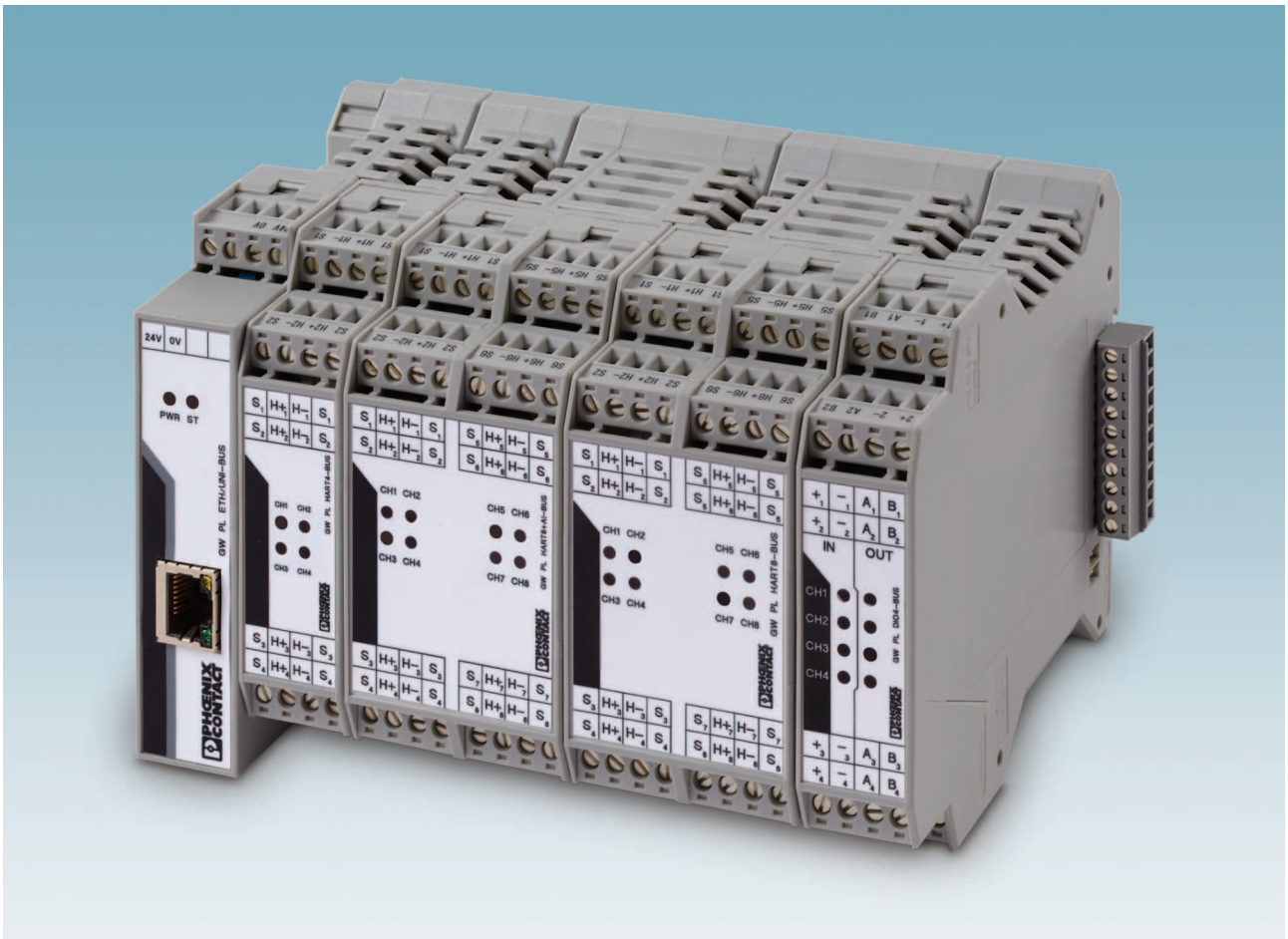


GW PL ETH/...-BUS

User manual

UM EN GW PL ETH/...-BUS

PHOENIX CONTACT
INSPIRING INNOVATIONS

User manual

GW PL ETH/...-BUS

UM EN GW PL ETH/...-BUS, Revision F 2020-01-21

This user manual is valid for:

Designation	Order No.
GW PL ETH/UNI-BUS	2702233
GW PL ETH/BASIC-BUS	2702321
GW PL HART4-BUS	2702234
GW PL HART4-R-BUS	2702879
GW PL HART8-BUS	2702235
GW PL HART8-R-BUS	2702880
GW PL HART8+AI-BUS	2702236
GW PL DIO4-BUS	2702237

3433_en_F

Table of contents

1 For your safety

Read this user manual carefully and keep it for future reference.

1.1 Labeling of warning notes

This symbol indicates hazards that could lead to personal injury.

There are three signal words indicating the severity of a potential injury.

DANGER
Indicates a hazard with a high risk level. If this hazardous situation is not avoided, it will result in death or serious injury.

WARNING
Indicates a hazard with a medium risk level. If this hazardous situation is not avoided, it could result in death or serious injury.

CAUTION
Indicates a hazard with a low risk level. If this hazardous situation is not avoided, it could result in minor or moderate injury.

This symbol together with the **NOTE** signal word alerts the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.

Here you will find additional information or detailed sources of information.

1.2 Qualification of users

The use of products described in this user manual is oriented exclusively to:

– Qualified electricians or persons instructed by them. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.
– Qualified application programmers and software engineers. The users must be familiar with the relevant safety concepts of automation technology as well as applicable standards and other regulations.

1.3 Product changes

Changes or modifications to hardware and software of the device are not permitted.

Incorrect operation or modifications to the device can endanger your safety or damage the device. Do not repair the device yourself. If the device is defective, please contact Phoenix Contact.

1.4 Safety 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 due to 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 System description

The GW PL ... system provides a simple way to parameterize and monitor field devices on an Ethernet network. The modular design allows up to five expansion modules to be connected to a single head station. All expansion modules are powered via the head station.

2.1 GW PL ETH/…BUS

The GW PL ETH/BASIC-BUS head station provides an efficient data exchange and communicates on an Ethernet network. Up to five fieldbus-specific expansion modules can be connected, and the field device data can be accessed using FDT/DTM, HART IP, and Modbus TCP. The GW PL ETH/UNI-BUS head station also adds PROFINET communication. The head station features an embedded web server for configuring the device, as well as a CommDTM for use with an FDT Frame application, such as PACTware.

Table 2-1 GW PL ETH/…BUS structure

Item	Function
1	Power connector
2	Ethernet port (RJ45)
3	Power LED, green
4	Status LED, green

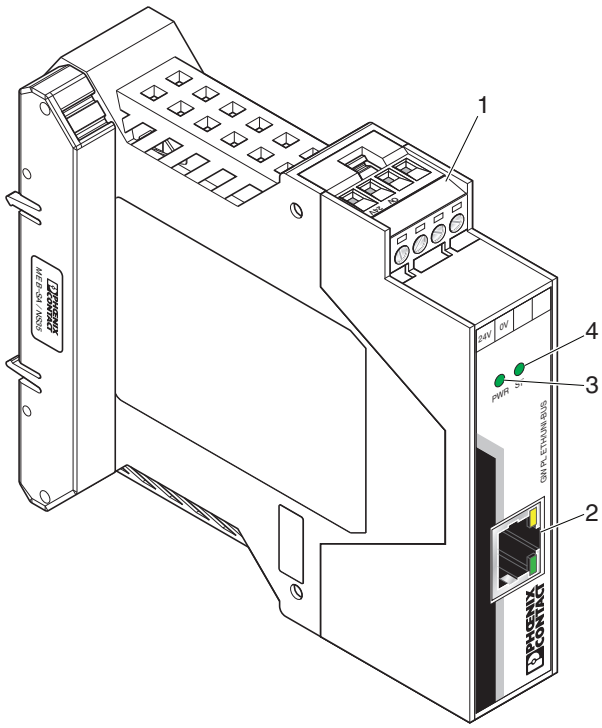


Figure 2-1 GW PL ETH/…BUS structure

2.1.1 Connections

Power

Connect a 24 V DC power source to the power connector.

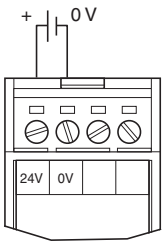


Figure 2-2 Power connection

Ethernet

Connect a CAT5 or better Ethernet cable to the RJ45 port on the GW PL ETH/…BUS and an Ethernet network (switch). Both crossover (C/O) or 1:1 cables are acceptable, as the GW PL ETH/…BUS has autocross capability. The cable should not exceed 100 m in length.

2.2 GW PL HART...-BUS expansion modules

The GW PL HART...-BUS expansion modules allow the system to function as a HART to Ethernet gateway, an up-to-date option that replaces the widely used RS-485 HART multiplexer solutions. The GW PL HART4-BUS and GW PL HART4-R-BUS are equipped with four channels, while the GW PL HART8-BUS and GW PL HART8-R-BUS have eight channels. Up to five expansion modules can be connected to the head station, allowing a maximum of 40 HART channels to be operated in parallel.

The GW PL HART…-R-BUS provides internal loop resistance of 250 Ω for applications using a 4 to 20 mA HART isolator or loops with low-loop resistance.

Each channel provides galvanic isolation from the HART signal. With the GW PL ETH/…BUS CommDTM, the modules can be integrated into an FDT Frame application. With HART IP protocol, access from the popular HCF OPC server is possible as well. Common HART parameters can also be accessed using the Modbus TCP or PROFINET protocol.

Table 2-2 GW PL HART4-BUS/GW PL HART4-R-BUS structure

Item	Function
1	Channel 1 connector
2	Channel 2 connector
3	Channel 3 connector
4	Channel 4 connector
5	Status LEDs (one per channel)
6	BUS connector

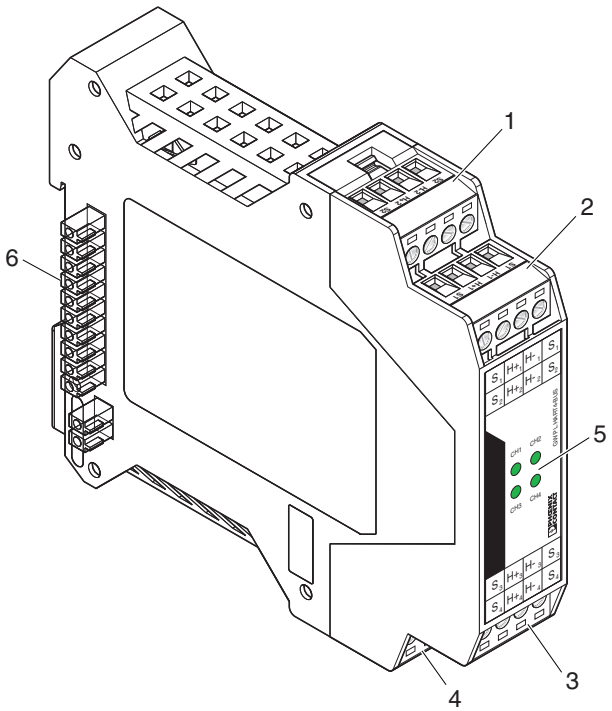


Figure 2-3 GW PL HART4-BUS/GW PL HART4-R-BUS structure

Table 2-3 GW PL HART8-BUS/GW PL HART8-R-BUS structure

Item	Function
1	Channel 1 connector
2	Channel 2 connector
3	Channel 3 connector
4	Channel 4 connector
5	Channel 5 connector
6	Channel 6 connector
7	Channel 7 connector
8	Channel 8 connector
9	Status LEDs (one per channel)
10	BUS connector

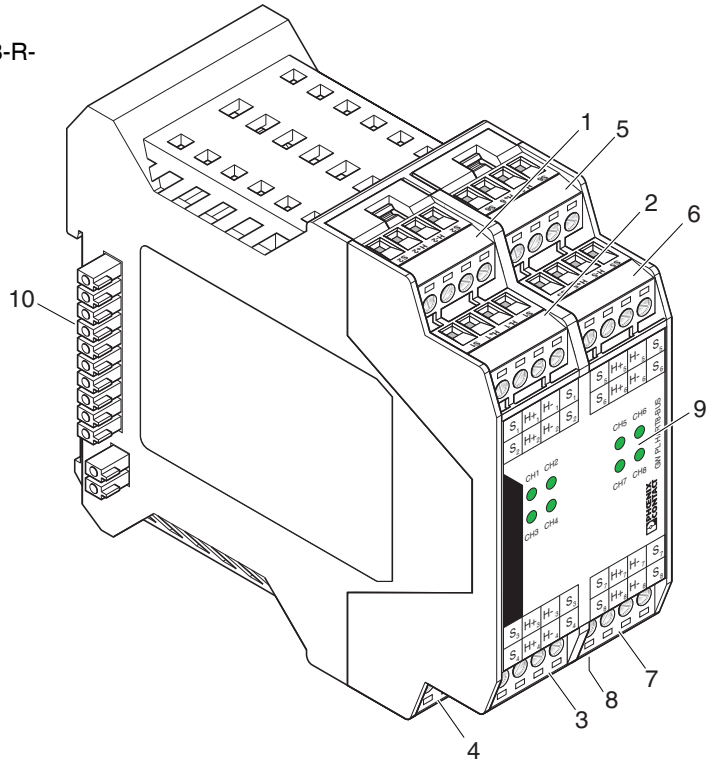
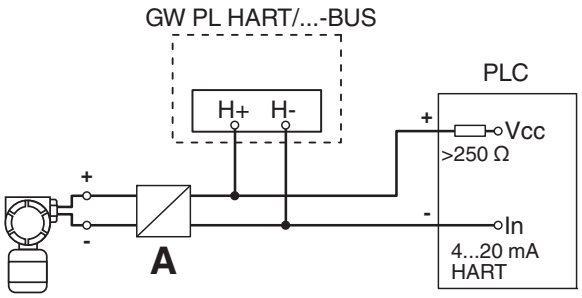


Figure 2-4 GW PL HART8-BUS/GW PL HART8-R-BUS structure

2.2.1 Connections

HART

Connect the HART field devices according to Figure 2-5 to Figure 2-8. An optional isolator or repeater power supply may be installed.



A	Optional isolator or repeater power supply

Figure 2-5 HART analog in connection

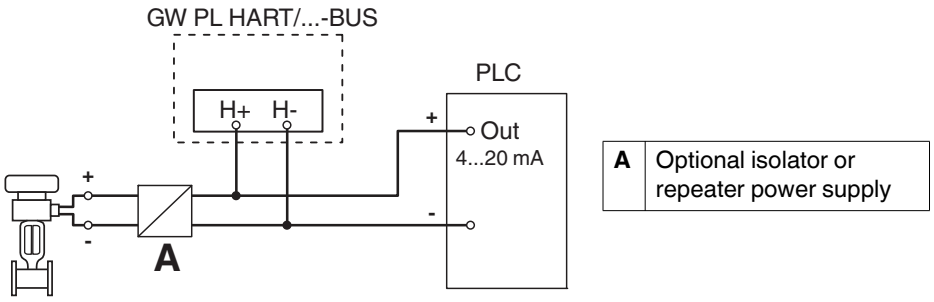


Figure 2-6 HART analog out connection

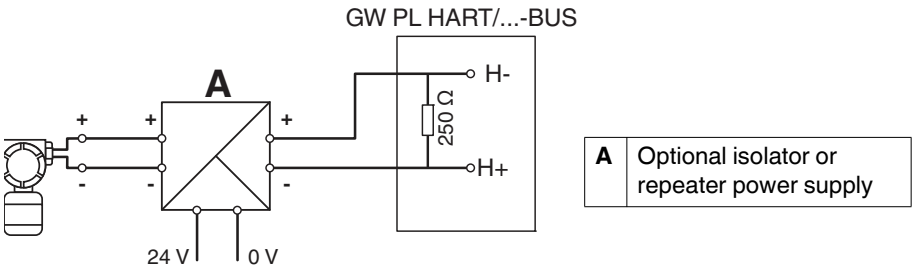


Figure 2-7 HART analog in connection to a GW PL HART…-R-BUS

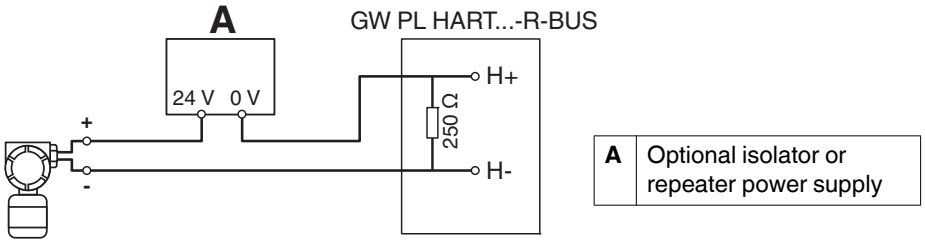


Figure 2-8 HART analog out connection to a GW PL HART…-R-BUS

2.3 GW PL HART8+AI-BUS expansion module

The GW PL HART8+AI-BUS expansion module functions similarly to the GW PL HART8-BUS expansion module, but also supplies the loop current to HART slaves, including loop resistance, and adds the ability to transmit analog data. Up to five HART expansion modules can be connected to the head station, allowing a maximum of 40 HART channels to be operated in parallel. Each channel provides galvanic isolation from the HART signal.

Table 2-4 GW PL HART8+AI-BUS structure

Item	Function
1	Channel 1 connector
2	Channel 2 connector
3	Channel 3 connector
4	Channel 4 connector
5	Channel 5 connector
6	Channel 6 connector
7	Channel 7 connector
8	Channel 8 connector
9	Status LEDs (one per channel)
10	BUS connector

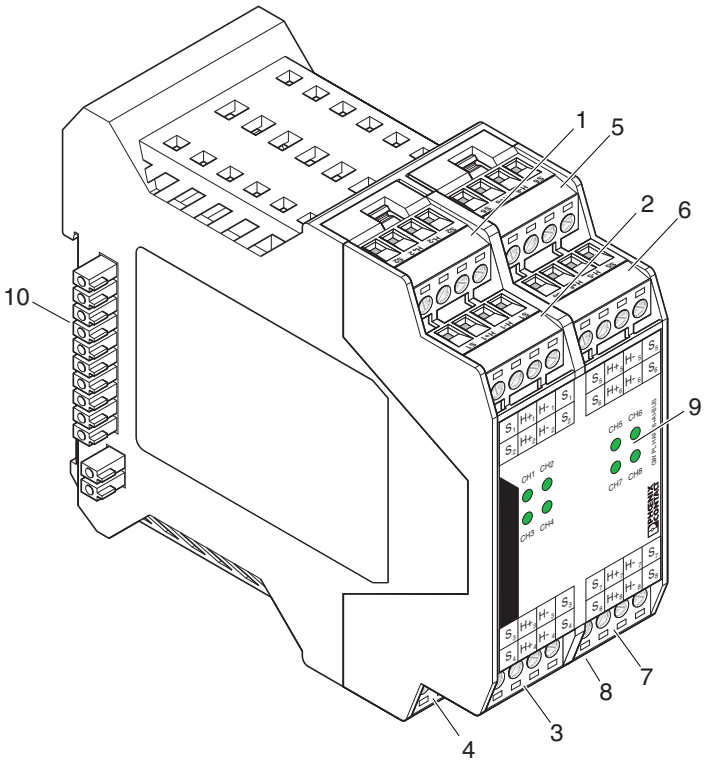


Figure 2-9 GW PL HART8+AI-BUS structure

2.3.1 Connections

HART

Connect the HART field devices according to Figure 2-10 and Figure 2-11. An optional isolator or repeater power supply may be installed.

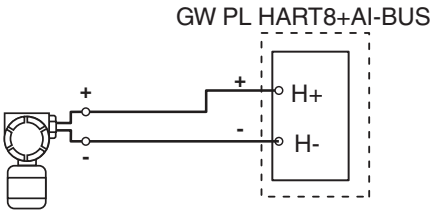
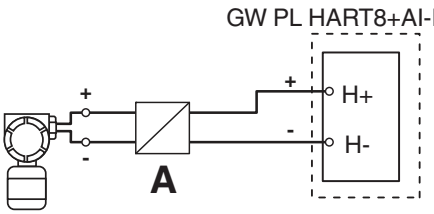


Figure 2-10 HART direct connection with current power



A	Optional isolator or repeater power supply

Figure 2-11 Intrinsically safe HART connection

2.4 GW PL DIO4-BUS

The GW PL DIO4-BUS is a four-channel digital input/output expansion module. The module can manage inputs that sense the level or status of motors, valves, and other equipment, as well as outputs for on/off, high/low, and open/close status of motors, pumps, valves, heaters, fans, and other industrial equipment. Connected to different fieldbus-specific modules, the GW PL DIO4-BUS can extend any network with digital I/O capabilities.

Table 2-5 GW PL DIO4-BUS structure

Item	Function
1	Channel 1 connector
2	Channel 2 connector
3	Channel 3 connector
4	Channel 4 connector
5	Status LEDs (two per channel)
6	BUS connector

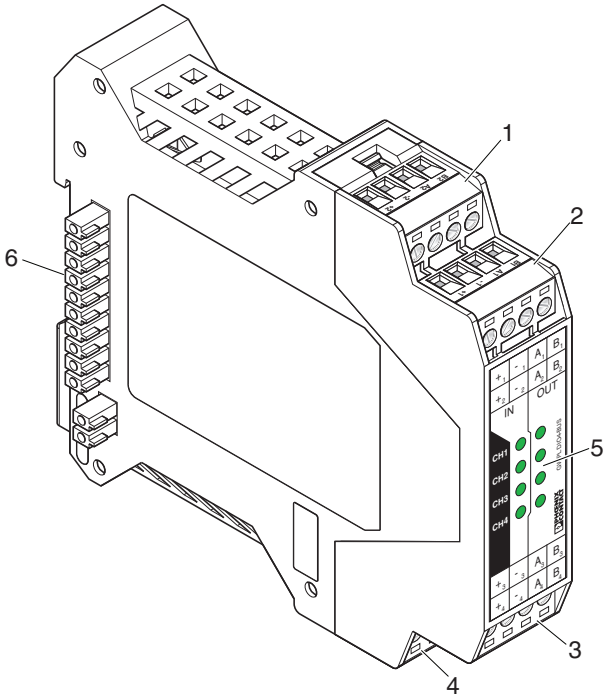


Figure 2-12 GW PL DIO4-BUS structure

2.4.1 Connections

Digital input

Connect any digital input field devices according to Figure 2-13.

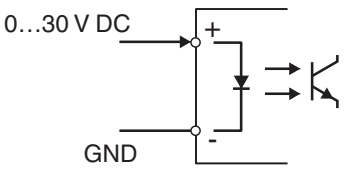


Figure 2-13 Typical digital input connection

Digital output

Connect any digital output field devices according to Figure 2-14.

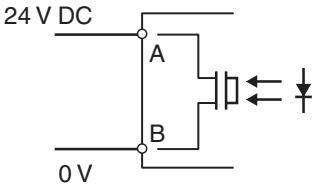


Figure 2-14 Typical digital output connection

3 Installation

All GW PL ... devices are installed on an NS 35 DIN rail. An internal communication bus within the rail allows the head station to power and communicate with the various expansion modules. Up to five expansion modules of different types can be attached and powered from one head station.

3.1 Mounting

Installation

1. Hook the GW PL ETH/…BUS head station over the top edge of the DIN rail (A) and rotate down until it snaps onto the bottom edge of the DIN rail (B).

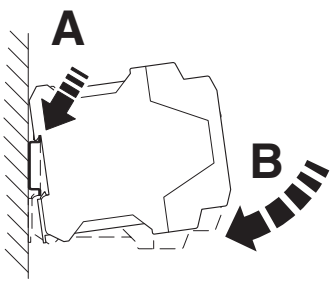


Figure 3-1 Mounting

2. Repeat step 1 for all expansion modules, ensuring that they are to the right of the GW PL ETH/…BUS.
3. Slide the expansion modules, one at a time, to the left until the bus connectors mate. Repeat for each module.

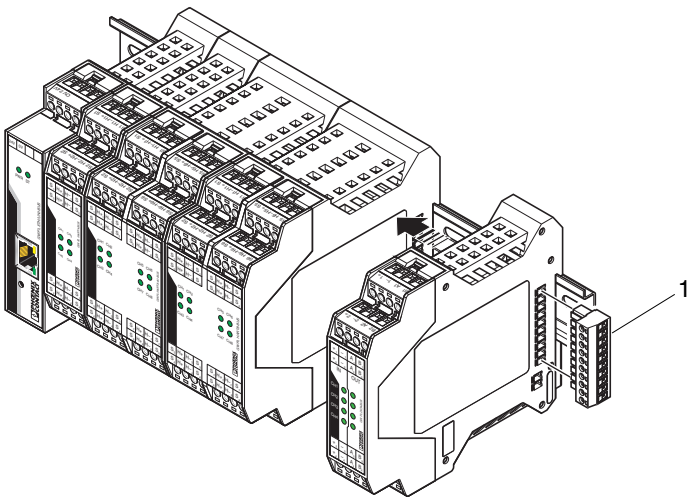


Figure 3-2 Module and terminator plug installation

4. Install the terminator plug (1) on the last module.

The terminator plug is shipped on the GW PL ETH/…BUS. It must be removed from that module and installed on the last module.

Removal

1. Remove power and disconnect the cables to the head station.
2. Slide the last terminator to the right, away from the head station.
3. Using a screwdriver, release the latch and rotate the bottom of the module off the DIN rail.
4. Lift the module off the top rail and remove.

4 Programming

4.1 Default settings

The default network settings of the GW PL ETH/…BUS 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.

4.1.1 Login

1. Set the IP address of the connected PC to the subnetwork of the GW PL ETH/…BUS: 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 PL ETH/…BUS in the “Address” field (default = 192.168.254.254).
   The web server responds immediately.

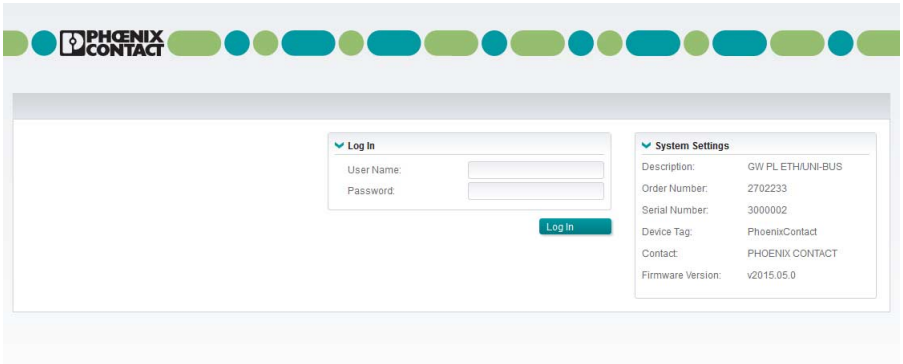


Figure 4-1 Log-in screen

If the web server does not load, first check the IP parameters of the PC. If everything is set correctly, check if there are any proxy settings loaded in the web browser. The proxy setting must be “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 will cause a network conflict, and incorrect parameters may be set in the GW PL ETH/UNI-BUS 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 each device has a unique IP address they can be powered on together while on the same network.

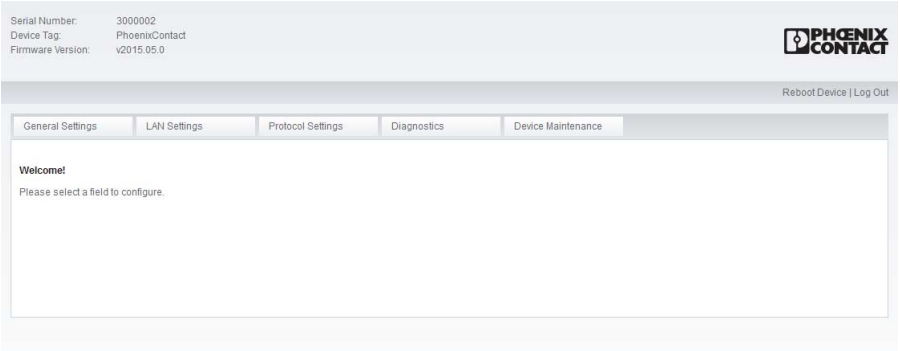


Figure 4-2 “Home” screen of the GW PL ETH/UNI-BUS

4.2 Configuration via web server

The user-friendly, web-based management interface can be used to manage the GW PL ETH/…BUS 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 on a graphic user interface.

4.2.1 General settings

Click the “General Settings” tab to view and edit general information about the GW PL ETH/…BUS.

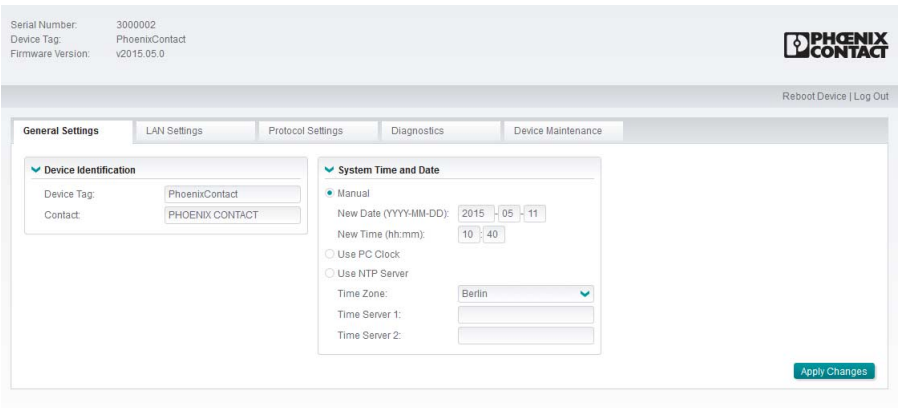


Figure 4-3 “General Settings” page

Groups of attributes can be expanded and collapsed by clicking the arrow to the left of the group name.

The “General Settings” page displays basic information and time settings for the respective GW PL ETH/…BUS head station.

Device Identification

Provides fields in which to enter descriptive information regarding the GW PL ETH/…BUS. This information may be visible to other devices.

– **Device Tag:** Enter a name for the device. The default is **GW PL ETH/…BUS**. The field accepts up to 32 characters. Spaces are not allowed.
– **Contact:** Enter the name of a contact person, group, or department responsible for this device.

System Time and Date

– **Manual:** Enter the time and date in the appropriate fields.
– **Use PC Clock:** Transfers the current time and date from a connected PC to the GW PL ETH/…BUS.
– **Use NTP Server:** The time and date are downloaded from the server(s) specified in the “Time Server 1” and “Time Server 2” fields. The “Time Zone” field must also be specified for the time to display correctly.

4.2.2 LAN configuration

Click the “LAN Settings” tab to view and edit the network information.

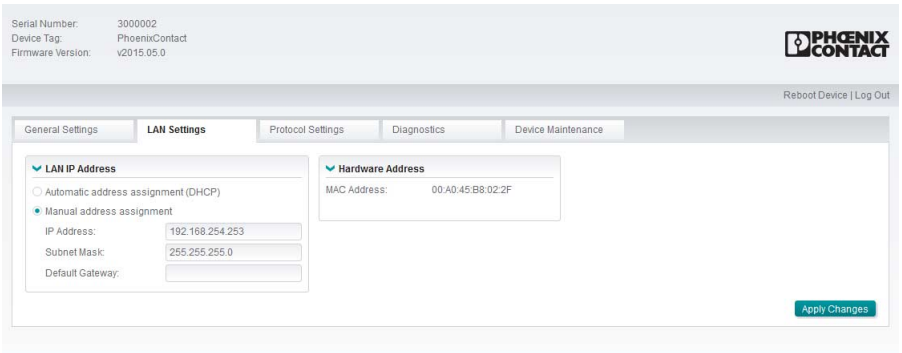


Figure 4-4 “LAN Settings” page

Groups of attributes can be expanded and collapsed by clicking the arrow to the left of the group name.

– **LAN IP Address:** Chose the method the network uses to obtain IP addresses. If a DHCP server on the network assigns IP addresses, click the “Using DHCP to get an IP address” option button.

If using static IP addresses, click the “Specify a static IP address” option button. Enter the desired information in the fields provided.

Each device must have a different IP address. When the IP address is changed from the factory default, you must know the address to log back in to the web server. If DHCP addressing is used, additional software may be necessary to determine the IP address based on the MAC address of the device.

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

4.2.3 Diagnostics

Click the “Diagnostics” tab to view the expansion modules that are connected to the GW PL ETH/…BUS head station.

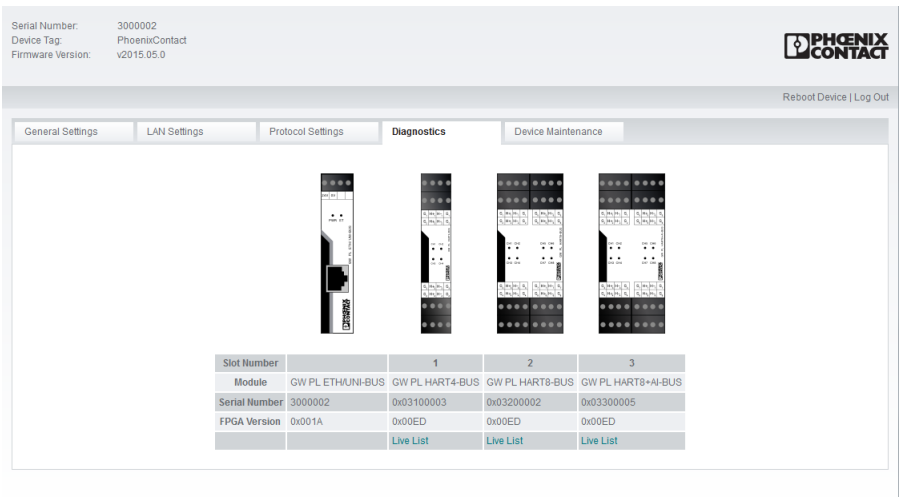


Figure 4-5 “Diagnostics” page

The “Diagnostics” page provides the slave ID designation for any connected expansion modules. Click the “Live list” link under each module to view information about the HART devices connected to that module.

4.2.3.1 Live list

The “Live list” page displays information about all devices connected to the selected GW PL ETH/…BUS expansion module.

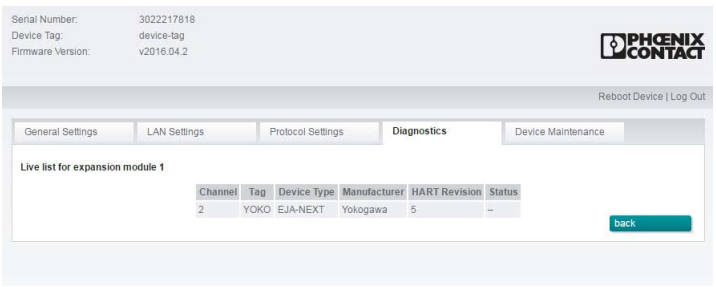


Figure 4-6 “Live list” page

Fields specific to the device are visible on the “Live list” page. These values are important when determining Modbus addresses and when configuring PROFINET.

– **Channel:** Displays the physical channel the specified device is connected to. Refer to “Modbus registers” on page 37 for the corresponding Modbus register.
– **Tag:** Displays the device-specific tag programmed into the device at time of commissioning.
– **Device Type:** Displays the manufacturer’s device-specific product name.
– **Manufacturer:** Displays the name of the device manufacturer.
– **HART Revision:** Displays the HART version of the connected device. This is useful when determining the type of data available.

The poll address must be **0** for Modbus data to be available to other devices.

– **Status:** Displays device-specific information for operation of the connected device.

Status codes are only valid for devices that utilize HART Revision 6 and higher.

Table 4-1 Status codes

Code	Description	Explanation
0x01	Maintenance required	The field device requires maintenance.
0x02	Device variable alert	This bit is set to indicate that a process variable has entered an alarm or warning state.
0x04	Critical power failure	The power source dropped below a sustainable level to maintain operation of the device.
0x08	Failure	The process variables are out of range due to a malfunction in the device.
0x10	Out of specification	Environmental conditions (temperature, humidity, etc.) are outside the device’s permissible range.
0x20	Function check	Work or maintenance is currently being performed on the specific device.

4.2.4 Protocol settings

Click the “Protocol Settings” tab to view and configure the protocols available for communication between the GW PL ETH/…BUS and the host system.

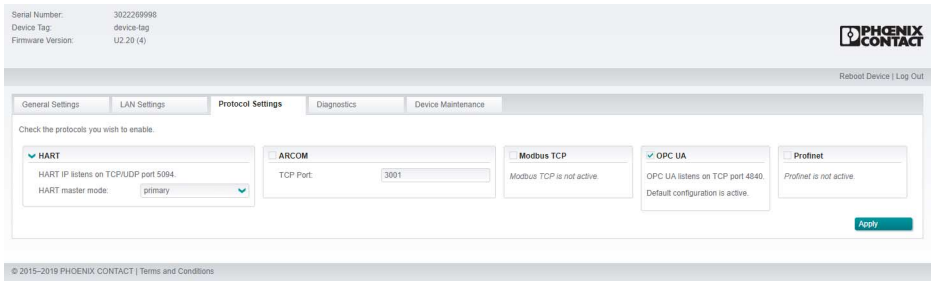


Figure 4-7 “Protocol Settings” page

Modbus, PROFINET, and OPC UA cannot be active at the same time.

4.2.4.1 HART IP configuration

HART IP is a connection option that facilitates host-level systems to access and integrate measurement and device diagnostics information from HART-enabled field devices using the existing plant networking infrastructure.

The GW PL ... modules will act as a gateway between a HART IP-enabled host station, such as a HART Server, PDM, PACTware, HCF OPC Server, etc., and a HART device.

When adding the GW PL ETH/…BUS to a HART IP-enabled host system, use the following configuration:

Network[1]	TCP/UDP
Port	5094
Poll address	0
IP address	Physical LAN port address

1 TCP is recommended

4.2.4.2 HART master mode

The GW PL ETH/…BUS acts as a primary HART master by default. It may be useful for the GW PL ETH/…BUS to act as a secondary HART master to a handheld communicator for maintenance purposes.

From the “HART master mode” field drop-down menu, select either **primary** or **secondary** based on the application.

4.2.4.3 Modbus configuration

When the GW PL ETH/…BUS is used in conjunction with any GW PL HART… expansion modules, the process variables of a HART device can be accessed. Additionally, digital inputs and outputs can be monitored and controlled with GW PL DIO4-BUS modules.

Activate Modbus

Navigate to the “Protocol Settings” page in the web-based manager (see Figure 4-7).

Check the “Modbus TCP” box to activate the Modbus registers on TCP port 502. The system automatically requests several HART parameters from the field devices and populates the correct Modbus registers.

The polling address of any HART devices must be set to **0**.

Click the “Apply changes” button to save changes.

Modbus mapping

See “Modbus registers” on page 37 for mapping of HART-device process variables.

4.2.4.4 ARCOM

When the GW PL ETH/…BUS is connected with Emerson AMS, the ARCOM protocol must be activated. Check the “ARCOM” protocol box and enter a TCP port number. It is freely configurable, but you must ensure that no other service on the network is using the TCP port chosen.

Click the “Apply Changes” button to activate ARCOM.

COM Port Redirector

The redirector application is used to create a virtual COM port on the PC running Emerson AMS. The virtual COM ports are physically redirected to the network card and a destination IP in the network. One GW PL ETH/…BUS with a corresponding IP address is configured as the receiver in the network for each COM port.

The COM Port Redirector software can be downloaded from phoenixcontact.com

Launch the redirector application, click the “New Port” button, and then select **Client**. Choose a COM port number, and enter the IP address of the GW PL ETH/…BUS and ARCOM TCP port number. Click the “OK” button to create the virtual COM port.

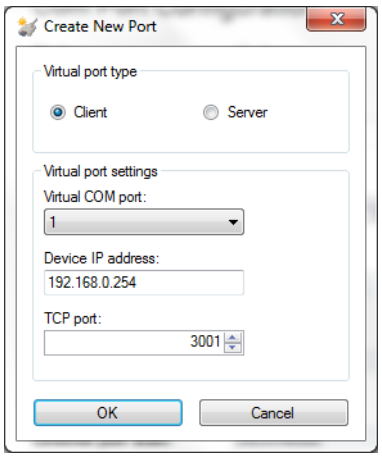


Figure 4-8 “Create New Port” dialog box

It is recommended that auto-reconnect and cache data options be enabled. on the “Advanced Settings/Connection Settings” page.

Emerson AMS

1. Install the EDD file for the GW PL ETH/…BUS by using the “Add Device Type” tool in AMS.

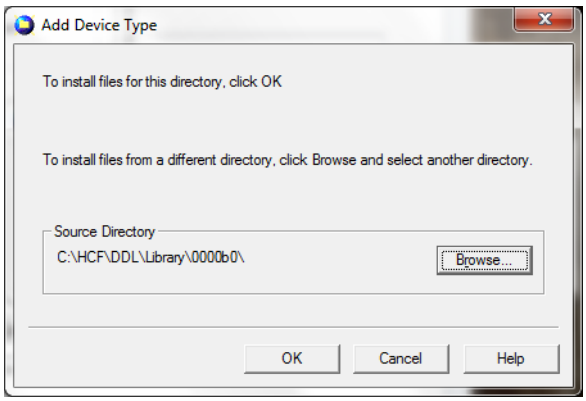


Figure 4-9 “Add Device Type” dialog box

2. Start the “Network Configuration” tool in AMS, and select Multiplexer Network. Click the “Install” button and follow the prompts to the “Connection” screen.

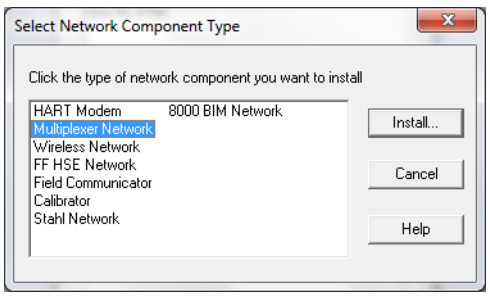


Figure 4-10 “Select Network Component Type” dialog box

3. Select the virtual COM port and set the multiplexer address range from **0** to **1**.

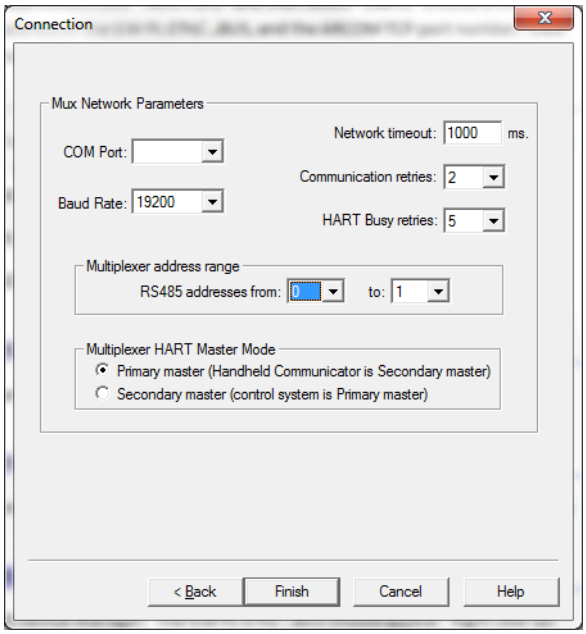


Figure 4-11 “Connection” dialog box

4. Launch AMS Device Manager. The GW PL ETH/…BUS should appear. Right click on the icon, and select **Rebuild Network** from the context-sensitive menu. AMS will scan for HART devices connected to the GW PL ETH/…BUS.

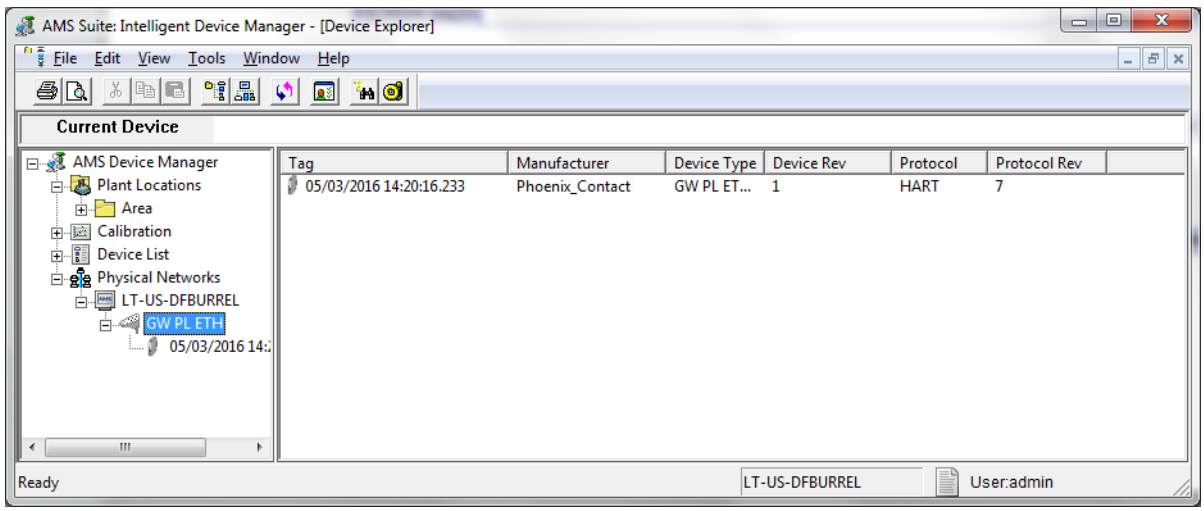


Figure 4-12 Device Explorer

Any changes to the HART network (adding or removing devices) requires a “Rebuild Loop” command executed from the DD. To send the “Rebuild Loop” command, open the gateway DD, navigate to the “Methods” tab and click the “Rebuild Loop” button. Then rebuild the network hierarchy.

The rebuild process takes a few minutes and may need to be repeated, if interrupted.

4.2.4.5 PROFINET configuration (GW PL ETH/UNI-BUS only)

When the GW PL ETH/UNI-BUS is used with GW PL HART… expansion modules, the process variables of a HART device can be accessed via PROFINET.

The PROFINET slot address is determined via the GSDML Creation Tool.

Only one PROFINET connection can be open at a time.

The polling address of any HART device must be set to **0**.

Activate PROFINET

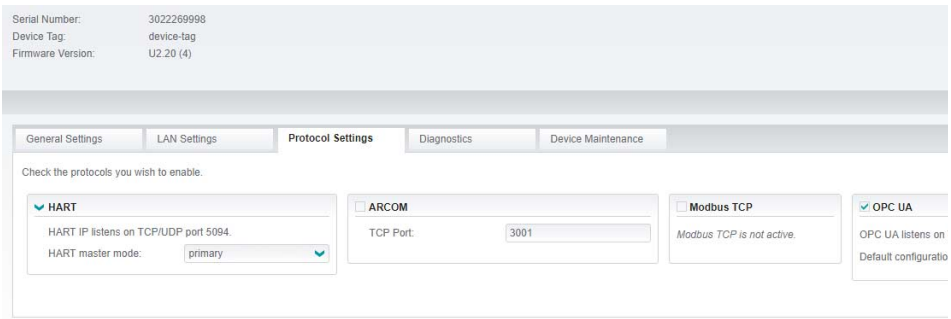


Figure 4-13 “Protocol Settings” page

1. Click the “Protocol Settings” tab in the web server.
2. Click the “Profinet” checkbox.

GSDML file creation

Each channel on every expansion module has a unique PROFINET slot address corresponding to the position (1 to 5) of the module in the station. GSDML files describe the features of a PROFINET device in XML format. This file is then loaded into a PROFINET master. This allows the PROFINET master to access the process variables of a HART device.

The GSDML Creation Tool is available from the download section of the GW PL ETH/UNI-BUS details page at phoenixcontact.com.

1. Using a file explorer, navigate to the GSDML.exe file and double-click the file. The initial view shows the GW PL ETH/…BUS head station without any installed expansion modules.

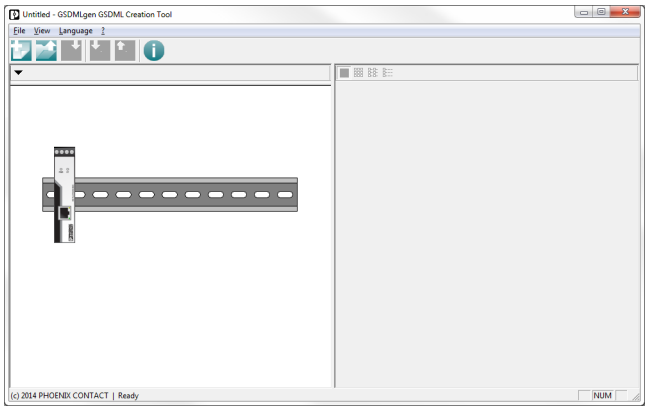


Figure 4-14 GSDML Creation Tool

2. Click the “Expand” button in the upper left corner to display the available modules.

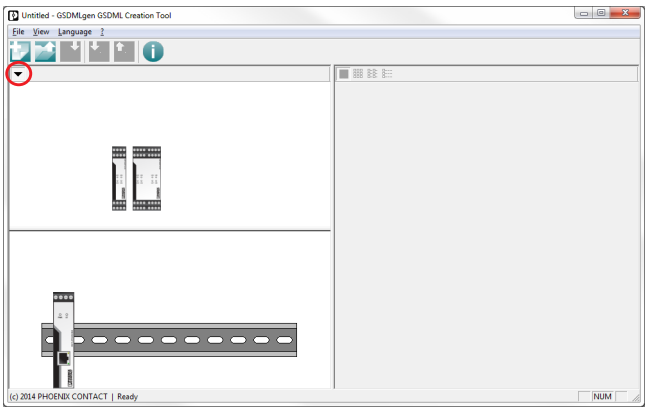


Figure 4-15 GSDML Creation Tool with expansion module support opened

3. Click the desired expansion module in the upper window that is physically installed next to the GW PL ETH/…BUS head station.

Expansion modules must be selected and displayed in the same order as they are physically installed.

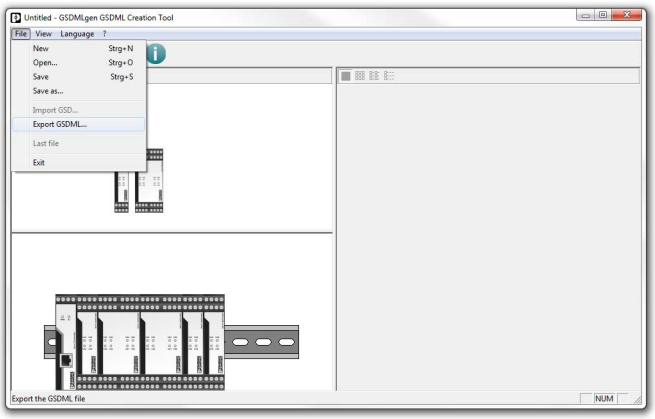


Figure 4-16 Exporting a GSDML file

4. Click the “File/Export GSDML…” menu to open a “Browse” dialog box. Navigate to the desired location, enter a file name, and click the “Export” button. Three files are created: an .xml, an .html, and a .bmp file, all based on the name entered.
   – The .xml file can be used directly in a PROFINET master for direct programming in PROFINET.
   – The .html document designates the PROFINET slots for specific HART channels combined with the HART device slave address.
   – The .bmp file is used in the PROFINET master to display an icon representing the GW PL ETH/…BUS system.
5. Load the files according to the PROFINET controller procedure.

4.2.4.6 FDT/DTM

If a host system supporting DTMs is used, such as PACTware, a user must download the DTM from phoenixcontact.com and install it prior to connecting the GW PL ETH/…BUS to the host system.

An FDT container can be downloaded from phoenixcontact.com.

4.2.4.7 OPC UA (GW PL ETH/UNI-BUS only)

The GW PL ETH/UNI-BUS can communicate directly with an OPC UA client to transmit process and diagnostic data from up to 40 connected HART devices.

OPC UA communication requires installation of firmware version 3.0 or higher. Updates be downloaded from phoenixcontact.com.

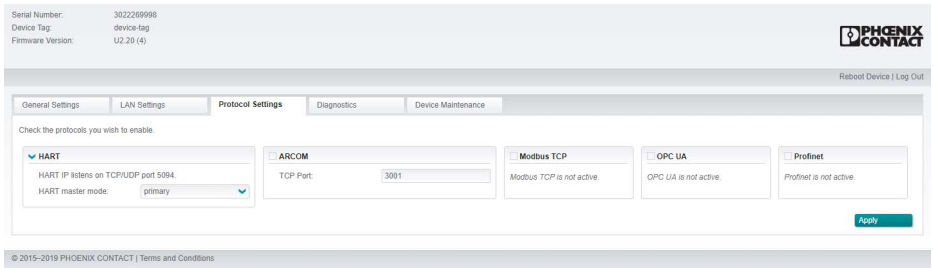


Figure 4-17 OPC UA activation

1. Click the “Protocol Settings” tab in the web server.
2. Click the “OPC UA” checkbox.
3. Click the “Apply changes” button.

The OPC UA server will be started on TCP Port 4840. OPC UA servers may connect with or without security. The GW PL ETH/UNI-BUS currently supports the security protocols as shown in Figure 4-18.

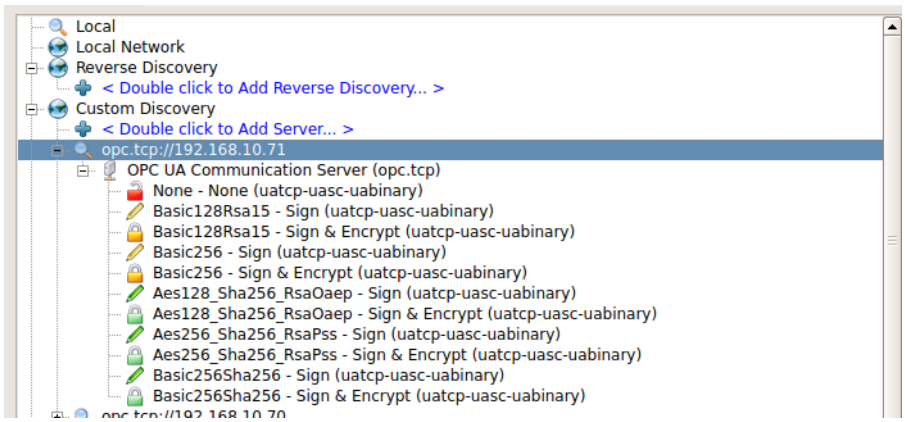


Figure 4-18 Supported security protocols

Table 4-2 shows the HART commands supported with both read and write capabilities.

Table 4-2 Available HART commands

Command number	Description
0	Read unique identifier
2	Read look current and percent of range
3	Read dynamic variables (PV, SV, TV, QV) with unit codes and loop current
12	Read message
13	Read tag, descriptor, and date
14	Read primary variable transducer information
15	Read device information
17	Write message
18	Write tag, descriptor, and date
20	Read long tag
22	Write long tag
38	Reset configuration changed flag
42	Perform device reset
48	Read additional device status
Any	Device status bits (from response)

The multiplexer requires no special configuration to support these commands. One HART device is connected to each channel. The HART polling address must be set to **0** on each device.

The GW PL ETH/UNI-BUS executes HART commands cyclically. After the response for command 0 is received, command 2 is sent, and so on.

The information model for the OPC UA server is as follows.

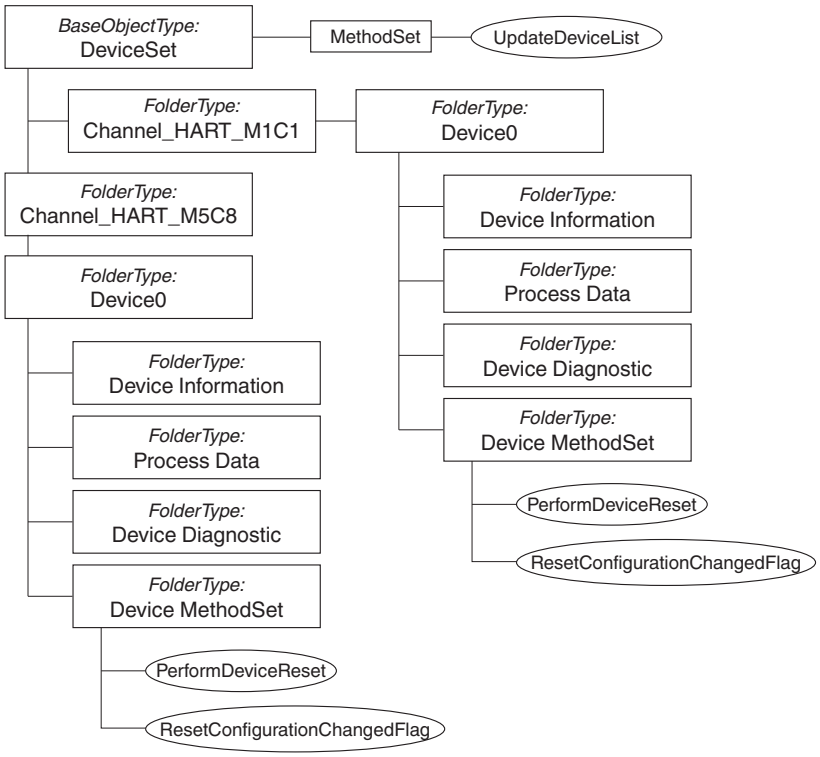


Figure 4-19 OPC UA flowchart

The number of instances of “Channel_HART_MxCy” is dynamic and reflects the hardware configuration. There are up to five modules with **4** or **8** HART channels possible. The name “M*x*” reflects the module number (M1…M5) and the channel number C*y* (C1…C8). Each channel can be scanned separately.

The same applies to the objects “Device0”, which are available only if there is a HART device connected. The OPC UA server doesn't support HART multidrop, therefore there is a maximum of one HART instrument, which is connected to HART address 0.

The list of connected HART instruments and their corresponding nodes inside the information model can be renewed by execution of the method “UpdateDeviceList”. Initially this list will be created on server startup. The server itself does not renew the list on its own.

All objects below “Device0” can be overwritten by user specific configuration. This includes the name of the device (here “Device0”).

For each HART instrument, the functions “PerformDeviceReset” (mapped to HART universal command 42) and “ResetConfigurationChangedFlag” (mapped to HART universal command 38) are available by default.

4.2.5 Device maintenance

Click the “Device Maintenance” tab to access the available maintenance functions of the GW PL ETH/…BUS head station.

4.2.5.1 Restore defaults

From the “Device Maintenance” page, click the “Restore Defaults” tab to return the GW PL ETH/…BUS to the original factory defaults, including the IP address.

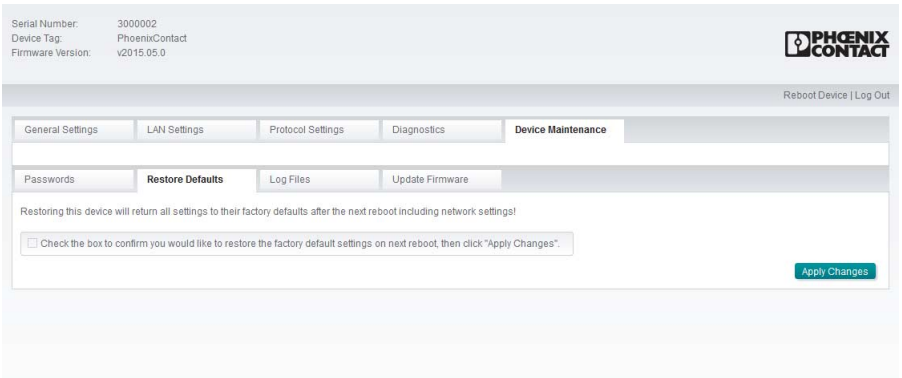


Figure 4-20 “Restore Defaults” page

Check the “Check the box to confirm...” box, and then click the “Apply Changes” button. Note that the IP address will return to the factory defaults and may require modification to prevent multiple devices on the network from trying to use the same address.

4.2.5.2 Passwords

From the “Device Maintenance” page, click the “Passwords” tab to change the password used to access the web server.

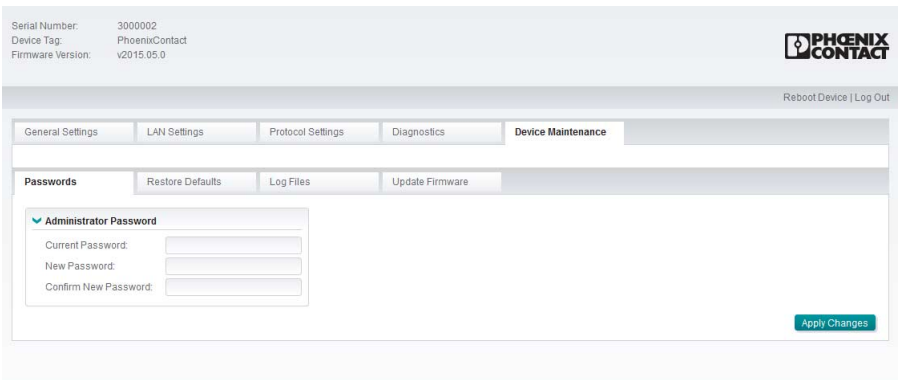


Figure 4-21 “Passwords” page

The GW PL ETH/…BUS 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.

To change a password, enter the current password and the new password (twice) in the appropriate fields.

Click the “Apply Changes” button to save changes.

4.2.5.3 Log files

From the “Device Maintenance” page, click the “Log Files” tab to review the log files.

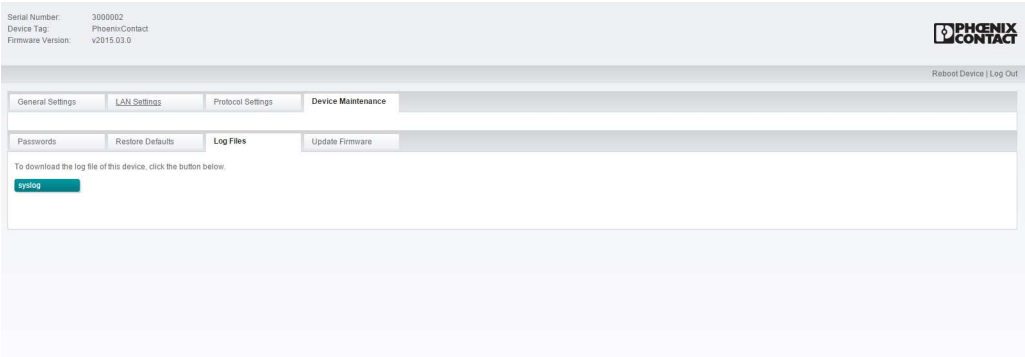


Figure 4-22 “Log Files” page

The log files can be used to aid in troubleshooting.

Click the “Syslog” button to open the file in a text editor. All configuration changes made to the system are recorded.

4.2.5.4 Update firmware

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

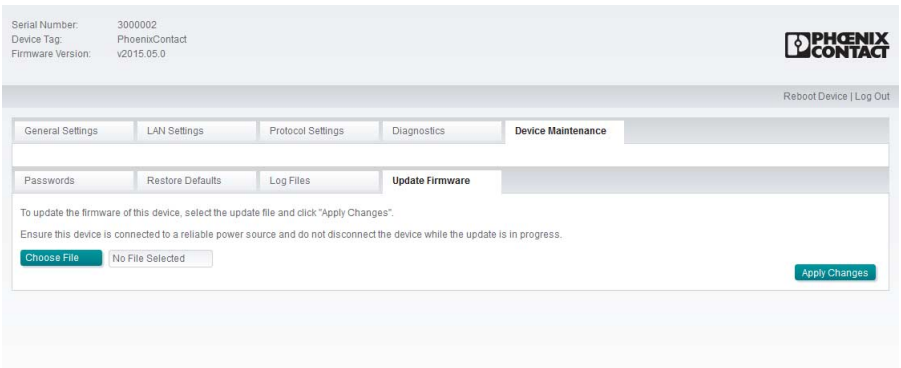


Figure 4-23 “Update Firmware” page

Occasionally, a new version of firmware may be provided to enhance operation of the GW PL ETH/…BUS or any of the modules. To install a new version of firmware, download the firmware to a local drive on the connected computer. Click the “Choose File” button and navigate to the file in the “Browse” dialog box. Highlight the file to select it, click the “Close” button, and then click the “Apply Changes” button to install the firmware.

NOTE:

Ensure 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 will be lost.

5 Troubleshooting

5.1 Resetting the device

If, for some reason, you need to reset the module to factory settings, there are two methods available.

Hardware reset

The reset button resets the device to the default settings, without the use of a PC, loaded during manufacturing, including the user interface settings. Any user-loaded firmware, including updates, is also removed.

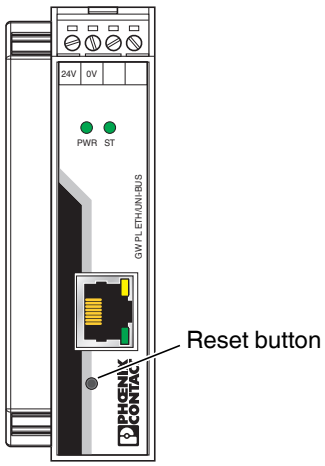


Figure 5-1 GW PL ETH/UNI-BUS reset button

To force a hardware reset:

1. Remove power from the device.
2. Press and hold the reset button. While holding the reset button, apply power to the device. The reset button must be held for at least five seconds after applying power.

   Reinitializing the module and firmware reset may take some time. Do not disconnect from power.
3. After a successful reset, the module will return to the factory-loaded firmware version and default address (192.168.254.254).

Software reset

A software reset returns the user interface settings to the default settings.

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 will return to the factory default address (192.168.254.254).

5.2 LEDs

The GW PL ETH/UNI-BUS and GW PL ETH/BASIC-BUS include two LEDs.

Table 5-1 Head station LEDs

Label	Indication	Description
PWR	On	Power supplied, normal operation
	Off	No power: Check power source
ST	On	Device is booting
	Off	Normal operation
	Flashing (1 Hz)[1]	Device identification: Responding to DCP request from host (typically 3 s duration)
	Flashing (2 Hz)[1]	Bus failure: No connection to controller; network cable unplugged, etc.
	Flashing (10 Hz)[1]	System failure

[1] The ST flash indications only apply with an active PROFINET connection

The GW PL ETH/…BUS expansion modules have LED indication for each channel.

Table 5-2 Channel LEDs

Indication	Description
Off	Channel not initialized
On green	Channel initialized
Flashing	HART data transfer
On red (GW PL HART8+AI-BUS only)	Short circuit detected, power to the channel is disabled

A Technical appendix

A 1 Modbus mapping

Each expansion module has a unique Modbus slave ID corresponding to the position (1 to 5) of the module in the station.

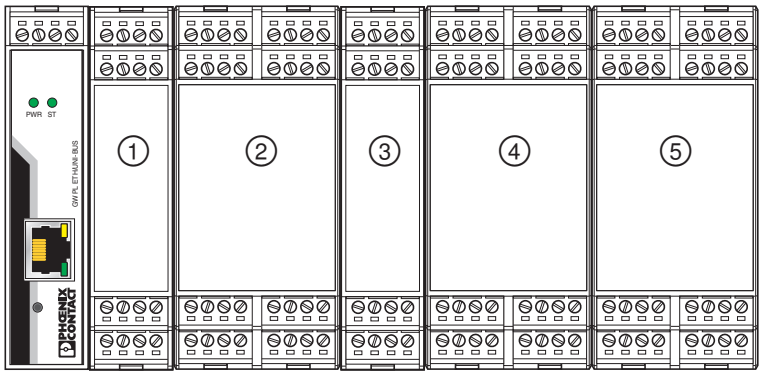


Figure A-1 Slave ID designation for expansion modules

For example, to read the Primary Value (PV) of a HART device connected to module 1, configure the Modbus client to request registers 30256 and 30257 from Slave ID 1 of the IP address of the head station.

Modbus function codes 3, 4, 6, and 16 are supported.

Table A-1 Modbus registers

Module channel no.	HART parameter	Read/Write	Type	Modbus input register Base 1 addressing
1	Primary Variable (PV)	Read	Float	30257 (MSW) 30258 (LSW)
	Secondary Variable (SV)	Read	Float	30259 (MSW) 30260 (LSW)
	Tertiary Variable (TV)	Read	Float	30261 (MSW) 30262 (LSW)
	Quaternary Variable (QV)	Read	Float	30263 (MSW) 30264 (LSW)
	Status*	Read	Word	30265
	†Loop Current	Read	Float	33207 (MSW) 33208 (LSW)

Table A-1 Modbus registers [...]

Module channel no.	HART parameter	Read/Write	Type	Modbus input register Base 1 addressing
2	Primary Variable (PV)	Read	Float	30266 (MSW) 30267 (LSW)
	Secondary Variable (SV)	Read	Float	30268 (MSW) 30269 (LSW)
	Tertiary Variable (TV)	Read	Float	30270 (MSW) 30271 (LSW)
	Quaternary Variable (QV)	Read	Float	30272 (MSW) 30273 (LSW)
	Status	Read	Word	30274
	†Loop Current	Read	Float	36279 (MSW) 36280 (LSW)
3	Primary Variable (PV)	Read	Float	30275 (MSW) 30276 (LSW)
	Secondary Variable (SV)	Read	Float	30277 (MSW) 30278 (LSW)
	Tertiary Variable (TV)	Read	Float	30279 (MSW) 30280 (LSW)
	Quaternary Variable (QV)	Read	Float	30281 (MSW) 30282 (LSW)
	Status	Read	Word	30283
	†Loop Current	Read	Float	39351 (MSW) 39352 (LSW)
4	Primary Variable (PV)	Read	Float	30284 (MSW) 30285 (LSW)
	Secondary Variable (SV)	Read	Float	30286 (MSW) 30287 (LSW)
	Tertiary Variable (TV)	Read	Float	30288 (MSW) 30289 (LSW)
	Quaternary Variable (QV)	Read	Float	30290 (MSW) 30291 (LSW)
	Status	Read	Word	30292
	†Loop Current	Read	Float	312423 (MSW) 312424 (LSW)

Table A-1 Modbus registers [...]

Module channel no.	HART parameter	Read/Write	Type	Modbus input register Base 1 addressing
5	Primary Variable (PV)	Read	Float	30293 (MSW) 30294 (LSW)
	Secondary Variable (SV)	Read	Float	30295 (MSW) 30296 (LSW)
	Tertiary Variable (TV)	Read	Float	30297 (MSW) 30298 (LSW)
	Quaternary Variable (QV)	Read	Float	30298 (MSW) 30300 (LSW)
	Status	Read	Word	30301
	†Loop Current	Read	Float	315495 (MSW) 315496 (LSW)
6	Primary Variable (PV)	Read	Float	30302 (MSW) 30303 (LSW)
	Secondary Variable (SV)	Read	Float	30304 (MSW) 30305 (LSW)
	Tertiary Variable (TV)	Read	Float	30306 (MSW) 30307 (LSW)
	Quaternary Variable (QV)	Read	Float	30308 (MSW) 30309 (LSW)
	Status	Read	Word	30310
	†Loop Current	Read	Float	318567 (MSW) 318568 (LSW)
7	Primary Variable (PV)	Read	Float	30311 (MSW) 30312 (LSW)
	Secondary Variable (SV)	Read	Float	30313 (MSW) 30314 (LSW)
	Tertiary Variable (TV)	Read	Float	30315 (MSW) 30316 (LSW)
	Quaternary Variable (QV)	Read	Float	30317 (MSW) 30318 (LSW)
	Status	Read	Word	30319
	*Loop Current (GW PL HART8+AI-BUS only)	Read	Float	321639 (MSW) 321640 (LSW)

Table A-1 Modbus registers [...]

Module channel no.	HART parameter	Read/Write	Type	Modbus input register Base 1 addressing
8	Primary Variable (PV)	Read	Float	30320 (MSW) 30321 (LSW)
	Secondary Variable (SV)	Read	Float	30322 (MSW) 30323 (LSW)
	Tertiary Variable (TV)	Read	Float	30324 (MSW) 30325 (LSW)
	Quaternary Variable (QV)	Read	Float	30326 (MSW) 30327 (LSW)
	Status	Read	Word	30328
	*Loop Current (GW PL HART8+AI-BUS only)	Read	Float	324711 (MSW) 324712 (LSW)

* See “Status word” on page 41

† GW PL HART8+AI-BUS only

With the GW PL DIO4-BUS, the status of digital input signals can be monitored. A value of **1** indicates the input is on, and a value of **0** indicates the input is off (see Table A-3 on page 41).

With the GW PL DIO4-BUS, the digital output signals can control external devices by writing a **1** to turn on the output channel and writing a **0** to turn off the output channel (see Table A-4 on page 41).

The Modbus TCP client must support Modbus slave IDs in conjunction with the IP address of the Modbus TCP server (the GW PL ETH/…BUS head station).

Table A-2 Status word

High byte		Low byte	
Value	**Description**	**Value**	**Description**
0x00	Valid data received (see low byte values)	0x01	Valid PV
		0x02	Valid SV
		0x03	Valid TV
		0x04	Valid QV
		0x05	Unexpected length of CMD2 in valid response
0x01	Busy		Not used
0x02	Disabled		Not used
0x10	Initialization of HART communication with device		Not used
0x20	HART IP failure (see response code)	0x23	HART server disconnected
0x21	HART failure (see response code)	0xFF	Internal error
		Other value	HART response code
0x24	No response from HART device		Not used
0xFE	Invalid (see response code)	0xFF	Unavailable channel
0xFF	Internal error		Not used

Table A-3 GW PL DIO4-BUS Modbus (Input registers)

Modbus input register	30002															
Bit number	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Module channel number													DI4	DI3	DI2	DI1

Table A-4 GW PL DIO4-BUS Modbus (Output registers)

Modbus output register	40002															
Bit number	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Module channel number													DO4	DO3	DO2	DO1

B Appendixes

B 1 List of figures

Section 2

Section 3

Section 4

Section 5

Appendix A

B 2 List of tables

Section 2

Section 4

Section 5

Appendix A

B 3 Index

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