Anybus® BY HMS NETWORKS

ENGLISH

Anybus® Communicator™ - Modbus RTU Server to Modbus TCP Client

STARTUP GUIDE

SP3377
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HMS

Important User Information

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1. Preface

1.1. About This Document

This document describes how to install Anybus® Communicator™.

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

1.2. Document Conventions

Safety Symbols

DANGER
Instructions that must be followed to avoid an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
Instructions that must be followed to avoid a potential hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION
Instruction that must be followed to avoid a potential hazardous situation that, if not avoided, could result in minor or moderate injury.

IMPORTANT
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.

Information Symbols

NOTE
Additional information which may facilitate installation and/or operation.

TIP
Helpful advice and suggestions.

1.3. Trademarks

Anybus® is a registered trademark of HMS Networks.

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.

IMPORTANT
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. Cybersecurity

3.1. General Cybersecurity

IMPORTANT
It is important to maintain the cybersecurity of the Communicator.

Before connecting the Communicator to a PLC, ensure the PLC is configured and installed in accordance with the PLC supplier hardening guidelines.

IMPORTANT
To physically secure networks and equipment and to prevent unauthorized access, it is recommended to install the equipment in a locked environment.

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

IMPORTANT
To avoid exposure of sensitive data, always perform a factory reset before decommissioning the equipment.

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

4. Preparation

4.1. Support and Resources

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

TIP
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.

4.2. Cabling

Have the following cables available:

- Power cable.
- Ethernet cable for configuration.
- Ethernet cable for connecting to network.
- 7-pin screw terminal block connector is included with the product.

4.3. Mechanical Tools and Equipment

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.

4.4. HMS Software Applications

Download the software installation files and user documentation from www.hms-networks.com/technical-support.

HMS IPconfig

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

NOTE
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.

NOTE
HMS IPconfig is only available for Windows.

4.5. Software License Information

For license agreements regarding the third-party software used in the Communicator, refer to the *LICENSE.txt* file(s) included in the Communicator firmware update package zip file.

To download the Communicator firmware update package zip file, please visit www.hms-networks.com/technical-support.

TIP
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.

5. Installation

5.1. Label the Communicator with Network Stickers

If you update the pre-configured firmware, you can use the included stickers to relabel the laser engraved marking next to the network LED indicators and connectors. See also ???.

- Check which LEDs indicate the networks of the firmware installed on the Communicator. See Communicator LED Indicators (page 25).
- Check which connector is used for which network of the firmware installed on the Communicator. See Connector Port Guide (page 9).

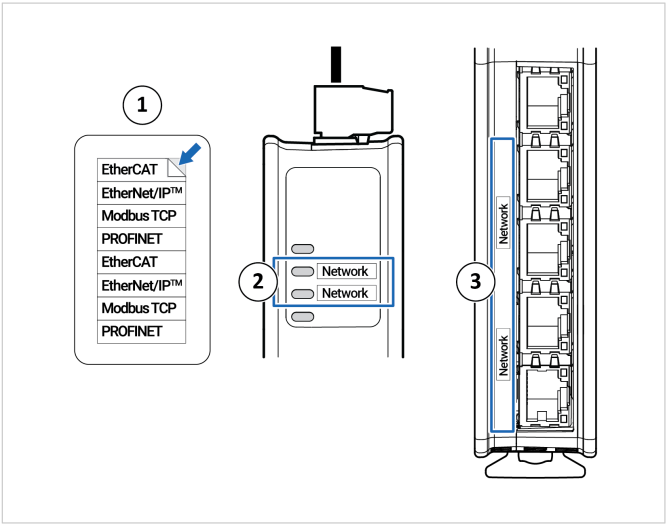


Figure 1. Stickers placed next to the Communicator LED indicators and connectors

5.2. DIN Rail Mounting

IMPORTANT
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.

IMPORTANT
To physically secure networks and equipment and to prevent unauthorized access, it is recommended to install the equipment in a locked environment.

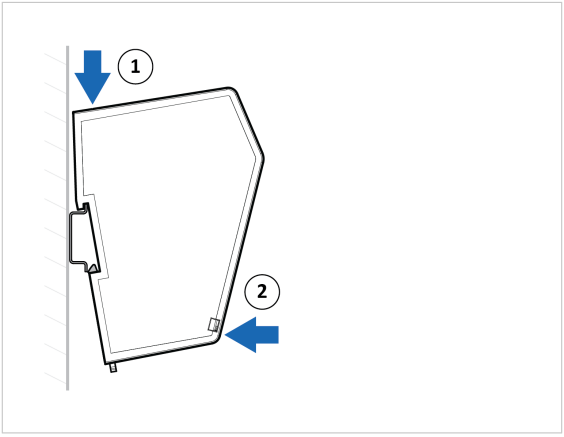


Figure 2. Attach the Communicator on the DIN rail

5.3. Connector Port Guide

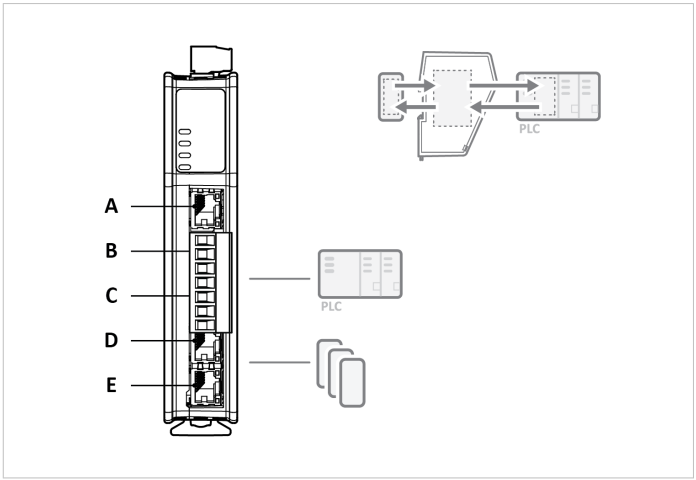


Figure 3. Communicator connector ports

Position	Port Number	Connector	Port Usage
A	X1	Ethernet RJ45	Configuration port
B	X2	7 Pin Screw Terminal Block	Modbus RTU Server network
C	X3.1	Ethernet RJ45	Modbus TCP Client network
D	X3.2	Ethernet RJ45	Modbus TCP Client network

5.4. Connect to Networks

5.4.1. Procedure

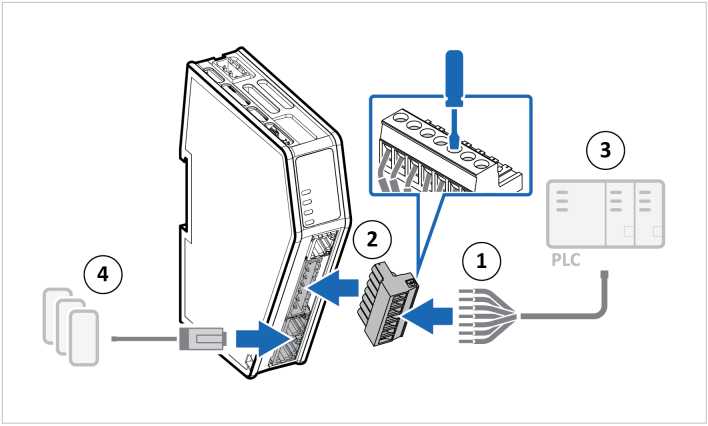


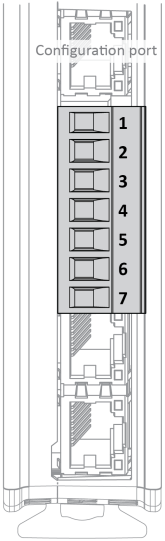
Figure 4. Connect Modbus RTU Server (3) and Modbus TCP Client (4)

Procedure

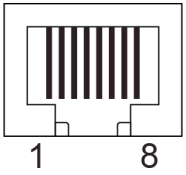
1. Insert the cable wires into the 7-pin connector and tighten the wire clamp screws (1). See Modbus RTU Serial Connector Pinout (page 11).
2. Connect the 7-pin connector to the Communicator (2).
3. Connect the Communicator to the Modbus RTU Server network (3).
4. Connect the Communicator to the Modbus TCP Client network (4).

5.4.2. Modbus RTU Serial Connector Pinout

NOTE
Use minimum 90 oC copper (Cu) wire only.

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 Transmit Data
	7	RS232 Rx Receive Data

5.4.3. Ethernet RJ45 Connector Pinout

Ethernet RJ45 Connector	Pin	Description
	1	TD+
	2	TD-
	3	RD+
	4	Not used
	5	Not used
	6	RD-
	7	Not used
	8	Not used

5.5. Connect to Power

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

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

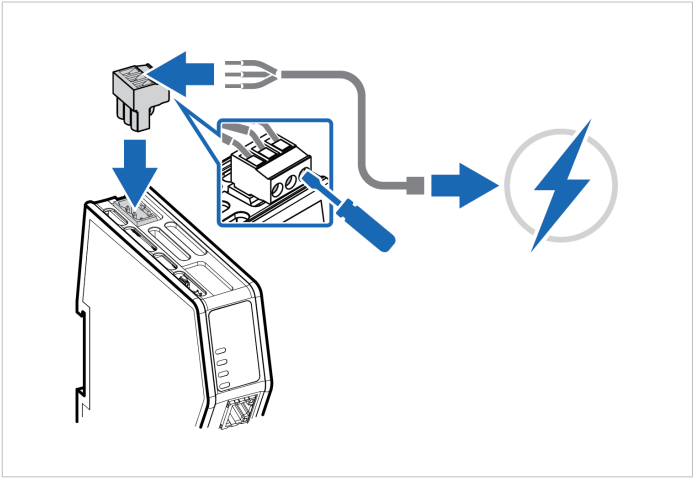
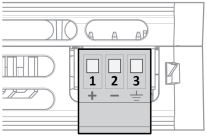


Figure 5. Connect to power

Power Connector Pinout

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

5.6. Security Switch

IMPORTANT
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 cannot be accessed, and the Communicator cannot be configured using the built-in web interface. Network specific parameters, configured via the PLC is still available.

To Lock and Unlock the Security Switch

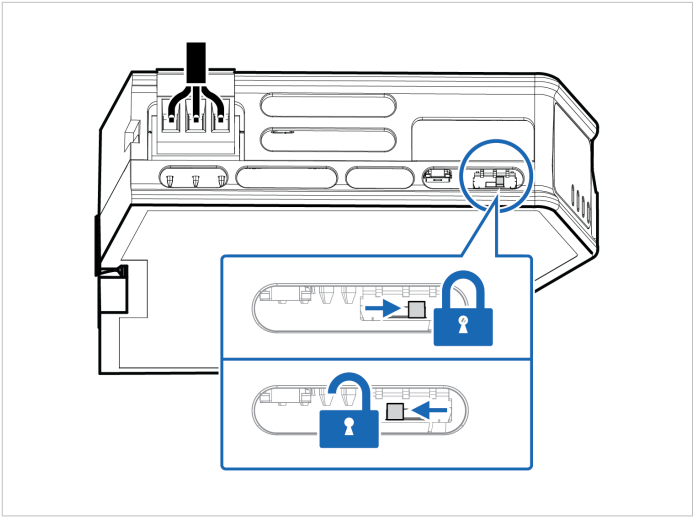


Figure 6. Security switch in locked and unlocked position

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

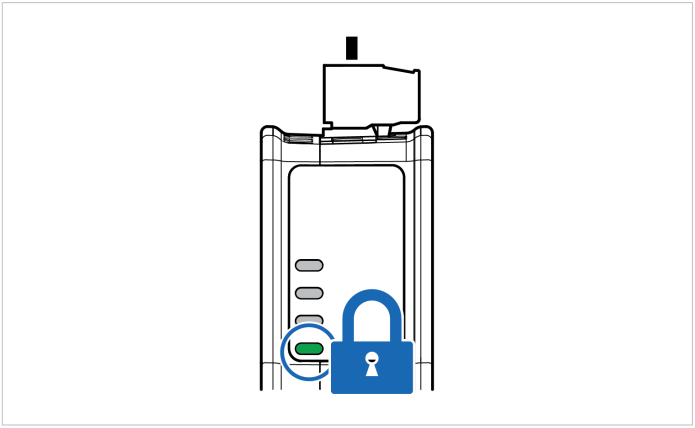


Figure 7. Security switch locked status LED

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. Lock the Cables

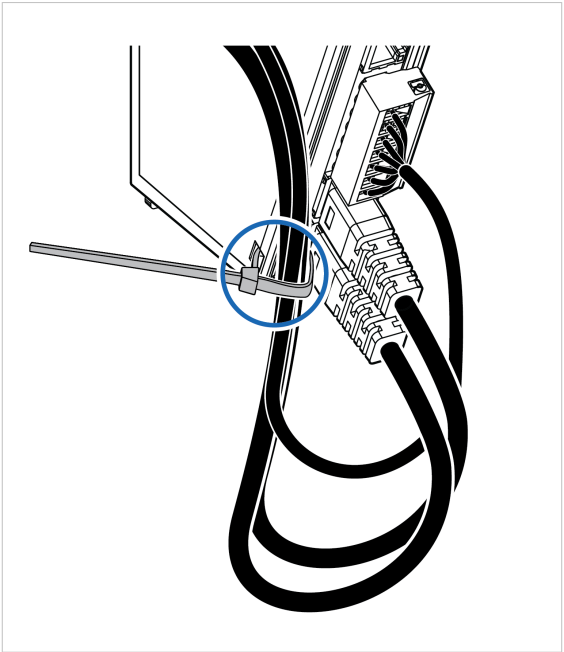


Figure 8. Lock the cables

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

5.8. DIN Rail Demount

Before You Begin

IMPORTANT
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.

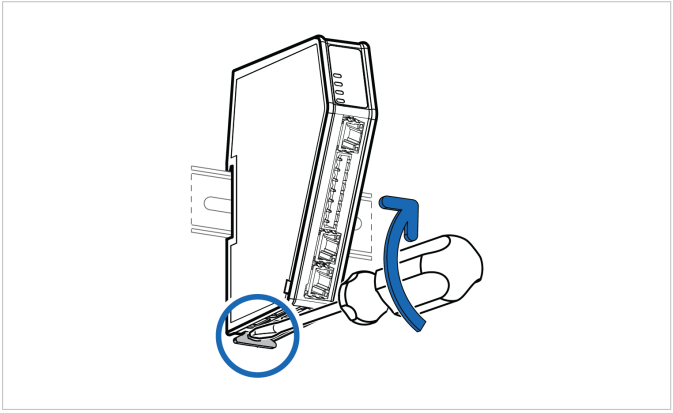


Figure 9. Unlock the Communicator

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

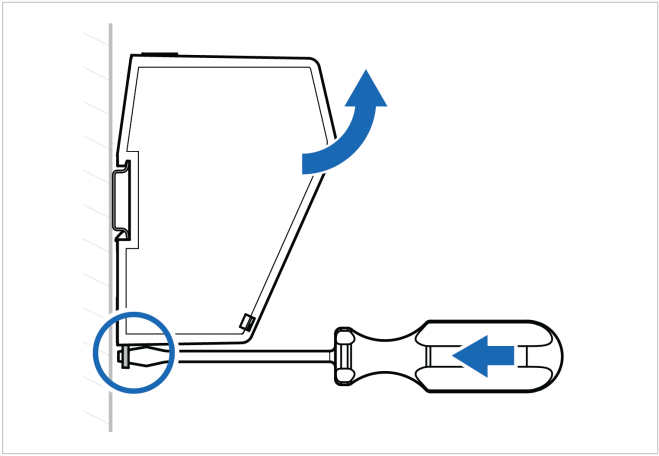


Figure 10. Unhook the Communicator

6. Configuration

6.1. Connect to PC and Power

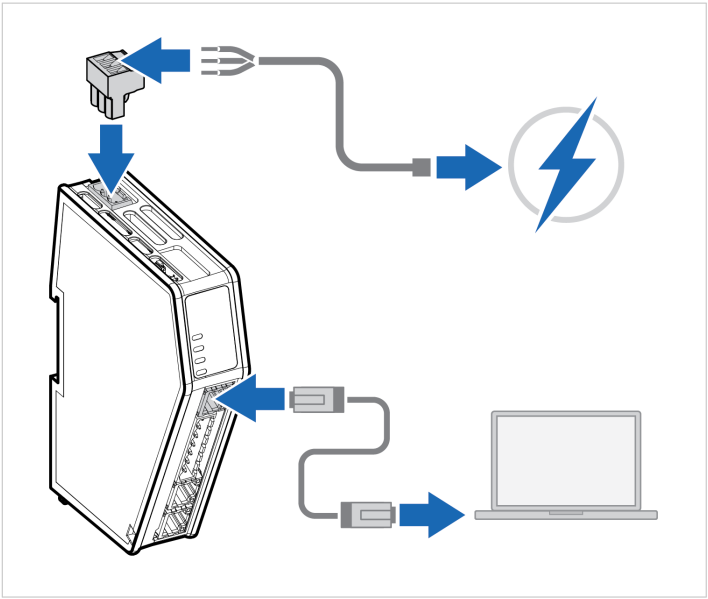


Figure 11. Connect to PC and Power

6.2. Find the Communicator on Your PC

The Communicator default IP address is 192.168.0.10.

To be able to access the Communicator built-in web interface you may need to adjust the IP settings, choose one of the following methods:

Option 1 | Set a static IP address on the PC

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.

To access the Communicator built-in web interface, ensure that port Port 80 TCP is open in your PC Windows Firewall.

Note that when you change to a static IP address on your PC, internet access is lost.

Option 2 | Change the IP address on the Communicator configuration port

Use the software application HMS IPconfig to find and change the IP address on the Communicator configuration port, to one within the same IP address range as the PC accessing the Communicator built-in web interface.

To download the installation files, please visit www.hms-networks.com/technical-support and enter the product article number to search for the Communicator support web page. You find the product article number on the product cover.

6.3. Configure the Communicator

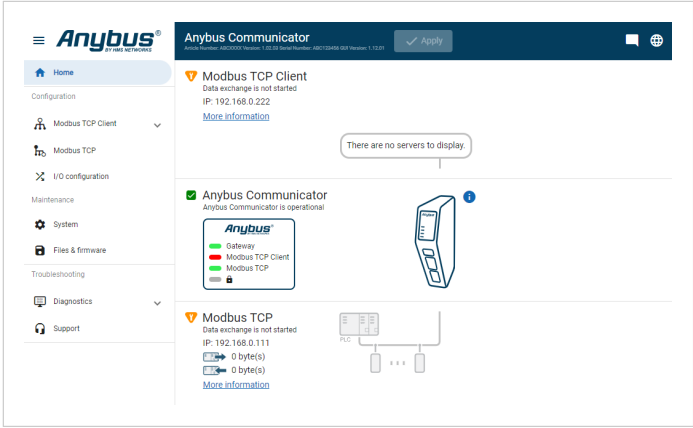


Figure 12. The Communicator built-in web interface Home page

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

The built-in web interface takes you through the steps to configure the Communicator.

Web Interface Language Settings

The default web interface language is **English**. To change language, click the **Language** icon and select a new language from the list. The language change takes effect immediately.

Support and Resources

If you need more in-depth information about the configuration, please visit www.hms-networks.com/technical-support and enter the product article number to search for the Communicator support web page. You find the product article number on the product cover.

6.4. Change Language

Default language is **English**.

To change the language of the Communicator built-in web interface:

1. In the Communicator built-in web-interface header, click the **Language** icon .

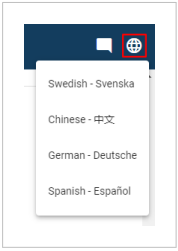


Figure 13. Language menu

2. Select a new language from the list.

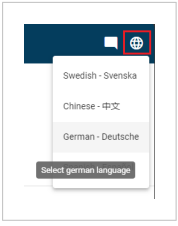


Figure 14. Example: Change language to German

The language change takes effect immediately.

7. Technical Data

For complete technical specifications and regulatory compliance information, please visit www.hms-networks.com.

7.1. Technical Specification

Article identification	ABC3210
Configuration connector	RJ45
Communication connector	7-pin screw connector
Modbus TCP Client connector	RJ45 x 2
Power connector	3-pin screw connector
Power supply	12-30 VDC, Reverse voltage protection and short circuit protection
Power consumption	Typical: 90 mA @ 24 V (2.2 W) Max: 3 W
Storage temperature	-40 to +85 °C
Operating temperature	-25 to +70 °C
Humidity	EN 600068-2-78: 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 (W x H x D) with connectors included
Mounting	DIN-rail

8. Communicator LED Indicators

NOTE
Before you can verify operation, you must configure the Communicator.

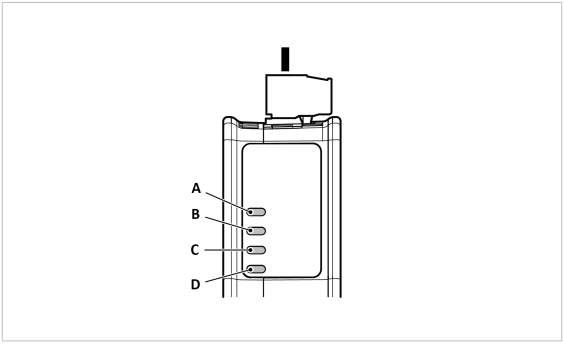


Figure 15. Gateway status (A), Network connection (B)/(C) and Security switch (D)

LED A - Gateway status	
Operation Status	**Description**
Off	No power
Green, flashing	Startup phase
Green, solid	Operational
Red, flashing	Invalid configuration
Green/Red, flashing	Power up self-test/Firmware update/Firmware recovery

Connection to high level network IO controller device

- **LED B for PROFINET netwok**
- **LED C for EtherNet/IP, EtherCAT, PROFIBUS, Modbus TCP, or Modbus RTU networks**

Operation status	EtherNet/IP	EtherCAT	PROFIBUS	PROFINET	Modbus TCP	Modbus RTU
Off	No power/No IP address.	No power	No power/No data exchange.	No power/No connection with IO controller.	No power/No Modbus TCP IP address.	No power, no active nodes, or all nodes are stopped.
Green, solid	Connection with IO controller established.	EtherCAT on.	Operate, data exchange.	Connection with IO controller established. IO controller in Run state.	Modbus TCP online, at least one message received.	At least one Modbus message received.
Green, one flash	N/A	N/A	N/A	Connection with IO controller established. IO controller in STOP state or IO data is inaccurate.	N/A	N/A
Green, flashing	EtherNet/IP online, no connections established.	EtherCAT online, no connections established.	Clear, data exchange.	Used by engineering tools to identify the node on the network.	Modbus TCP online, no messages received.	Waiting for first Modbus message.
Red, solid	IP address conflict detected.	Fatal event			IP address conflict detected.	Fatal event
Red, one flash	N/A	Unsolicited state change SubDevice application has changed the EtherCAT state autonomously.	Parameterization error.	Station name not set.	N/A	
Red, two flash	N/A	Sync Manager watchdog timeout.	Configuration error.	IP address not set.	N/A	

Connection to high level network IO controller device

- **LED B for PROFINET netwok**
- **LED C for EtherNet/IP, EtherCAT, PROFIBUS, Modbus TCP, or Modbus RTU networks**

Operation status	EtherNet/IP	EtherCAT	PROFIBUS	PROFINET	Modbus TCP	Modbus RTU
Red, three flash	N/A	N/A	N/A	Expected Identification differs from Real Identification .	N/A	
Red, flashing	Connection timeout	Invalid configuration.	N/A	N/A	Connection timeout	Connection timeout. No Modbus messages has been received within the configured process active timeout time.

Connection to subnetwork Modbus TCP client device

- **LED C for PROFINET network**
- **LED B or EtherNet/IP, EtherCAT, PROFIBUS, Modbus TCP, or Modbus RTU networks**

Operation status	Description
Off	No IP address.
Red, flashing	At least one connection error or timeout.
Red, solid	IP address conflict detected, or FATAL event.
Green, solid	No connections errors or timeouts.

Security switch - LED D	
Operation status	**Description**
Off	No power/Security switch is unlocked/Exception/Fatal error
Green	Security switch is locked

Fatal Error and Exception Error

Fatal error: A fatal error causes the Communicator firmware application to crash in an uncontrolled manner.

Exception error: An exception error causes the Communicator to enter a controlled error state. The Communicator firmware application is still running.

LED	Fatal error	Exception error
A	Red, solid	Red, solid
B	Red, solid	Off
C	Red, solid	Off
D	Off	Off

9. Ethernet LED Indicators

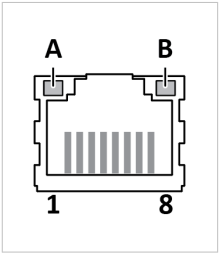


Figure 16. LED A. Activity LED B. Not used

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

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