

Anybus[®] Communicator[™]

Modbus TCP[®] to Modbus RTU

USER MANUAL

SCM-1202-162 1.0 en-US ENGLISH



Important User Information

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1 Preface

1.1 About This Document

This manual describes the installation and configuration of theAnybus Communicator.

For additional documentation and software downloads, FAQs, troubleshooting guides and technical support, please visit www.anybus.com/support.

1.2 Document Conventions

Numbered lists indicate tasks that should be carried out in sequence:

1. First do this
2. Then do this

Bulleted lists are used for:

- Tasks that can be carried out in any order
- Itemized information
- An action
 - and a result

User interaction elements (buttons etc.) are indicated with bold text.

```
Program code and script examples
```

Cross-reference within this document: [Document Conventions, p. 4](#)

External link (URL): www.hms-networks.com



WARNING

Instruction that must be followed to avoid a risk of death or serious injury.



Caution

Instruction that must be followed to avoid a risk of personal injury.



Instruction that must be followed to avoid a risk of reduced functionality and/or damage to the equipment, or to avoid a network security risk.



Additional information which may facilitate installation and/or operation.

1.3 Trademarks

Anybus® is a registered trademark of HMS Networks AB.

All other trademarks are the property of their respective holders.

2 Safety

2.1 Intended Use

The intended use of this equipment is as a communication interface and gateway.

The equipment receives and transmits data on various physical layers and connection types.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

2.2 General Safety

**Caution**

Ensure that the power supply is turned off before connecting it to the equipment.

**Caution**

This equipment contains parts that can be damaged by electrostatic discharge (ESD). Use ESD prevention measures to avoid damage.

**Caution**

To avoid system damage, the equipment should be connected to ground.



Using the wrong type of power supply can damage the equipment. Ensure that the power supply is connected properly and of the recommended type.

3 Preparation

3.1 Cabling

Have the following cables available:

- **Ethernet cable for configuration**
- **Ethernet cable for connecting to the high level network**
- **Power cable**

3.2 System Requirements

3.2.1 Supported Operating Systems

Operating System	Description
Windows 7 SP1, 32-bit	Windows 7 32-bit with Service Pack 1
Windows 7 SP1, 64-bit	Windows 7 64-bit with Service Pack 1
Windows 10 64-bit	Windows 10 64-bit

3.2.2 Supported Web Browsers

The Communicator built-in web interface can be accessed from the following standard web browsers.

- Google Chrome
- Microsoft Edge
- Mozilla Firefox

3.3 Tools

Have the following tools available:

- **Flat-head screwdriver, size 5.5 mm**
Needed when removing the Communicator from *DIN-rail*.
- **Flat-head screwdriver, size 3 mm**
Needed when connecting the cables to the *7-pin connector*.

3.4 Support and Resources

For additional documentation and software downloads, FAQs, troubleshooting guides and technical support, please visit www.anybus.com/support.



Have the product article number available, to search for the product specific support web page. You find the product article number on the product cover.

3.5 HMS Software Applications

Download the software installation files and user documentation from www.anybus.com/support.

IPconfig

Use the HMS software application IPconfig and scan your network to discover and change the Communicator IP address and to access the Communicator built-in web interface.



As an alternative, you can set a static IP address within the same IP address range as the Communicator IP address on the computer accessing the Communicator built-in web interface.



IPconfig is only available for Windows.

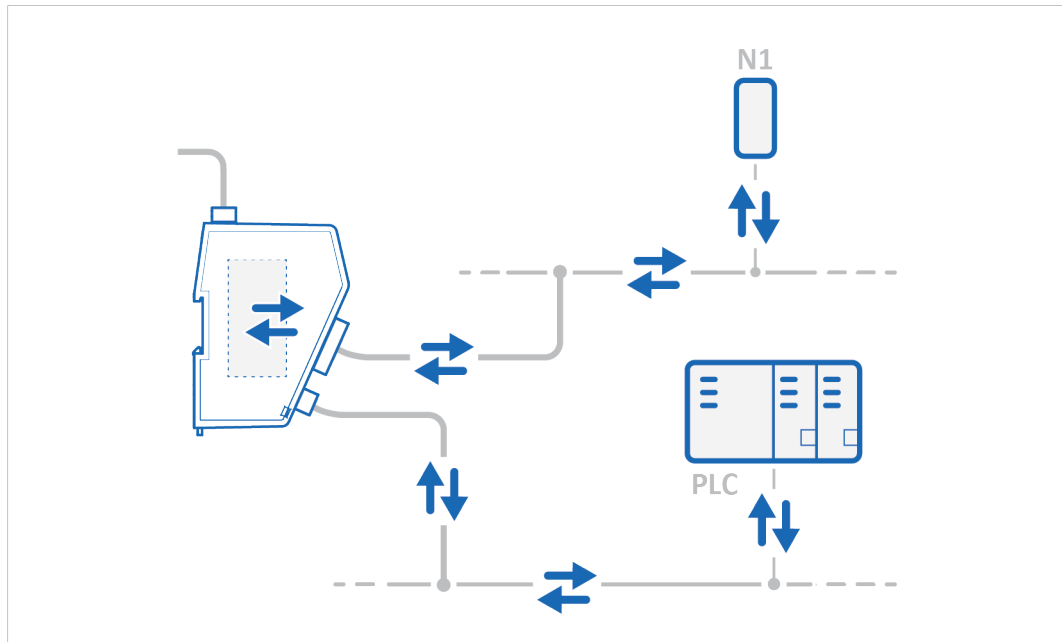
3.6 Third-Party Software Applications

Microsoft Excel, or equivalent software application that supports the Office Open XML Workbook (xlsx) file format.

Needed to open and read the I/O data mapping file.

4 About Anybus Communicator

4.1 How the Communication Works

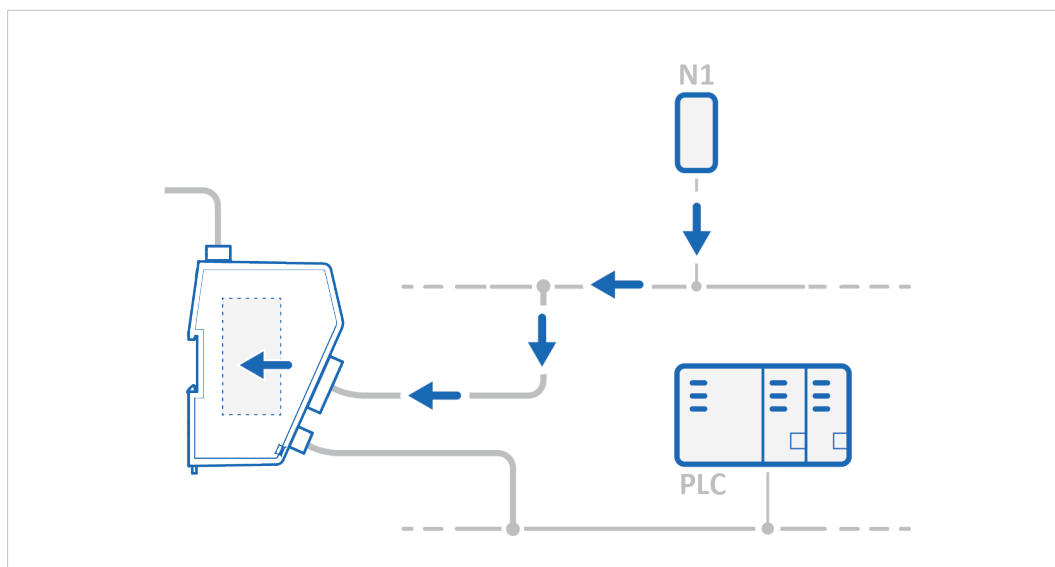


The Communicator enables communication, data exchange, between one or more slave devices connected to a *serial subnetwork* and a master device connected to a *high level network*.

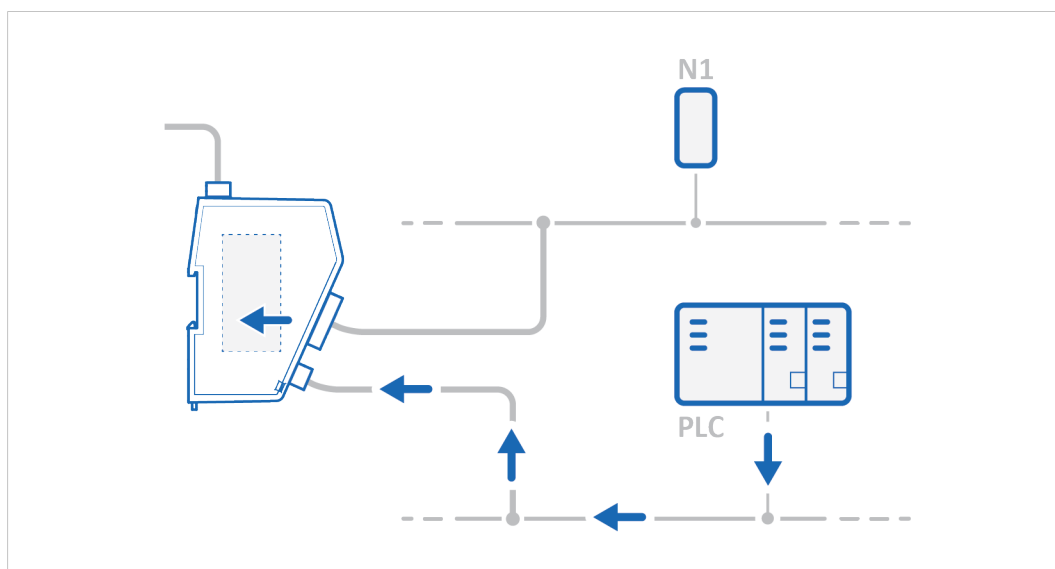
For example:

- The master device can be a PLC controller or a PC.
- A slave devices can be a sensor, scanner or industrial robot.

The Communicator main task is to cyclically send the commands that the slave(s) are configured to execute, in order to request and transfer process data.

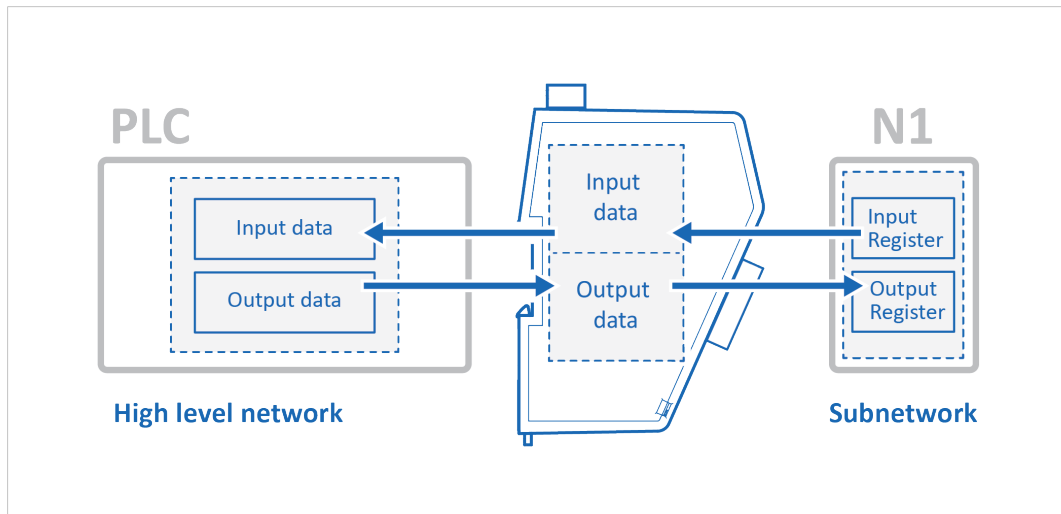
Request process data

Request process data from the *serial subnetwork* nodes, specified in the Communicator configuration, and make the process data available on the slave interface and for the *high level network* master device.

Transfer process data

Transfer process data from the *high level network* master device and make it available on the slave interface and for the *serial subnetwork* nodes included in the configuration.

4.2 How the Data Exchange Works



The data exchanged between the Communicator and the *serial subnetwork* and the *high level network* resides in the Communicator internal memory buffer.

To exchange data with the *serial subnetwork*, the *high level network* reads and writes data to the Communicator internal memory buffer.

The same memory locations are exchanged on the serial subnetwork.

The memory locations are specified when configuring the Communicator, using the Communicator built-in web interface.

The Communicator internal memory buffer is divided into two areas: Input data and Output data.

Input Data

This *Input data area* is read by the *high level network*.

The Communicator can handle up to 1500 bytes input data.

Output Data

The *Output data area* is read/written by the *high level network*.

The Communicator can handle up to 1500 bytes output data.

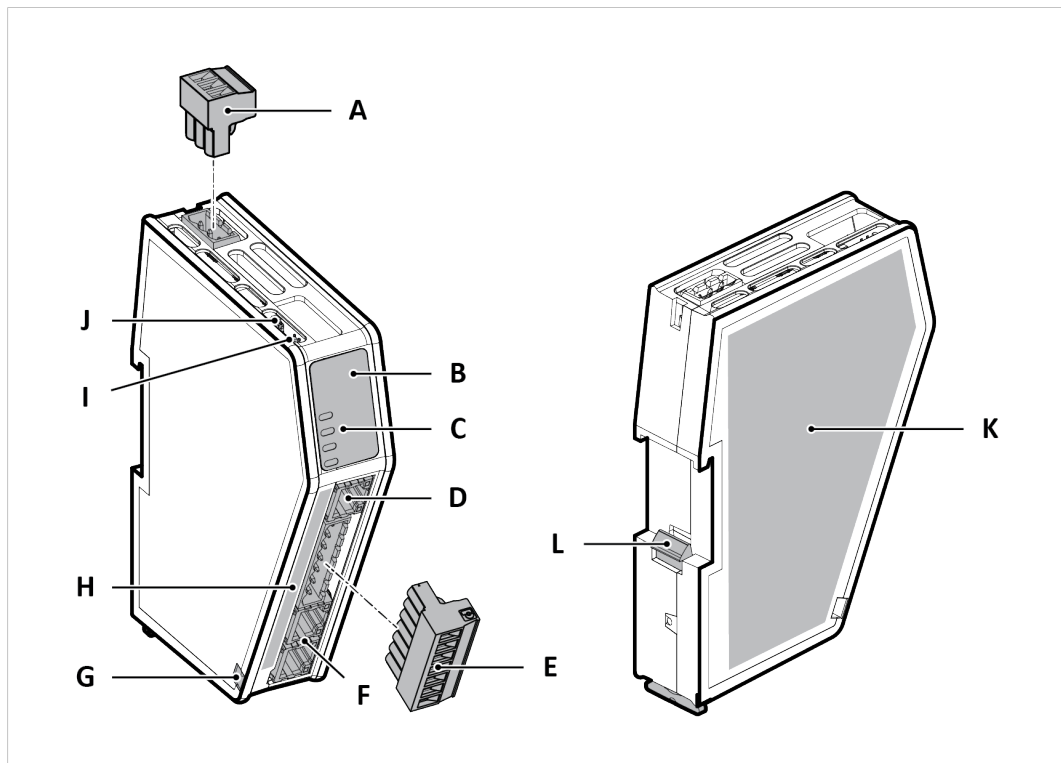
4.3 Data Integrity

A snapshot of the process data buffer between the Modbus Master and the slave interface is used during the operation of executing all the commands within one cycle.

When the cycle is completed, the process data available on the slave interface is updated and a new snapshot is created for the next cycle.

5 Installation

5.1 External Parts

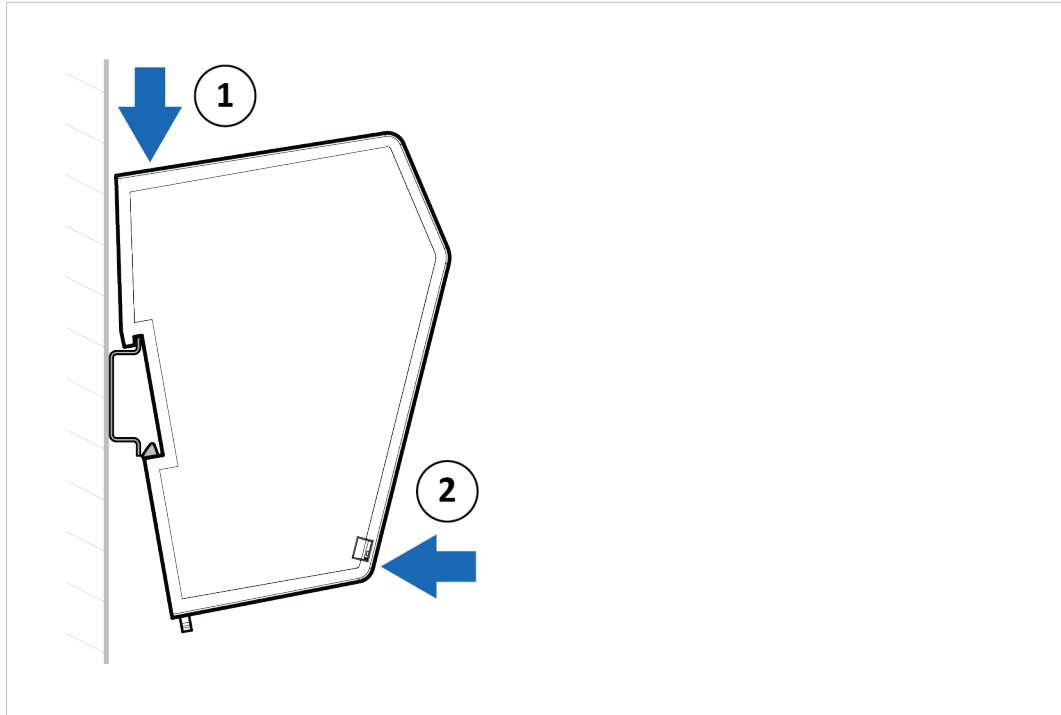


- | | | |
|-------------------------------|--|--|
| A. Power connector | E. 7-pin connector | I. Security switch |
| B. Label with LED designation | F. Modbus TCP port x 2 | J. Factory reset button |
| C. Status LEDs | G. Cable tie mount | K. Laser engraved label with product information |
| D. Configuration port | H. Laser engraved connectors designation | L. DIN rail locking mechanism |

5.2 DIN Rail Mounting



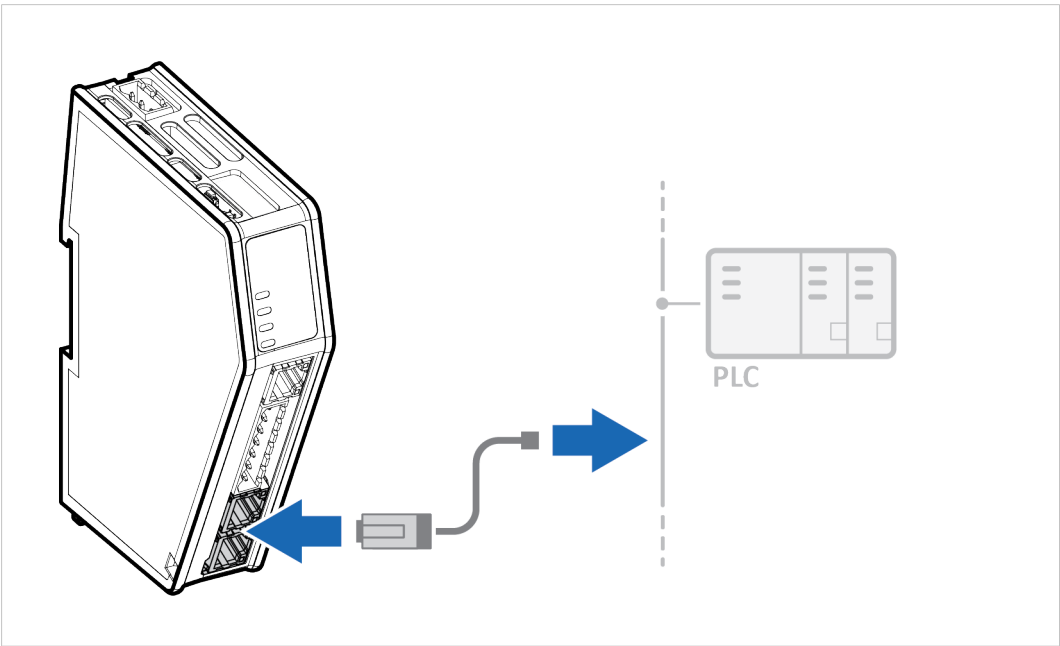
The equipment must be electrically grounded through the DIN rail for EMC compliance. Make sure that the equipment is correctly mounted on the rail and that the rail is properly grounded.



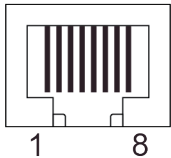
To attach the Communicator on the DIN rail:

1. Insert the upper end of the *DIN rail clip* into the DIN rail.
2. Push the bottom of the *DIN rail clip* into the DIN rail.

5.3 Connecting to Modbus TCP Network




- 1. Connect the Communicator to your Modbus TCP network.

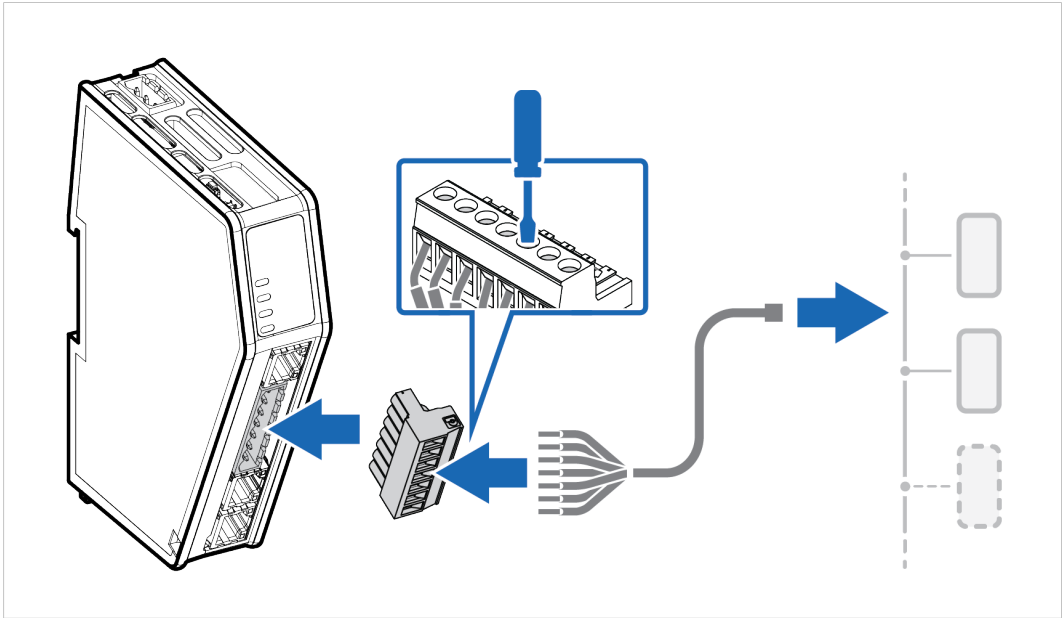
Modbus TCP Connector		
	Pin	Description
	1	TD+
	2	TD-
	3	RD+
	4	
	5	
	6	RD-
	7	
	8	

To Do Next

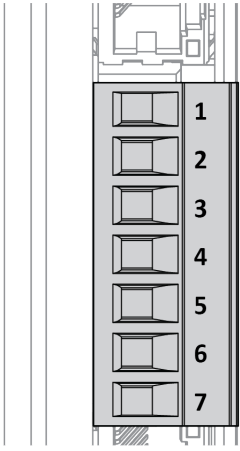
Connect the Communicator to the serial subnetwork and to power.
Check LED status, refer to [Communicator LED Indicators, p. 53](#).

5.4 Connecting to Serial RS232/RS485 Subnetwork

 Use minimum 90 oC copper (Cu) wire only.



- 1. Insert the cable wires into the 7-pin connector and tighten the wire clamp screws.

7-pin connector		
	Pin	Signal
	1	+5 V OUT
	2	RS485- A
	3	RS485+ B
	4	Signal GND
	5	Functional Earth (FE)
	6	RS232 Tx Output
	7	RS232 Rx Input


- 2. Connect the 7-pin connector to the Communicator.
- 3. Connect the Communicator to your serial subnetwork.


To Do Next

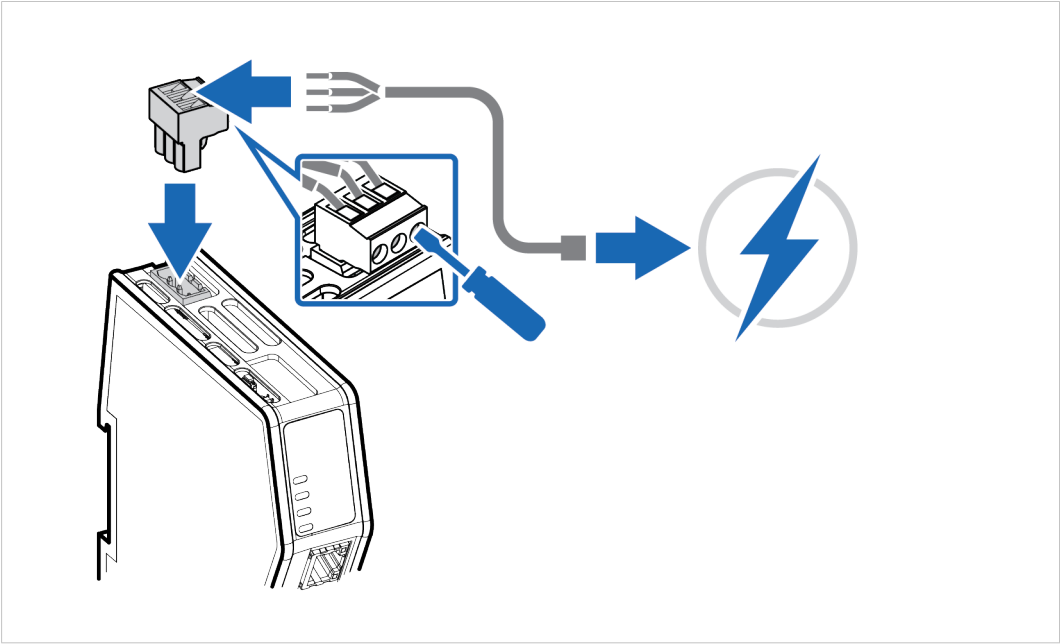
Connect the Communicator to the Modbus TCP network and to power.

Check LED status, refer to [Communicator LED Indicators, p. 53](#).

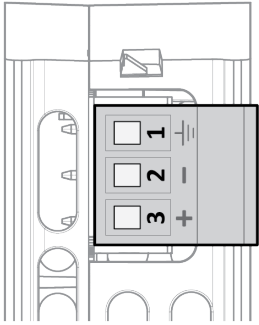
5.5 Connecting to Power

**Caution**
Ensure that the power supply is turned off before connecting it to the equipment.

Using the wrong type of power supply can damage the equipment. Ensure that the power supply is connected properly and of the recommended type.



1. Insert the cable wires to the terminal block and tighten the wire clamp screws.

Power port		
	Pin	Description
	1	Functional Earth (FE)
	2	Ground (GND)
	3	12-30 VDC Power Connector

2. Connect the terminal block to the Communicator.
3. Connect the Communicator to a power supply.
4. Turn on the power supply.

To Do Next

Connect the Communicator to the Modbus TCP and serial subnetwork.

Check LED status, refer to [Communicator LED Indicators, p. 53](#).

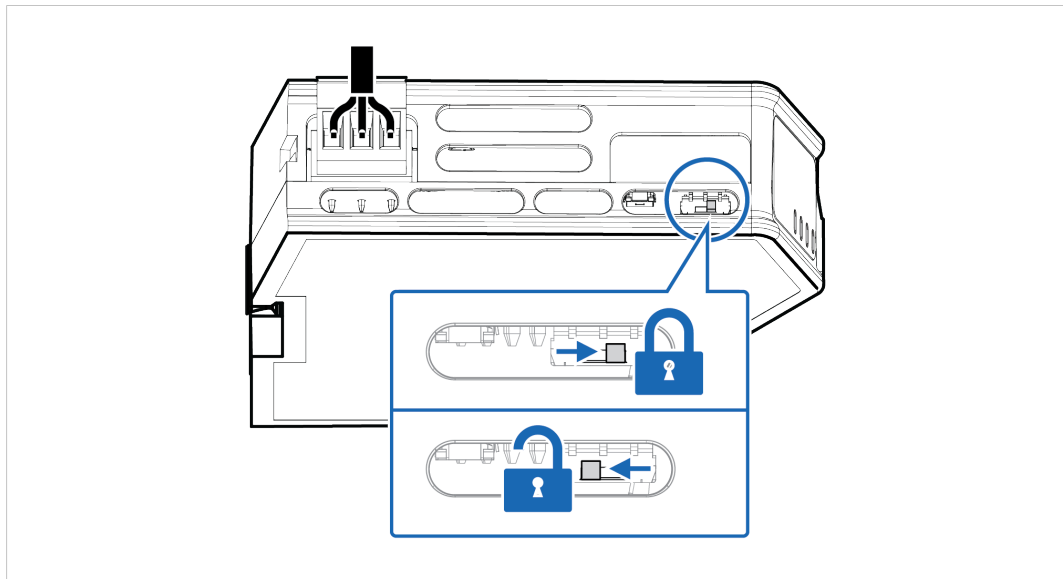
5.6 Security Switch



After completing the configuration of the Communicator, lock the security switch to prevent unauthorized access to the Communicator built-in web interface.

When the *security switch* is in its locked position, the Communicator built-in web interface can not be accessed and the Communicator can not be configured. Network specific parameters, configured via the PLC is still available.

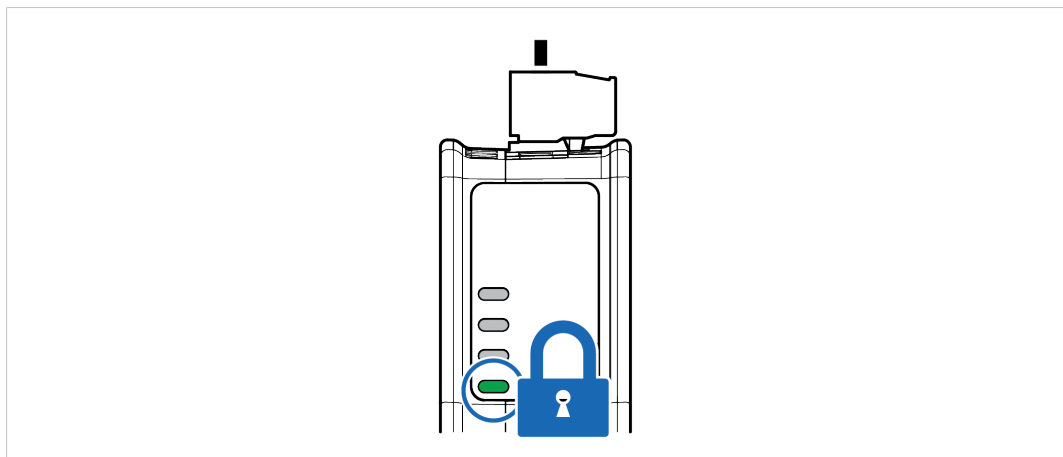
To Lock and Unlock the Security Switch



Use a pointed object, such as a ballpoint pen.

- To **lock** the security switch, push the toggle towards the **Communicator front**.
- To **unlock** the security switch, push the toggle towards the **Communicator back**.

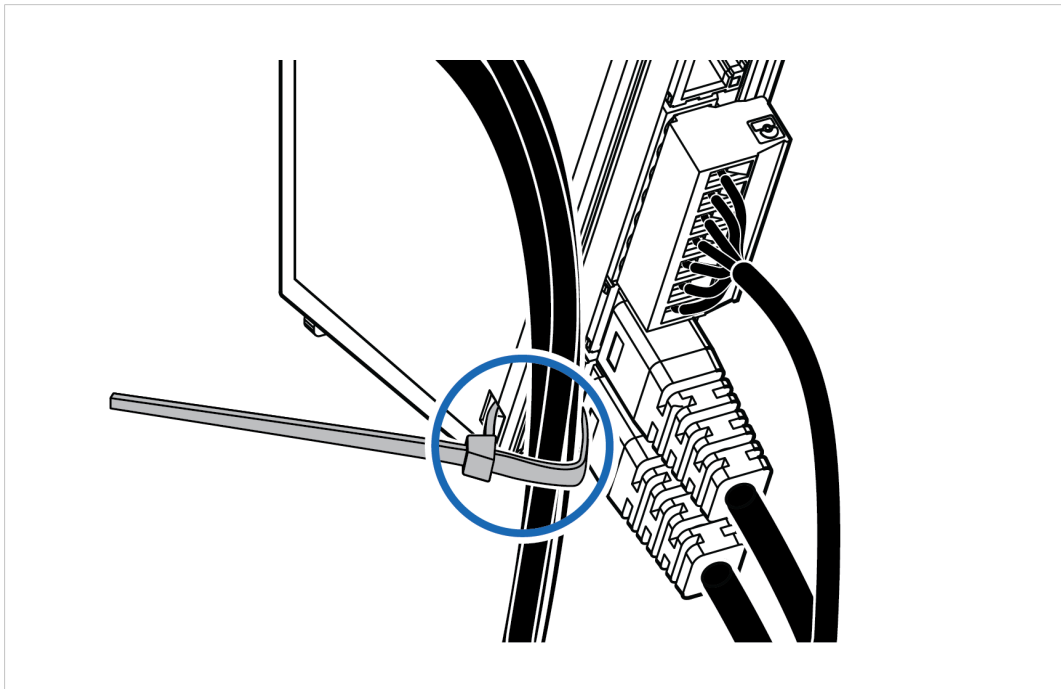
Security Switch Status LED



When the security switch is in its:

- locked position, the security switch status LED turn solid green.
- unlocked position, the security switch status LED is turned off.

5.7 Locking the Cables



To strain relieve the cables, place a cable tie in the holder and lock the cables.

5.8 DIN Rail Demount

Before You Begin



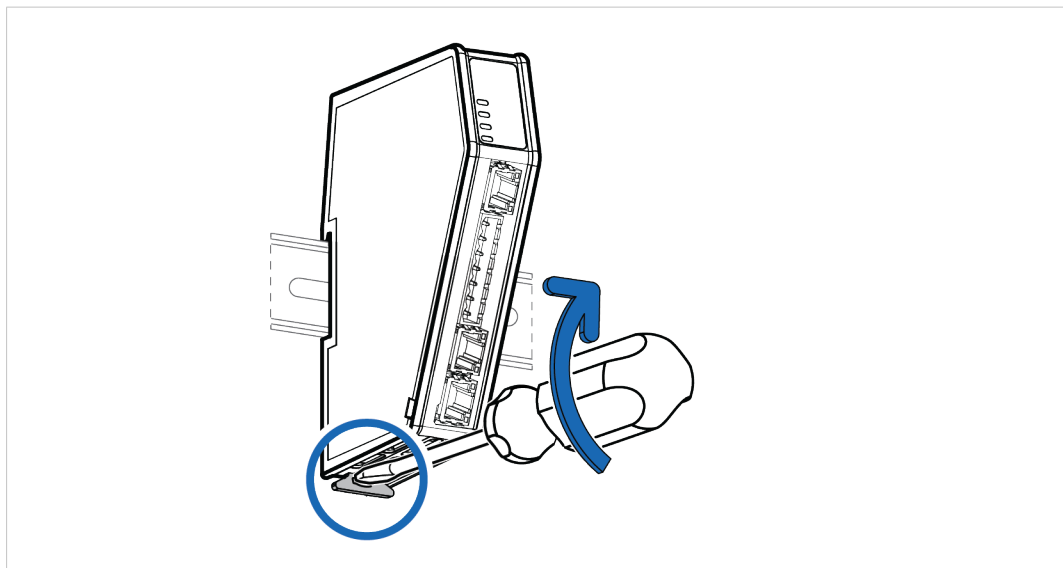
Be careful when removing the Communicator from the DIN-rail. If not removed properly, the DIN rail locking mechanism and the product cover can break.

Have a flat-blade screwdriver, size 5.5 mm, available.

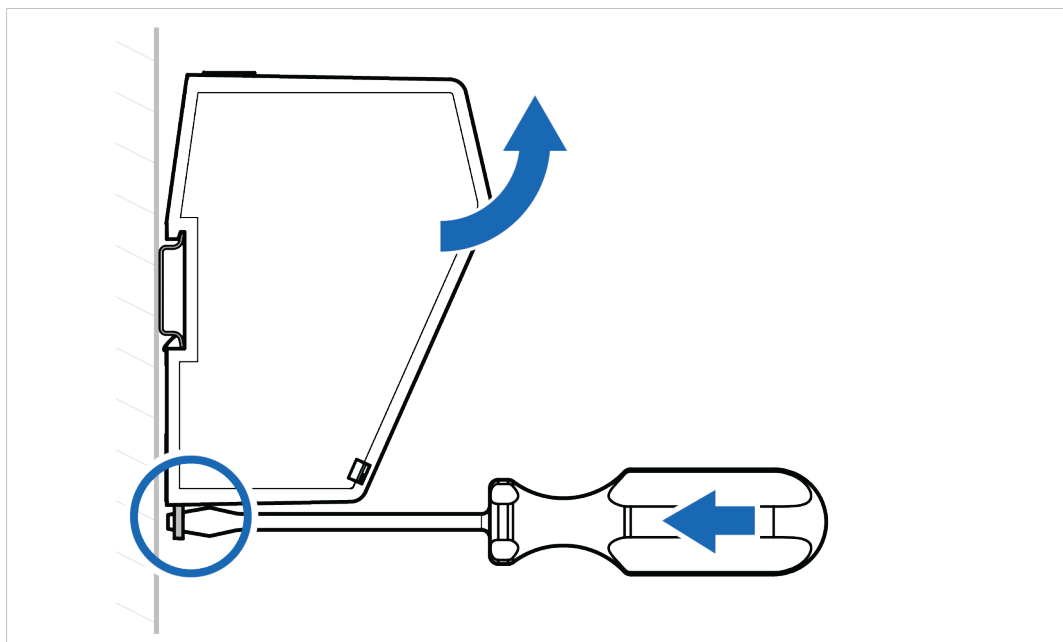
Procedure

Remove the Communicator from the DIN Rail:

1. Insert the screwdriver into the Communicator *DIN rail locking mechanism*.
2. To unlock the Communicator *DIN rail locking mechanism*, turn the screwdriver clockwise.



3. Hold the screwdriver in the *DIN rail locking mechanism* while you unhook the Communicator from the DIN rail.



6 Configuration Quick Guide

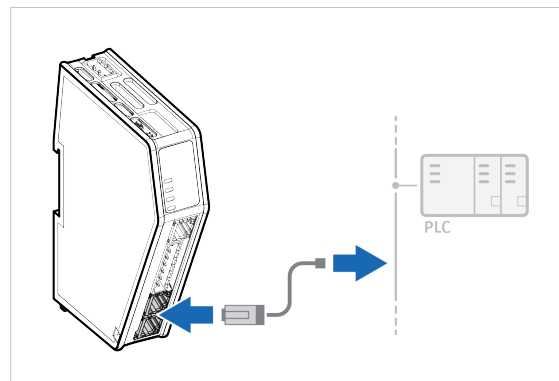
This section is intended to give you a short overview of the tasks you need to perform to configure the Communicator.

For detailed information, please refer to [Communicator Configuration, p. 26](#).

6.1 Prepare Configuration

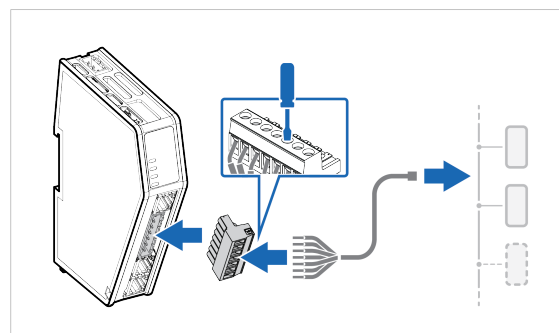
1. Connecting to the high level network

Connect the Communicator to the Modbus TCP high level network.



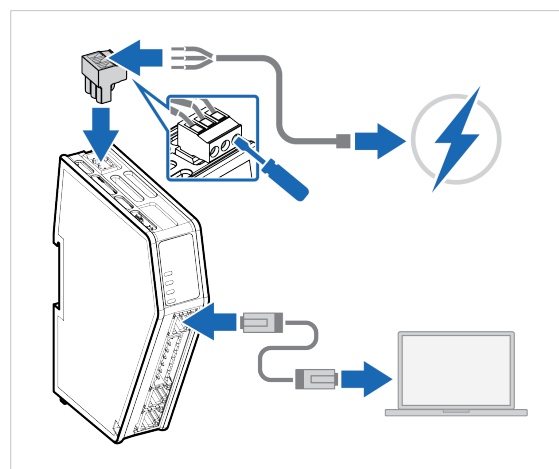
2. Connecting the Communicator to the subnetwork

Connect the Communicator to the serial RS232/RS485 subnetwork.



3. Connecting to PC and power

- Connect an *Ethernet cable* between the *Communicator configuration port* and your PC.
- Connect the Communicator to a power supply.



4. Finding the Communicator on your PC

The Communicator default IP address is **192.168.0.10**.

Option 1

On the PC accessing the Communicator built-in web interface, set a static IP address within the same IP address range as the Communicator IP address.



Option 2

Change the IP address on the Communicator configuration port to one within the same IP address range as your PC.

Use the software application HMS IPconfig to find the Communicator default IP address on your PC.

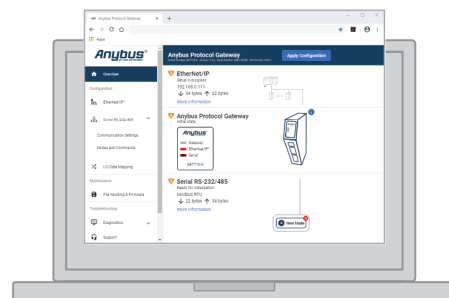
Download the installation files and user documentation from www.anybus.com/support.



5. Access the Communicator built-in web interface

Open the Communicator built-in web interface in HMS IPconfig or enter the Communicator IP address in your web browser.

The Communicator built-in web interface overview page opens in your browser.



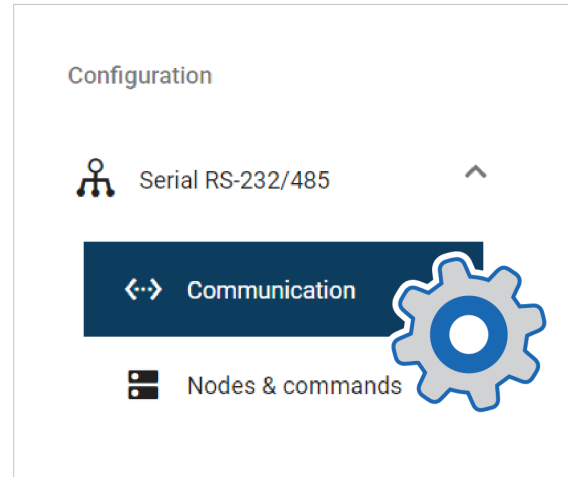
6.2 Setup New Configuration

Follow these steps to setup a new Communicator configuration.

1. Subnetwork configuration

On the **Communication** page:

Configure the basic settings Physical standard, Baud rate, Data bits, Parity and Stop bits.

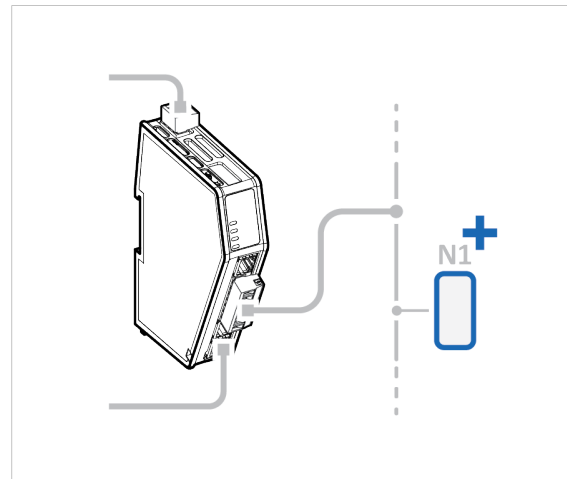


2. Add Nodes and Commands

On the **Nodes & commands** page:

- Add a node and configure the node settings.
- Add commands to the node and configure the command settings.

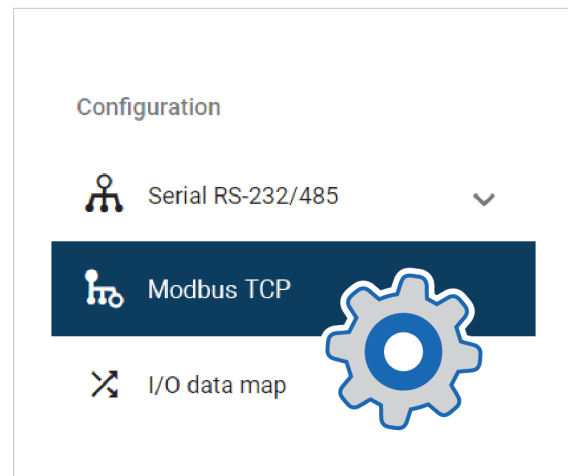
Repeat until you have added and configured all your nodes.



3. High level network configuration

On the **Modbus TCP** page:

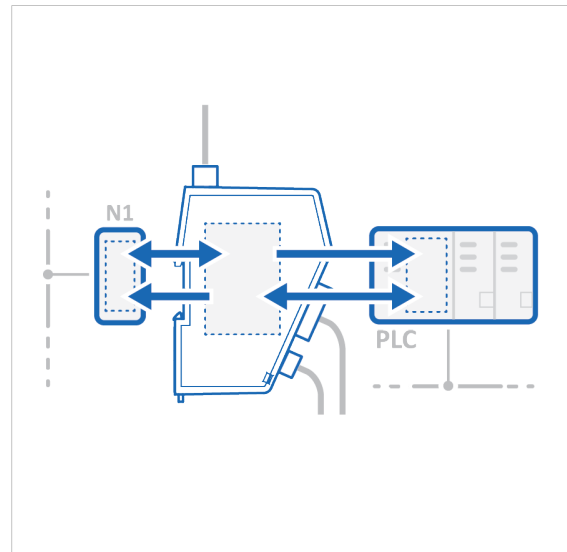
- Use Automatic I/O sizes provided by the subnetwork or choose to set them manually.
- Enable DHCP server or choose to set a specific IP address.
- Apply the IP settings.



4. I/O Data Mapping

The commands you added to the nodes are automatically mapped to the Communicator internal memory area.

View the added nodes and commands on the **I/O data map** page.



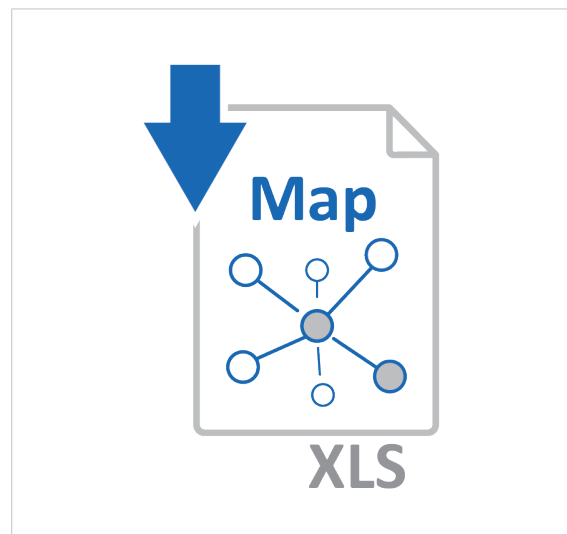
6.3 PLC Configuration

In the Communicator built-in web interface:

1. Export I/O data map

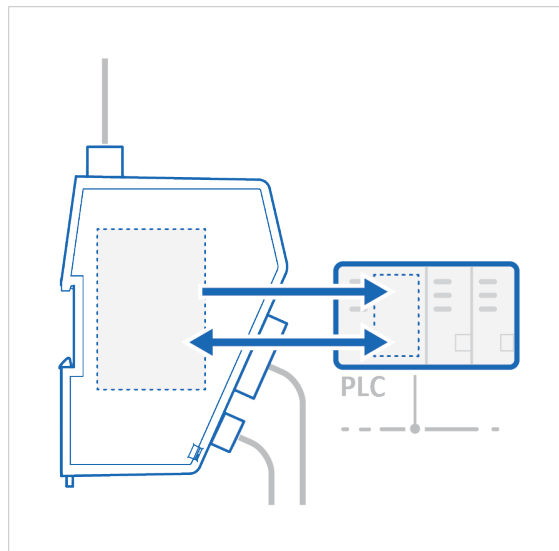
When you configure the communication between the Communicator and the PLC, you can use the I/O data map as a specification to ensure that the commands match.

On the **I/O data map** page: You can download the I/O data mapping in a spreadsheet to your PC.



In the PLC program:**2. Configure the communication**

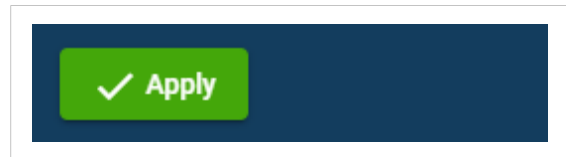
Configure the PLC to communicate with the Communicator according to the I/O data map created in the Communicator.



6.4 Verify Operation

1. Apply the configuration

When you have completed and verified the configuration, click **Apply** for the settings to take effect.

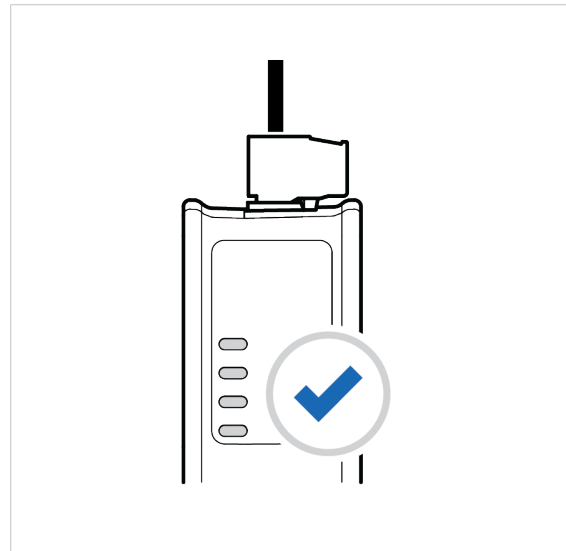


2. Verify status and LED indications

On the **Home** page:

Monitor the Communicator, network and node status.

You can also view the Communicator LED indications remotely.



3. Verify and monitor communication

In **Diagnostics**, use the:

- **Serial RS-232/485** page to verify that the serial commands are sent and received by the Communicator.
- **Event log** page to detect failures and unexpected behavior over time.



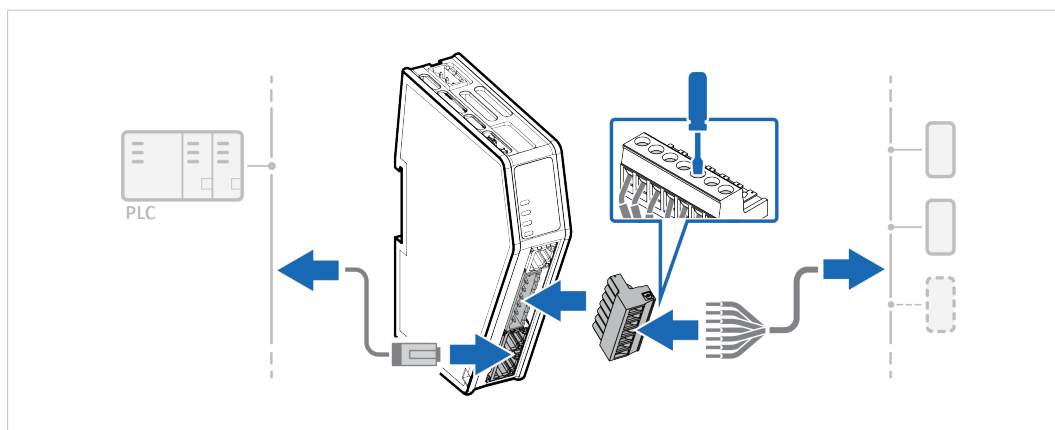
7 Communicator Configuration

This section is intended to give you detailed information about the tasks you need to perform to setup a new Communicator configure.

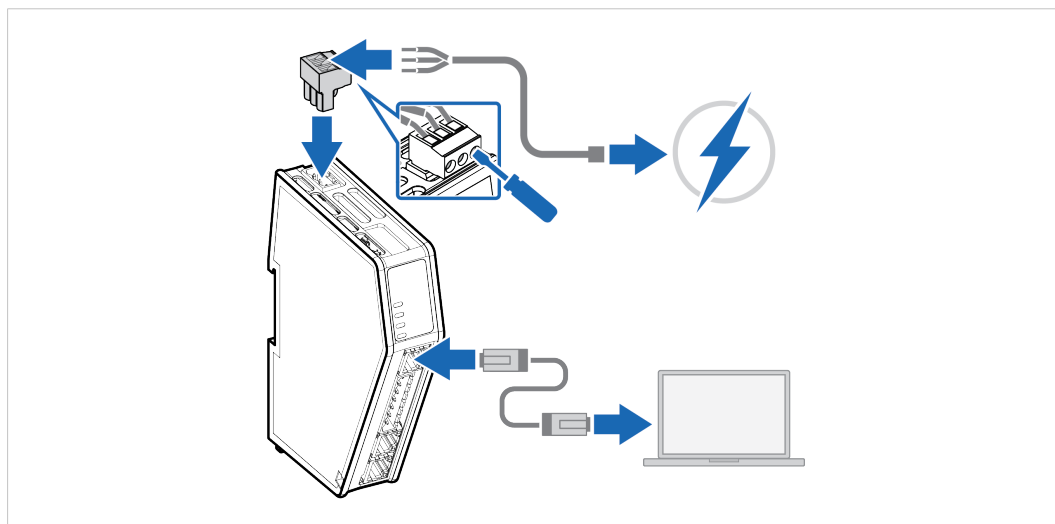
For a more brief overview of the configuration steps, please refer to [Configuration Quick Guide, p. 20](#).

7.1 Connecting the Communicator

Procedure



1. Connect the Communicator to the *high level network*.
2. Connect the Communicator to the *subnetwork*.



3. Connect an *Ethernet cable* between the *Communicator configuration port* and your PC.
4. Connect the Communicator to a power supply.

7.2 Access the Built-In Web Interface From HMS IPconfig

Before You Begin

Download the software application HMS IPconfig installation files and user documentation from www.anybus.com/support.



The Communicator default IP address is **192.168.0.10**.



To access the Communicator built-in web interface, ensure that Port 80 TCP is open in your Firewall. This applies to any Firewall between the web browser and the gateway.



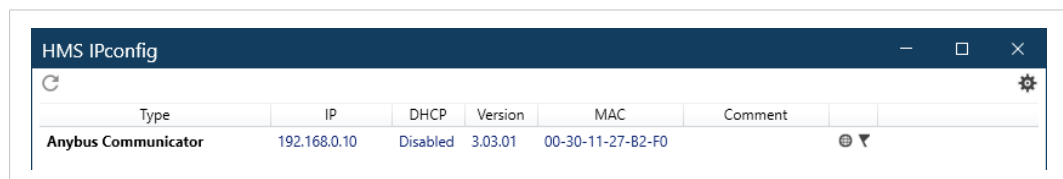
To access the Communicator built-in web interface from HMS IPconfig, ensure that port Port 3250 UDP is open in your PC Windows Firewall.



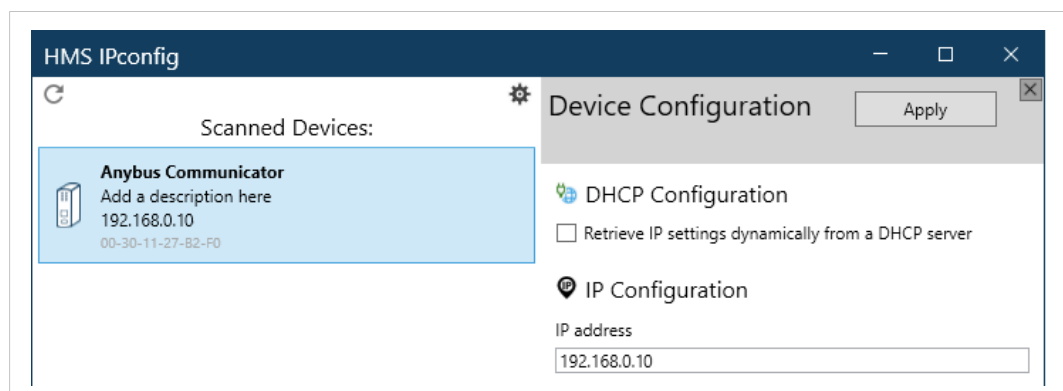
Make sure the security switch is unlocked. HMS IPconfig cannot configure the Communicator if the security switch is locked.

Procedure

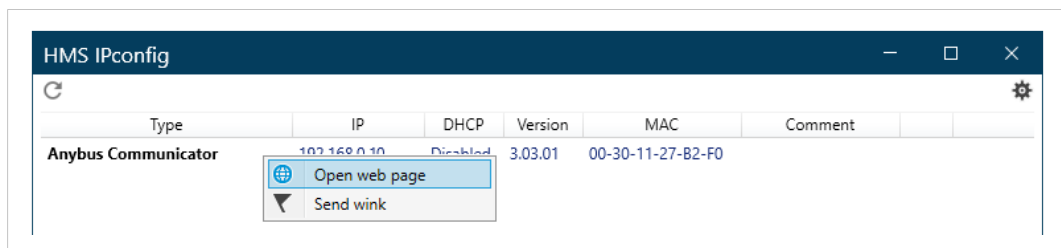
1. Install HMS IPconfig on your PC.
2. Open HMS IPconfig.
 - HMS IPconfig automatically starts scanning for compatible and active HMS devices.
 - Found HMS devices are added to the device list.



3. To open the settings pane, click on the Communicator in the device list.
4. Change the Communicator IP address to one within the same IP address range as your PC.

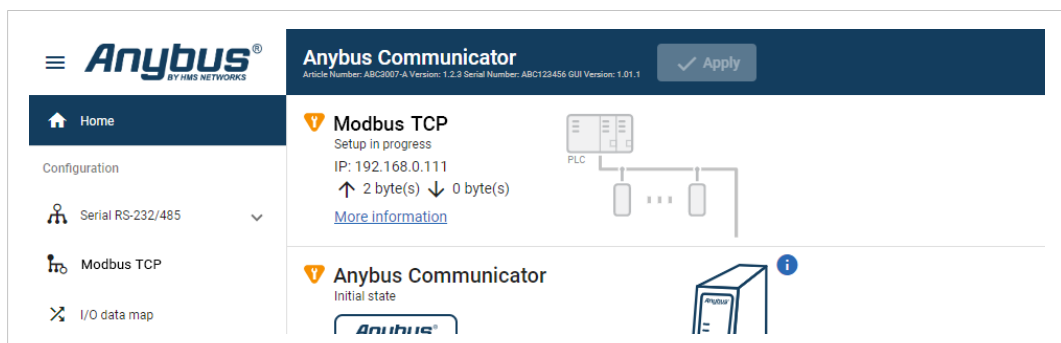


5. To open the Communicator built-in web interface, click **Open web page**.



Result

→ You are redirected to the Communicator built-in web interface Home page.



7.3 Access the Built-In Web Interface From a Web Browser

Before You Begin



The Communicator default IP address is **192.168.0.10**.



To access the Communicator built-in web interface, ensure that Port 80 TCP is open in your Firewall. This applies to any Firewall between the web browser and the gateway.



When you change to a static IP address on your computer, internet access may be lost.

Procedure

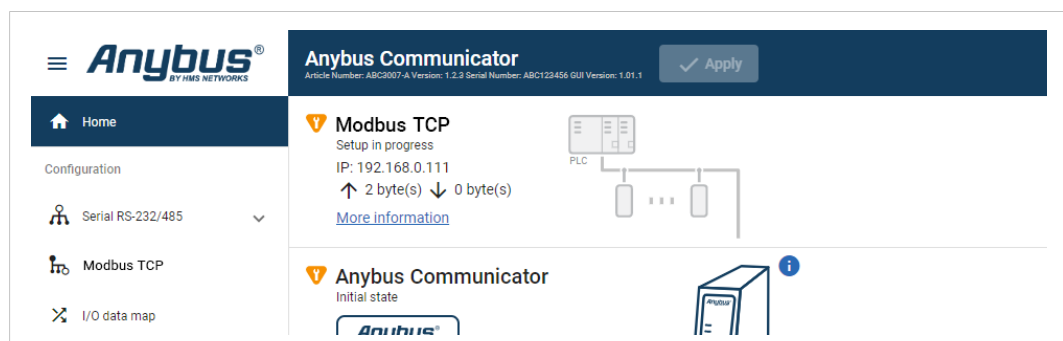
1. On the PC accessing the Communicator built-in web interface, set a static IP address within the same IP address range as the Communicator IP address.



2. Open a web browser.
3. Click to select the **Address bar** and enter the *Communicator IP address*.

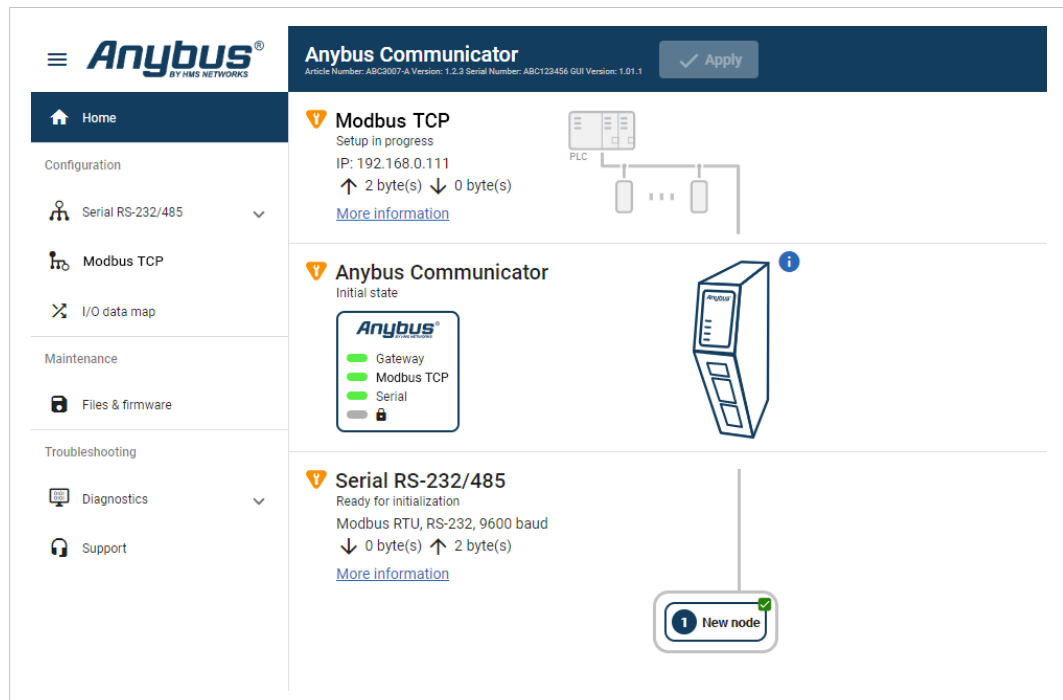


4. To open the built-in web interface Home page, press **Enter**.



7.4 Communicator Built-In Web Interface Overview

Use the Communicator built-in web interface to configure, maintain and troubleshoot the Communicator.



Home

View the Communicator, network and node status.

Apply

After configuration changes are made and verified, press Apply to make the settings take effect.

Modbus TCP

High Level Network with Master. Configure I/O Size and IP settings.

Serial RS-232/485

Serial Subnetwork with Nodes. Configure communication and add nodes and commands.

I/O data map

View the added commands mapped to the Communicator internal memory area.

Files & firmware

Save settings in a configuration files, upload configuration files and upgrade firmware.

Diagnostics

Monitor and troubleshoot the Communicator.

Support

Contains Communicator product information, Anybus contact information, link to Anybus support website, and product file for download.

Here you can generate a support package with product information, to send to your Anybus support technician.

7.5 General Subnetwork Settings

7.5.1 Setting Up Communication

Anybus Communicator

Article Number: AB7710-A Version: 1.2.3 Serial Number: ABC123456 GUI Version: 0.44.1

✓ Apply

Communication

Basic settings

Physical standard

RS232

Baud rate

19200 baud

Data bits

8 data bits

Parity

None

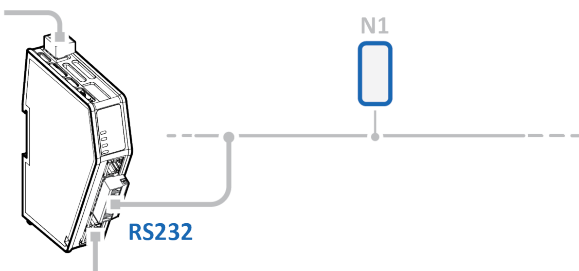
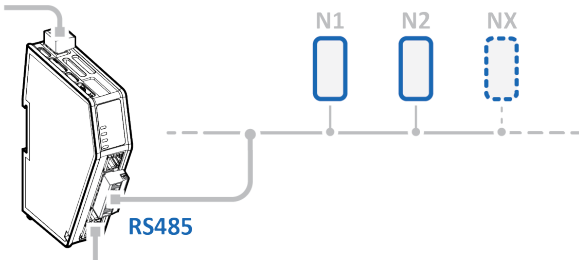
Stop bits

1 stop bit

Physical standard

Specify the physical interface type for the device connected to the Communicator.

1. Select a *physical standard* from the **Physical standard** drop-down menu.

Setting	Value	Description
Physical standard	RS-232 Default standard	Use RS-232 when one <i>single node</i> is connected to the subnetwork. 
	RS-485	Use RS-485 when <i>multiple nodes</i> are connected to the subnetwork. 

Baud rate

Specify the baud rate, number of signal units transmitted per unit time that's needed to represent the data bits.

2. Select a *baud rate* value from the **Baud rate** drop-down menu.

Setting	Value
Baud rate	1200 baud
	1800 baud
	2400 baud
	4800 baud
	9600 baud | Default value
	19200 baud

Setting	Value
	35700 baud
	38400 baud
	57600 baud
	115200 baud
	128000 baud

Data bits

Data bits is the rate at which data is processed/transferred.

The rate for Modbus RTU is 8 data bits and can not be changed.

Parity

Specify if parity should be used to detect errors in the code.

3. Select *parity* value from the **Parity** drop-down menu.

Setting	Value	Description
Parity	None | Default value	No parity checking Parity bit is not transmitted
	Odd	Odd parity checking
	Even	Even parity checking

Stop bits

Specify the number of stop bits used to indicate the end of data transmission.

4. Select a *stop bits* value from the **Stop bits** drop-down menu.

Setting	Value
Stop bits	1 stop bit | Default value
	2 stop bit

Apply configuration

5. To apply the settings, click **Apply** in the web-interface header, and follow the instructions.

7.6 Nodes and Commands

A node represents a single device on the serial subnetwork.

Add nodes and set up the communication between the nodes and the master.

Before You Begin

Obtain user documentation, from the manufacturers of the devices to communicate with, describing available registers and how to address them.

7.6.1 Add Node



The maximum number of nodes that can be added is 31.

The screenshot shows the 'Anybus Communicator' web interface. The top header includes the logo and version information. The left sidebar has a 'Nodes and commands' menu item. The main content area is titled 'Nodes' and features a 'New node' button. To the right, the 'Node settings' section contains input fields for 'Slave address' (set to 1), 'Name' (set to 'New node'), 'Timeout time' (1000 ms), 'Reconnection ti...' (10000 ms), and 'Retries' (0). Below this is the 'Modbus commands' section with an 'Add' button and a table with columns: Active, Command name, Function, Quantity, and Address. The table currently has one row with a checkbox for 'Active'.

1. In the web-interface left sidebar menu, click **Nodes & commands**.
2. Click **Add node**.
 - A new node is added to the node list.

7.6.2 Node Settings

Ensure that the Communicator Basic settings, on the Communication page, match the Node settings.

1. In the node list, select a node to configure.
2. Configure the *Node settings*.

Setting	Value	Description
Slave address	1 to 247	Node ID, also called node address, is the node's identity on the subnetwork. The node id is a number between 1 and 247. By default, the node is assigned the next available number. The same node id cannot be used on multiple nodes.
Name	N/A	By default, the node is assigned the name New node and the corresponding Slave address. The node name can be changed.
Timeout time	10 ms to 10 000 ms Default value: 1000 ms.	If a command in a transaction fulfills the specified timeout time value for all specified retries, the remaining transactions defined for the node will be skipped in the current cycle. The maximum addition to the cycle length is only one instance of the timeout setting. Specify how long the Communicator should wait before sending the message again, when no response is received from the node. If the timeout time is exceeded, the Communicator continues to send the message until the maximum number of retries has been reached.
Reconnection time	Min 10 ms Max 60 000 ms Default 1000 ms	Specify for how long the Communicator should wait before attempting to reconnect, if the node is disconnected. The default value is 10 000 ms. Reconnect time (10 ms) is not applicable for the <i>broadcast node</i> , that hold transactions destined to all nodes.
Retries	0 to 10 Default value: 0	Specify the number of attempts the Communicator should make, when no response is received from the node.
Address format	Default format: Address Register Modicon Modicon extended	Specify the address format. Address: 0, 1, 2, ... Register: 1, 2, 3, ... Modicon: 00001/10001/30001/40001 Modicon extended: 000001/100001/...

3. To apply the settings, click **Apply** in the web-interface header, and follow the instructions..

7.6.3 Add Command



The maximum number of commands that can be added to a node is 150.

The screenshot shows the 'Anybus Communicator' software interface. On the left, under 'Nodes', there is a 'Modbus RTU' icon and a list with one node labeled '1 New node'. A '+ Add node' button is above the list. The main area is titled 'Node settings' and contains fields for 'Slave address' (1), 'Name' (New node), 'Timeout time' (1000 ms), 'Reconnection ti...' (10000 ms), and 'Retries' (0). Below these is an 'Address format' dropdown set to 'Address (0, 1,...)'. Under 'Modbus commands', there is a '+ Add' button and a table of commands. The table has columns for 'Active', 'Command name', 'Function', 'Quantity', and 'Address'. One command is listed: 'New command' with function 'Read Holding Registers (3)', quantity '1', and address '0'. 'Duplicate' and 'Delete' buttons are to the right of the table.

Active	Command name	Function	Quantity	Address
<input checked="" type="checkbox"/>	New command	Read Holding Registers (3)	1	0

1. In the node list, select a node to configure.
2. In the command list, click **Add**.
 - A new command is added to the command list.

7.6.4 Command Settings

For Modbus command reference guide, refer to [Modbus Commands, p. 69](#).

The screenshot displays the 'Anybus Communicator' web interface. The top header includes the Anybus logo, version information (Article Number: AB7710-A Version: 1.2.3, Serial Number: ABC123456, GUI Version: 0.44.1), and an 'Apply' button. The main interface is divided into three sections:

- Nodes:** A sidebar on the left showing a 'Modbus RTU' icon and a list with '+ Add node' and '1 New node'.
- Node settings:** A central panel for configuring a selected node. It includes fields for 'Slave address' (1), 'Name' (New node), 'Timeout time' (1000 ms), 'Reconnection ti...' (10000 ms), and 'Retries' (0). There is also an 'Address format' dropdown set to 'Address (0, 1,...)'.
- Modbus commands:** A table listing configured commands. Below the table are 'Add', 'Duplicate', and 'Delete' buttons.

<input checked="" type="checkbox"/>	Active	Command name	Function	Quantity	Address
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	New command	Read Holding Registers (3)	1	0
- Command settings sidebar:** A panel on the right for configuring the selected command. It includes fields for 'Command name' (New command), 'Modbus command' (Read Holding Regist...), 'Address' (0), 'Quantity' (1), 'Update mode' (Cyclically), and 'Update time' (1000 ms).

1. In the node list, select a node to configure.
2. In the command list, select a command to configure.
→ The command sidebar opens, on the right side of the screen.

3. Configure the Command settings.

Setting	Value	Description
Command name	N/A	By default, the node is assigned the name New command. The Command name can be changed.
Function Modbus command	N/A	The command type defines what the node should perform when the command is executed. Select a command type from the drop-down menu.
Read quantity	1 to 125	Specifies the number of registers to read to follow in the read data field. Appear when Modbus command Read Write Multiple Registers (23) is selected.
Address	0 to 65 535	Specify the address in the slave device Modbus holding register, define by the node. The address acts as an address to the data position, where the data is read from or written to. Modbus holding register addresses starts at 0. Modbus address 0 = Register 1
Write quantity	Read Write Multiple Registers (23) 1 to 123	Specifies the quantity of registers to follow in the write data field. Appear when Modbus command Read Write Multiple Registers (23) is selected.
Quantity	Read Holding Registers (3) Read Input Registers (4) 1 to 125 Write Multiple Coils (15) 1 to 1968 Write Multiple Registers (16) 1 to 123 Read Coils (1) Read Discrete Inputs (2) 1 to 2000	The Quantity parameter appear when you select a Modbus command that can address more than one data object. Example when Quantity is set: For the Modbus Command <i>Read Input Registers (4)</i> you need to set the Quantity in order to define the array of data. Example when no Quantity is set: For the Modbus Command <i>Write Single Coil (5)</i> you do not need to set the Quantity parameter because there can not be an array of data. The command is used to write a single output to either ON or OFF in a remote device. For Write Single Coil (5), Write Single Register (6) and Mask Write Register (22) Quantity cannot be set.
Update mode	Cyclically On data change	Specify when a transaction shall be sent to the slave. The transaction is issued cyclically, at the interval specified in the Update time parameter.
Update time	10 ms to 60 000 ms	Update mode parameter must be set to Cyclically. The Update time parameter appear when Cyclically is select. Specify how often, in steps of 10 ms, the transaction are going to be issued.

4. To apply the settings, click **Apply** in the web-interface header, and follow the instructions..

7.6.5 Activate/Deactivate Command

Modbus commands

+ Add Duplicate Delete

Active	Command name	Function	Quantity	Address
<input checked="" type="checkbox"/>	New command	Read Holding Registers (3)	1	0

The command default status is **Active**.

To deactivate/activate a command, select the command and click the **slide toggle**.

7.6.6 Duplicate Command

When you duplicate a command, all settings are preserved.

Modbus commands

+ Add Duplicate Delete

Active	Command name	Function	Quantity	Address
<input checked="" type="checkbox"/>	New command	Read Holding Registers (3)	1	0

To duplicate:

- One command, select the command and click **Duplicate**.
- Multiple commands, select the checkbox in front of each command you want to duplicate and click **Duplicate**.

→ The duplicated command are added at the bottom of the Command list.

7.6.7 Delete Command

Modbus commands

+ Add Duplicate Delete

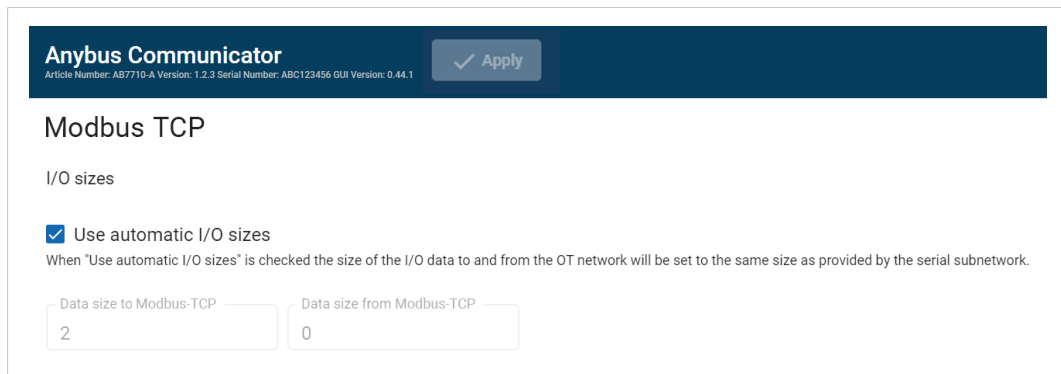
Active	Command name	Function	Quantity	Address
<input checked="" type="checkbox"/>	New command	Read Holding Registers (3)	1	0

1. To delete:
 - One command, select the command and click **Delete**.
 - Multiple commands, select the checkbox in front of each command and click **Delete**.
2. To confirm, click **Yes**.

7.7 High Level Network Settings

Configure the Modbus TCP network settings.

7.7.1 To Use Automatic I/O Sizes



Anybus Communicator
Article Number: AB7710-A Version: 1.2.3 Serial Number: ABC123456 GUI Version: 0.44.1

✓ Apply

Modbus TCP

I/O sizes

☒ Use automatic I/O sizes
When "Use automatic I/O sizes" is checked the size of the I/O data to and from the OT network will be set to the same size as provided by the serial subnetwork.

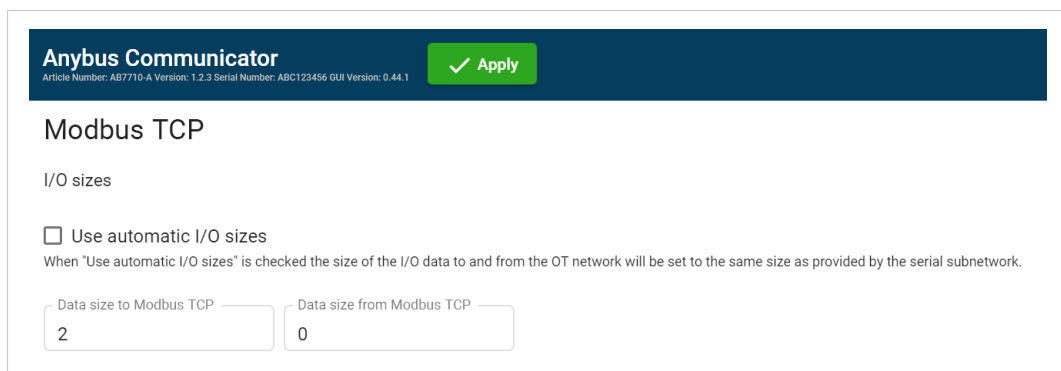
Data size to Modbus-TCP: 2 Data size from Modbus-TCP: 0

By default, the Communicator is set to use automatic I/O sizes.

The size of the input data, *Data Size to Modbus TCP*, and the output data, *Data Size from Modbus TCP*, is determined by the subnetwork configuration.

In the Communicator built-in web interface, the **Use Automatic I/O Sizes** checkbox is selected.

7.7.2 To Configure I/O Sizes Manually



Anybus Communicator
Article Number: AB7710-A Version: 1.2.3 Serial Number: ABC123456 GUI Version: 0.44.1

✓ Apply

Modbus TCP

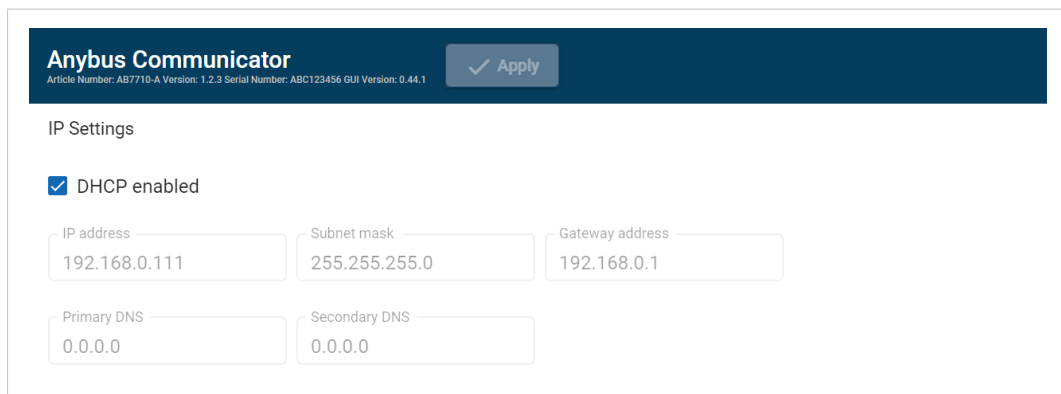
I/O sizes

☐ Use automatic I/O sizes
When "Use automatic I/O sizes" is checked the size of the I/O data to and from the OT network will be set to the same size as provided by the serial subnetwork.

Data size to Modbus TCP: 2 Data size from Modbus TCP: 0

1. Deselect the **Use Automatic I/O Sizes** checkbox.
2. Enter a value for *Data Size to Modbus TCP* and a value for *Data Size from Modbus TCP*.

7.7.3 To Use DHCP Server



The screenshot shows the 'Anybus Communicator' configuration window. At the top, there is a header bar with the title 'Anybus Communicator' and a version string 'Article Number: AB7710-A Version: 1.2.3 Serial Number: ABC123456 GUI Version: 0.44.1'. To the right of the header is an 'Apply' button. Below the header, the 'IP Settings' section is visible. It contains a checkbox labeled 'DHCP enabled' which is checked. Below this, there are five input fields arranged in two rows. The first row contains 'IP address' (192.168.0.111), 'Subnet mask' (255.255.255.0), and 'Gateway address' (192.168.0.1). The second row contains 'Primary DNS' (0.0.0.0) and 'Secondary DNS' (0.0.0.0).

By default, the IP settings are provided by the high level network DHCP server.

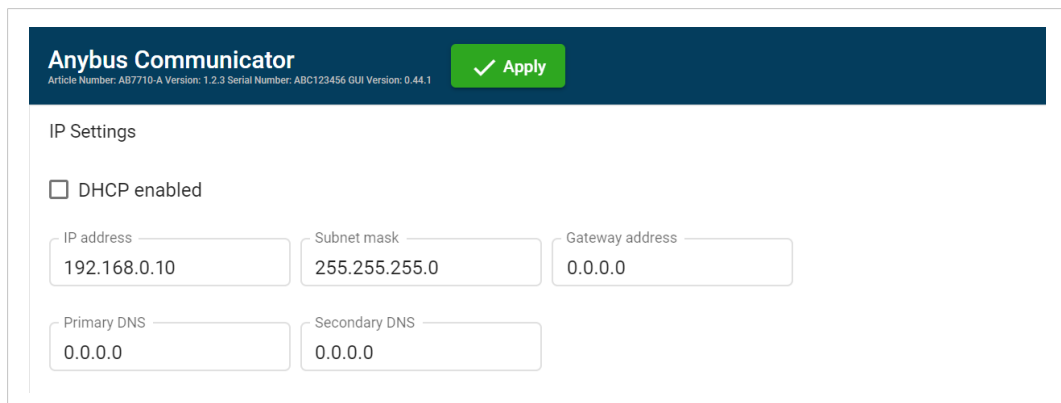
The **DHCP enabled** checkbox is selected.

Default Communicator IP Settings

The Communicator comes with the following factory default IP settings:

Setting	Default value
IP address	0.0.0.0
Subnet mask	0.0.0.0
Gateway address	There is no default Gateway address.
Primary DNS server	There is no default Primary DNS server.
Secondary DNS server	There is no default Secondary DNS server.
DHCP	Enabled
Host name	There is no default Host name.

7.7.4 To Configure IP Settings Manually



Anybus Communicator
Article Number: AB7710-A Version: 1.2.3 Serial Number: ABC123456 GUI Version: 0.44.1 ✓ Apply

IP Settings

☐ DHCP enabled

IP address: 192.168.0.10 Subnet mask: 255.255.255.0 Gateway address: 0.0.0.0

Primary DNS: 0.0.0.0 Secondary DNS: 0.0.0.0

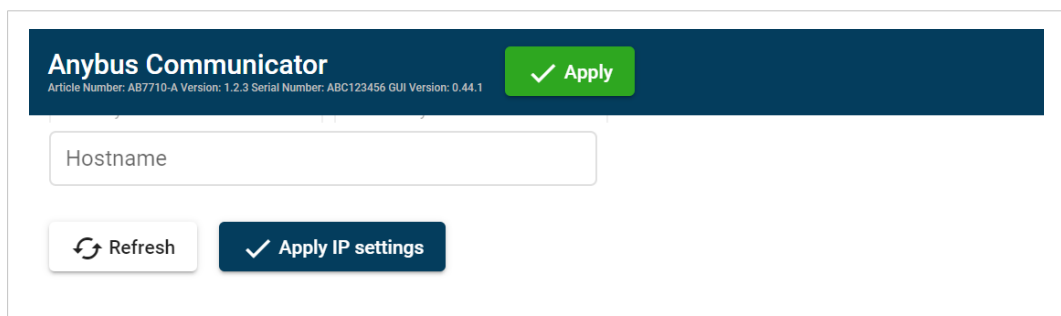
1. Deselect the **DHCP enabled** checkbox.
2. Configure the IP settings.

Setting	Description
IP address	Assign a static IP address to the Communicator, on the network where it is installed.
Subnet mask	The subnet mask identifies the subnetwork to which the static IP address belongs.
Gateway address	The IP address of the gateway device is used when communicating with devices outside the configured subnet. If there is no gateway available, set the Gateway address to: 0.0.0.0
Primary DNS	In a primary/secondary DNS server setup.
Secondary DNS	In a primary/secondary DNS server setup. The secondary server provide redundancy in the DNS network.

If you change a value and click **Refresh**, the value is reset to the last applied value.

3. To apply the settings, click **Apply IP Settings**.

7.7.5 Naming the Host



Anybus Communicator
Article Number: AB7710-A Version: 1.2.3 Serial Number: ABC123456 GUI Version: 0.44.1 ✓ Apply

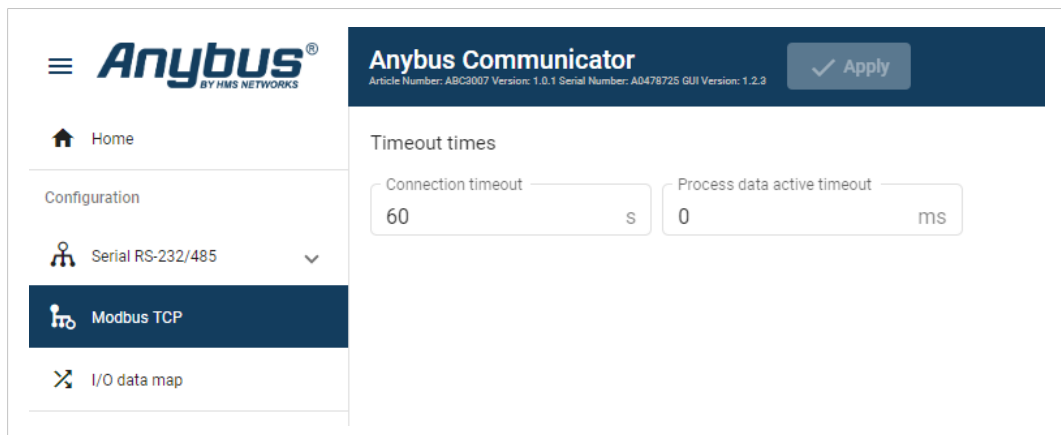
Hostname

↻ Refresh ✓ Apply IP settings

You can label the Communicator.

- The maximum allowed length of the *Hostname* is 64 characters.
- No symbol characters, punctuation characters, or whitespace are permitted.
- Write the *Hostname* as one single word.

7.7.6 Timeout Time Settings



The screenshot shows the 'Anybus Communicator' web interface. The top header includes the 'Anybus' logo and version information: 'Article Number: ABC2007 Version: 1.0.1 Serial Number: A0478725 GUI Version: 1.2.9'. A blue 'Apply' button is in the top right. The left sidebar contains navigation links: 'Home', 'Configuration', 'Serial RS-232/485', 'Modbus TCP' (highlighted in blue), and 'I/O data map'. The main content area is titled 'Timeout times' and contains two input fields: 'Connection timeout' with a value of '60' and unit 's', and 'Process data active timeout' with a value of '0' and unit 'ms'.

Connection timeout

Specify how long a Modbus TCP connection may be idle before it is closed by the Communicator.

The default value is 60 seconds

Process data active timeout

Specify the maximum allowed time between two incoming messages in steps of 10 ms.

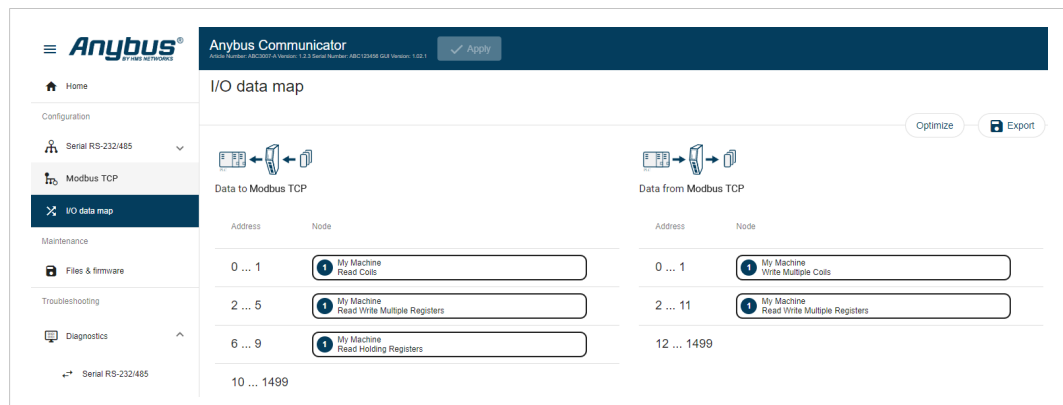
If this time is exceeded, the high level network is considered to be offline.

The data sent to the sub-network is frozen.

A value of 0 disables this feature, i.e. the high level network can never go offline.

The default value is 0 ms.

7.8 I/O Data Map



On the **I/O data map** page the data communication between the subnetwork (Node) and the high level network (PLC) is mapped.

For more information about addressing and register mapping, refer to [Addressing and Register Mapping, p. 50](#).

The allocated I/O area is auto-generated based on how the settings on the **Serial communication** page and the **Nodes and commands** page are configured.

It is possible to set the I/O area manually, if you want to pro-actively allocate more I/O for future expansions without re-configuring the PLC. Refer to [To Configure I/O Sizes Manually, p. 39](#).

7.8.1 Optimize the I/O Data Map

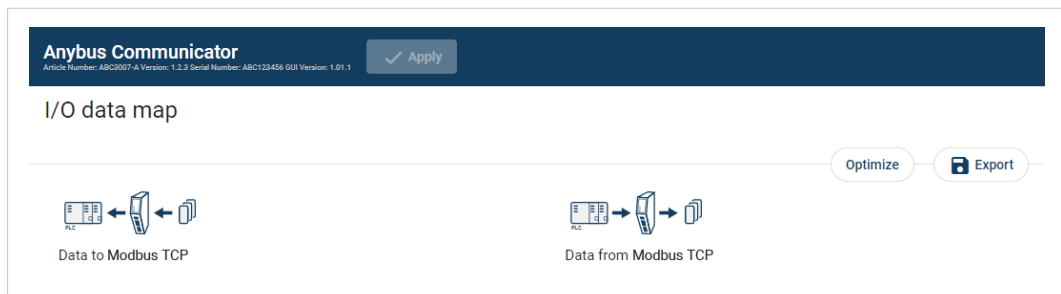
The optimize function is used to automatically remove gaps between the mapping.



Optimize remove gaps between the data objects in the map and should be used with care on already commissioned systems. Expected mapping in the PLC may change.



If you optimize the I/O data map, the current I/O data map will be overwritten.



To optimize the map:

1. Click **Optimize**.
2. To confirm, click **OK**.

7.8.2 Endian Swap

In most cases, no endian swap is needed, as both Modbus TCP and Modbus-RTU use big-endian by default.

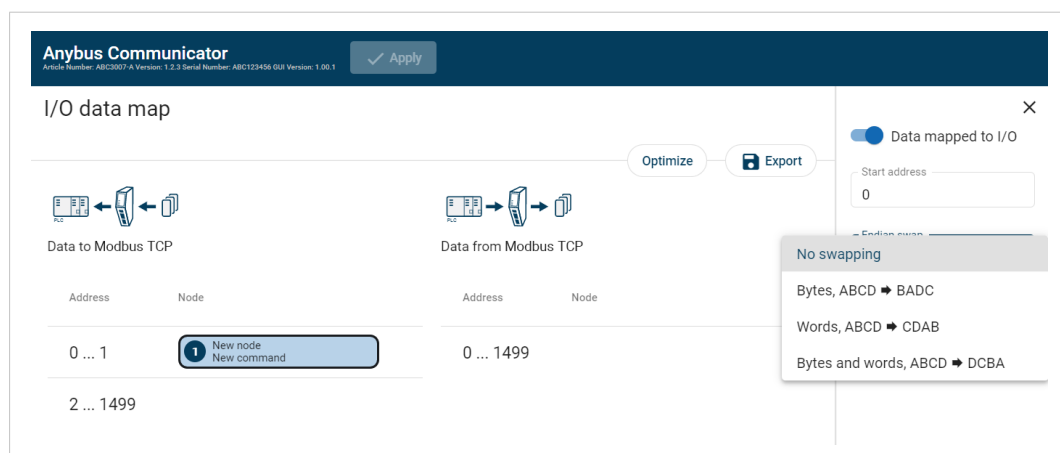
Big-endian

The big-endian format places the most significant byte of the data at the byte with the lowest memory address.

Little-endian

The little-endian format places the least significant byte of the data at the byte with the lowest memory address.

To convert between big-endian and little-endian you must reverse the byte order.



To reverse the byte order:

1. In the web-interface left sidebar menu, click **I/O data map**.
2. In the data map, select the command for which you want to do swap the byte order.
3. Select the swapping type from the **Endian swap** drop-down menu.

Setting	Description
No swapping	Default setting No swapping is performed on the data.
Byte swap	Swap 2 bytes AA BB CC DD becomes BB AA DD CC
Word swap	Swap 4 bytes AA BB CC DD becomes CC DD AA BB
Byte and Word swap	AA BB CC DD becomes DD CC BB AA

4. To apply the settings, click **Apply** in the web-interface header, and follow the instructions.

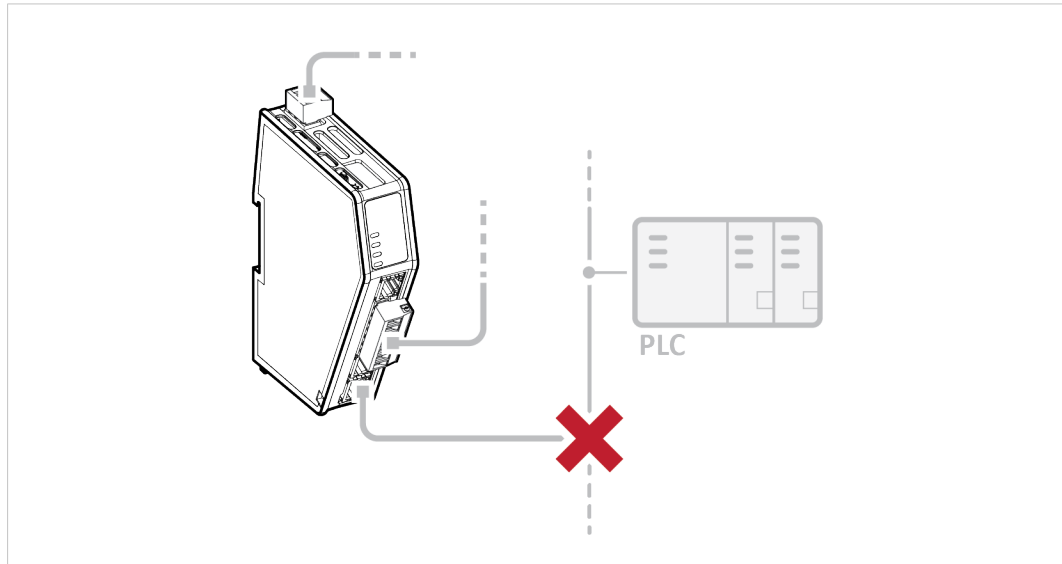
7.9 Apply Configuration

Before You Begin



When you apply the configuration, any existing configuration is overwritten.

Disconnect the Communicator from the Modbus TCP network



Before you can apply the configuration, ensure that there is no active communication on the Modbus TCP network where the Communicator is connected.

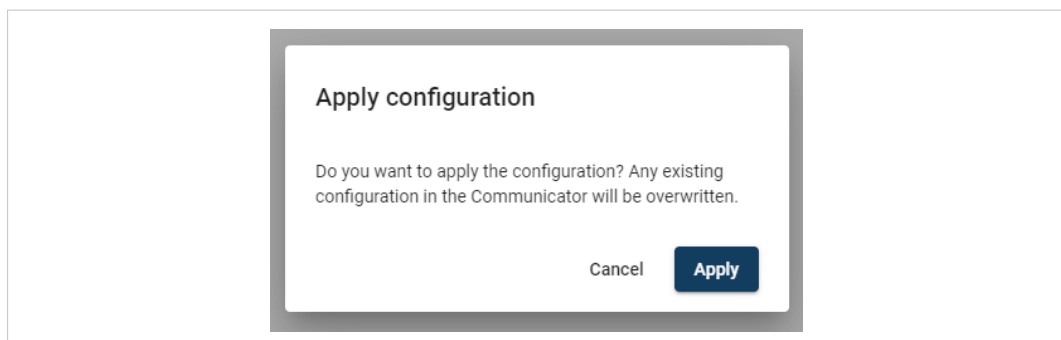
Procedure

To make the settings take effect, download the configuration to the Communicator:

1. In the web-interface header, click **Apply**



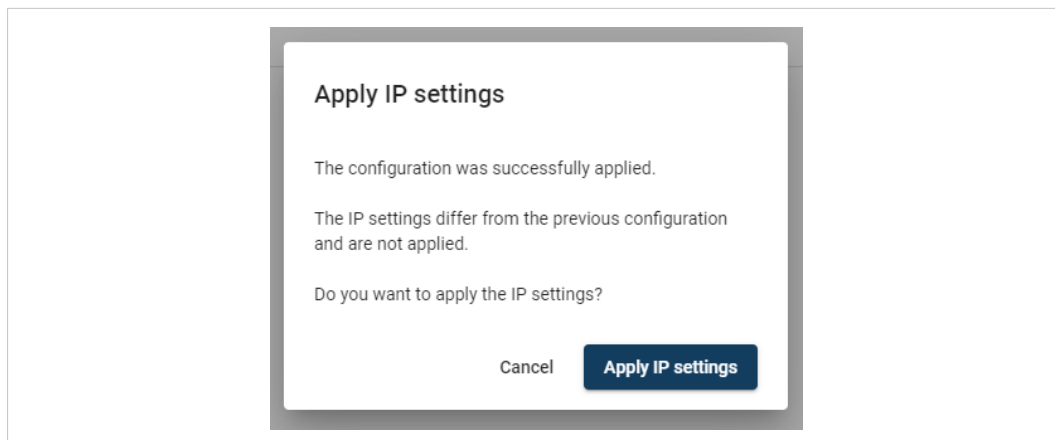
2. To confirm download, click **Apply**.



→ The configured settings are downloaded and applied to the system.

If you have made changes to the IP settings you are prompted to apply these settings.

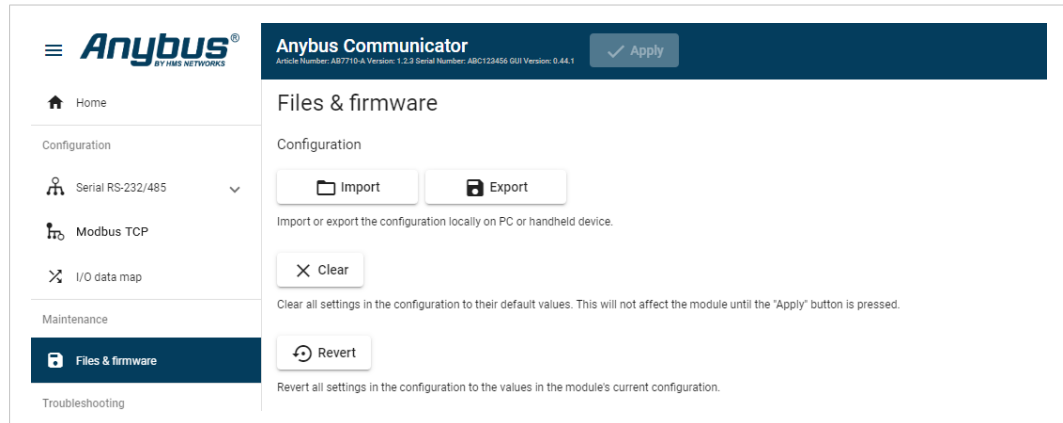
3. To apply the IP settings, click **Apply IP settings**.



7.10 Use an Existing Configuration

When you have configured a Communicator and want to use the same settings to configure additional Communicators, do the following.

Procedure



In the built-in web-interface of the Communicator with the configuration you want to use:

1. On the Files & firmware page, click **Export**
→ The configuration is saved in a conf file and downloaded to your PC.

In the built-in web-interface of the new Communicator to be configured:

2. On the Files & firmware page, click **Import**
3. In the Import configuration window, click **Select file (.conf)**.
4. In the Open dialog box, browse to and select the configuration file and click **Open**
5. To import the configuration file, click **Import**.

Result

All the configuration settings are imported.

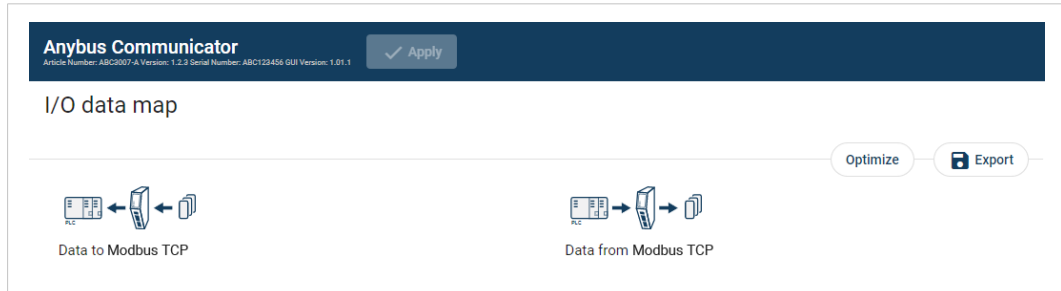
To apply the settings, click **Apply** in the web-interface header, and follow the instructions.

8 PLC Configuration

8.1 Export I/O Data Map

When configuring the communication between the PLC and the nodes on the subnetwork, use the I/O data map as a specification to ensure that the commands match.

In the Communicator built-in web-interface:



On the I/O data map page you can export the I/O data map in an Excel XLS file, where all the nodes and transactions are listed.

To export the I/O data map:

1. Click **Export**.

→ An Excel XLS file with the mapping is downloaded to your PC.

8.2 Addressing and Register Mapping

8.2.1 Data From Modbus TCP Network to Serial-Subnet

Process data offset	Coil address	Holding register
0x0000 — 0x0001	0x0000 — 0x000F	0x0000
0x0002 — 0x0003	0x0010 — 0x001F	0x0001
...
0x05D8 — 0x05D9	0x2EC0 — 0x2ECF	0x02EC
0x05DA — 0x05DB	0x2ED0 — 0x2EDF	0x02ED

8.2.2 Data From Serial-Subnet to Modbus TCP Network

Process data offset	Discrete input address	Input register	Holding register
0x0000 — 0x0001	0x0000 — 0x000F	0x0000	0x0800
0x0002 — 0x0003	0x0010 — 0x001F	0x0001	0x0801
...
0x05D8 — 0x05D9	0x2EC0 — 0x2ECF	0x02EC	0x0AEC
0x05DA — 0x05DB	0x2ED0 — 0x2EDF	0x02ED	0x0AED

8.2.3 Idle Mode

Command	Holding Register	Description
Enter/Exit Idle Mode	0x1004	Used by the Modbus TCP master to indicate an idle/offline mode on the network.

9 Verify Operation

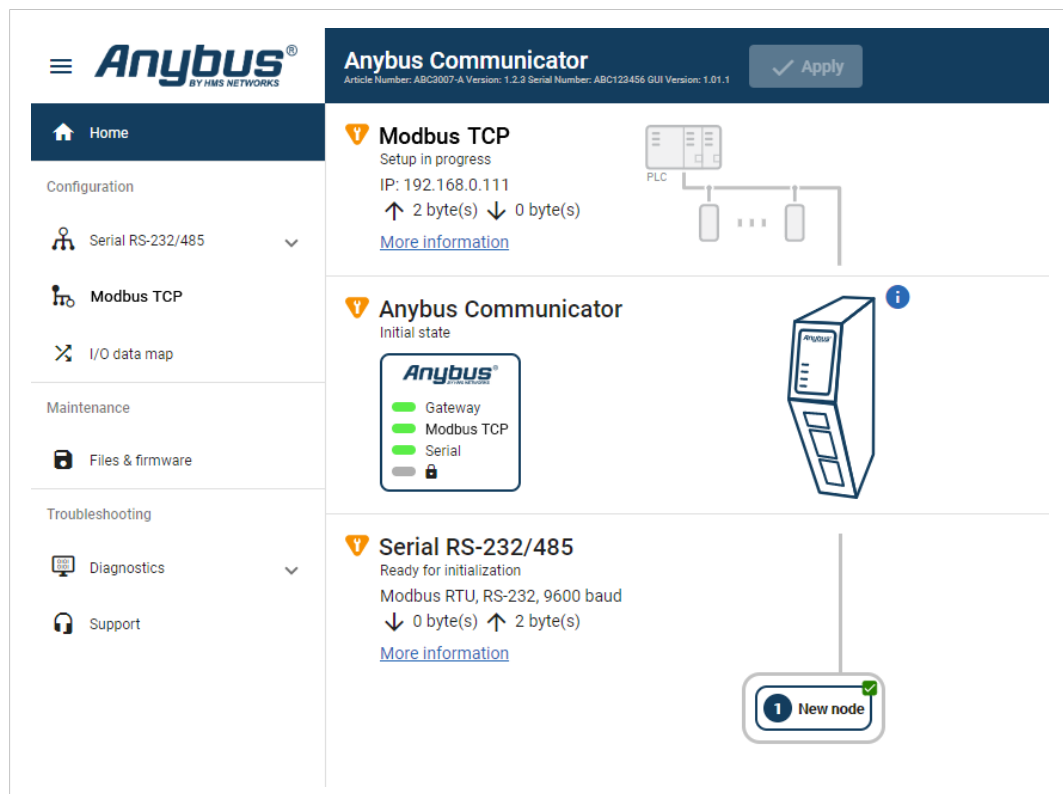
Before You Begin

Ensure that the Communicator is connected to your PC, to a power supply and to the OT network.

Refer to [Installation, p. 12](#).

9.1 Communicator Status Monitor

On the Home page, you can get a quick overview of the network and the Communicator operating status.



Gateway status

Overview the Communicator LED indications remotely.

Refer to [Communicator LED Indicators, p. 53](#).





Node Status

Overview the status for each node added to the subnetwork.

Network Status and Settings

Overview communication status and the current networks settings.

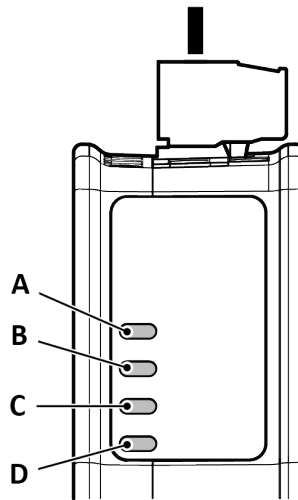
Status Symbols

Symbol	Description
	Internal error has occurred and operation cannot be guaranteed.
	Out of Specification.
	Check Function: <ul style="list-style-type: none">• Initial state where non network components are started and configured.• Network startup in progress.• Invalid configuration detected.
	Normal operation.

9.2 Communicator LED Indicators

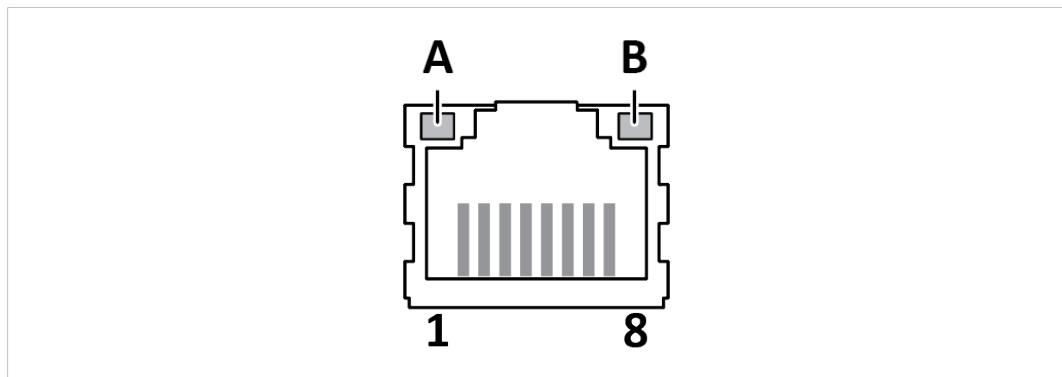


Before you can verify operation you must configure the Communicator.



	LED A	LED B	LED C	LED D
Operation Status	Gateway status	Modbus TCP Server	Subnetwork	Security switch
Off	No power	No power/Exception/ No Modbus TCP IP address	No power/Exception/ Subnetwork not running	No power/Security switch is unlocked/ Exception/Fatal error
Green, flashing	Startup phase	Modbus TCP online, no messages received.	Running, one or more nodes are offline	N/A
Green	Operational	Modbus TCP online, at least one message received.	Running	Security switch is locked
Red	Exception/Fatal error	IP address conflict detected, or Fatal error.	Fatal error	N/A
Red, flashing	Invalid configuration	Connection timeout.	All nodes are offline	N/A
Green/Red, flashing	Power up self-test/ Firmware update/ Firmware recovery	N/A	N/A	N/A

9.3 Modbus TCP LED Indicators



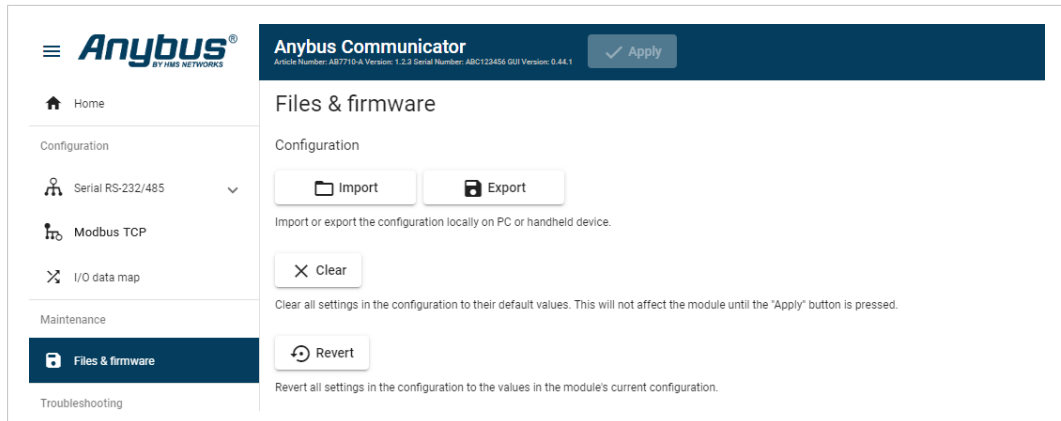
LED A	Function
Off	No link (or no power)
Green	Link (100 Mbit/s) established
Green, flashing	Activity (100 Mbit/s)
Yellow	Link (10 Mbit/s) established
Yellow, flashing	Activity (10 Mbit/s)
LED B	Function
Off	Not used

10 Maintenance

10.1 Configuration File Handling

10.1.1 Export Configuration

You can export the current configuration, in order to import and use the same settings to configure additional Communicators.



To export a configuration file:

1. In Files & firmware, click **Export**.
 - The configuration settings are stored in a *.conf* file and downloaded to your PC.

10.1.2 Import Configuration

To easily configure multiple Communicators with the same settings, you can import a configuration file.

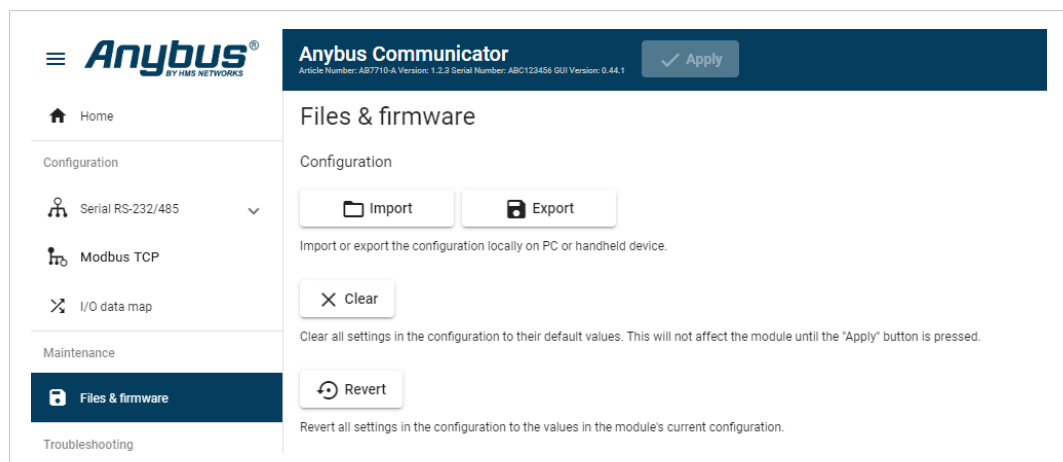
Before You Begin



Importing a configuration replaces the current applied configuration.

Supported file format is `.conf`.

Procedure



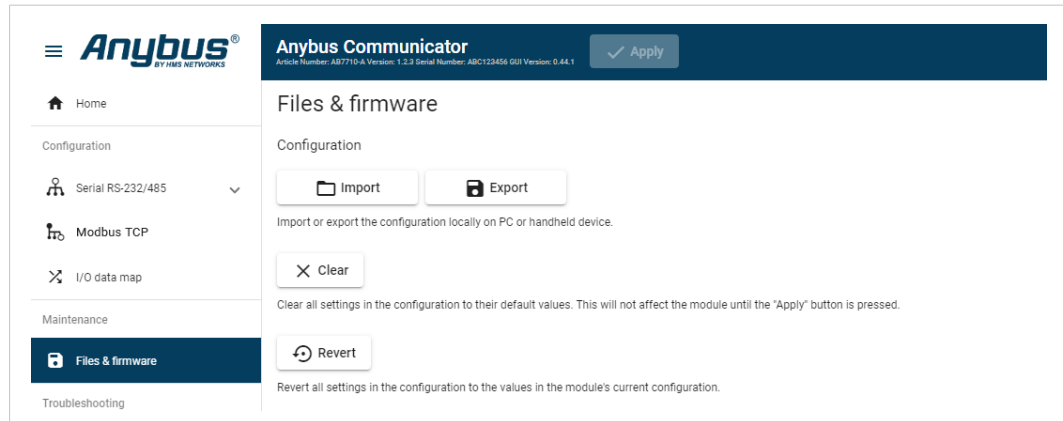
Import configuration file:

1. On the Files & firmware page, click **Import**.
2. In the Import configuration window, click **Select file (.conf)**.
3. In the Open dialog box, browse to and select the configuration file and click **Open**.
4. In the Import configuration window, click **Import**.
5. In the Communicator address settings window:
 - To import *IP settings* from the selected configuration file, click **Imported settings**. All configuration settings are imported.
 - To continue using the current *IP settings*, click **Configured settings**. All configuration settings except the IP settings are imported.
6. The configuration file is parsed.
 - If the configuration is compatible, the settings are imported.
 - If any compatibility mismatches occurs, a message about the mismatch appears.
7. To apply the settings, click **Apply** in the web-interface header, and follow the instructions.

10.2 Clear and Revert Configuration

You can restore all settings in a configuration to the default settings.

Procedure



To clear the configuration:

1. On the Files & firmware page, click **Clear**.
2. In the Confirm clear window, click **Clear**.
3. To apply the change, click **Apply** in the web-interface header, and follow the instructions.

You can revert all changes done to the settings in the current configuration.

To Revert the configuration:

1. On the Files & firmware page, click **Revert**.
2. In the Confirm revert window, click **Revert**.
3. To apply the change, click **Apply** in the web-interface header, and follow the instructions.

10.3 Firmware Management

10.3.1 View the Firmware Version

On the **Support** page, you can view the current applied firmware version.



10.3.2 Firmware and Configuration Compatibility

Compatibility after firmware upgrade

Current configuration is still compatible after upgrading the firmware.

Compatibility after firmware downgrade



Compatibility after a firmware downgrade can not be guaranteed.

The current configuration may use features not available in the older firmware version.

10.3.3 Firmware File Validation

Before the firmware file is imported into the system, the firmware upgrade function perform a validation of the file, to ensure that:

- the firmware is compatible with the Communicator hardware
- the firmware is suited for the product
- that the officially HMS software signatures are valid
- that the firmware file is not corrupt or damaged

If the firmware file does not pass the validation, the firmware file is rejected and an error message appear.

10.3.4 Update Firmware

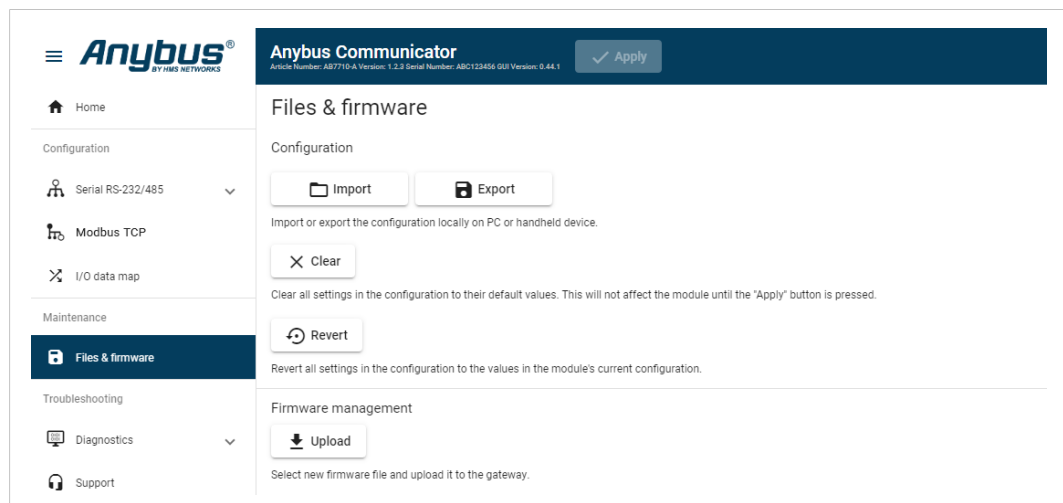
Before You Begin



To eliminate the risk of interference with plant operation, firmware update is only available when the Communicator is disconnected from the OT networks.

Ensure that the Communicator is disconnected from the OT networks.

Procedure



To update the firmware:

1. On the Files & firmware page, click **Upload**.
2. In the Upload Firmware window, click **Select firmware (.hiff)**.
3. In the Open dialog box, browse to and select the firmware file and click **Open**.
4. To start the firmware upgrade, click **Update firmware**.
 - The firmware file is validated and transferred.

Result

- If the firmware file pass the validation: The firmware is upgraded and then the Communicator automatically reboots, for the upgrade to take effect.
- If the firmware file is rejected: An error message appear.

11 Troubleshooting

11.1 Diagnostics

11.1.1 Serial RS-232/485 Data Monitor

On the Serial RS-232/485 page you can monitor how the data flow between the nodes and the gateway changes over time.

The screenshot shows the 'Anybus Communicator' interface for 'Serial RS-232/485'. The left sidebar contains navigation options: Home, Configuration (Serial RS-232/485, Modbus TCP, I/O data map), Maintenance (Files & firmware), and Troubleshooting (Diagnostics, Serial RS-232/485, Event log). The main area displays a table of data flow messages. The table has three columns: Time (d:hh:mm:ss.ms), Direction (indicated by arrows), and Data (hexadecimal values). The data is displayed in Hexadecimal format. The interface also includes buttons for Start, Clear, Auto scroll, Hex, Dec, Ascii, and Export.

Time (d:hh:mm:ss.ms)	Direction	Data
0:03:53:36.759	←	32 3c e8 41 97 f2 5b 3a 55 1c ba 42 33 e8 70 a8 bf 90 71 e4 31 ec b8 09 37 e8 08 30 9c 13 94 df d9 fc 5a f3 a4 c3 11 ba 5c bd 7a a7 f8 fa 17 d2 1c cb 76 7a a0 4e db eb 60 ad f0 24 1c a3 f0 d7 0a 4f 2b 6b 80 89 29 75 cf a8 b1 cf 09 04 3c f2 3c 89 fd d7 d1 6e 27 92 2d c2 39 ea c2 9c fd 77 ee 3e 50 86
0:03:53:36.810	→	ce 0a 03 7a f4 46 e3 10 6d eb b6 2e f9 da 0f 02 ec 8a 51 c8 98 ec df 89 92 49 3d 13 a0 80 b7 f8 5e 84 58 e4 1d ca a3 e8 eb b5 40 41 25 ca 92 dd 73 de 7e e5 db d2 60 af 42 9c 0b e1 dc c8 dd bc b0 ec 02 15 ae 3e 7f 55 1b af a1 11 4d fa 8c 95 76 d2 bb af a8 ad 20 92 e1 5a ee 98 97 38 51 62 33 64 cf ec
0:03:53:36.859	←	80 d3 99 b2 a5 2f 06 77 8b ba 87 87 ff 5e fc db 1f 72 84 cd 26 5d f0 b6 a0 6f 96 c6 2a d2 c2 00 75 c8 49 7e 9c 81 e0 81 a4 bc d7 f3 33 1f 29 ac bf b4 49 39 14 07 ed b9 97 e2 52 40 0d 23 4c 28 75 c9 d6 90 2e 00 e2 ca 38 51 df ec 24 0b ef 61 69 e4 15 5a 7d 25 33 87 69 ad 27 4e 35 06 2e 4b a1 48 9f 9f
0:03:53:36.910	→	d9 c5 b5 36 aa 7e e0 3a 60 f3 21 5a b7 84 2d cd 75 81 75 45 0a 0b fc 2c 07 93 c9 ad 73 04 79 c8 66 18 35 9d 5a c5 bc 52 db 29 9f fa 21 23 a4 72 23 75 3b 34 91 d5 2f d8 59 91 1e ab 3a 6e 99 7f 86 97 2b 64 44 e8 e2 2d ca 3d 3a 46 bf 31 0f 96 f5 eb 96 84 1c 1d 67 c8 bf 05 22 90 49 49 1e 84 59 b6 be 1e
0:03:53:36.959	←	50 b6 7f d8 c1 41 60 f9 b3 e3 05 8d d0 2b 44 60 37 02 a4 ad 3f 7e a6 78 b4 e8 31 08 53 20 f6 45 e5 c5 06 65 b0 1c a5 07 f0 71 9f c1 eb 97 5a 27 6d 43 e6 ca f6 d7 e5 55 db 01 30 ff 95 56 a5 1e 69 8e 43 d3 c6 d2 ad 20 12 e9 87 26 90 56 ff e4 c5 35 31 3d 64 e9 3f 40 47 a5 c6 9f 24 71 3f 3a 49 cd e2 81

The table can contain at most 10000 messages. When the limit is reached, the oldest messages are discarded when new messages are added.

Choose how data is displayed

To choose if the data should be displayed in Hexadecimal, Decimal or ASCII, click **Hex**, **Dec** or **Ascii**.

Start and Stop Data flow

To start the data flow, click **Start**.

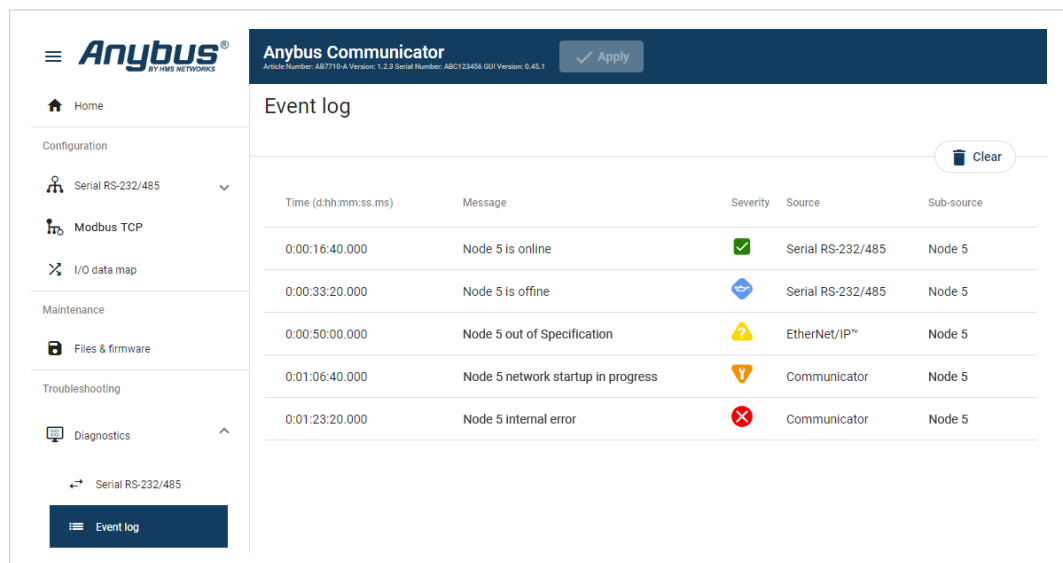
To end the data flow, click **Stop**.

Export data flow

To export the data flow, click **Export**.

→ An Excel file with the data flow is downloaded to your PC.

11.1.2 Event Log



How To Analyze the Information

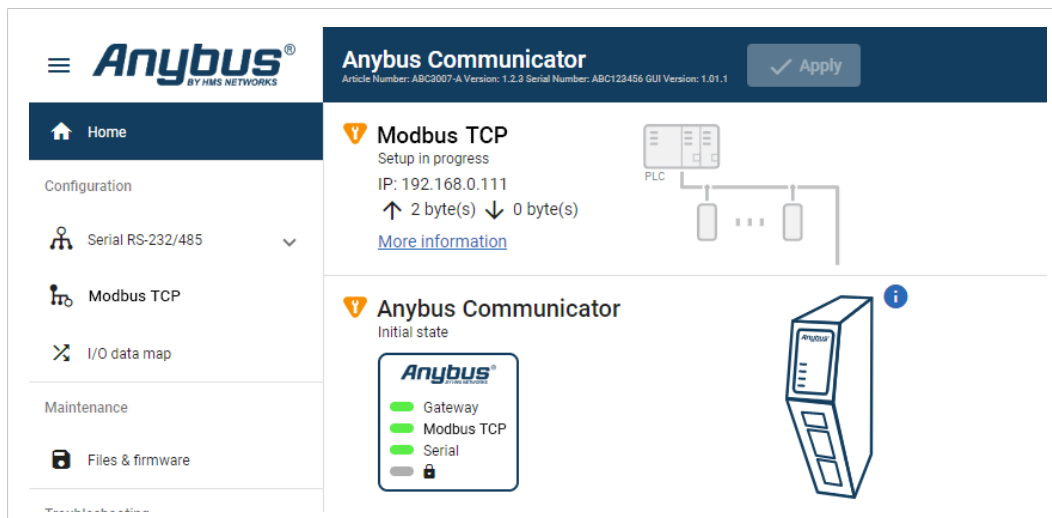
The log follows the FIFO principle, first in and first out. The oldest (first) value is processed first.

Time (d:hh:mm:ss.ms)	The date and time when the event occurred.	
Message	A brief description of the event.	
Severity	The severity of the event occurred. For description of the symbols, refer to Communicator Status Monitor, p. 51 .	
Source	0	Communicator
	1	High level network, Modbus TCP
	2	Subnetwork, Serial RS-232/485
Sub-source	The nodes connected to the subnetwork and the PLC connected to the high level network. If there is a problem with a node the node name is displayed in the Sub-source column. Example: If the node name is 5, number 5 is displayed in the Sub-source column.	

To clear the current log, click **Clear log**.

11.1.3 LED Status

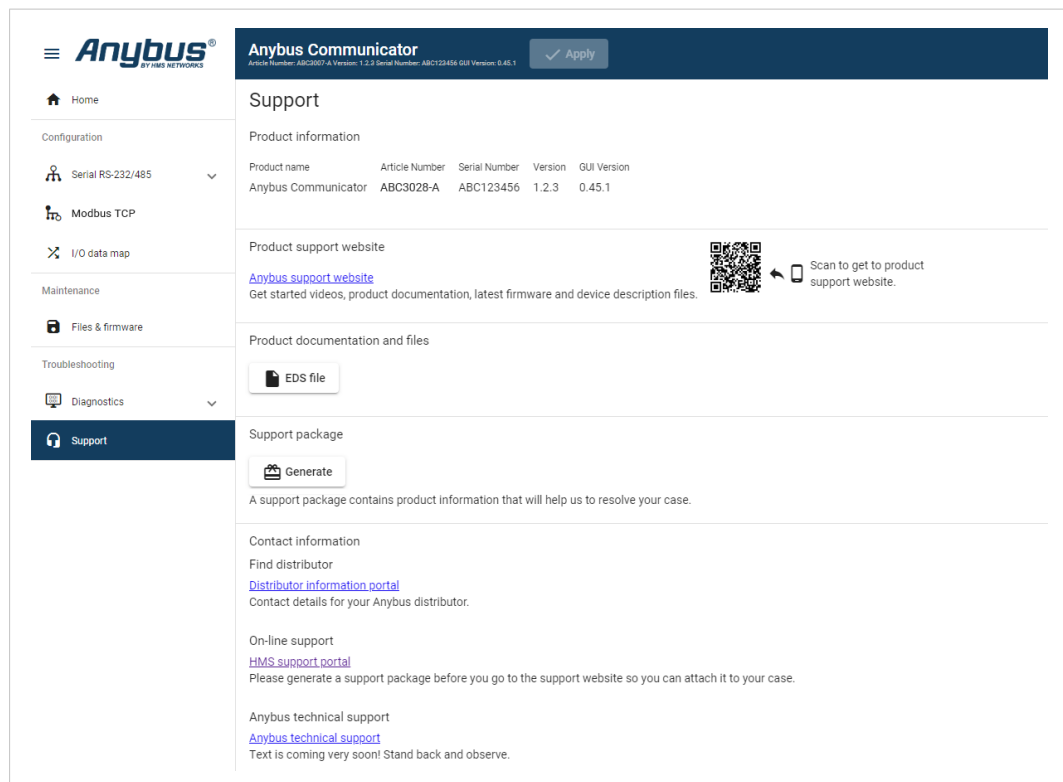
On the Home page, you can remotely monitor the Communicator LED status.



For information about the LED indication, refer to [Communicator LED Indicators, p. 53](#).

11.2 Support

11.2.1 Support Package



Before you create a ticket for technical support, generate a support package.

The support package contain information about what has occurred and will help the Anybus technical support team resolve the support case as quickly and efficiently as possible.

Support Package Content

The information in the support package are available to open and read, the files are not locked or encrypted.

Generate Support Package

1. On the **Support** page, click **Generate**.
 - A zip file with the support files is downloaded to your PC.

Create a Support Ticket

1. On the Support page, click **Anybus support website**.
 - You are redirected to the Anybus support website.
2. On the Anybus support website, create a support ticket and upload the support package.

11.3 Reset to Factory Settings

Before You Begin

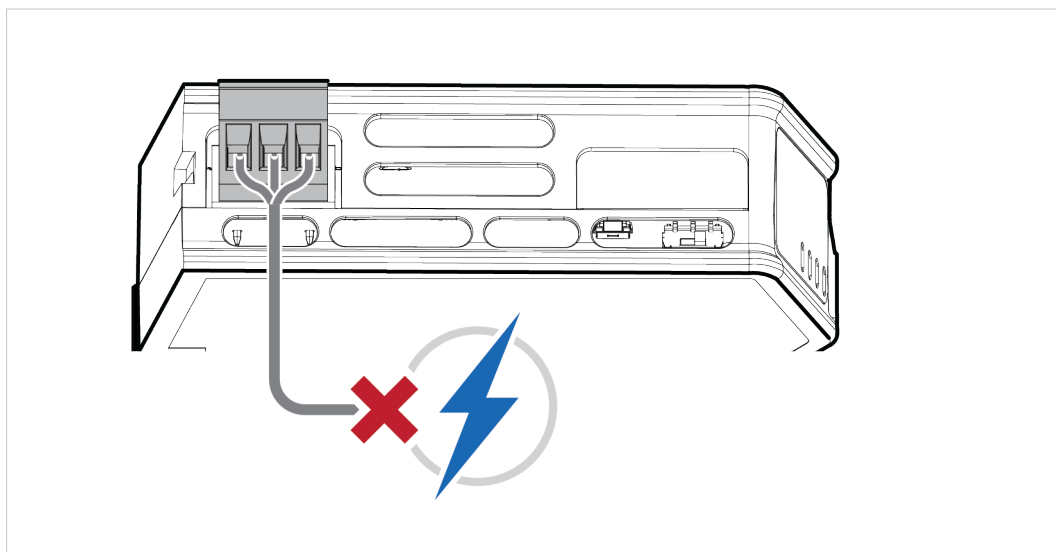
Factory reset will reset any on site made configuration changes and set the Communicator to the same state as leaving HMS production.

If the Firmware has been updated, factory reset will revert the Communicator configuration to initial state after the update.

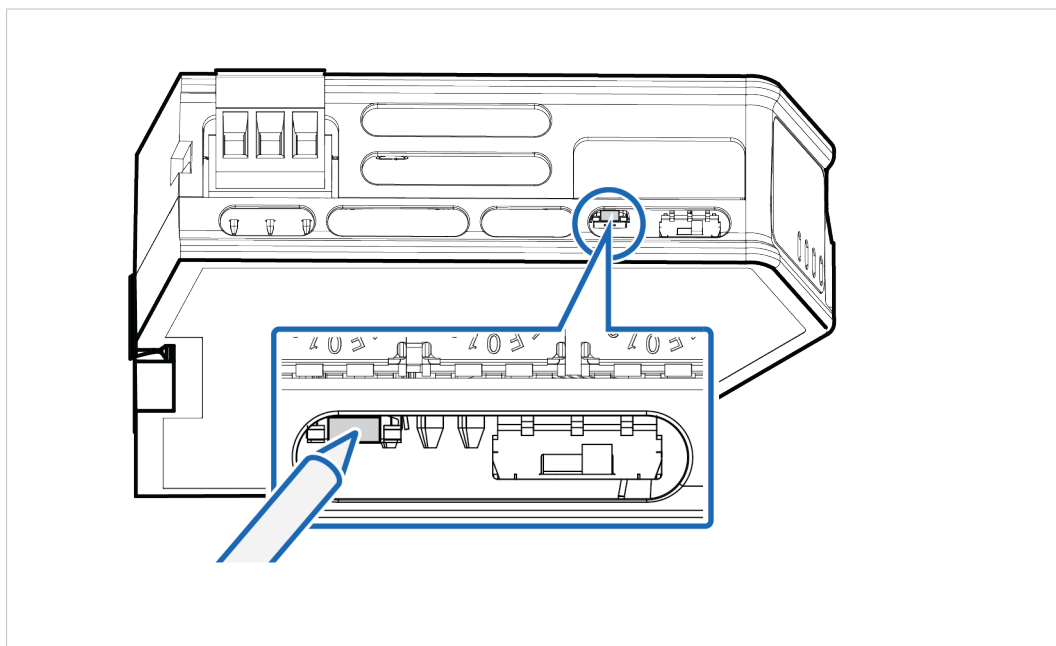
Procedure

To reset the Communicator:

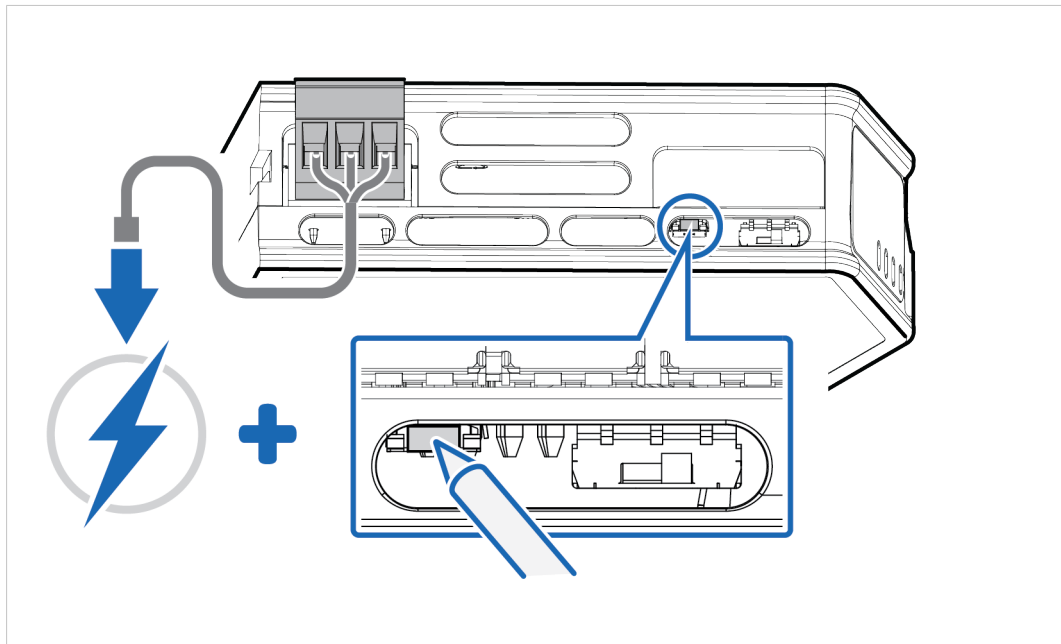
1. Disconnect the Communicator from power.



2. Use a pointed object, such as a ballpoint pen to press and hold the **reset** button.



3. While holding the **reset** button, reconnect the Communicator to power.



4. Release the **reset** button.
→ The Communicator enters Exception state.
5. Reboot the Communicator.

Result

- When the Communicator has successfully rebooted, the Communicator configuration is reset to the factory default configuration or the current configuration after firmware upgrade.

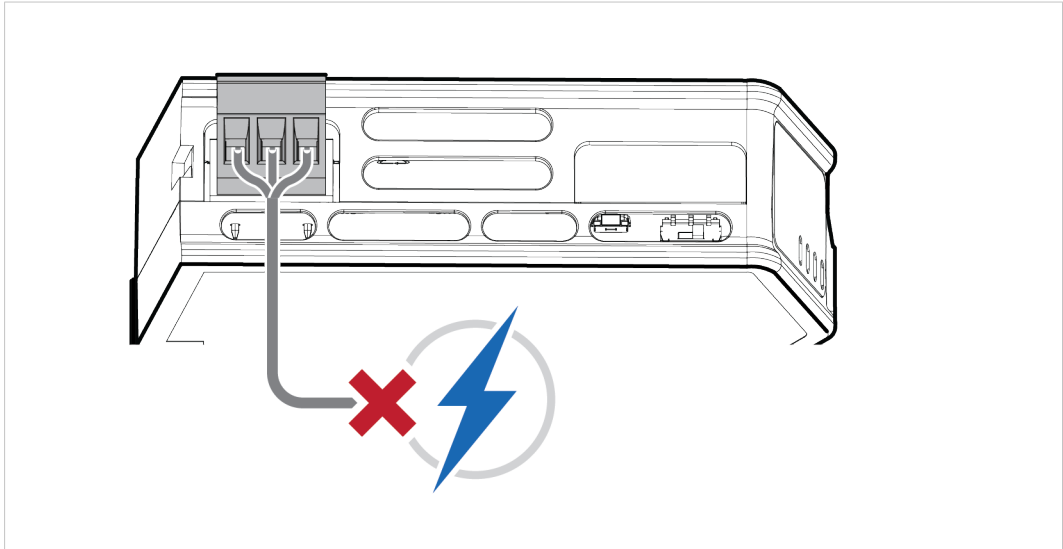
11.4 Firmware Upgrade Error Management

If the firmware update process is interrupted or if the power is lost during the update process, the Communicator goes into fallback mode.

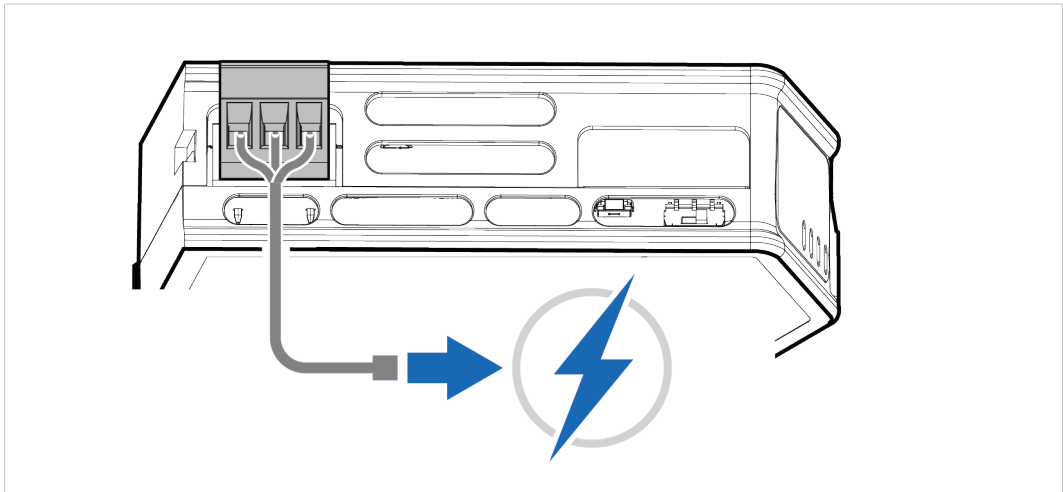
The last working firmware is still available on the flash, but it is not active.

To complete the interrupted firmware update:

1. Disconnect the Communicator from power.

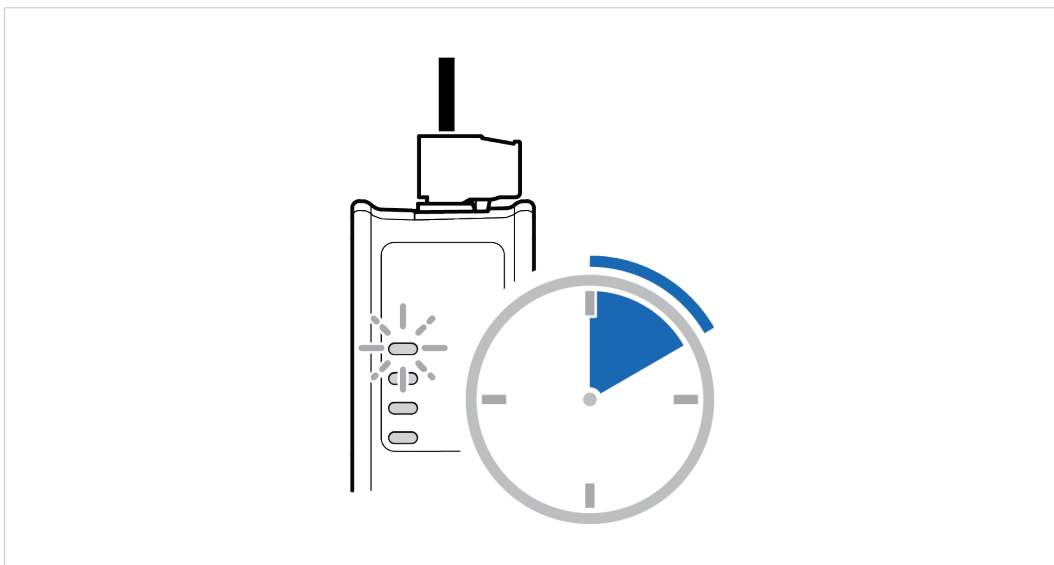


2. Reconnect the Communicator to power.

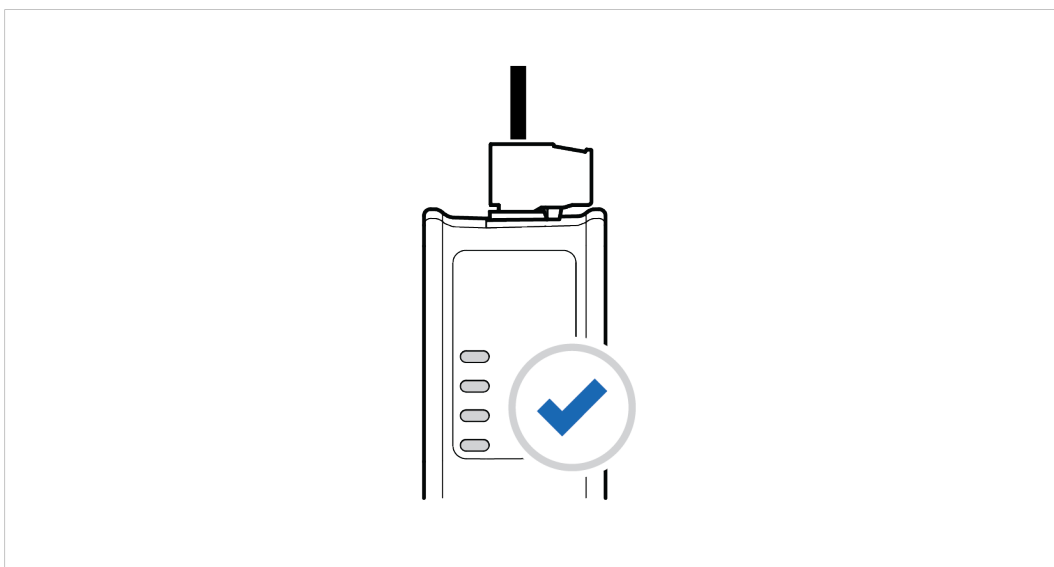


3. Leave the Communicator for 10 minutes.

The *Gateway status* led indicator flashes red and green until the firmware upgrade is completed.

**Result**

→ The Communicator recover and return to normal operation.



To check LED status, refer to [Communicator LED Indicators, p. 53](#).

12 Technical Data

12.1 Technical Specifications

Article identification	ABC3028-A
Communication connector	RJ45 x 2
Configuration connector	RJ45
Serial connector	7-pin screw connector
Power connector	3-pin screw connector
Power supply	12-30 VDC Reverse voltage protection and short circuit protection
Power consumption	Typical: 160 mA @ 24 V Max: 400 mA @ 12 V
Storage temperature	-40 to +85 °C
Operating temperature	-25 to +70 °C
Humidity	EN 60068-2-78: Damp heat, +40°C, 93% humidity for 4 days EN 60068-2-30: Damp heat, +25°C – +55°C, 95% RH, 2 cycles
Vibration	See datasheet
Housing material	Plastic See datasheet for details
Protection class	IP20
Product weight	150 g
Dimensions	27 x 144 x 98 mm (H x W x D) with connectors included
Mounting	DIN-rail

Additional technical data and information related to the installation and use of this product can be found at www.anybus.com/support.

A Reference Guides

A.1 About Input Registers and Holding Registers

Modbus data is most often read and written as registers which are 16-bit pieces of data.

Holding registers and Input registers are both 16-bit registers.

Input registers

Input registers can only be read.

Holding registers

Holding registers can be read or written.

These registers can be used for a variety of things such as inputs, outputs, configuration data, or other requirement for holding data.

A.2 Modbus Data Model

Discretes Input	Single bit	Read-Only	Data can be provided by the I/O system.
Coils	Single bit	Read-Write	Data can be alterable by the application program.
Input Registers	16-bit word	Read-Only	Data can be provided by the I/O system
Holding Registers	16-bit word	Read-Write	Data can be alterable by the application program.

Reference: MODBUS Application Protocol Specification V1.1b3, April 26 2012

For more information refer to the Modbus organisation website.

A.3 Modbus Commands

Nr	Command	Area	Function Code	Description
1	Read Coils	Coils	0x01	Read from 1 to 2000 contiguous status of coils in a remote device.
2	Read Discrete Inputs	Discrete inputs	0x02	Read from 1 to 2000 contiguous status of discrete inputs in a remote device.
3	Read Holding Registers	Holding registers	0x03	Read the contents of a contiguous block of holding registers in a remote device.
4	Read Input Registers	Input registers	0x04	Read from 1 to 125 contiguous input registers in a remote device.
5	Write Single Coil	Coils	0x05	Write a single output to ON or OFF in a remote device.
6	Write Single Register	Holding registers	0x06	Write a single holding register in a remote device.
15	Write Multiple Coils	Coils	0x0F	In a sequence of coils, force each coil to either ON or OFF in a remote device.
16	Write Multiple Registers	Holding registers	0x10	Write a block of contiguous registers in a remote device.
23	Read/Write Multiple Registers	Holding registers	0x17	Performs a combination of one read operation and one write operation. The write operation is performed before the read.
43/14	Read Device Identification	N/A	0x2B/0x0E	Read the vendor name, product code (article number), firmware version, vendor URL and product name.

Reference: MODBUS Application Protocol Specification V1.1b3, April 26 2012

For more information refer to the Modbus organisation website.

A.4 Modbus Exception Codes

Exception Code	Name	Description
01	Illegal Function	The slave does not recognize or permit the function code.
02	Illegal Data Address	The data address (register, discrete input or coil number) is not an permitted address for the slave. If multiple registers were requested, at least one was not permitted.

Reference: MODBUS Application Protocol Specification V1.1b3, April 26 2012

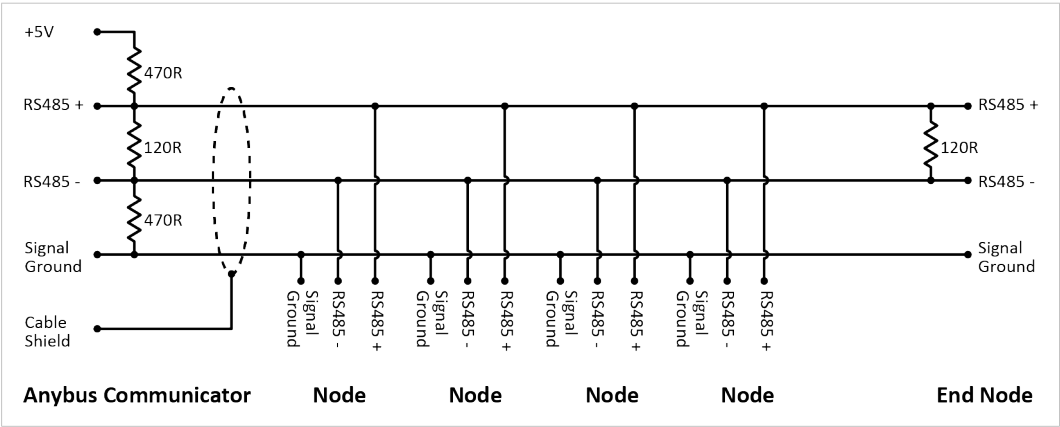
For more information refer to the Modbus organisation website.

A.5 ASCII Table

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	NUL 0	SOH 1	STX 2	ETX 3	EOT 4	ENQ 5	ACK 6	BEL 7	BS 8	HT 9	LF 10	VT 11	FF 12	CR 13	SO 14	SI 15
1x	DLE 16	DC1 17	DC2 18	DC3 19	DC4 20	NAK 21	SYN 22	ETB 23	CAN 24	EM 25	SUB 26	ESC 27	FS 28	GS 29	RS 30	US 31
2x	(sp) 32	! 33	" 34	# 35	\$ 36	% 37	& 38	' 39	(40	) 41	* 42	+ 43	, 44	- 45	. 46	/ 47
3x	0 48	1 49	2 50	3 51	4 52	5 53	6 54	7 55	8 56	9 57	: 58	; 59	< 60	= 61	> 62	? 63
4x	@ 64	A 65	B 66	C 67	D 68	E 69	F 70	G 71	H 72	I 73	J 74	K 75	L 76	M 77	N 78	O 79
5x	P 80	Q 81	R 82	S 83	T 84	U 85	V 86	W 87	X 88	Y 89	Z 90	[91	\ 92	] 93	^ 94	_ 95
6x	` 96	a 97	b 98	c 99	d 100	e 101	f 102	g 103	h 104	i 105	j 106	k 107	l 108	m 109	n 110	o 111
7x	p 112	q 113	r 114	s 115	t 116	u 117	v 118	w 119	x 120	y 121	z 122	{ 123	| 124	} 125	~ 126	DEL 127

A.6 RS485/RS232 Electrical Connection

A.6.1 RS485 Typical Connection



A.6.2 RS232 Typical Connection



