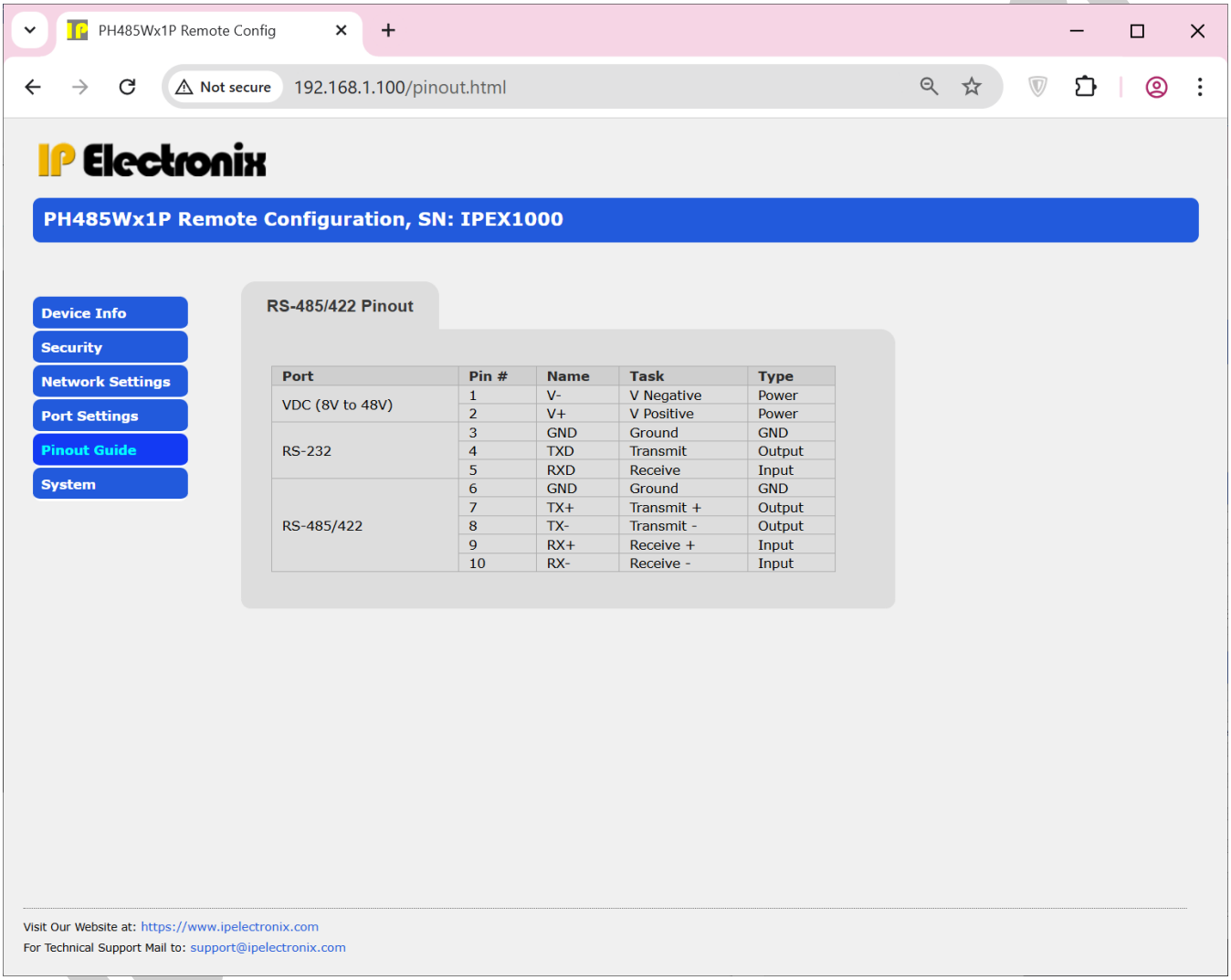
TCP Keep Alive Timeout: standard keep alive timeout, for TCP mode.

TCP Inactivity Timeout: standard Inactivity timeout for TCP mode.

UDP Learn Remote IP, Port: In UDP Mode, if this parameter checked, PH485Wx1P skips Remote IP and Port from LAN Settings, listen to local port and response to any IP, Port which receive requests from them.

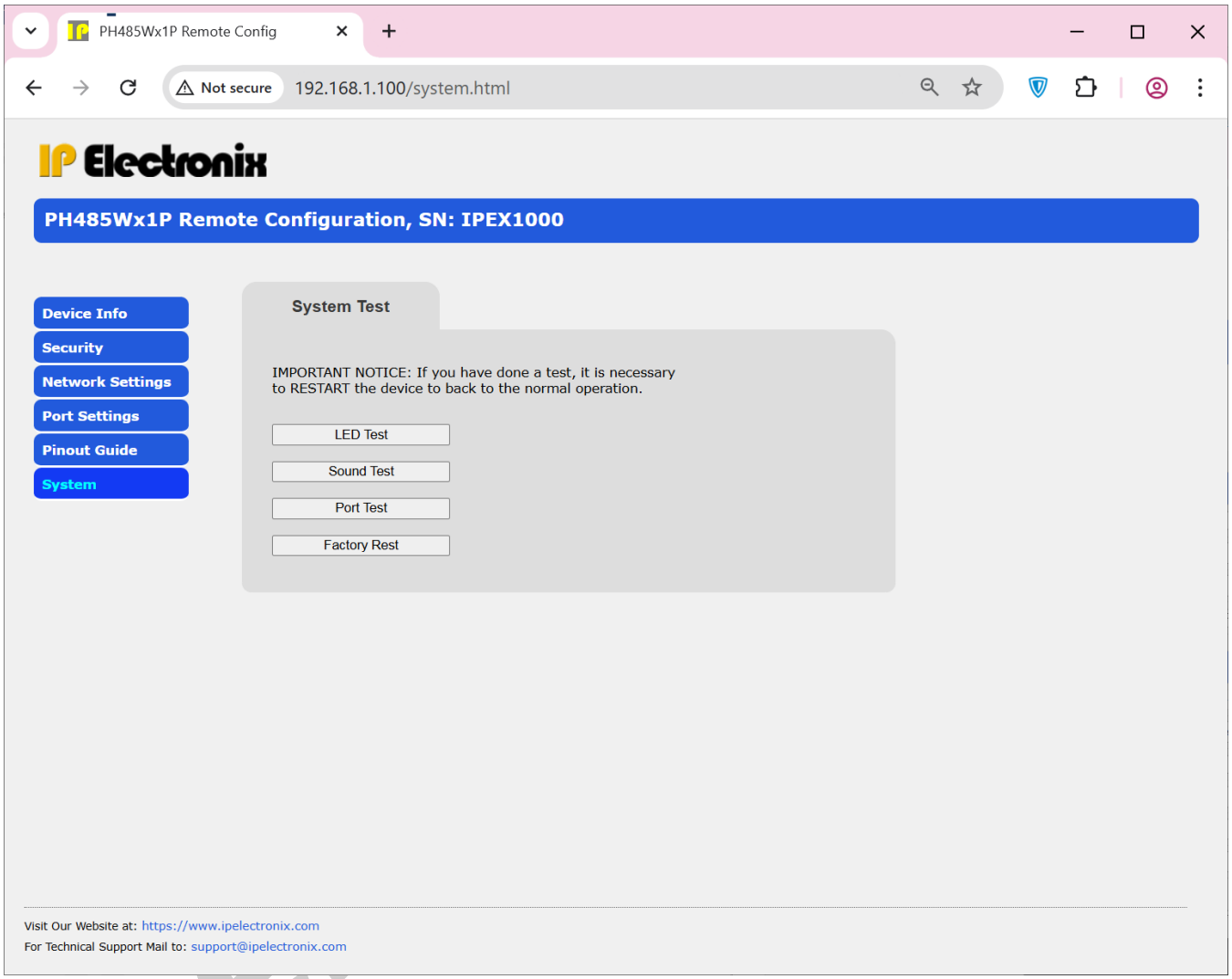
- Pinout Guide

RS-232/485/422 Port pinout is seen in this page.



Port	Pin #	Name	Task	Type
VDC (8V to 48V)	1	V-	V Negative	Power
	2	V+	V Positive	Power
RS-232	3	GND	Ground	GND
	4	TXD	Transmit	Output
	5	RXD	Receive	Input
RS-485/422	6	GND	Ground	GND
	7	TX+	Transmit +	Output
	8	TX-	Transmit -	Output
	9	RX+	Receive +	Input
	10	RX-	Receive -	Input

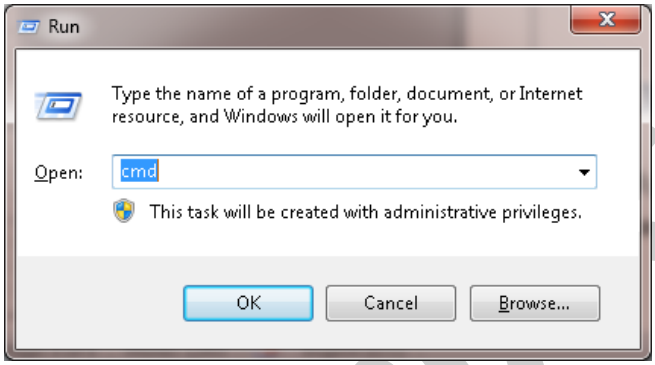
- System

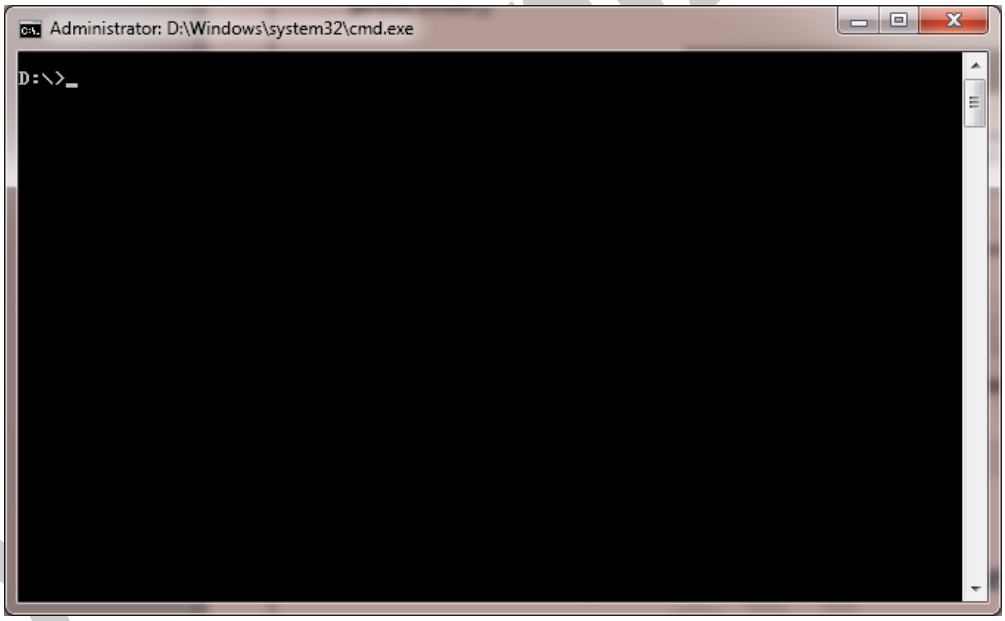


NETWORK CONNECTION TESTING

It is important to check the network wiring topology and testing all the settings, routers, switches … in the route from PH485Wx1P to the computer. This test is done simply by using PING command from computer.

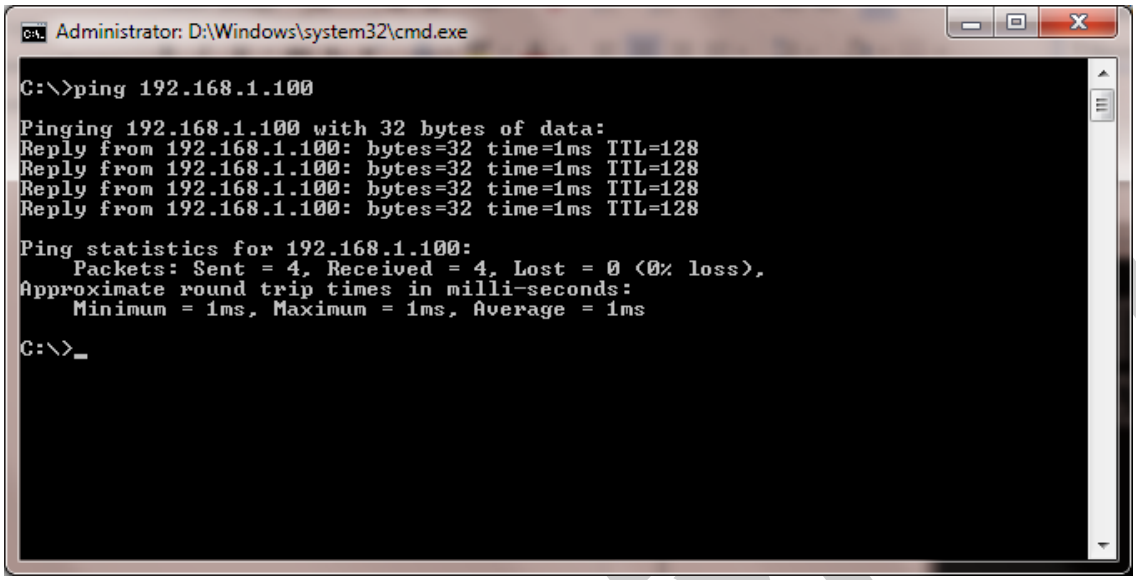
Go to Windows command prompt, (press WINDOWS KEY + R to going to run dialog and then type CMD and press enter):



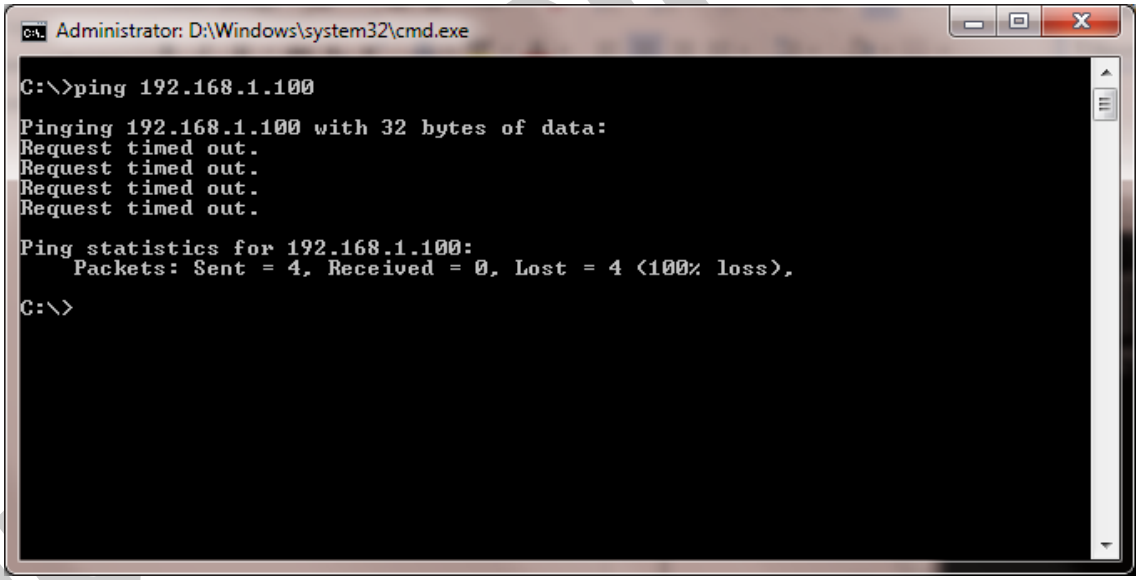


Type ping with the device IP address, for example "ping 192.168.1.100"and press Enter.

Now you should see the ping response from the device.



If there are any problems in the network, you could not see response from the device:



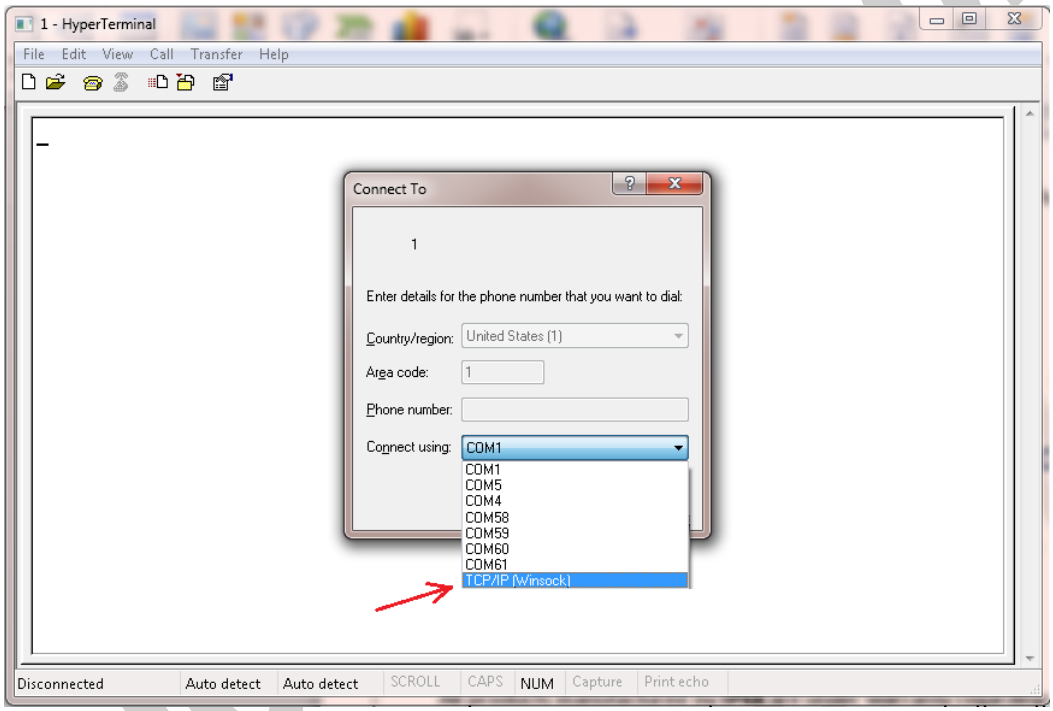
If you see this timeout window, you can't continue installation and first you should solve network problem by consulting your network administrator.

14. CONNECTING TO DEVICE VIA TCP SOCKET

It is possible to directly connect to PH485Wx1P RS-232 Serial Ports from any node of the network by using socket programming. This is simply done if you know only PH485Wx1P IP Address and socket port number for each Port. The default port number is as follow:

- Port 1: 9761

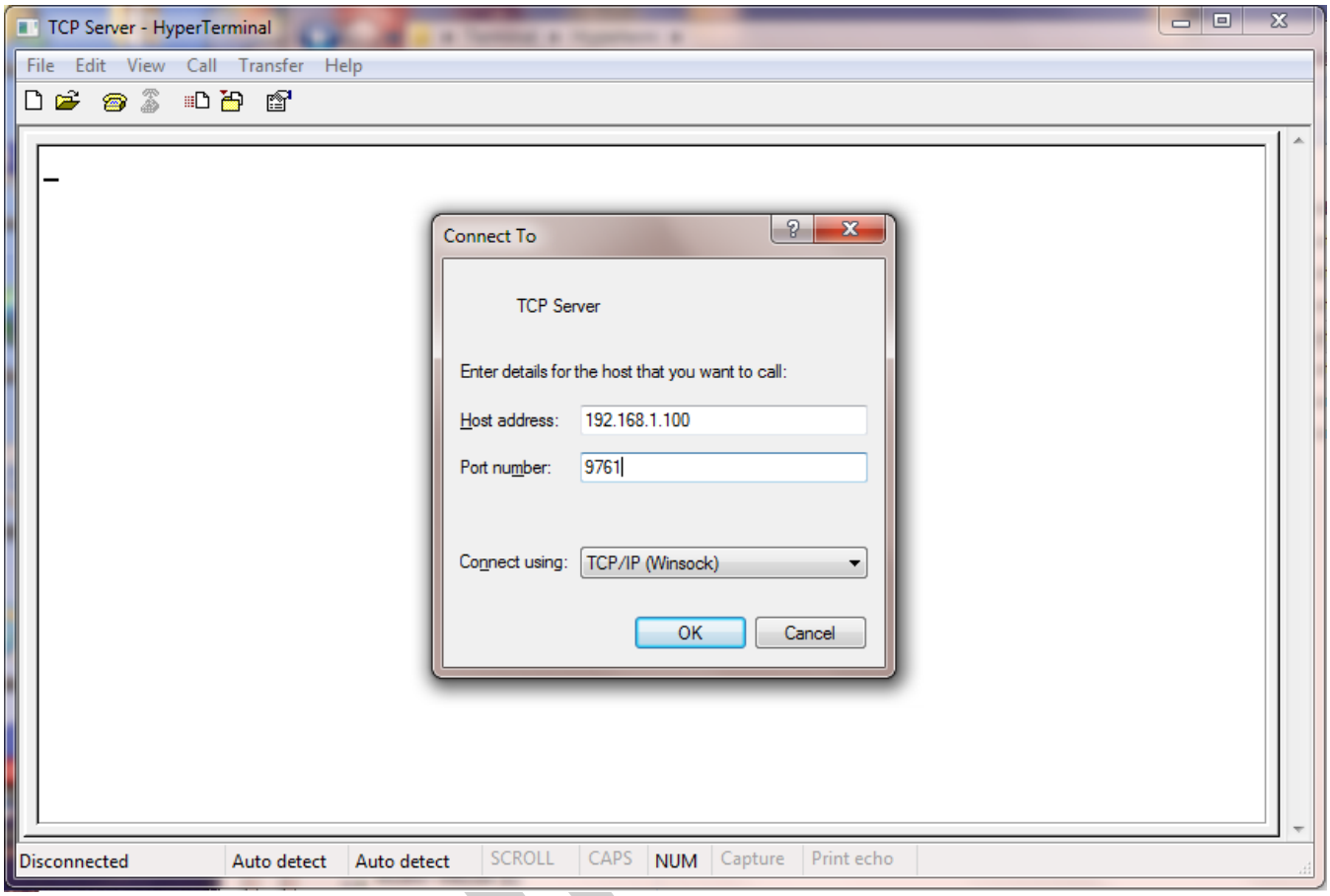
For example, we connect to RS-232 Port by means of Hyper Terminal. Run Hyperterm.exe and from properties dialog box, select "TCP/IP (Winsock)":



Enter device IP Address in the "Host address:" section, for example 192.168.1.100 and the port number in the "Port Number:" section (port number for RS-232 Port is 9761), then click on OK.

Now if you type some characters, you can see that TX Blue LED is blinking that means the data is sent to PH485Wx1P RS-232 port.

NOTICE: Don't forget to set PH485Wx1P in ***SERVER Mode*** for this method of connection.



15. GUARANTEE

All products manufactured by **IPEX** are under warranty regarding defective materials for a period of one year from the date of delivery to the original purchaser.

16. TECHNICAL SUPPORT

If you have any technical question or need any technical support, please contact us using this Email address: support@ipelectronix.com.