
# Protocol converter for ASCII to PROFINET®

User manual

PHOENIX CONTACT
INSPIRING INNOVATIONS

# User manual

# Protocol converter for ASCII to PROFINET®

2018-04-11

Revision: A

This user manual is valid for:

| Designation | Order No. |
|---|---|
| GW PN/ASCII 1E/1DB9 | 1021080 |
| GW PN/ASCII 1E/2DB9 | 1021058 |
| GW PN/ASCII 2E/2DB9 | 1021056 |
| GW PN/ASCII 2E/4DB9 | 1020882 |

# Table of contents

# 1 Description

The GW PN/ASCII... devices provide a simple way to integrate Raw/ASCII serial and Ethernet devices, such as bar code scanners, weigh scales, or radio frequency identification (RFID) tags, into PROFINET® controllers.

The family consists of universal RS-232/422/485 one-, two-, and four-port serial versions, with one or two Ethernet ports to fit any application.

This user manual is valid for:

Table 1-1 GW PN/ASCII... types

| Type Description | Order No. |
|---|---|
| GW PN/ASCII 1E/1DB9 | 1021080 |
| GW PN/ASCII 1E/2DB9 | 1021058 |
| GW PN/ASCII 2E/2DB9 | 1021056 |
| GW PN/ASCII 2E/4DB9 | 1020882 |

## 1.1 Structure

### GW PN/ASCII 1E/1DB9

The GW PN/ASCII 1E/1DB9 features one Ethernet port and one RS-232/422/485 serial port with a D-SUB 9 connector.

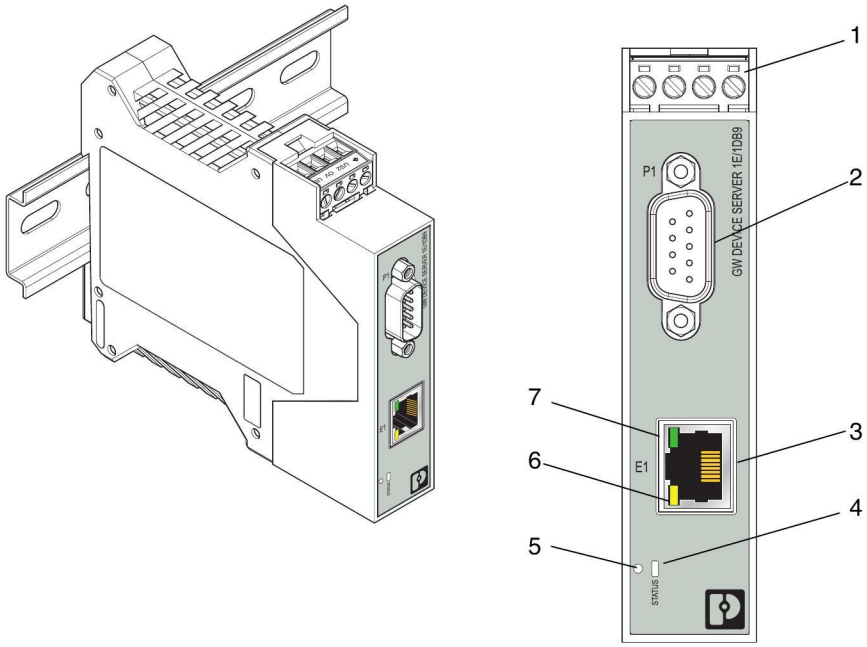


Figure 1-1 GW PN/ASCII 1E/1DB9

Table 1-2 GW PN/ASCII 1E/1DB9 structure

| Item | Description |
|---|---|
| 1 | Power connector |
| 2 | P1 D-SUB 9 connector |
| 3 | Ethernet port (RJ45) |
| 4 | Status LED |
| 5 | Reset button |
| 6 | Ethernet activity status LED |
| 7 | Ethernet link status LED |

### GW PN/ASCII 1E/2DB9

The GW PN/ASCII 1E/2DB9 features one Ethernet port and two RS-232/422/485 serial ports with D-SUB 9 connectors.

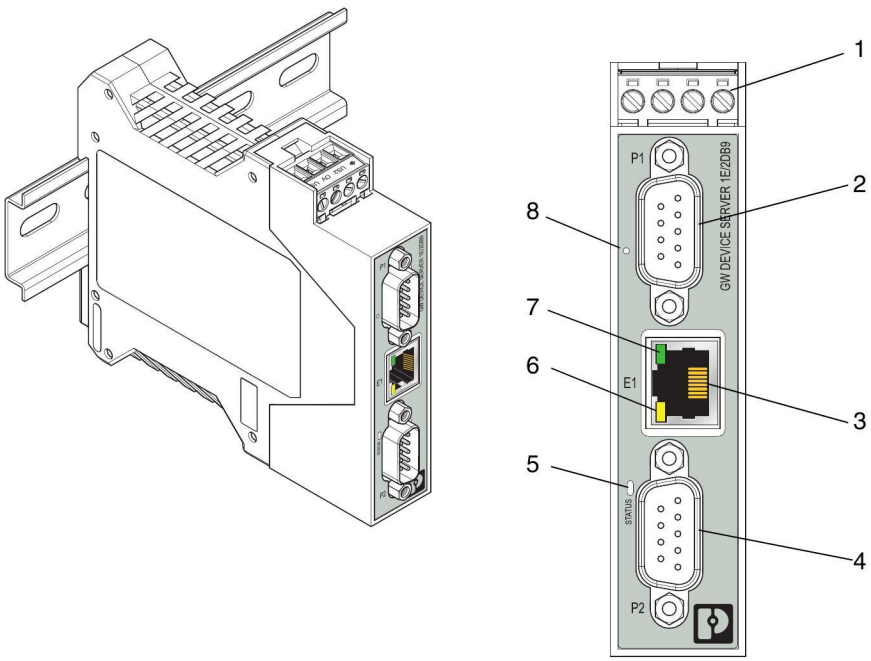


Figure 1-2 GW PN/ASCII 1E/2DB9

Table 1-3 GW PN/ASCII 1E/2DB9 structure

| Item | Description |
|---|---|
| 1 | Power connector |
| 2 | P1 D-SUB 9 connector |
| 3 | Ethernet port (RJ45) |
| 4 | P2 D-SUB 9 connector |
| 5 | Status LED |
| 6 | Ethernet activity status LED |
| 7 | Ethernet link status LED |
| 8 | Reset button |

### GW PN/ASCII 2E/2DB9

The GW PN/ASCII 2E/2DB9 features two Ethernet ports with integrated switch functionality and two RS-232/422/485 serial ports with D-SUB 9 connectors.

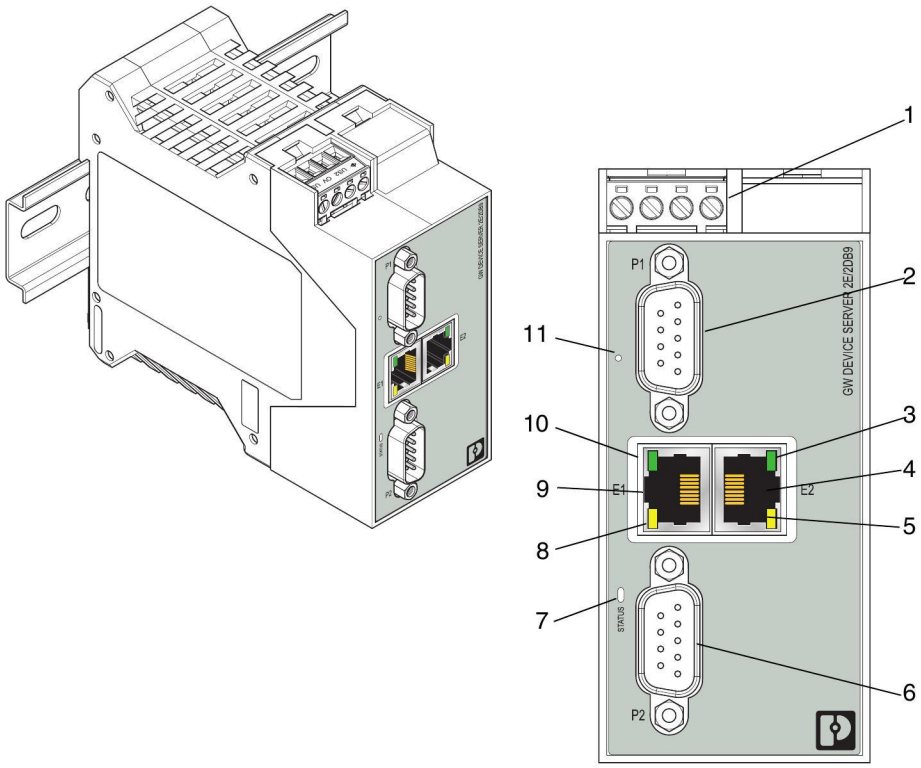


Figure 1-3 GW PN/ASCII 2E/2DB9

Table 1-4 GW PN/ASCII 2E/2DB9 structure

| Item | Description |
|---|---|
| 1 | Power connector |
| 2 | P1 D-SUB 9 connector |
| 3 | Ethernet link status LED |
| 4 | E2 Ethernet port (RJ45) |
| 5 | Ethernet activity status LED |
| 6 | P2 D-SUB 9 connector |
| 7 | Status LED |
| 8 | Ethernet activity status LED |
| 9 | E1 Ethernet port (RJ45) |
| 10 | Ethernet link status LED |
| 11 | Reset button |

### GW PN/ASCII 2E/4DB9

The GW PN/ASCII 2E/4DB9 features two Ethernet ports with integrated switch functionality and four RS-232/422/485 serial ports with D-SUB 9 connectors.

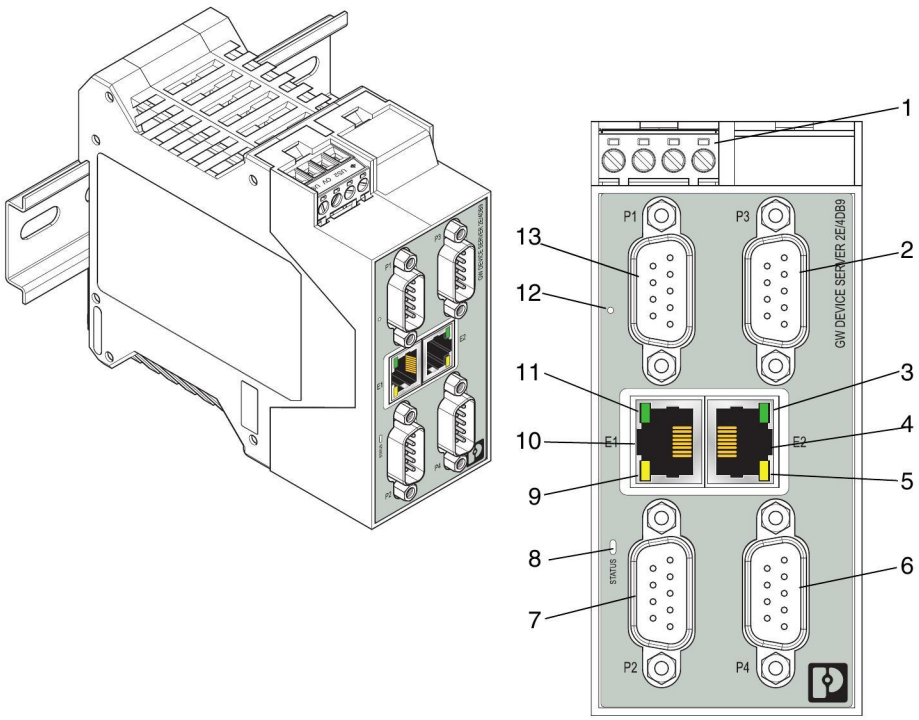


Figure 1-4 GW PN/ASCII 2E/4DB9

Table 1-5 GW PN/ASCII 2E/4DB9 structure

| Item | Description |
|---|---|
| 1 | Power connector |
| 2 | P3 D-SUB 9 connector |
| 3 | Ethernet link status LED |
| 4 | E2 Ethernet port (RJ45) |
| 5 | Ethernet activity status LED |
| 6 | P4 D-SUB 9 connector |
| 7 | P2 D-SUB 9 connector |
| 8 | Status LED |
| 9 | Ethernet activity status LED |
| 10 | E1 Ethernet port (RJ45) |
| 11 | Ethernet link status LED |
| 12 | Reset button |
| 13 | P1 D-SUB 9 connector |

# 2 Installation

## 2.1 Safety regulations and installation notes

Installation, operation, and maintenance may be carried out only by qualified electricians. Follow the specified installation instructions. The applicable specifications and safety directives (including the national safety directives), as well as the general technical regulations, must be observed during installation and operation. The technical data should be taken from the packaging instructions and the certificates (conformity assessment, other possible approvals).

Opening the device or making changes to it is not permitted. Do not repair the device yourself, but replace it with an equivalent device. Repairs may be carried out only by the manufacturer. The manufacturer is not liable for any damage caused by violation of the prescribed regulations.

The IP20 degree of protection (EN 60529) of the device is intended for a clean and dry environment.

Do not subject the device to any load that exceeds the prescribed limits.

The device is not designed for use in environments with danger of dust explosions.

## 2.2 Mounting

To mount on the DIN rail:

1. Place the device onto the DIN rail from above (A), so that the upper housing keyway hooks onto the top edge of the DIN rail.
2. Hold the device by the housing cover and carefully push the device toward the mounting surface (B).
3. After the foot is snapped onto the DIN rail, verify that it is attached securely.

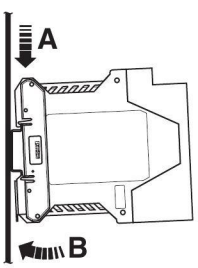


Figure 2-1 DIN rail mounting

To remove:

1. Use a suitable screwdriver to release the locking mechanism (A) on the snap-on foot of the device.
2. Hold on to the device by the housing cover and carefully tilt it upward (B).
3. Remove the device from the DIN rail (C).

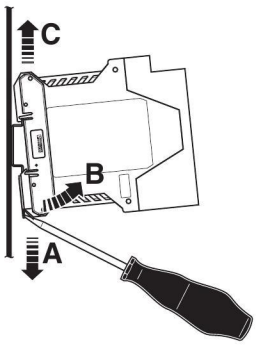


Figure 2-2 DIN rail removal

## 2.3 Data interfaces

### 2.3.1 Connecting the V.24 (RS-232) cable

The D-SUB 9 connector may function as an RS-232, RS-422, or RS-485 interface. The RS-232 interface is a data terminal equipment (DTE) device that behaves like a personal computer (PC). A null modem cable or adapter is required to connect to a PC.

The V.24 (RS-232) interface of the GW PN/ASCII... is a DTE assignment.

Connect the GW PN/ASCII... to the V.24 (RS-232) device to be connected (for example, a PC) by way of the PSM-KA-9SUB 9/BB/2 METER V.24 (RS-232) cable (Order No. 2799474). The cable is an interface cable with 1:1 connected contacts.

Table 2-1 D-SUB 9 to RS-232 pin out

| GW PN/ASCII... | | End device | | | |
|---|---|---|---|---|---|
| | RS-232 | D-SUB 9 (DCE) | D-SUB 9 (DTE) | D-SUB 25 (DCE) | D-SUB 25 (DTE) |
| 1 | DCD | 1 | 4 | 8 | 20 |
| 2 | RxD | 2 | 3 | 3 | 2 |
| 3 | TxD | 3 | 2 | 2 | 3 |
| 4 | DTR | 4 | 1, 6 | 20 | 6, 8 |
| 5 | GND | 5 | 5 | 7 | 7 |
| 6 | DSR | 6 | 4 | 6 | 20 |
| 7 | RTS | 7 | 8 | 4 | 5 |
| 8 | CTS | 8 | 7 | 5 | 4 |
| 9 | RI | 9 | - | 22 | - |

### 2.3.2 Connecting the RS-422 cable

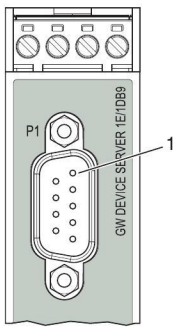


Figure 2-3 Pin 1 location

In RS-422 mode, a point-to-point connection can be established. Use a twisted-pair, common shielded bus cable to connect the I/O device.

To connect the RS-422 cable:

1. Connect the individual conductors of the data cable to the GW PN/ASCII... using a SUBCON 9/F SH (Order No. 2761499).
2. Make sure the signal assignment is correct.
   This operating mode supports full duplex transmission mode.

Table 2-2 D-SUB 9 to RS-422 and RS-485 pin out

| GW PN/ASCII... | | | End device | |
|---|---|---|---|---|
| | RS-422 | RS-485 | RS-422 | RS-485 |
| 2 | T(A) | – | D(A) | – |
| 3 | D(A) | D(A) | T(A) | D(A) |
| 5 | GND | GND | GND | GND |
| 7 | D(B) | D(B) | T(B) | D(B) |
| 8 | T(B) | – | D(B) | – |

### 2.3.3 Connecting the RS-485 cable

In RS-485 mode, an RS-485 network with several I/O devices can be created. Use a twisted-pair, common shielded bus cable to connect the I/O devices.

Connect the individual conductors of the data cable to the GW PN/ASCII... using a SUBCON 9/F SH (Order No. 2761499) (see Table 2-2).

**NOTE:**

Observe the polarity of the RS-485 cable.

Fit this bus cable with a termination network at the two furthest points of the RS-485 network.

The termination resistors are integrated in the GW PN/ASCII... and can be switched on through the web-based management interface.

## 2.3.4 Connecting the Ethernet cable

The GW PN/ASCII... has an Ethernet interface on the front in RJ45 format, to which only twisted-pair cables with an impedance of 100 Ω can be connected. The data transmission rate is either 10 or 100 Mbps. The GW PN/ASCII... supports the auto negotiation function for automatic selection of the transmission speed, as well as an automatic crossover feature for the selection of line or crossover cabling.

Push the Ethernet cable with the crimped RJ45 connector into the GW PN/ASCII... until it engages with a click.

### 2.3.4.1 Models with two Ethernet ports

When using two Ethernet ports, the GW PN/ASCII... is classified as a switch. When using only one port, it is a simple end node device. The maximum number of daisy-chained GW PN/ASCII... units, and the maximum distance between units, is based on the Ethernet standards, and is determined by the environment and conformity of the network to these standards. There may be some performance degradation on the devices at the end of the chain, so it is recommended to overload and test for performance in the environment. The application may also limit the total number of ports that may be installed. Some basic guidelines are listed below.

- Ethernet 10BASE-T rules
  - The maximum number of repeater segments is four.
  - Use Category 3 or 5 twisted-pair 10BASE-T cables. The maximum length of each cable is 100 m (328 ft.).
- Fast Ethernet 100BASE-TX rules
  - The maximum number of repeater segments is two (for a Class II hub). A Class II hub can be connected directly to one other Class II Fast Ethernet hub. A Class I hub cannot be connected directly to another Fast Ethernet hub.
  - Category 5 twisted-pair cable must be used. The maximum length of each twisted-pair cable is 100 m (328 ft.).
  - The total length of twisted-pair cabling (across directly connected hubs) must not exceed 205 m (672 ft.).
- IEEE 802.3 specification: A network using repeaters between communicating stations (PCs) is subject to the 5-4-3 rule of repeater placement on the network:
  - The maximum number of segments connected on a network is five.
  - Four repeaters is the maximum that can be applied to a network.
  - Only three segments can have user connections. The other two segments must act as repeaters with no user connections.

## 2.4 Connecting the power supply

**CAUTION:**

Incorrect connection may result in damage to equipment and/or serious personal injury.

Only qualified personnel may connect the power, start up, and operate this device. According to the safety instructions in this text, qualified personnel are persons who are authorized to start up, to ground, and to mark devices, systems, and equipment according to the standards of safety technology. In addition, these persons must be familiar with all warning instructions and maintenance measures in this text.

Disregarding this warning may result in damage to equipment and/or serious personal injury.

The device can be connected to a single power source or two power sources for redundancy. The GW PN/ASCII... is powered using a +24 V DC SELV power supply. The power supply is connected by way of COMBICON plug-in screw terminal blocks (24 V and 0 V).

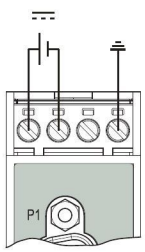


Figure 2-4 Single power supply connection

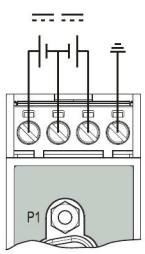


Figure 2-5 Redundant power supply connection

# 3 Configuration and startup

## 3.1 Default settings

The default network settings of the GW PN/ASCII... are:

IP address: 192.168.254.254
Subnet mask: 255.255.255.0
Gateway: 0.0.0.0

The default settings are invoked whenever the system is reset.

## 3.2 Web-based management

The user-friendly, web-based management interface, a graphical user interface (GUI), can be used to manage the GW PN/ASCII... from anywhere in the network using a standard browser. Comprehensive configuration and diagnostic functions, including a wide range of information about the device itself, the current parameters, and the operating state, are clearly displayed.

## 3.3 Login

To log in:

1. Set the IP address of the connected PC to the subnetwork of the GW PN/ASCII...: for example, IP = 192.168.254.10, subnetwork = 255.255.255.0.
2. Open a web browser and enter the IP address of the GW PN/ASCII... in the “Address” field (default = 192.168.254.254).

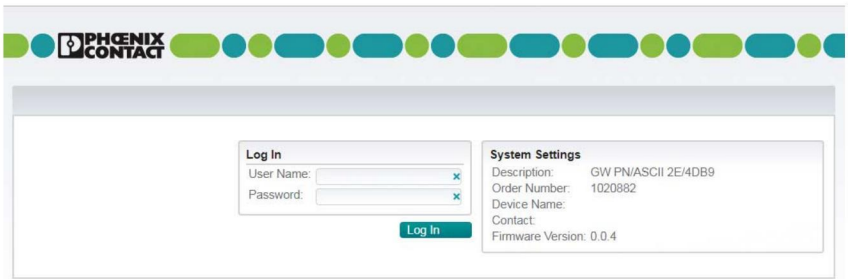


Figure 3-1 “Login” screen

The web server responds immediately.

If the web server does not load, first check the IP parameters of the PC. If everything is set correctly, check to see if there are any proxy settings loaded in the web browser. The proxy setting must be set to “Load automatically” or “Deactivated” to properly establish communication.

3. Enter the credentials to access the web server configuration pages. The default credentials are:
   User name: Admin
   Default password: admin

Powering multiple devices with factory default IP addresses causes a network conflict, and incorrect parameters may be set in the GW PN/ASCII... modules. When programming modules for the first time, it is important to apply power to only one at a time, and change the IP address of each module to a unique IP address. Once all devices have a unique IP address, they can be powered on together while on the same network.

## 3.4 Home screen

Immediately after login, the “Home” screen is displayed. From the “Home” screen, the basic settings of the GW PN/ASCII... can be immediately configured by clicking on the appropriate Ethernet port or serial port in the diagram of the module.

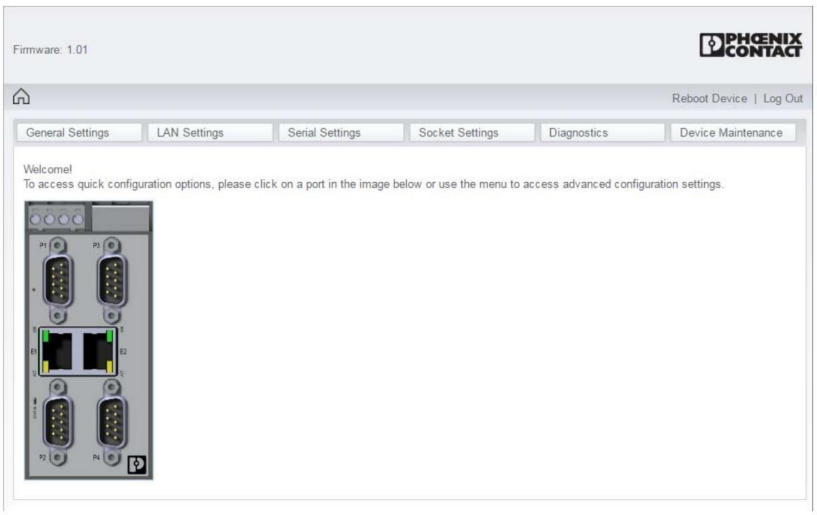


Figure 3-2 “Home” screen

Advanced settings can be accessed through the menu at the top of the screen. The “Home” screen can be accessed at any time by clicking the “Home” button in the upper-left corner of the web-based management interface.

## 3.5 General settings

To view and edit general settings:

1. Click the “General Settings” tab to view and edit general information about the GW PN/ASCII....

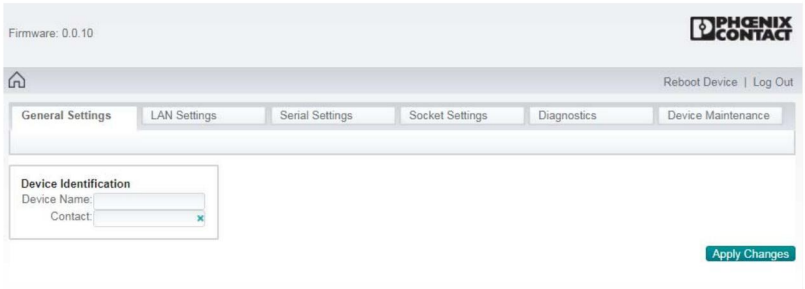


Figure 3-3 “General Settings” page

2. View the listed information.
3. If desired, change the listed information.

   The “Device Identification” group provides fields for entering descriptive information about individual devices.

   **Device Name:** Enter a name for the device. The field accepts up to 16 characters.

   **Contact:** Enter the name of a contact person, group, or department responsible for this device. The field accepts up to 16 characters.
4. Click the “Apply Changes” button to save the configuration.

## 3.6 LAN settings

### 3.6.1 IP address

To enter the IP address:

1. From the “LAN Settings” page, click the “IP Address” tab to access the “IP Address” page.

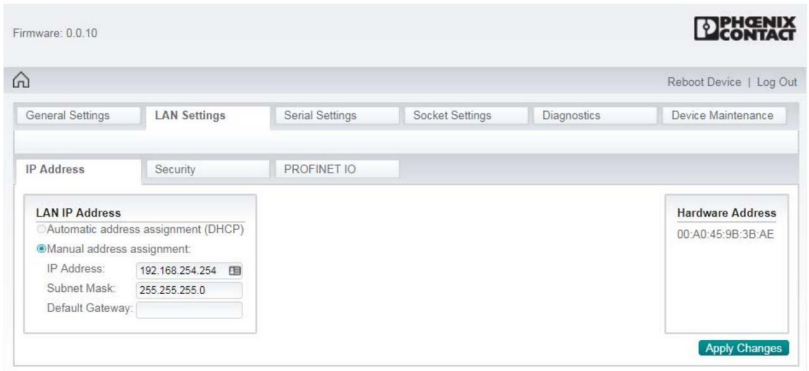


Figure 3-4 “LAN Settings/IP Address” page

2. Select the method for assigning the LAN IP address.
   If a DHCP server assigns IP addresses, click the “Automatic address assignment (DHCP)” button.
   If using static IP addresses, click the “Manual address assignment” button and enter the appropriate information in the various fields.
   **MAC Address:** The MAC address of the GW PN/ASCII... is displayed.
3. Click the “Apply Changes” button to save the configuration.

Discover and basic configuration protocol (DCP) settings will overwrite the Device Name configured in the web manager.

### 3.6.2 Security

The GW PN/ASCII... includes several security options for device authentication. It is possible to configure the GW PN/ASCII.... so that only authorized client applications can connect using SSL/TLS. For secure operation, the GW PN/ASCII... uses a set of three keys and certificates. These keys and certificates are configurable.

To configure security settings:

1. From the “LAN Settings” page, click the “Security” tab.

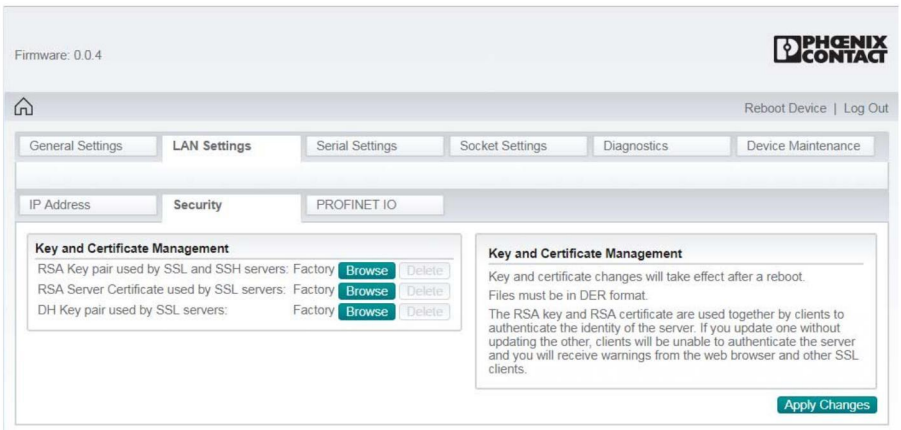


Figure 3-5 “LAN Settings/Security” page

2. Configure the GW PN/ASCII... so that only authorized client applications can connect using SSL/TLS.

   For secure operation, the GW PN/ASCII... uses a set of four keys and certificates. These keys and certificates may be configured.

   **RSA Key pair used by SSL and SSH servers:** This is a private/public key pair that is used for two purposes:

   – It is used by some cipher suites to encrypt the SSL/TLS handshaking messages. Possession of the private portion of this key pair allows an eavesdropper to decrypt traffic on SSL/TLS connections that use RSA encryption during handshaking.
   – It is used to sign the RSA server certificate in order to verify that the GW PN/ASCII... is authorized to use the RSA server identity certificate.

| |
|---|
| Possession of the private portion of this key pair allows others to pose as the GW PN/ASCII.... |

   If the RSA server key is to be replaced, a corresponding RSA identity certificate must also be generated and uploaded, or clients cannot verify the identity certificate.

   **RSA Server Certificate used by SSL servers**: This is the RSA identity certificate that the GW PN/ASCII... uses during SSL/TLS handshaking to identify itself. It is used most frequently by SSL server code in the GW PN/ASCII... when clients open connections to the GW PN/ASCII... secure web server or other secure TCP ports. If a GW PN/ASCII... serial port configuration is set up to open (as a client) a TCP connection to another server device, the GW PN/ASCII... also uses this certificate to identify itself as an SSL client if requested by the server.

   In order to function properly, this certificate must be signed using the RSA server key. This means that the RSA server certificate and RSA server key must be replaced as a pair.

**DH Key pair used by SSL servers:** This is a private/public key pair that is used by some cipher suites to encrypt the SSL/TLS handshaking messages.

Possession of the private portion of the key pair allows an eavesdropper to decrypt traffic on SSL/TLS connections that use DH encryption during handshaking.

The key or certificate notation changes from **factory** or **none** to **user** when the GW PN/ASCII... is secure.

Certificates and keys to be uploaded to the GW PN/ASCII... must be in the .DER binary file format, not in the .PEM ASCII file format. (The openssl tools can create files in either format and can convert files back and forth between the two formats.)

### 3.6.3 PROFINET IO

The PROFINET IO settings provide the ability to enable advanced diagnostic for troubleshooting. These settings are disabled by default.

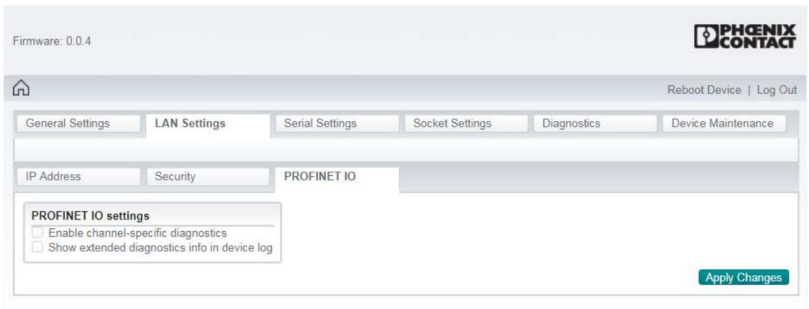


Figure 3-6 “LAN Settings/PROFINET IO” page

**Enable channel-specific diagnostics:** Check this box to notify the IO controller through an alarm when an oversize packet is available. The feature is disabled by default. Once enabled, the GW PN/ASCII... sends a diagnostic alarm to the IO controller when an oversize packet is saved. The alarm is a channel-specific diagnostic alarm with an error type **4096** (16#1000). Using the slot information associated with the alarm, the IO controller can start a record data read instruction to retrieve the saved packet for the corresponding port/device. The GW PN/ASCII... clears the alarm automatically after the packet is read.

**Show extended diagnostics info in device log**: Check this box to provide more detailed system log information in the “Diagnostics System Log” file. Items logged include Thread name, ID, State, Priority, Stacksize, Stackused, SuspendCnt, WakeupCnt, SleepReason, WakeReason, TimerID, Type, Base, Count, Callback, UserID, Message_Queue, TaskID, Length, MaxLen, Sent, Received, and Error.

## 3.7 Serial settings

To configure serial settings:

1. Click the “Serial Settings” tab to configure the serial port(s).
   The “Overview” page provides a quick summary of the current configuration of the serial port(s).
2. Click the appropriate configuration tab to edit the configuration of that port.

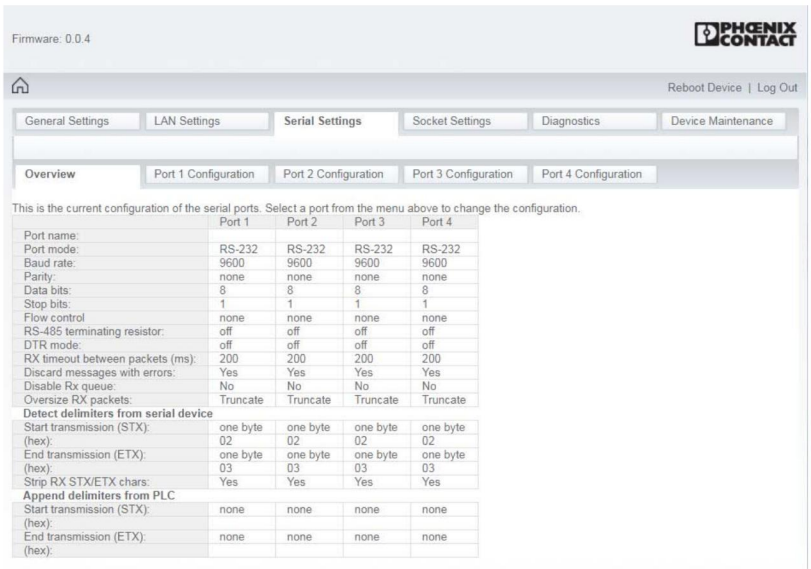


Figure 3-7 “Serial Settings/Overview” page

### 3.7.1 Port configuration

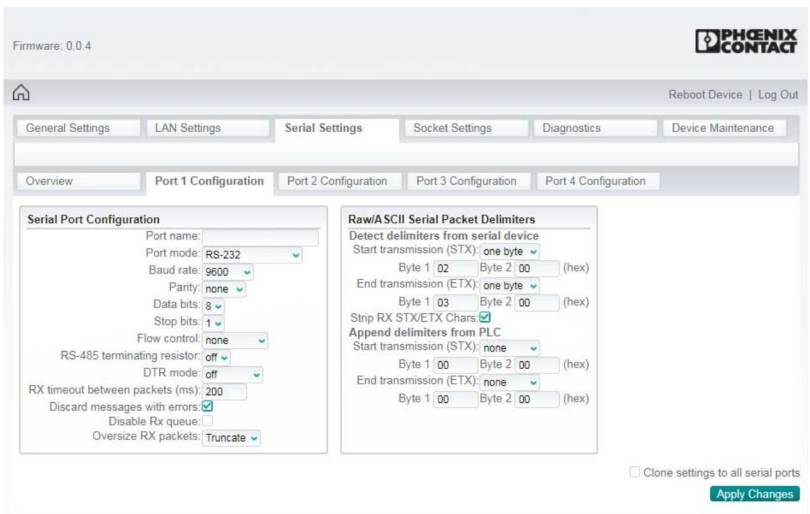


Figure 3-8 “Serial Settings/Port 1 Configuration/Serial Port Configuration” page

#### 3.7.1.1 Serial port configuration

To configure serial ports:

1. From the “Serial Settings” page, click the “Port Configuration” tab.
2. In the “Serial Port Configuration” group, specify the settings of each serial port to match the connected serial device.

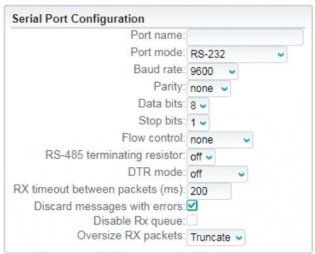


Figure 3-9 “Serial Port Configuration” dialog box

**Port name**: Enter a label for the port. This could correspond to the connected device, “Shipping Label” for example, for easy identification.

**Port mode**: Select the port operating mode. Available settings are **RS-232**, **RS-422**, **RS-485 2-wire**, **RS-485 4-wire (M)**, and **RS-485 4-wire (S)**, where “M” indicates master and “S” indicates slave. When **RS-485 4-wire (M)** is selected, the RS-485 transmitter is always enabled on the GW PN/ASCII.... When **RS-485 4-wire (S)** is selected, the RS-485 transmitter is enabled only when the GW PN/ASCII... has data to send. This is important when a four-wire RS-485 multidrop network is installed.

**Baud rate**: Select the baud rate of the serial port; **300**, **600**, **1200**, **2400**, **4800**, **9600**, **19200**, **38400**, **57600**, **115200**, and **230400** bps are supported.

**Parity**: Select **odd**, **even**, **mark**, **space**, or **none**.

**Data bits**: Select **5**, **6**, **7**, or **8** data bits.

**Stop bits**: Select **1** or **2** stop bits.

**Flow control**: Available options for RS-232 flow control are hardware **RTS/CTS**, software **Xon/Xoff**, **half duplex,** and **none**.

**RS-485 terminating resistor:** The terminating resistor is used only in RS-485 networks. If the GW PN/ASCII... is the last device in the RS-485 network, enable the terminating resistor.

**DTR mode:** Select **on** all the time or **off** all the time when a connection is established on this port.

**Rx timeout between packets:** This is the maximum spacing between received bytes allowed before the received Modbus serial message is expected to be complete. The default value is **200 ms**.

**Discard packets with errors:** If enabled, all packets with parity, framing, or overrun errors are dropped.

**Disable RX queue:** If enabled, the receiving queue sends the last received packet to the PLC during an IO update cycle. By default this option is disabled and the GW PN/ASCII... buffers received packets and sends the PLC one packet for each IO update cycle.

**Oversize RX packets:** When **Truncate** is enabled, oversized packets are truncated and sent to the IO controller as cyclic IO data. When **SaveRec** is enabled, oversized packets are truncated and sent to the IO controller as cyclic IO data while saving the original packets as acyclic record data. When **Drop** is enabled, oversized packets are dropped.

The GW PN/ASCII... modules can be configured to detect serial packet delimiters used for the identification of a raw data packet.

### 3.7.1.2 Raw/ASCII serial packet delimiters

“Detect Delimiters from Serial Device”:

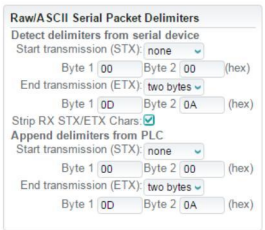


Figure 3-10 “Raw/ASCII Serial Packet Delimiiters” dialog box

**Start transmission (STX)**: When enabled, GW PN/ASCII... detects an STX (start of transmission) byte sequence which is configured as **one byte** or **two bytes** when it receives a serial packet. If **none** is selected, the GW PN/ASCII... accepts the first byte received after the last End Transmission (ETX) byte(s) as the start of the next data packet. If **one byte** is selected, the GW PN/ASCII... starts to collect data when the STX byte is detected. If the first byte is not the STX byte, it discards the byte. The GW PN/ASCII... continues to discard the bytes until it finds an STX byte. If **two bytes** is selected, the GW PN/ASCII... starts to collect data when both of the STX bytes are detected. If the STX bytes cannot be found, it discards the bytes. The GW PN/ASCII... continues to discard the bytes until it finds the two STX bytes.

– **Byte 1:** Specifies the character that represents the first STX byte. The GW PN/ASCII... looks for this character in the first STX byte, if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.
– **Byte 2:** Specifies the character that represents the second STX byte. The GW PN/ASCII... looks for this character in the second STX byte, only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

**End transmission (ETX):** When enabled, the GW PN/ASCII... detects an ETX (end of transmission) byte sequence that is configured as **one byte** or **two bytes** marking the end of the serial packet. The length indicates the number of ETX bytes; if **none** is selected, this function is disabled and the GW PN/ASCII... uses the Rx Timeout Between Packets to indicate the end of data packet. If **one byte** is selected, the serial data is checked for one ETX byte to identify the end of a serial packet. If **two bytes** is selected, the serial data is checked for two ETX bytes to identify the end of a serial packet.

– **Byte 1:** Specifies the character that represents the first ETX byte. The GW PN/ASCII... looks for this character in the first ETX byte, if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.
– **Byte 2:** Specifies the character that represents the second ETX byte. The GW PN/ASCII... looks for this character in the second ETX byte, only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

**Strip RX STX/ETX Chars:** When enabled, the STX and ETX characters are removed from the received serial packets. Packets sent from the PLC by way of Ethernet to the serial ports of the GW PN/ASCII... are not checked for STX/ETX characters.

The GW PN/ASCII... modules can also be configured to append characters to the beginning or end of a serial packet.

Similar information is then entered under “Append Delimiters from PLC” in the same group:

**Start transmission (STX):** When enabled, GW PN/ASCII... adds an STX (start of transmission) byte sequence which is configured as **one byte** or **two bytes** when it transmits a serial packet. If **none** is selected, the feature is disabled. If **one byte** is selected, the GW PN/ASCII... adds one byte the beginning of the packet. If **two bytes** is selected, the GW PN/ASCII... appends two bytes.

– **Byte 1:** Specifies the character that represents the first STX byte. The GW PN/ASCII... appends this byte if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.

– **Byte 2:** Specifies the character that represents the second STX byte. The GW PN/ASCII... adds this byte only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

**End transmission (ETX):** When enabled, the GW PN/ASCII... adds an ETX (end of transmission) byte sequence that is configured as **one byte** or **two bytes** marking the end of the serial packet. The length indicates the number of ETX bytes; if **none** is selected, this function is disabled. If **one byte** is selected, one ETX byte is appended to identify the end of a serial packet. If **two bytes** is selected, two ETX bytes are appended to identify the end of a serial packet.

– **Byte 1:** Specifies the character that represents the first ETX byte. The GW PN/ASCII... appends this byte if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.

– **Byte 2:** Specifies the character that represents the second ETX byte. The GW PN/ASCII... adds this byte only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

## 3.8 Socket settings

1. Click the “Socket settings” tab to configure the socket connections data.
   The overview page provides a quick view of the configuration related to each Ethernet TCP/IP connection of the GW PN/ASCII... device.

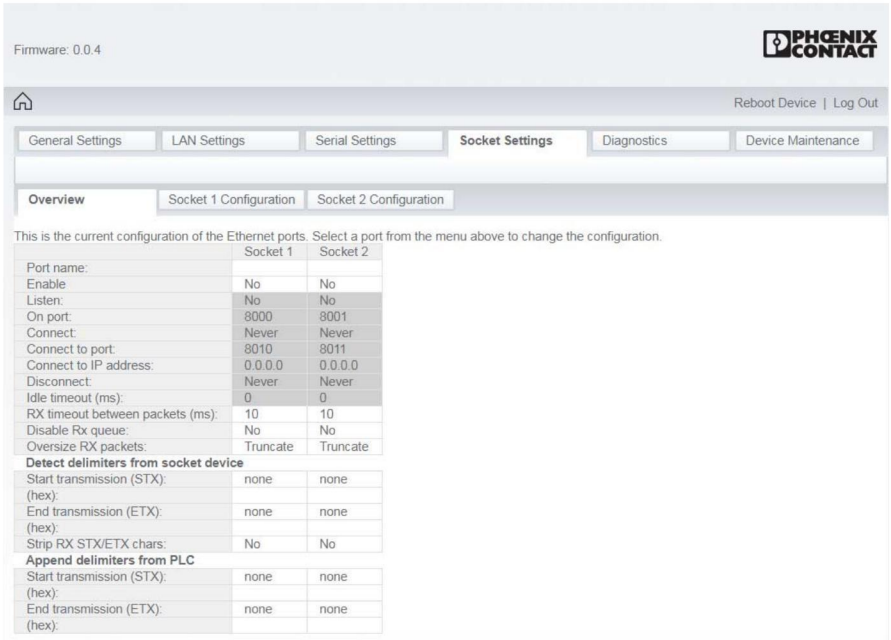


Figure 3-11 “Socket/Settings Overview” page

2. To edit the configuration of an Ethernet TCP/IP connection, click the appropriate “Socket Configuration” tab.

The number of Ethernet TCP/IP connections supported by the GW PN/ASCII... is equal to the number of Ethernet ports on the device, but the TCP/IP connections are not directly linked to a particular serial port.

## 3.8.1 Socket configuration

On the “Socket Configuration” page, specify the settings for each socket.

### 3.8.1.1 TCP configuration

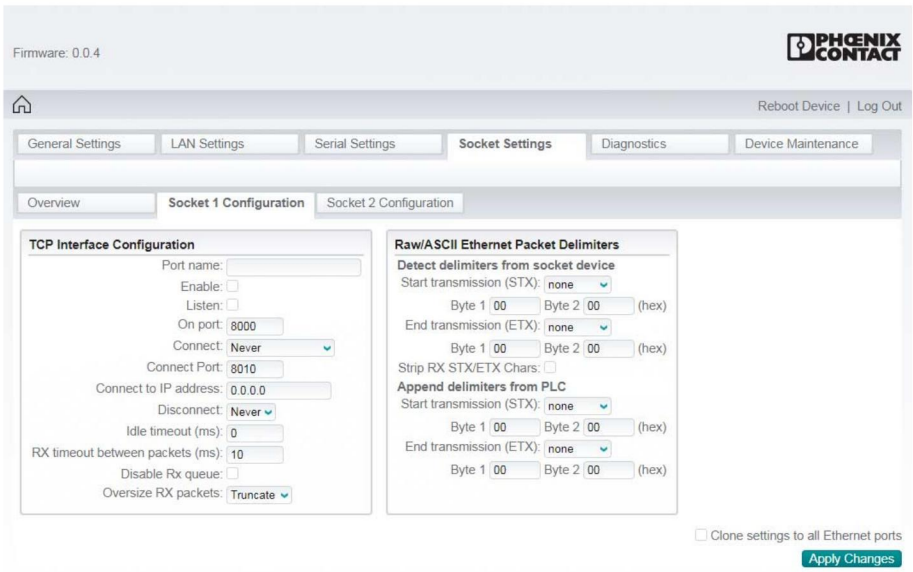


Figure 3-12 “Socket Settings/Socket Configuration/TCP Configuration” page

The TCP configuration specifies how the GW PN/ASCII... connects to a TCP/IP Raw/ASCII device, such as a bar code scanner.

1. In the “TCP Interface Configuration” group, specify the TCP settings of the Ethernet port.

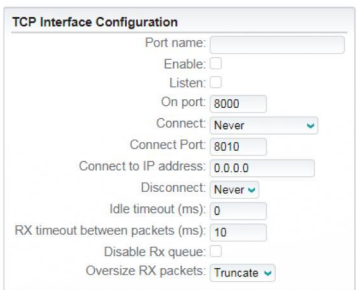


Figure 3-13 “TCP Interface Configuration” group

– **Port name:** Enter a label for the port. This could correspond to the connected device, for example “Label Scanner” for easy identification.
– **Enable:** This must be checked to use the port as a socket.
– **Listen:** Check the “Listen” box so that the GW PN/ASCII... listens for incoming TCP/IP socket connections on the port number specified in the “On port” field.
– **On port:** Enter the TCP port number on which the GW PN/ASCII... listens for connections.

- **Connect:** If **Enable** is selected, this setting determines how to connect to a device. If **Never** is selected, the GW PN/ASCII... does not attempt to make a connection. If **Always** is selected, the GW PN/ASCII... maintains a permanent connection to the device specified by the “Connect to IP address” and “Connect to port” fields.
- **Connect to IP address:** Enter an IP address to which the GW PN/ASCII... initiates a connection. Use the standard AAA.BBB.CCC.DDD format.
- **Connect to port:** Enter a TCP Port number to which the GW PN/ASCII... initiates a connection.
- **Disconnect:** This field determines how the GW PN/ASCII... disconnects from the device. Select **Never** to maintain the connection when there is no data. Select **Idle** to close the connection after a period of inactivity specified by the Idle timeout field.
- **Idle timeout:** The Idle Timeout is the number of seconds before a disconnect occurs if the **Disconnect Idle** option is selected.
- **RX timeout between packets:** Receive timeout between packets in ms. This is the maximum spacing between received bytes allowed before the received message is expected to be complete. The range is **0** to **65565** ms.

2. Click the “Apply Changes” button to save the configuration.

   The fields may be edited at any time, be sure to click the “Apply Changes” button to save the modifications.

The GW PN/ASCII... modules can be configured to detect serial packet delimiters used for the identification of a raw data packet.

#### Raw/ASCII serial packet delimiters

“Detect Delimiters from Serial Device”:

**Start Transmission (STX):** When enabled, GW PN/ASCII... detects an STX (start of transmission) byte sequence which is configured as **one byte** or **two bytes** when it receives a serial packet. If **none** is selected, the GW PN/ASCII... accepts the first byte received after the last End Transmission (ETX) byte(s) as the start of the next data packet. If **one byte** is selected, the GW PN/ASCII... starts to collect data when the STX byte is detected. If the first byte is not the STX byte, it discards the byte. The GW PN/ASCII... continues to discard the bytes until it finds an STX byte. If **two bytes** is selected, the GW PN/ASCII... starts to collect data when both of the STX bytes are detected. If the STX bytes cannot be found, it discards the bytes. The GW PN/ASCII... continues to discard the bytes until it finds the two STX bytes.

- **Byte 1:** Specifies the character that represents the first STX byte. The GW PN/ASCII... looks for this character in the first STX byte, if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.
- **Byte 2:** Specifies the character that represents the second STX byte. The GW PN/ASCII... looks for this character in the second STX byte, only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

**End Transmission (ETX):** When enabled, the GW PN/ASCII... detects an ETX (end of transmission) byte sequence that is configured as **one byte** or **two bytes** marking the end of the serial packet. The length indicates the number of ETX bytes; if **none** is selected, this function is disabled and the GW PN/ASCII... uses the Rx Timeout Between Packets to indicate the end of data packet. If **one byte** is selected, the serial data is checked for one ETX byte to identify the end of a serial packet. If **two bytes** is selected, the serial data is checked for two ETX bytes to identify the end of a serial packet.

- **Byte 1:** Specifies the character that represents the first ETX byte. The GW PN/ASCII... looks for this character in the first ETX byte, if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.

– Byte 2: Specifies the character that represents the second ETX byte. The GW PN/ASCII... looks for this character in the second ETX byte, only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

**Strip Rx STX/ETX Characters:** When enabled, the STX and ETX characters are removed from the received serial packets. Packets sent from the PLC by way of Ethernet to the serial ports of the GW PN/ASCII... are not checked for STX/ETX characters.

The GW PN/ASCII... modules can also be configured to append characters to the beginning or end of a serial packet.

Similar information is then entered under “Append Delimiters from PLC” in the same group:

**Start Transmission (STX):** When enabled, GW PN/ASCII... adds an STX (start of transmission) byte sequence which is configured as **one byte** or **two bytes** when it transmits a serial packet. If **none** is selected, the feature is disabled. If **one byte** is selected, the GW PN/ASCII... adds one byte the beginning of the packet. If **two bytes** is selected, the GW PN/ASCII... appends two bytes.

– **Byte 1:** Specifies the character that represents the first STX byte. The GW PN/ASCII... appends this byte if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.
– **Byte 2:** Specifies the character that represents the second STX byte. The GW PN/ASCII... adds this byte only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

**End Transmission (ETX):** When enabled, the GW PN/ASCII... adds an ETX (end of transmission) byte sequence that is configured as **one byte** or **two bytes** marking the end of the serial packet. The length indicates the number of ETX bytes; if **none** is selected, this function is disabled. If **one byte** is selected, one ETX byte is appended to identify the end of a serial packet. If **two bytes** is selected, two ETX bytes are appended to identify the end of a serial packet.

– **Byte 1:** Specifies the character that represents the first ETX byte. The GW PN/ASCII... appends this byte if the length is one byte or two bytes. Specify a value between **0** and **FF** in hexadecimal format.
– **Byte 2:** Specifies the character that represents the second ETX byte. The GW PN/ASCII... adds this byte only if the length is two bytes. Specify a value between **0** and **FF** in hexadecimal format.

## 3.9 Diagnostics

A variety of packet statistics can be used to diagnose a configuration or application problem.

To view any diagnostics data:

1. Click the “Diagnostics” tab to view a variety of packet statistics that can be used to diagnose a configuration or application problem.

### 3.9.1 Communication statistics

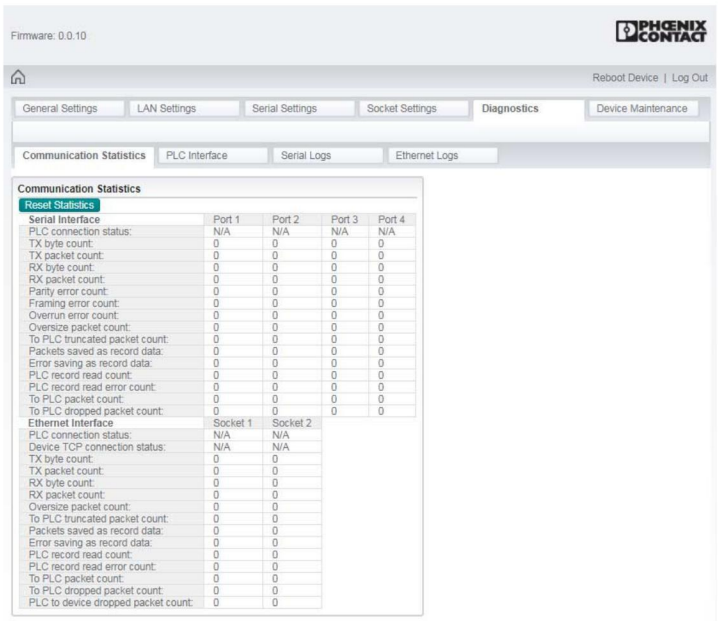


Figure 3-14 “Diagnostics/Communication Statistics” page

1. Click the “Communication Statistics” tab.

   The “Communication Statistics” page provides an overview of the activity on each serial and EtherNet/IP ports. The values can be reset to zero at any time by clicking the “Reset Statistics” button.

2. “Serial Interface” group

   **PLC connection status:** This displays the application relationship number of the current PLC connection.

   **TX byte count:** This displays the number of bytes transmitted from the serial port.

   **TX packet count:** This displays the number of serial packets transmitted from the serial port.

   **RX byte count:** This displays the number of bytes received on the serial port.

   **RX packet count:** This displays the number of packets received on the serial port.

   **Parity error count:** This displays the number of parity errors dropped due to parity errors.

   **Framing error count:** This displays the number of received serial packets dropped due to framing errors.

**Overrun error count:** This displays the number of received serial packets dropped due to overrun error incidents.

**Oversize packet count:** This displays the number of received serial data packets that were larger than the configured input module.

**To PLC truncated packet count:** This displays the number of received serial packets that were truncated before being sent to the PLC.

**Packets saved as record data:** This displays the number of received serial packets that were saved as record data when the “Oversize RX Packets” option is set to **Save Record**.

**Error saving as record data:** This displays the number of errors that occurred when saving serial packets as record data.

**PLC record read count:** This displays the number of serial packets read by the PLC as record data.

**PLC record read error count:** This displays the number of errors that occurred while reading serial packets as record data.

**To PLC packet count:** This displays the number of serial packets sent to the PLC.

**To PLC dropped packet count:** This displays the number of received serial packets intended for the PLC that were dropped. Packets are dropped in the following circumstances:

- STX bytes are configured, but no STX byte(s) were found.
- ETX bytes are configured, but no ETX byte(s) were found.
- message time-outs.
- packet too large.
- receive buffer queue overflows.

3. “Ethernet Interface” group

**PLC connection status:** This displays the application relationship number of the current PLC connection

**Device TCP connection status:** This displays the information of the device TCP connection.

**TX byte count:** The number of bytes transmitted by the GW EIP/ASCII… socket port.

**TX packet count:** The number of packets transmitted by the GW EIP/ASCII… socket port.

**RX byte count:** The number of bytes received by the GW EIP/ASCII… socket port.

**RX packet count:** The number of packets received by the GW EIP/ASCII… socket port.

**Oversize packet count:** This displays the number of received serial data packets that were larger than the configured input module.

**To PLC truncated packet count:** This displays the number of received Ethernet packets that truncated before being sent to the PLC.

**Packets saved as record data:** This displays the number of received serial packets that were saved as record data when the “Oversize RX Packets” option is set to **Save Record**.

**Error saving as record data:** This displays the number of errors that occurred when saving serial packets as record data.

**PLC record read count:** This displays the number of Ethernet packets read by the PLC as record data.

**PLC record read error count:** This displays the number of errors that occurred while reading Ethernet packets as record data.

**To PLC packet count:** This displays the number of Ethernet packets sent to the PLC.

**To PLC dropped packet count:** This displays the number of Ethernet packets intended for the PLC that were dropped. Packets are dropped in the following circumstances:

- STX bytes are configured, but no STX byte(s) were found.
- ETX bytes are configured, but no ETX byte(s) were found.
- message time-outs.
- packet too large.
- receive buffer queue overflows.

**PLC to device dropped packet count:** Displays the number of Ethernet packets received from the PLC intended for the socket port that were dropped. Packets are dropped in the following circumstances:

- transmit buffer queue overflow
- Ethernet device connection is offline.

4. If desired, click the “Reset Statistics” button to refresh the statistics shown.

### 3.9.2 PLC interface

The “PLC Interface” page provides diagnostic information about the PROFINET IO communication to a PLC. The values can be reset to zero at any time by clicking the “Reset Statistics” button.

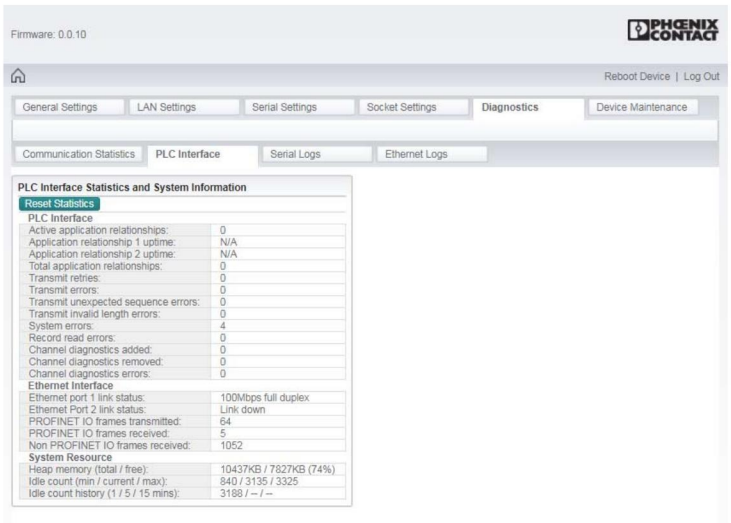


Figure 3-15 “PLC Interface” page

1. Click the “Communication Statistics” tab.

   The “PLC Interface” page provides an overview of the PLC activity. The values can be reset to zero at any time by clicking the “Reset Statistics” button.

2. “PLC Interface” group

   **Active application relationships:** This displays the number of active application relationships.

   **Application relationship 1 uptime:** This displays the uptime of application relationship 1.

   **Application relationship 2 uptime:** This displays the uptime of application relationship 2.

   **Total application relationships:** This displays the total number of application relationships that have been established.

**Transmit retries:** This displays the number of retries that occurred when transmitting PROFINET IO frames.

**Transmit errors:** This displays the number of errors that occurred when transmitting PROFINET IO frames.

**Transmit unexpected sequence errors:** This value is incremented when the GW PN/ASCII... receives a transmit message with a sequence number that is not equal to either the previous transmit sequence number or the previous transmit sequence number plus one. It is expected that the sequence number is incremented for each transmit message.

**Transmit invalid length errors:** This displays the number of output data lengths that were invalid.

**System errors:** This displays the number of system errors detected. Examples of system errors include:

- the port MAC address information not available.
- errors that occurred when accessing Ethernet interface.
- invalid application relationship number.
- invalid module, submodule, slot, or subslot number.

**Record read errors:** This displays the number of errors occurred when reading record data.

**Channel diagnostics added:** This displays the number of channel diagnostics alarms that have been added.

**Channel diagnostics removed:** This displays the number of channel diagnostics alarms that have been cleared.

**Channel diagnostics errors:** This displays the number of errors that occurred when adding and removing channel diagnostics alarms.

3. “Ethernet Interface” group

   **Ethernet port 1 link status:** This displays the link status of Ethernet port 1.

   **Ethernet port 2link status:** This displays the link status of Ethernet port 2. Only available on GW PN/ASCII 2E/…DB9 (dual Ethernet port) models.

   **PROFINET IO frames transmitted:** This displays the number of PROFINET IO frames transmitted.

   **PROFINET IO frames received:** This displays the number of PROFINET IO frames received.

   **Non PROFINET IO frames received:** The number of non PROFINET IO frames received.

4. “System Resources” group

   **Heap memory (total / free):** This displays the memory usage (total and free memory) of the GW PN/ASCII....

   **Idle count (min / current / max):** This displays the minimum, current, and maximum CPU idle count of the GW PN/ASCII....

   **Idle count history (1 / 5 / 15 mins):** This displays the average CPU idle count in the last 1, 5, and 15 minutes.

### 3.9.3 Serial logs

The “Serial Logs” page provides a log of received and transmitted messages on the serial port. Up to 128 bytes per message and up to 128 messages are logged. This is intended to help with debugging serial connectivity problems, determining the proper start and end of transmission bytes, and diagnosing device problems. Click the “Reset Log” button at any time to clear the log. This page displays the serial messages transmitted and received during normal operation.

To view serial log statistics:

1. Click the “Diagnostics” tab.
2. Click the “Serial Log” tab.

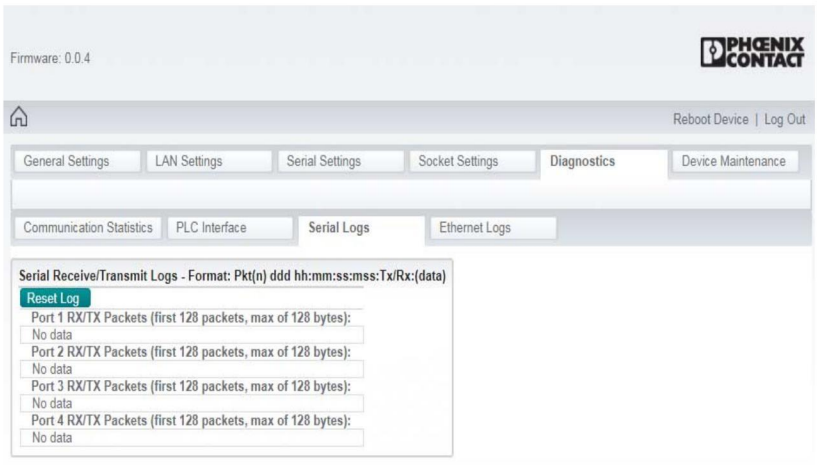


Figure 3-16 “Serial Log” page

The log format is as follows:

**Pkt(N):** ddd:hh:mm:ss.mss Rx/Tx>(data)
**ddd**: days since last system restart
**hh**: hours since last system restart
**mm**: minutes since last system restart
**ss**: seconds since last system restart
**mss:** milliseconds since last system restart
(**data**): Data packet received. For PROFINET IO data, all data bytes are shown in hexadecimal (xxh) format. For Raw/ASCII and PROFINET/ASCII data, ASCII characters are displayed as characters. Non-ASCII data is displayed in hexadecimal (xxh) format

3. Click the “Reset Log” button to clear the log.

### 3.9.4 Ethernet logs

The “Ethernet Logs” page provides a log of received and transmitted Ethernet port messages. Up to 128 bytes per message and up to 128 messages are logged. It is intended to help with debugging Ethernet connectivity problems, determining the proper start and end of transmission bytes, and diagnosing device problems. Click the “Reset Log” button at any time to clear the log.

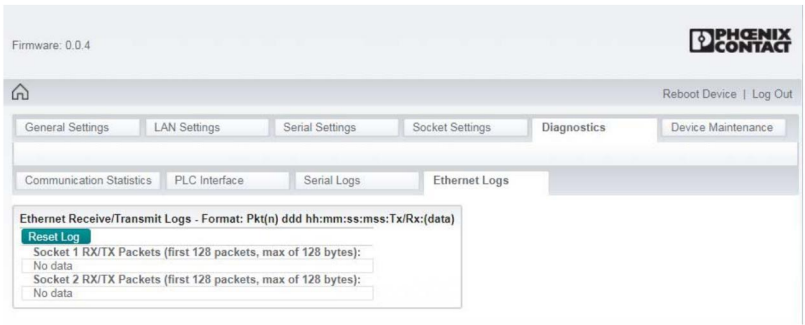


Figure 3-17 “Ethernet Logs” page

The format is as follows:

**Pkt(n):** ddd:hh:mm:ss.mmm Rx/Tx:<data>
**ddd -** days since last system restart
**hh -** hours since last system restart
**mm -** minutes since last system restart
**ss -** seconds since last system restart
**mmm -** milliseconds since last system restart
**<data>** - Data packet received. For PROFINET IO data, all data bytes are shown in hexadecimal (xxh) format. For Raw/ASCII and PROFINET/ASCII data, ASCII characters are displayed as characters. Non-ASCII data is displayed in hexadecimal (xxh) format

## 3.10 Maintenance

Click the “Device Maintenance” tab to access the available maintenance functions of the GW PN/ASCII....

### 3.10.1 Passwords

To change passwords:

1. Click the “Device Maintenance” page.
2. Click the “Passwords” tab to change the password used to access the web server.

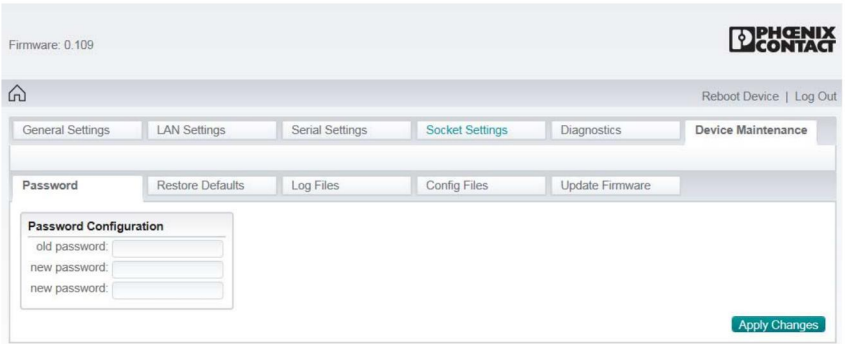


Figure 3-18 “Password” page

The GW PN/ASCII... has administrator-level passwords. The administrator-level user may make changes to the configuration.
The default user name and password are:
User name: Admin
Password: admin
The “Password” field is case sensitive. The user name is fixed and cannot be modified.

3. Enter the current password and the new password (twice) in the appropriate fields.
4. Click the “Apply Changes” button to save changes.

### 3.10.2 Restore defaults

To restore defaults:

1. From the “Device Maintenance” page, click the “Restore Defaults” tab to return the GW PN/ASCII... to the original factory defaults, including the IP address.

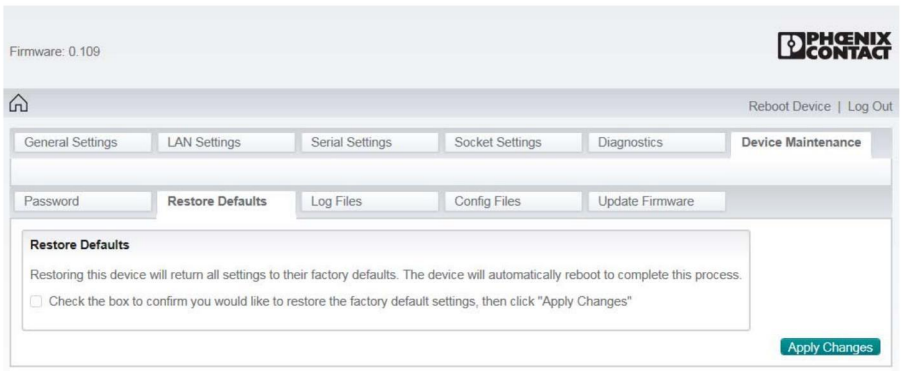


Figure 3-19 “Restore Defaults” page

2. Check the “Check the box to confirm...” box.
3. Click the “Apply Changes” button.

Note that the IP address returns to the factory defaults and may require modification to prevent multiple devices on the network from trying to use the same address.

### 3.10.3 Log files

To view log files:

1. From the “Device Maintenance” page, click the “Log Files” tab to review the log files of the device, which can be used for advanced troubleshooting.

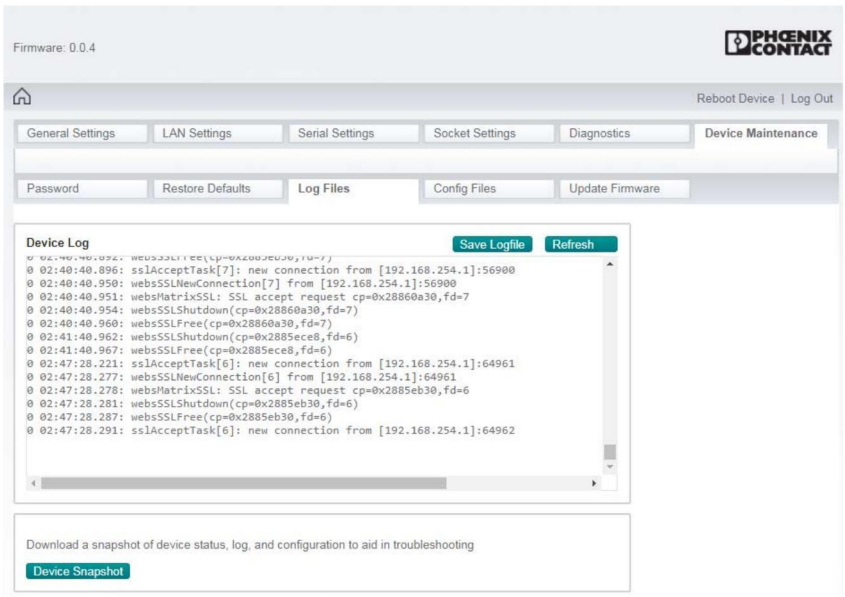


Figure 3-20 “Log Files” page

2. Click the “Save Logfile” button to save the log as a text file for future use, or review the log in the web browser.

   The log displays information about the device, such as when a PC created or broke a connection to the GW PN/ASCII....

   The “Device Snapshot” feature allows a user to capture the system log, configuration data, and other information that can be used for advanced troubleshooting or for “As Configured” record keeping as a single text file.

### 3.10.4 Configuration files

For fast and easy commissioning of a replacement unit, or in the event that many devices need the same configuration, it is possible to create and load a configuration file into the GW PN/ASCII....

To save and load configuration files:

1. From the “Device Maintenance” page, click the “Config Files” tab.

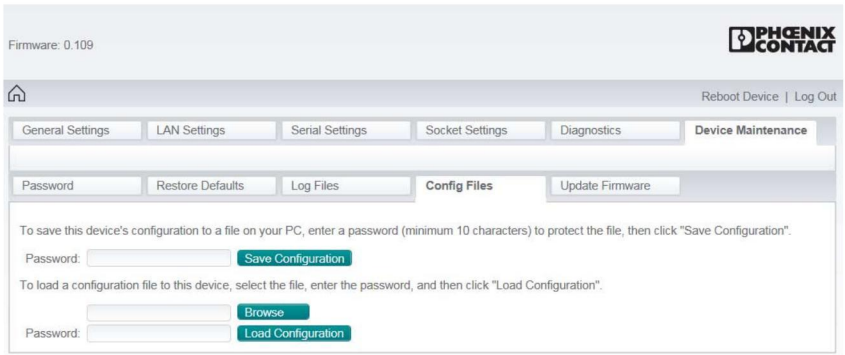


Figure 3-21 “Config Files” page

2. Enter a password that is used to protect the file.
   The password prevents unauthorized users from applying the system configuration file to an unapproved node to gain access to the network.
3. Click the “Save Configuration” button to open a dialog box where the file name and storage location on the PC are selected.
4. To load a configuration file to a GW PN/ASCII..., click the “Browse” button to open a dialog box and browse to the configuration file location on the PC.
5. After selecting the appropriate configuration file, enter the password for the file and click the “Load Configuration” button.

### 3.10.5 Update firmware

To update firmware:

1. From the “Device Maintenance” page, click the “Update Firmware” tab to install a new version of the firmware.

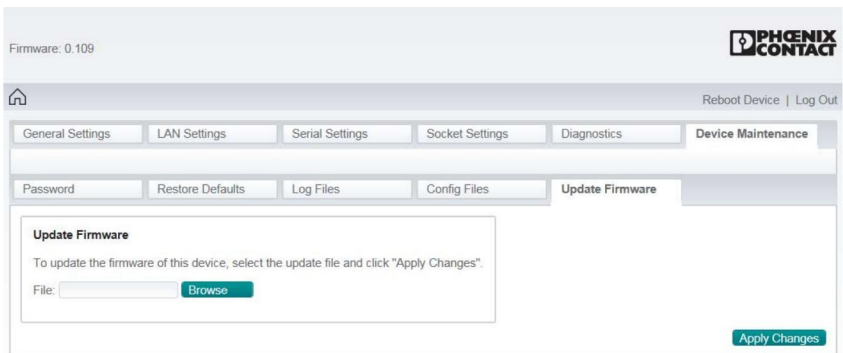


Figure 3-22 “Update Firmware” page

Occasionally, a new version of firmware may be provided to enhance operation of the GW PN/ASCII....

2. Download the firmware to a local drive on the connected computer.
3. Click the “Browse” button and navigate to the file in the “Browse” dialog box.
4. Highlight the file to select it, and then click the “Close” button.
5. Click the “Apply Changes” button to install the firmware.

**NOTE:**

Ensure that a reliable power connection is available during the firmware update. Do not restart the module or disconnect the Ethernet cable during this process.

When firmware is updated, the device configuration is maintained.

# 4 Data message format

## 4.1 Input and output submodule data format

Table 4-1 Data type definitions

| Data type | Data type definition |
|---|---|
| Byte | An integer 0 … 255 (8 bit). for example, ASCII strings are a series of bytes. |
| Word | Unsigned integer (16 bit) |
| Dword | Unsigned integer (32 bit) |

### 4.1.1 Data format of an input submodule.

The sequence number range is from 0 to 65535 (16#FFFF). Once the sequence number reaches 65535, it restarts at 0. The data length range is from 0 to 220, indicating the number of bytes received. The actual data starts from offset 4.

Table 4-2 Input submodule format

| Byte offset | Input submodule data type | Description |
|---|---|---|
| 0-1 | Word | Sequence number (big endian) |
| 2-3 | Word | Data length (big endian) |
| 4..N | Array of byte | Data array (maximum 220 bytes) |

When a packet larger than the configured input submodule is received, the packet is truncated by default. However, the length field always contains the original packet size. For example, a serial port is configured with a 32-byte input submodule. A packet of 40 bytes is received. The IO controller will receive the first 32 bytes input data and the length field will be 40. A length field larger than the size of input submodule indicates that the data has been truncated.

### 4.1.2 Data format of an output submodule.

Table 4-3 Output submodule format

| Byte offset | Output submodule data type | Description |
|---|---|---|
| 0-1 | Word | Sequence number (big endian) |
| 2-3 | Word | Data length (big endian) |
| 4..N | Array of byte | Data array (maximum 220 bytes) |

The output data has the same format as the input data of an input submodule. The GW PN/ASCII... transmits the number of output data indicated by the length field when the sequence number field changes. The GW PN/ASCII... only transmits the output data once. No further data is transmitted until the sequence number is changed again.

An output submodule also has a 2-byte input data (see Table 4-4). This 16-bit integer is the sequence number of the last output data packet that was transmitted. To confirm that the last data written to the output data area has been transmitted, compare the sequence number of the transmitted output data with the input data of that submodule. If they are the same, the data has been transmitted successfully.

Table 4-4 Byte offset

| Byte Offset | Data Type | Description |
|---|---|---|
| 0-1 | WORD | Last Transmitted Sequence Number (Big endian) |

# 5 Troubleshooting

## 5.1 Resetting the device

If, for some reason, the module needs to be reset to factory settings, there are two methods available: hardware reset and software reset.

### 5.1.1 Hardware reset

The reset button allows resetting the device without the use of a PC.

To force a hardware reset:

1. With the device powered off, press and hold the reset button. Apply power and hold the reset button for at least five seconds. Reinitializing the module and firmware reset may take some time. Do not disconnect from power (see Section 1.1, “Structure” for the location of the reset button on the GW PN/ASCII...).
2. After a successful reset, the module returns to the factory default address (192.168.254.254).

### 5.1.2 Software reset

To force a software reset:

1. Start the web server and navigate to the “Device Maintenance/Restore Defaults” page.
2. Click the check box on the page.
3. Click the “Apply Changes” button.
4. After a successful reset, the module returns to the factory default address (192.168.254.254).

## 5.2 LEDs

Table 5-1 LEDs

| LED | Color | Indication | Meaning |
|---|---|---|---|
| STATUS | Green | Flashing every 15 seconds | The device is booting. |
| | | Flashing every 10 seconds | No PLC is connected |
| | | On solid | One or more PLCs are connected |
| | | 3 flashes per 5 seconds | Indicates an internal error |
| LINK | Green | On solid | Indicates Ethernet network is connected[1] |
| ACT | Yellow | Flashing | Flashing indicates data transfer activity[1] |

[1] LEDs on Ethernet ports are not labeled. See Section 1.1, “Structure” for LED location.

# A Appendixes

## A 1 List of figures

### Section 1



### Section 2



### Section 3

## B 2 List of tables

### Section 1



### Section 2



### Section 4



### Section 5

# Please observe the following notes

**General terms and conditions of use for technical documentation**

Phoenix Contact reserves the right to alter, correct, and/or improve the technical documentation and the products described in the technical documentation at its own discretion and without giving prior notice, insofar as this is reasonable for the user. The same applies to any technical changes that serve the purpose of technical progress.

The receipt of technical documentation (in particular user documentation) does not constitute any further duty on the part of Phoenix Contact to furnish information on modifications to products and/or technical documentation. You are responsible to verify the suitability and intended use of the products in your specific application, in particular with regard to observing the applicable standards and regulations. All information made available in the technical data is supplied without any accompanying guarantee, whether expressly mentioned, implied or tacitly assumed.

In general, the provisions of the current standard Terms and Conditions of Phoenix Contact apply exclusively, in particular as concerns any warranty liability.



Phoenix Contact reserves the right to register its own intellectual property rights for the product identifications of Phoenix Contact products that are used here. Registration of such intellectual property rights by third parties is prohibited.

Other product identifications may be afforded legal protection, even where they may not be indicated as such.

# How to contact us

**Internet**

Up-to-date information on Phoenix Contact products and our Terms and Conditions can be found on the Internet at:
phoenixcontact.com

Make sure you always use the latest documentation.
It can be downloaded at:
phoenixcontact.net/products

**Subsidiaries**

If there are any problems that cannot be solved using the documentation, please contact your Phoenix Contact subsidiary.
Subsidiary contact information is available at phoenixcontact.com.

**Published by**

PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstraße 8
32825 Blomberg
GERMANY

PHOENIX CONTACT Development and Manufacturing, Inc.
586 Fulling Mill Road
Middletown, PA 17057
USA

Should you have any suggestions or recommendations for improvement of the contents and layout of our manuals, please send your comments to:
tecdoc@phoenixcontact.com