

Quick Startup Guide

pnGate PA/pnGate PB



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Softing Industrial Automation GmbH

Richard-Reitzner-Allee 6
85540 Haar / Germany
<http://industrial.softing.com>



+ 49 89 4 56 56-340



+ 49 89 4 56 56-488



info.idn@softing.com

support.automation@softing.com

The latest version of this manual is also available in the Softing download area at
<http://industrial.softing.com/en/downloads.html>

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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 this gateway 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.

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 pnGate PA/pnGate PB

The Softing pnGate PA/pnGate PB is a PROFINET gateway integrating PROFIBUS PA and PROFIBUS DP segments in PROFINET systems.

- **pnGate PA** is designed for direct integration of PROFIBUS PA (**P**rocess **A**utomation) segments in PROFINET systems at a fixed speed of 31.2 kbit/s, typically used in areas of process automation with explosive atmosphere.
- **pnGate PB** integrates PROFIBUS PA and additionally PROFIBUS DP (**D**ecentralised **P**eripherals) networks in PROFINET systems at speeds of up to 12Mbit/s, typically via a centralized controller in factory automation.

Both gateways support industry-standard device configuration, parameterization and condition-monitoring tools.

Devices connected to pnGate PA/pnGate PB can be managed with the following tools:

1. PROFINET engineering systems (e.g. Siemens TIA Portal)
2. FDT-based device configuration
3. Siemens SIMATIC PDM (Process Device Manager)

2.1 Intended use

The pnGate PA and pnGate PB gateways are designed to integrate PROFIBUS devices in PROFINET-based networks.



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 delivery of this gateway includes the following parts:

- pnGate PA/pnGate PB device
- CD-ROM including drivers, software, tools, video tutorials and user guide
- Printed Quick Startup Guide

2.3 Supported features

The pnGate PA/pnGate PB gateways map PROFIBUS devices into PROFINET networks.

- pnGate PA can map two or four PROFIBUS PA network segments (with the 2-channel model supporting up to 32 PROFIBUS devices and the 4-channel model supporting up to 64 PROFIBUS devices).
- pnGate PB can map two PROFIBUS PA and one PROFIBUS DP network segments supporting up to 32 PROFIBUS devices.
- Both gateways support the conversion of PROFIBUS GSD files into a single PROFINET GSDML using an integrated web-based conversion tool.

2.4 System requirements

These gateways require the use of a PROFINET engineering system such as the Siemens TIA portal (version 15 or higher) and STEP 7 (version 5.5 SP 4 or higher). For more details see the user guide. Engineering systems from other PLC vendors can also be used, provided they support PROFINET GSDML files.

2.5 Safety precautions



CAUTION

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



Note

Do not open the housing of the pnGate PA/pnGate PB. 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 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 pnGate PA/pnGate PB 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](#) ²⁸ for detailed information.

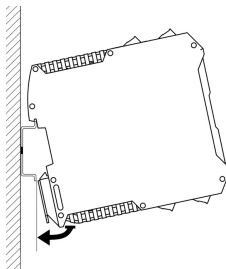


Installation and inspection

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

Mounting

1. For mounting the pnGate PA/pnGate PB 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.

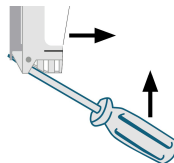


Note

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

Dismounting

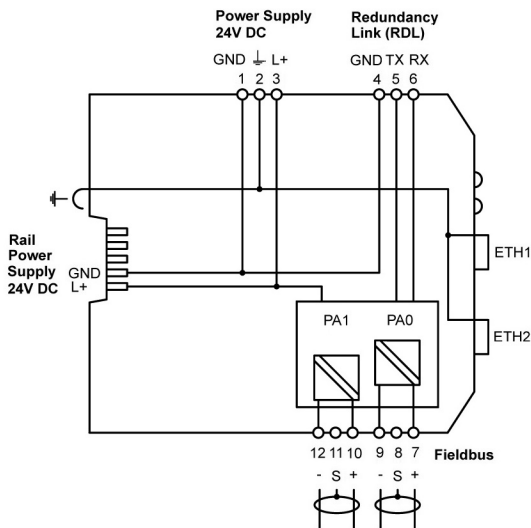
1. Slide a screw driver horizontally underneath the housing into the locking bar.
2. Slide the bar downwards – without tilting the screw driver - and fold the device upwards.



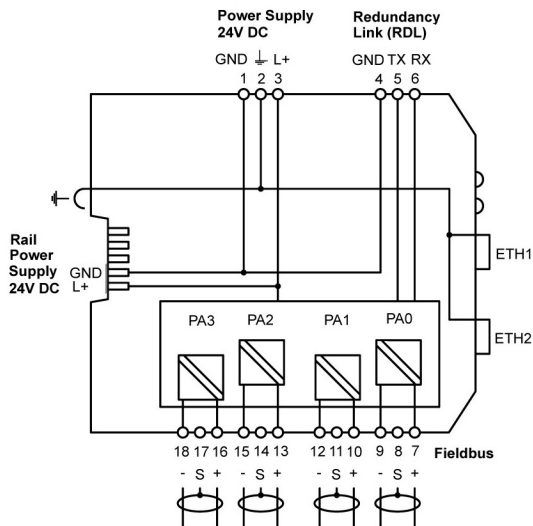
3.1.2 Connection diagrams pnGate PA

The following diagram shows the physical interfaces of the pnGate PA. The device is available as a 2-channel model and a 4-channel model. The 2-channel model has 2 physical PROFIBUS segment connections (PA0 to PA1), while the 4-channel model offers 4 physical PROFIBUS segment connections (PA0 to PA3).

2-channel model

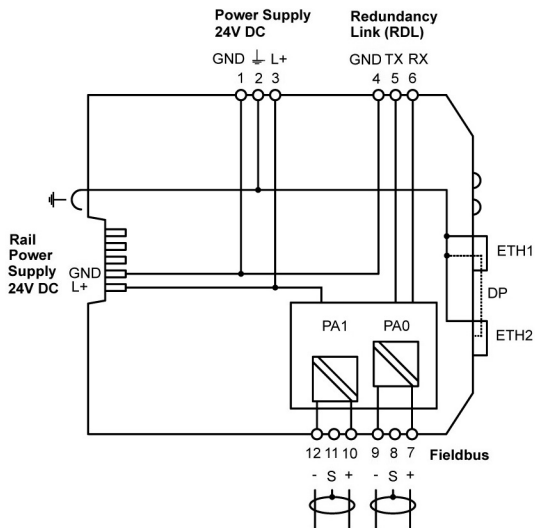


4-channel model



3.1.3 Connection diagram pnGate PB

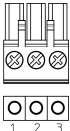

The following diagram shows the physical interfaces of the pnGate PB. The gateway has 2 physical PROFIBUS PA segment connections (PA0 to PA1) and supports one RS-485 link for PROFIBUS DP data communication.



3.1.4 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.



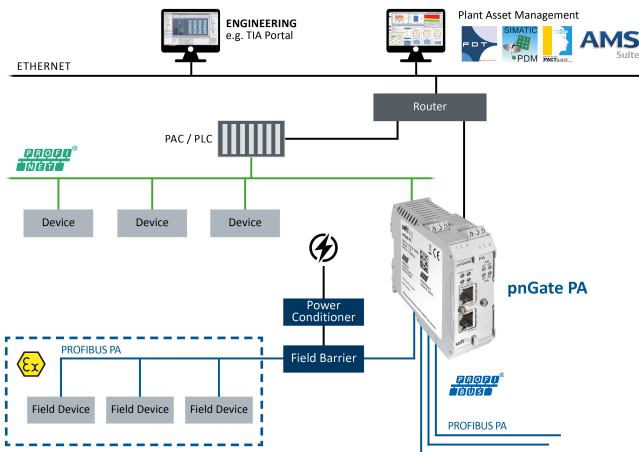
Note

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.

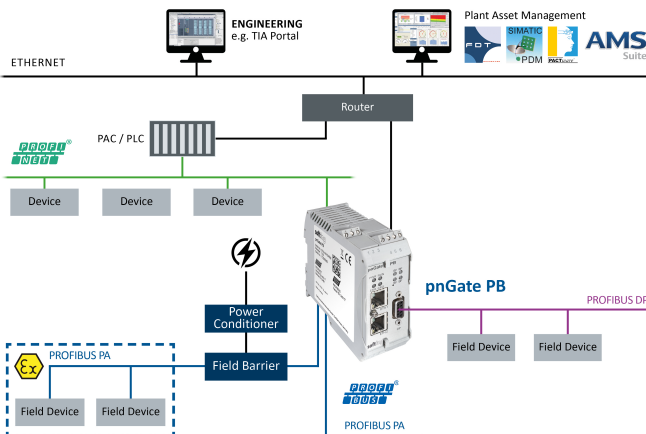
3.1.5 Connecting to the network

1. Connect the PROFIBUS PA devices to the PROFIBUS PA interfaces.
2. Connect the pnGate PA/pnGate PB to the PROFINET network. The pnGate PA/pnGate PB includes a PROFINET switch that enables line topology.

pnGate PA network diagram



pnGate PB network diagram



3.1.6 Powering up the device

Turn on the power supply. The boot process takes approx. 15 seconds. For indication of proper operation refer to section [Status indicators - LEDs](#) ²³.

3.1.7 Ethernet ports

The gateway is equipped with two 10/100 Base-T Ethernet ports (RJ45). Both ports are connected to the switch. The Ethernet ports corresponds 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 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 pnGate PA/pnGate PB Software and Documentation* in the startup page.
3. Select the installation setup files required.
4. Install the *SearchAnd Configure* software.

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

PACTware and the Softing PROFIdtm will be installed.
7. Install PROFIdtm libraries if you prefer using a different FDT frame application such as FieldCare, FieldMate or others to allow using a CommDTM in another FDT frame application. 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:

4.1 Login to web server

1. Start your web browser with the pnGate PA/pnGate PB 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** as **password**.
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. Log on to the gateway.
2. Select **Settings** → **User Accounts**.
As administrator you can change and confirm the passwords for different roles.
3. Enter the name of the user whose password you want to change, the old password and the new password in the corresponding field(s).
4. Retype your new password and click **[Apply]** 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:

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

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

Action	Administrator	Maintenance	Operator
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"/>

4.4 Updating the firmware

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 pnGate PA/pnGate PB will be rebooted.



Note

Do not access the web server of the pnGate PA/pnGate PB 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 pnGate PA/pnGate PB.









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

5 Status indicators - LEDs



The front side of the device shows eight LEDs:

PWR	power supply
RUN	running
ERR	error
CFG	configuration - displays configuration upload and firmware update
SF	system faults - displays PROFINET/PROFIBUS system faults (wrong configuration, internal error, ...)
BF	bus faults - displays PROFINET/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 in stand-alone mode
















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

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

5.3 PROFINET device LEDs (PN)


LEDs	Meaning
<div> <div>SF</div> <div>BF</div> <div>   </div> </div>	No connection to controller Possible causes: PROFINET name is missing on the gateway or the physical connection to the gateway is interrupted.
<div> <div>SF</div> <div>BF</div> <div>   </div> </div>	Connection establishment Time period the system needs to establish a connection; devices cannot yet communicate with each other.
<div> <div>SF</div> <div>BF</div> <div>   </div> </div>	Connected to controller All devices are exchanging data.
<div> <div>SF</div> <div>BF</div> <div>   </div> </div>	Configuration error or diagnosis Read errors from PROFINET engineering system.
<div> <div>SF</div> <div>BF</div> <div>   </div> </div>	PROFINET signal function active
<div> <div>SF</div> <div>BF</div> <div>   </div> </div>	Error in the PROFINET part of the device An error such as a software error ²⁴ or a hardware error has occurred.

5.4 PROFIBUS master LEDs (PA)

LEDs	Meaning
 SF  BF	All channels offline
 SF  BF	All devices exchange data on all channels
 SF   BF  	At least one used channel is not online
 SF  BF  	At least one slave is not in data exchange (BF: green - all channels are online; red: not any channel is online.)
 SF  BF	Error in the PROFIBUS part of the device An error such as a software error ²⁴ 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 is 200 mA; maximum is 1 A (considering the 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
Safety standard	IEC/EN/UL 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements and 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 (both with CB scheme).

6.2 Installation positions

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



Minimum distance

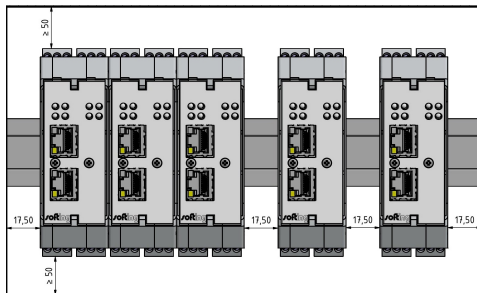
Provide a minimum distance of 50 mm to the air inlet and air outlet to ensure natural convection.



Rotated installation position

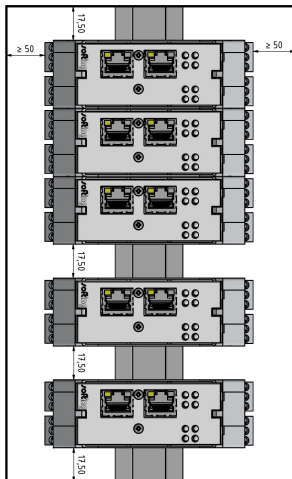
The maximum permissible ambient temperature values also apply to a 180° rotated installation position.

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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Softing Industrial Automation GmbH

Richard-Reitzner-Allee 6
85540 Haar / Germany
<http://industrial.softing.com>



Tel: + 49 89 45 656-340



Fax: + 49 89 45 656-488



info.idn@softing.com