

## Quick Startup Guide

### mbGate PA



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## Disclaimer of liability

The information contained in these instructions corresponds to the technical status at the time of printing of it and is passed on with the best of our knowledge. The information in these instructions is in no event a basis for warranty claims or contractual agreements concerning the described products, and may especially not be deemed as warranty concerning the quality and durability pursuant to Sec. 443 German Civil Code. We reserve the right to make any alterations or improvements to these instructions without prior notice. The actual design of products may deviate from the information contained in the instructions if technical alterations and product improvements so require.

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# 1 About this guide

## 1.1 Read me first

Please read this guide carefully before using the device to ensure safe and proper use. Softing does not assume any liability for damages due to improper installation or operation of this product.

## 1.2 Target audience

This guide is intended for experienced operation personnel and network specialists responsible for configuring and maintaining field devices in process automation networks. Any person using a mbGate PA must have read and fully understood the safety requirements and working instructions in this guide.

## 1.3 Typographic conventions

The following conventions are used throughout Softing customer documentation:

Keys, buttons, menu items, commands and other elements involving user interaction are set in bold font and menu sequences are separated by an arrow

Open **Start** → **Control Panel** → **Programs**

Buttons from the user interface are enclosed in brackets and set to bold typeface

Press **[Start]** to start the application

Coding samples, file extracts and screen output is set in Courier font type

MaxDlsapAddressSupported=23

Filenames and directories are written in italic

Device description files are located in C:  
\\<Application name>\\delivery\\software  
\\Device Description files



### **CAUTION**

This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury



### **Note**

This symbol is used to call attention to notable information that should be followed during installation, use, or servicing of this device.



### **Hint**

This symbol is used when providing you with helpful user hints.

## **1.4 Document feedback**

We would like to encourage you to provide feedback and comments to help us improve the documentation. If you have a PDF copy of this document simply write your comments and suggestions to the PDF file using the editing tool in Adobe Reader and email your feedback to [support.automation@softing.com](mailto:support.automation@softing.com).

If you prefer to write your feedback directly as an email, please include the following information with your comments:

- document name
- document version (as shown on cover page)
- page number

## 2 About mbGate PA

The mbGate PA from Softing is a Modbus gateway that connects PROFIBUS PA field devices with Modbus devices via a Modbus controller. Up to 64 PROFIBUS PA field devices can be connected to almost any type of controller.

### Two models, two versions

The mbGate PA is available as 2-channel model and a 4-channel model. Both models come in two versions. The only difference between these versions is the installation position which is rotated by 180°, including front panel and the LED position (see cover image).

### Engineering systems and asset management systems

The mbGate PA can be managed in the following systems:

- Modbus engineering system (e.g. Siemens TIA Portal, Schneider Unity Pro)
- FDT-based device configuration
- Siemens SIMATIC PDM (Process Device Manager)

## 2.1 Intended use

This gateway is designed and intended to connect Modbus devices with PROFIBUS PA field devices on different network segments. Any other use is not intended. Follow the instructions in this manual on how to use the mbGate PA.



### CAUTION

This gateway is not ATEX-certified and may not be used in explosive atmospheres or any other hazardous areas. The permissible ambient conditions given in Chapter [Technical Data](#)<sup>26</sup> must be observed.

## 2.2 Scope of delivery

The delivery of the mbGate PA includes the following parts:

- mbGate PA device
- CD-ROM including drivers, firmware, tools video tutorial and user guide
- Printed Quick Startup Guide

## 2.3 Supported features

The Softing mbGate PA gateway supports the following features:

- Simple connection to PROFIBUS PA devices using Modbus controllers.
- Two PROFIBUS PA segments for up to 16 devices per segment. An optional licence key supports 4 segments.
- Integration in FDT frame applications.
- Integration in Siemens SIMATIC PDM.
- Configuration of the gateway in a web browser.
- Integrated configurator to start up the PROFIBUS PA devices.
- Access to PROFIBUS PA process values (input und output) in the Modbus control program.
- Access to operation state and Life Sign of the PROFIBUS PA devices in the Modbus control program.
- Changing of operation state of the PROFIBUS PA Master (STOP / RUN) in the Modbus control program.



- Acyclic reading and writing of device parameters in the Modbus control program.
- Detailed display of the operation state by LEDs.
- Two Ethernet interfaces (connected internally on a single switch).
- Power supply by connectors or rail connectors.

## 2.4 System requirements

This gateway can be used in combination with a Modbus engineering system such as a Schneider Unity Pro or Siemens TIA Portal. When the gateway is used to parameterize PROFIBUS PA devices you need an FDT frame application, e.g. PACTware or Siemens SIMATIC PDM. See the user guide for details. Also required are:

- 24V power supply
- one power conditioner per segment
- field barrier (for Ex environment)
- PC with web browser
- GSD file for each PROFIBUS device in your network

## 2.5 Safety precautions



### **CAUTION**

During operation, the surface of the device will be heated up. Avoid direct contact. When servicing the gateway, turn off the power supply and wait until the surface has cooled down.



### **Note**

Do not open the housing of the mbGate PA. It does not contain any parts that need to be maintained or repaired. In the event of a fault or defect, remove the device and return it to the vendor. Opening the device will void the warranty!

## 3 Installation

### 3.1 Hardware installation



#### Note

With an ambient temperature above 55 °C at the place of installation it is very likely that the temperatures of connecting cables will increase if the cables are installed in an unfavourable position. In such cases, measure the temperature to ensure that the service temperature of the cables is not exceeded (i.e. 80 °C), or use cables sustaining high temperatures of at least 90 °C.

#### 3.1.1 Mounting and dismounting



#### Note

Make sure the mbGate PA is mounted in a manner that the power supply disconnecting device or interrupt facility can always be reached easily.



#### Note

Depending on the installation position, the maximum ambient operating temperature may differ. Refer to [Technical Data](#) <sup>26</sup> for detailed information.

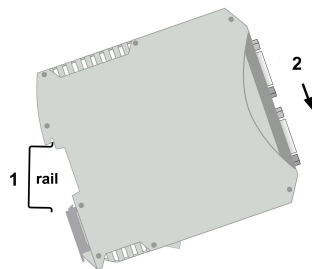


#### Installation and inspection

Installation and inspection must be carried out by qualified personnel only (personnel qualified according to the German standard TRBS 1203 or similar (Technical Regulations for Operational Safety)). The definition of terms can be found in IEC 60079-17.

## Mounting

1. Hook the upper notch of the cut-out on the back of the mbGate PA into a 35 mm DIN rail.
2. Press the mbGate PA down towards the rail until it slides into place over the lip of the locking bar.

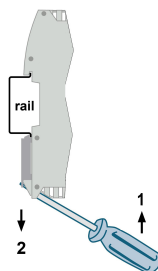


### Note

Do not put stress on the device by bending or torsion.

## Dismounting

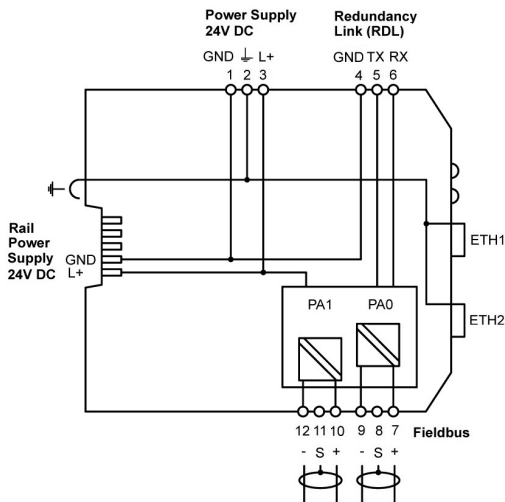
1. Slide a screwdriver diagonally under the housing into the locking bar.
2. Lever the screwdriver upwards, pull the locking bar downwards - without tilting the screwdriver - and move the gateway upwards off the rail.



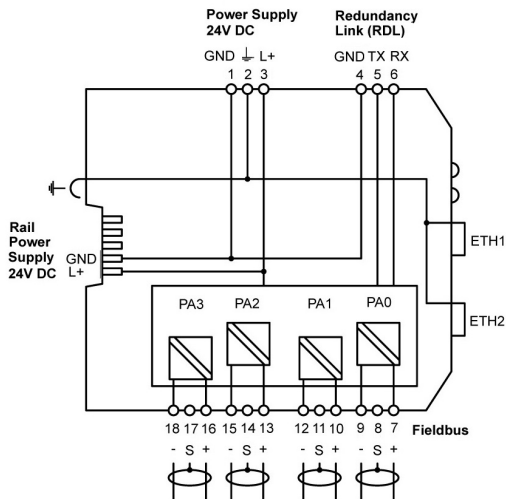
### 3.1.2 Connection diagrams

The mbGate PA is available as a 2-channel model and a 4-channel model. The Redundancy Link (RDL) has no function in this version of the device. The 2-channel model has 2 physical PROFIBUS segment connections (PA0 and PA1), while the 4-channel model supports 4 physical PROFIBUS segment connections (PA0 to PA3). Both models have two 10/100 Base-T Ethernet ports (ETH1 and ETH2). The following diagrams show the side profile of the two models with the input and output interfaces.

#### 2-channel model



## 4-channel model



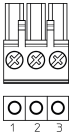

### 3.1.3 Connecting the power supply



#### Note

As the mbGate PA gateway does not supply power to the PROFIBUS PA connections (PA0 to PA3), each PA segment of your PROFIBUS network requires its own power supply with power conditioning (such as power conditioner R.STAHL 9412) and a field barrier for connecting to devices in explosive atmospheres.

Connect the device to a 24 V DC power supply. The supply voltage (18 VDC .... 32 VDC) is connected by a 3-pole terminal block. The power supply is connected to the plug connector via flexible wires with a cross section of 0.75 to 1.5 mm<sup>2</sup>. The ground connection wire must have a cross section of 1.5 mm<sup>2</sup>.

	Pin	Signal	Description
	1	GND	Ground
	2		Functional earth
	3	L+	Positive supply voltage



#### CAUTION

The Functional Earth (FE) connection of the device has to be connected at low inductance with the Protective Earth (PE) of the system.



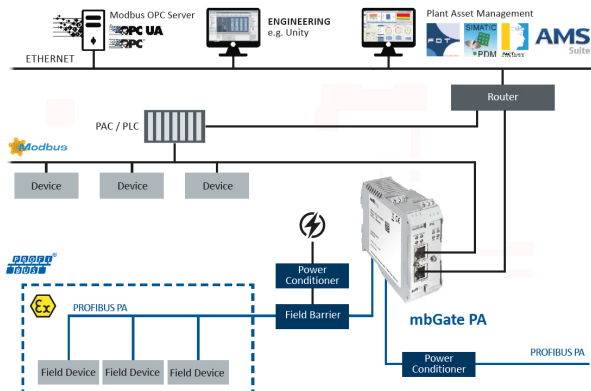
#### Note

As the connection diagrams show, power can also be applied by a special DIN rail connector (Rail Power Supply). For further details contact Softing Industrial Automation GmbH.

### 3.1.4 Connecting to the network

1. Connect each segment of your PROFIBUS PA network via a power conditioner to a PROFIBUS PA port of your gateway (PA0 to PA1 for 2-channel model and PA0 to PA3 for 4-channel model). If you connect to field devices in explosive atmospheres ensure that you also connect a field barrier in between.
2. Connect the mbGate PA from one of the two Ethernet ports with your Modbus network.
3. Connect your PC running the engineering and asset management tools with the second Ethernet port using.

#### Network topology of a 2-channel gateway





### 3.1.5 Powering up the device

Turn on the power supply. The boot process will take around 15 seconds. For indication of proper operation refer to section [LED status indicators](#)<sup>21</sup>.

## 3.2 Software installation

When you install a Softing product for the first time, you will be asked in a dialogue window if you to trust the publisher. Activate the option **Always trust software from Softing AG** if you do not want to be asked in subsequent installations and select **[Install]** to start the installation.

1. Insert the CD *Software and Documentation for Fieldbus Gateways* into the CD drive.
  - a. If Autorun is enabled on your system, the startup page is opened.
  - b. If Autorun is disabled, open an Explorer window, select your CD drive and double-click the file start.exe in the CD's root directory.
2. Select Installation of the mbGate PA Software and Documentation in the Start menu.
3. Install the mbGate PA software.

With the *SearchAndConfigure* function you will be able to detect and modify IP addresses. See the See the User Guide for more details.
4. Install PDM libraries if you are using a Siemens PDM application.
5. Install PACTware if no other FDT frame application is used.

PACTware and the Softing PROFIdtm will be installed.
6. Install PROFIdtm if you prefer using another FDT frame application like FieldCare or FieldMate.

## 4 Using the webserver interface

After you have established an IP connection between your PC and the gateway you can access the mbGate PA from your PC via a web browser that supports Java script (e.g. Google Chrome).

### 4.1 Login to webserver

1. Start your web browser with the mbGate PA default URL <http://192.168.0.10> .  
You will be prompted to log in with username and password.
2. Enter **administrator** in the **Username** field and **FGadmin!1** in the **Password** field  
The information page is opened. Depending on the web browser you are using the information presentation may vary.

### 4.2 Version information

The web interface of the gateway opens with the information page displaying details about the device and the system. Modules and devices are identified by hardware version numbers and serial numbers. The firmware version, the system id and a manufacturer-specific identifier for the system are also shown.

### 4.3 Changing the password

1. Select **Configuration → System Maintenance → User Accounts**.
2. Enter the name of the user whose password you want to change, the old password and the new password in the corresponding field(s).
3. Retype the new password in the Confirm field and click **[Change Password]** to confirm the modified password.



#### Note

Change the administrator password with great care! If you lose your changed administrator password, you can no longer make changes to configurations or settings. In this case contact the Softing support.

The following default logins and passwords are available and can be changed:

Role	Username	Password
Administrator	administrator	FGadmin!1
Maintenance	config	FGconfig!1
Observer	view	FGview!1
Expert*	expert	FS-QsHnc7BWa{6w<
Diagnostics*	diagnosis	?<fJ#/\$eB2qtGd*

\* Backdoor accounts for Softing Support access. Currently supporting same features as administrator account.

The table below shows which actions can be executed by the different roles:

Action	Admin / Expert / Diagnostics	Maintenance	Observer
Setting password	<input checked="" type="checkbox"/>		
Configuring gateway	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Reading configuration	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Reading diagnostics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## 4.4 Updating the firmware

By updating the firmware you will reset the default password and install new firmware file(s).

1. Log in to the gateway.
2. Select **Configuration** → **System Maintenance** → **Firmware**.  
This page will allow you to update the firmware and if needed delete gateway configuration data like IP settings and passwords.
3. Click **[Choose File]** in the **Select Firmware** field and select the firmware file you want to download.
4. Click **[Download Firmware and Reboot]** to download the firmware file and to reboot the system.  
The system performs a firmware file check. The download is started. System messages will inform you about the download status. When the download is completed the mbGate PA will be rebooted.



### Note

Do not access the web server of the mbGate PA before the "Success" message is displayed in the browser window. Otherwise you will have to clear the cache of your web browser after the boot process has finished and set up a connection to the web server of the mbGate PA.









When the boot process is completed, the RUN LED is ON.

## 5 LED status indicators



The front side of the device shows eight LEDs:

<b>PWR</b>	<b>power supply</b>
<b>RUN</b>	<b>running</b>
<b>ERR</b>	<b>error</b>
<b>CFG</b>	<b>configuration</b> - displays configuration upload
<b>SF</b>	<b>system faults</b> - displays Modbus/PROFIBUS system faults (wrong configuration, internal error, ...)
<b>BF</b>	<b>bus faults</b> - displays Modbus/PROFIBUS bus faults









The LEDs may be on permanently or flash in different colors and frequencies. We use the following symbols:











Symbole	Colour	Mode
	none	off
	red	permanently on
	green	permanently on
	red	flashing (1 Hz)
	red	flashing quickly (5 Hz)
	green	flashing (1 Hz)
	green	flashing slowly (0.5 Hz)
	green	flashing quickly (5 Hz)

## 5.1 PWR - power supply













	permanent green	24V DC power supply is ok
	off	no power supply

## 5.2 Status LEDs (PWR, RUN, ERR and CFG)

LEDs		Meaning
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>		<b>Start-up phase</b> (approximately 10 seconds) 24V DC power supply is ok.
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>		<b>Operating system</b> starts (approximately 2 seconds)
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>		<b>Device is running in factory mode</b> (only firmware update is possible)
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>		<b>Device is running/operational</b>













LEDs	Meaning
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>	<b>Software error</b> A software error occurred. Reboot the device. Refer to error description in web browser.
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>	<b>Permanent hardware fault detection during startup</b> A fatal error has been detected. Refer to error description in web browser.
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>	<b>Software error occurred, device has restarted automatically and error is reported in log file</b> Delete log file in web browser.
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>	<b>Firmware update is running (in factory mode if RUN LED blinking red)</b>
<div> <div>PWR</div>  <div>ERR</div> </div> <div> <div>RUN</div>  <div>CFG</div> </div>	<b>No power on device</b> Check power supply.

### 5.3 Modbus LEDs (MB)

LEDs	Meaning
<div> <div>SF</div>  </div> <div> <div>BF</div>  </div>	<b>No connection to a Modbus client</b> The communication between the gateway and Modbus client is interrupted.
<div> <div>SF</div>  </div> <div> <div>BF</div>  </div>	<b>Connection establishment</b> Time period the system needs to establish a connection; devices cannot yet communicate with each other.
<div> <div>SF</div>  </div> <div> <div>BF</div>  </div>	<b>Connected to the controller</b> All devices are exchanging data.
<div> <div>SF</div>  </div> <div> <div>BF</div>  </div>	<b>Configuration error or diagnosis</b> Read errors from Modbus engineering system.
<div> <div>SF</div>  </div> <div> <div>BF</div>  </div>	<b>Modbus signal function active</b>
<div> <div>SF</div>  </div> <div> <div>BF</div>  </div>	<b>Error in the Modbus part of the device</b> An error such as a software error or a licence error has occurred.



## 5.4 PROFIBUS Master LEDs (PA)

LEDs	Meaning
  <b>SF</b> <b>BF</b>	<b>All channels offline</b>
  <b>SF</b> <b>BF</b>	<b>All devices exchange data on all channels</b>
 /   <b>SF</b> <b>BF</b>	<b>At least one used channel is not online</b>
  /  <b>SF</b> <b>BF</b>	<b>At least one slave is not in data exchange</b> (BF: green - all channels are online; red: not any channel is online.)
  <b>SF</b> <b>BF</b>	<b>Error in the PROFIBUS part of the device</b> An error such as a software error or a license error has occurred.

## 6 Technical data

### 6.1 Specifications

Power supply	18 VDC...32 VDC; SELV/PELV supply mandatory Typical input current: 200 mA, maximum input current: 1 A (allowing for rush-in current at switch-on). No power supply to PROFIBUS PA segments through mbGate PA.
Ethernet	IEEE 802.3 100BASE-TX/10BASE-T
Minimum ambient operating temperature	-40 °C (see <a href="#">Installation positions</a> □ <sup>27</sup> for the maximum ambient temperature depending on the mounting position)
Storage temperature	-40 °C...+85 °C
Altitude	Must not exceed 2,000 m
Location	Indoor use only; no direct sunlight
Safety standard	IEC/EN/UL 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements  IEC/EN/UL 61010-2-201 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 2-201: Particular requirements for control equipment.

## 6.2 Installation positions

The mbGate PA can be mounted horizontally and vertically. Depending on the installation position, different ambient operating temperatures ( $T_a$ ) are allowed:



### Minimum distance

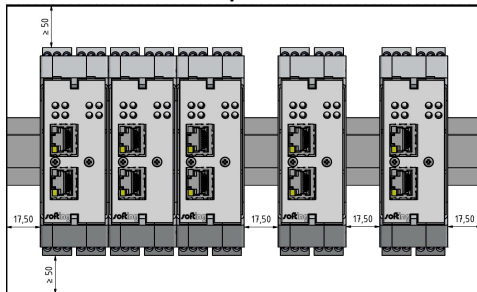
Provide a minimum distance of 50 mm to the air inlet and air outlet to ensure natural convection.



### Rotated installation position

The maximum permissible ambient temperature values also apply to a 180° rotated installation position.

### Horizontal installation position



Minimal distance	Maximum permissible ambient temperature $T_a$
0 mm	55 °C
17.5 mm	65 °C

Technical drawing of a 48-port patch panel (type 4800) showing front and rear views. The drawing includes dimensions and labels for components.

**Dimensions:**

- Overall height: 17.50
- Overall width: 50
- Port spacing: 17.50

**Labels:**

- 4800 (Model number)
- 48 (Number of ports)
- 17.50 (Port spacing)
- 50 (Overall width)

**Front View (Top):** Shows the panel with 48 ports arranged in 4 rows of 12. Each port is labeled with a number (1-48) and a status indicator (ON/OFF). The panel is labeled "4800" and "48".

**Rear View (Bottom):** Shows the back of the panel with 48 ports arranged in 4 rows of 12. Each port is labeled with a number (1-48) and a status indicator (ON/OFF). The panel is labeled "4800" and "48".

Minimal distance	Maximum permissible ambient temperature T <sub>a</sub>
0 mm	40 °C
17.5 mm	50 °C

## 7 Declaration of conformity

This device is compliant with EC directive 2014/30/EG for "Electromagnetic Compatibility" (EMC) and meets the following harmonized standards:

- EN 55011 Industrial, scientific and medical (ISM) devices - radio disturbance - limits and methods of measurement
- EN 55032 Electromagnetic compatibility of multimedia equipment (MME) and interference emission
- EN 61000-6-4 Electromagnetic compatibility (EMC); Part 6-4: generic standard – emission for industrial environments
- EN 61000-6-2 Electromagnetic compatibility (EMC); Part 6-2: generic standard - immunity for industrial environments



### Note

To fulfill the EMC requirements, the other components of your installation (DC adapter, Industrial Ethernet devices, etc.) also have to meet the EMC requirements. A shielded cable must be used. In addition, the cable shield must be grounded properly.



### CAUTION

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures!



### CE

A Declaration of Conformity in compliance with the above standards has been made and can be requested from Softing Industrial Automation GmbH.



### **ROHS**

This product is ROHS compliant.



### **FCC**

This equipment has been tested and found to comply with the limits for a Class A digital device, under part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.



### **VCCI**

This Class A product conforms to the regulations of Voluntary Control Council for Interference (VCCI) by Information Technology Equipment.



### **WEEE**

Electrical and electronic equipment must be disposed of separately from normal waste at the end of its operational lifetime. Packaging material and worn components shall be disposed of according to the regulations applicable in the country of installation.

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