

Quick Startup Guide

epGate PN



Version: EN-072018-1.00

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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 an epGate PN 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

File names 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.

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 epGate PN

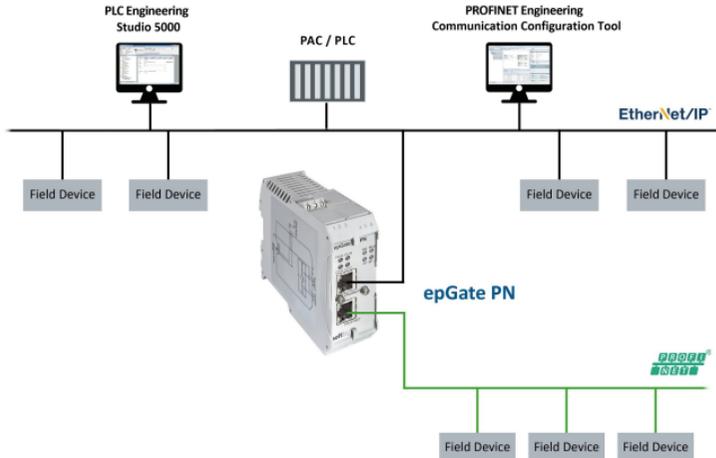
epGate PN is a gateway intended for mapping EtherNet/IP data to PROFINET devices in factory and process automation. The gateway is designed to work on the concept of assembly objects transferring data cyclically between EtherNet/IP and PROFINET devices. epGate PN collects data in an input assembly object and writes it to an output assembly object where it can be retrieved by the programmable logic controller (PLC) or any other connected I/O network devices.

epGate PN supports two input and two output assemblies. When the field devices have been configured using the Communication Configuration Tool the data is automatically exchanged between the EtherNet/IP and the PROFINET network. However, the amount of data that can be transferred, collected and processed is limited due to a number of reasons explained below:

Data exchange limitations

- epGate PN collects the data of I/O devices in two input and two output assembly objects.
- Each assembly object can hold a maximum of 255 bytes.
- Some PLCs support only one pair of input and output assemblies.
- The overall amount of data that can be exchanged with epGate PN is restricted to 1020 bytes (4 x 255 bytes).
- With the standard epGate PN solution you can connect to a maximum of 16 PROFINET devices. With a software license upgrade your epGate PN can interact with up to 32 field devices.

Network overview



The epGate PN can be managed from your PC with the following tools:

- RS Logix 5000/Studio 5000 or any other EtherNet/IP PLC engineering tool
- Communication Configuration Tool
- Search And Configure Tool

2.1 Intended use

epGate PN has been designed to connect PROFINET IO devices to EtherNet/IP and PLCs in factory and process automation.



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 specifications](#) ²⁸ must be complied with.

2.2 Scope of delivery

The epGate PN comprises the following parts:

- epGate PN device
- CD-ROM including tools, manuals, sample projects and additional material
- Printed Quick Startup Guide

2.3 Supported features

The Softing epGate PN gateway supports the following features:

- Simple connection to PROFINET devices using EtherNet/IP controllers.
- Access to PROFINET process values (input and output) in the EtherNet/IP control program.
- Access to operation state and Life Sign of the PROFINET devices in the EtherNet/IP control program.
- Detailed display of the operation state by LEDs.
- Power supply by connectors or rail connectors.
- Automatic mapping between PROFINET data and EtherNet/IP data by the Communication Configuration Tool.

2.4 System requirements

Operation of the epGate PN requires the following components:

- At least one PROFINET device and GSDML file
- 24V power supply
- PC with web browser
- Communication Configuration Tool (part of supplied CD-ROM) installed on PC
- Ethernet IP PLC and associated engineering software (e.g. Rockwell Studio 5000)
- DHCP server for EtherNet/IP side of the gateway (e.g. part of the plant network, the PLC or a local PC tool like Rockwell's BOOTP-DHCP Server)
- Ethernet cables and if necessary Ethernet switches

2.5 Safety precautions



CAUTION

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



Note

Do not open the housing of the epGate PN. 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 dismantling



Note

Make sure the epGate PN 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 specifications](#) ²⁸ for detailed information.

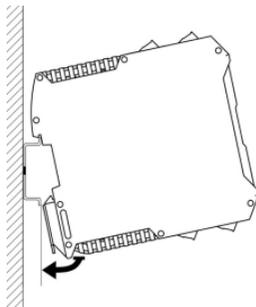


Installation and inspection

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

Mounting

1. For mounting the epGate PN on a DIN rail (35 mm), attach the two upper notches to the rail.
2. Press the device down towards the rail until it locks into place.

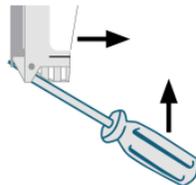


Note

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

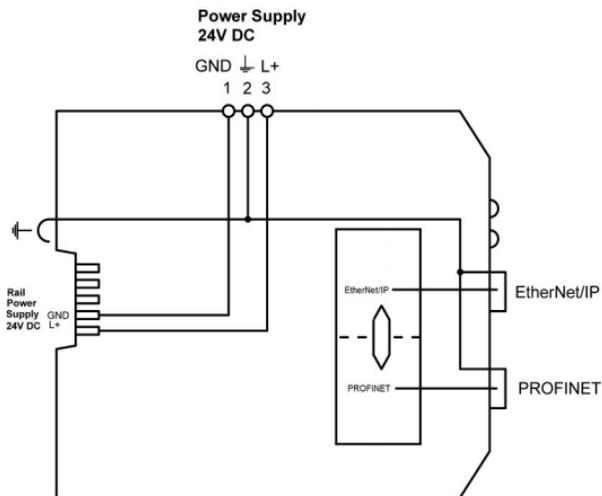
Dismounting

1. Slide a screw driver horizontally underneath the housing into the locking bar.
2. Slide the bar downwards – without tilting the screw driver - and fold the device upwards.



3.1.2 Connection diagrams

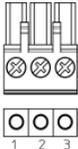
The following connection diagram shows the side profile of the epGate PN with its input and output interfaces:



3.1.3 Connecting the power supply

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 mm². The ground connection wire must have a cross section of 1.5 mm².

	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

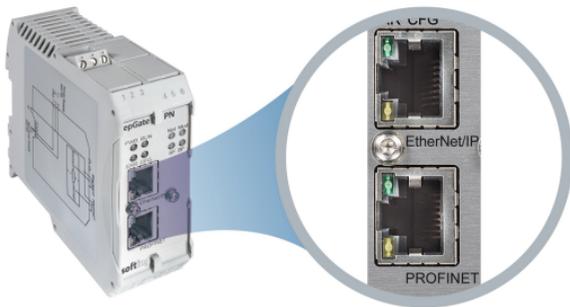
The epGate PN has an EtherNet/IP and a PROFINET network connection.

1. Connect the PROFINET devices to the PROFINET output.
2. Connect the EtherNet/IP devices to the EtherNet/IP output.



Note

We strongly recommend connecting the two Ethernet interfaces to different physical LAN networks (EtherNet/IP communication system and PROFINET communication system).



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 [LED status indicators](#) .

3.1.6 Ethernet ports

The epGate PN is equipped with two 10/100 Base-T Ethernet ports (RJ45). Both ports are connected to the switch. The Ethernet ports conform to the IEEE 802.3 and have the following pin assignment.

Ethernet Port 1 (ETH 1):

Pin	Signal	Description
1	TX+	Transmit signal positive
2	TX-	Transmit signal negative
3	RX+	Receive signal positive
4	Not used	Drain wire
5	Not used	Drain wire
6	RX-	Receive signal negative
7	Not used	Drain wire
8	Not used	Drain wire

Ethernet Port 2 (ETH 2):

Pin	Signal	Description
1	TX+	Transmit signal positive
2	TX-	Transmit signal negative
3	RX+	Receive signal positive
4	Not used	Drain wire
5	Not used	Drain wire
6	RX-	Receive signal negative
7	Not used	Drain wire
8	Not used	Drain wire

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 "*Softing Fieldbus Gateway Software and Documentation*" 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 epGate PN Software and Documentation* in the start menu.
3. Install the Softing Communication Configuration Tool.
4. Install the *Search And Configure* software.

With the *Search And Configure* function you will be able to detect and modify device IP addresses. See the User Guide for more details..

4 Using the web interface

When your PC and the gateway have an IP connection, start a web browser that supports JavaScript (Google Chrome) to access the gateway from your PC to familiarize yourself with the device and system details and to perform one of the following tasks.

4.1 Login to web server

The IP address of the web server in the EtherNet/IP LAN is configured by default via DHCP. The default IP address for the Ethernet interface in the PROFINET LAN is 0.0.0.0.

1. Start the *Search And Configure* tool on your PC to retrieve the current web server IP address of the epGate PN.
The search will open a new window showing the devices connected to your Local Area Network (LAN).
2. Click on the IP address of your epGate PN in the IP Address column.
This will launch the login window of your epGate PN in your web browser.
3. Enter **administrator** in the **Username** field and **FGadmin!1** as **password**.
The epGate PN information page is opened. Depending on the web browser you are using the information presentation may vary.

4.2 General information

This window provides detailed information about the device and the system. The device is identified by hardware version numbers and serial numbers. Additionally, the firmware version, the system ID and a manufacturer-specific identifier for the system and the open source declarations and open source software packages used are shown.

4.3 Changing the password

1. Select **Settings** → **User Accounts**.

As administrator you can change and confirm the passwords for different roles.

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 your new password and click **[Apply]** to confirm the modified password.



Note

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#\SeB2qtGd*

* 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 on to the gateway.
2. Select **Settings** → **Firmware** in the side bar navigation.
3. Click **[Choose Firmware File...]** to select the firmware file you want to download.
4. Tick the checkbox in the field **Erase Configuration**.
If you tick the checkbox your current configuration data will be deleted and your password is reset to default.
5. Click **[Update]** to download the firmware file and to reboot the system.
The system performs a firmware file check. The download starts automatically. When the download is completed the epGate PN will be rebooted.



Note

Do not access the web server of the epGate PN 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 reconnect to the web server of the epGate PN.

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

5 LED status indicators

The front side of the device shows eight LEDs:

PWR	power supply - displays the power status
RUN	running - displays the status (on/off)
ERR	error - displays information/mapping
CFG	configuration - displays configuration upload
NET	Network - displays EtherNet/IP Network status
Mod	Module - displays EtherNet/IP module status
SF	system faults - displays PROFINET system faults
BF	bus faults - displays PROFINET 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 Gateway status LEDs (PWR, RUN, ERR and CFG)

LEDs		Meaning
PWR   ERR	RUN   CFG	Start-up phase (approximately 10 seconds) 24V DC power supply is ok.
PWR   ERR	RUN   CFG	Operating system starts (approximately 2 seconds)
PWR   ERR	RUN   CFG	Device is running in factory mode (only firmware update is possible)
PWR   ERR	RUN   CFG	Device is running/operational
PWR   ERR	RUN   CFG	Software error A software error occurred. Reboot the device. Refer to error description in web browser (Diagnosis → Logfile → Support Data).

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

5.2 PROFINET status LEDs (SF and BF)

The LEDs indicate one of the following meanings:

LEDs		Meaning
 SF	 BF	Not powered.
 SF	 BF	Operating. The network status is ok.
 SF	 BF	Controller has been successfully configured.
 SF	 BF	Configuration failed. PROFINET protocol has not been configured successfully Device issue. At least one configured device is not in data exchange mode Non volatile storage problem. Application watchdog has expired
 SF	 BF	Address conflict detected. The network communication may be disturbed Internal error. The UDP stack has reported an internal unrecoverable error Duplicate name error. A duplicated name has been detected.

5.3 EtherNet/IP status LEDs

Network status

LED	Meaning
	<p>Not powered, no IP address, no Ethernet link</p> <p>The device is powered off, or is powered on with no IP address configured</p>
	<p>No connections</p> <p>An IP address is configured, but no CIP connection is established</p>
	<p>Connected</p> <p>An IP address is configured, at least one CIP connection is established</p>
	<p>Connection timeout</p> <p>An established connection has timed out</p>
	<p>Duplicate IP address</p> <p>For devices that support duplicate address detection, the device has detected that its IP address is already in use</p>
 	<p>Self-test</p> <p>The device is performing its power up testing</p>

Module status

LED	Meaning
	<p>No power No power is supplied to the device</p>
	<p>Operating The device is operating correctly</p>
	<p>Standby The device has not been configured</p>
	<p>Major recoverable fault The device has detected a recoverable error Note: An incorrect or inconsistent configuration is considered a major recoverable fault</p>
	<p>Major unrecoverable fault The device has detected a non-recoverable error</p>
 	<p>Self-test The device is performing its power-up testing</p>

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).
Ethernet	IEEE 802.3 100BASE-TX/10BASE-T
Minimum ambient operating temperature	-40 °C (see section Installation positions ²⁹ 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

6.2 Installation positions

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



Minimum distance

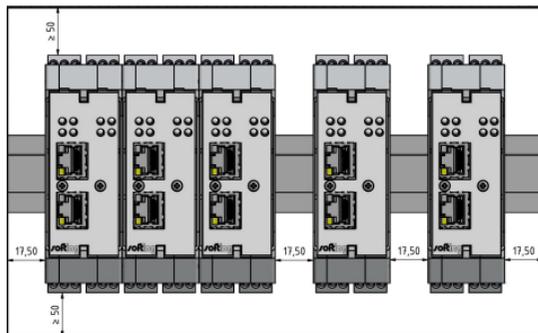
Provide a minimum distance of 50 mm to the air inlet and air outlet to ensure natural convection.



Rotated installation position

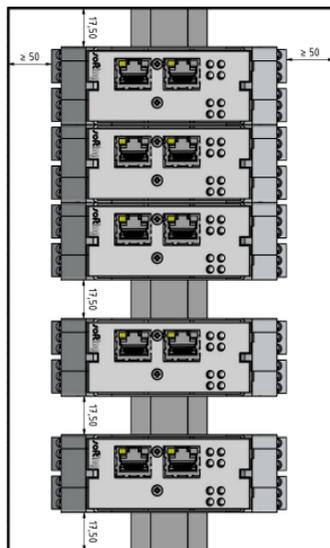
The maximum permissible ambient temperature values also apply to a 180° rotated installation position.

Horizontal installation position



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

Vertical installation position



Minimal distance	Maximum permissible ambient temperature T_a
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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