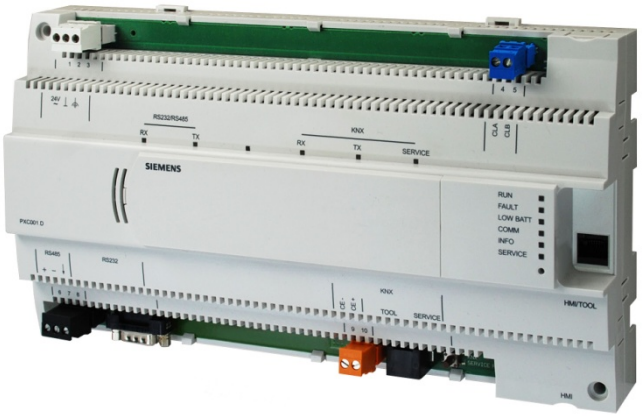
SIEMENS

9223



Desigo™ PX

System controllers

PXC001.D
PXC001-E.D
PXA40-RS...

for the integration of third-party devices and systems in Desigo

- **Integration platforms and system controllers for third-party devices and systems via KNX, Modbus, M-Bus and other protocols into the automation level via BACnet**
- **System controllers for the integration of Desigo RXB/RXL room controllers**
- **Native BACnet devices with communication via BACnet/LonTalk or BACnet/IP**
- **BTL label (BACnet communications passed the BTL test)**
- **Comprehensive management and system functions (alarm management, time scheduling, trends, remote management, access protection etc.)**
- **Supports operation via local or network-compatible operator units PXM…**

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Building Technologies

Use

- The system controllers support the integration of Desigo RXB/RXL room controllers as well as third-party devices and systems via KNX, Modbus or M-Bus etc. in the automation level using BACnet/LonTalk or BACnet/IP
- Mapping and monitoring of third-party disciplines as HVAC, light, SPS etc.
- Functionality as freely programmable system controllers for standard or proprietary protocol applications

Functions

- The system controllers provide the infrastructure to hold and execute the system and application specific functions. They are freely programmable.
- Comprehensive management and system functions are available:
  - Alarm management
  - Time scheduling
  - Trends
  - Access protection

Type summary

System controllers	Type
System-Controller for the integration of KNX, M-Bus, Modbus or SCL over **BACnet/LonTalk**	**PXC001.D**
System-Controller for the integration of KNX, M-Bus, Modbus or SCL over **BACnet/IP**	**PXC001-E.D**
Option modules	**Type**
Up to 800 data points	**PXA40-RS1**
SCL: up to 1000 data points, M- Bus and Modbus: up to 2000 data points)	**PXA40-RS2**

Equipment combinations

	PXC001.D PXC001-E.D	PXA40-RS1	PXA40-RS2
Interfaces			
KNX	**X**	**--**	**--**
Serial RS232	**X**	**--**	**--**
Serial RS485	**X**	**--**	**--**
Network functions			
Integration KNX	**2000 DP**	**--**	**--**
Integration M-Bus	**250 DP**	**800 DP**	**2000 DP**
Integration Modbus	**250 DP**	**800 DP**	**2000 DP**
Integration SCL	**250 DP**	**800 DP**	**1000 DP**

Option modules are "hot-pluggable"

PXA40-… option modules can be plugged and unplugged when the automation station is operating.

- The functionality is available immediately after inserting.
- The functionality disappears approx.1 minute after unplugging.

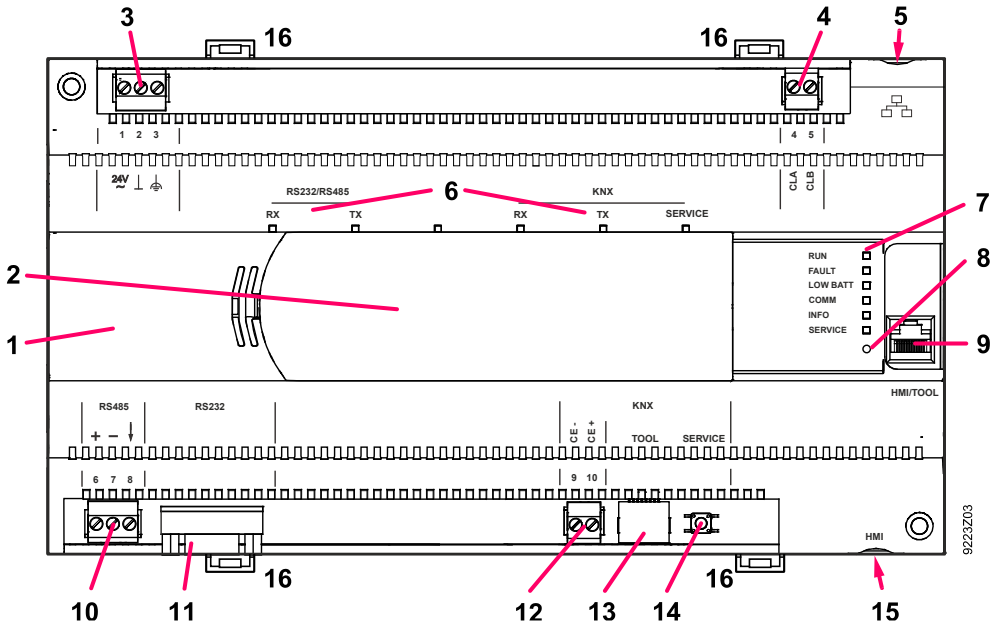
Ordering

Product number	Stock number	Designation
PXC001.D	S55372-C113	System controllers (BACnet/LonTalk)
PXC001-E.D	S55372-C114	System controllers (BACnet/IP)
PXA40-RS1	S55372-C115	Option module RS1
PXA40-RS2	S55372-C116	Option module RS2

Mechanical design

The compact construction enables the devices to be mounted on a standard mounting rail.

PXC001...



1	Plastic housing
2a **2b**	Front cover PXM40-RS... option module
3	Plug-in screw terminal block (operating voltage)
4	Plug-in screw terminal block (LONWORKS bus, PXC001.**D** only)
5	Network interface RJ45 (BACnet / IP, PXC001-**E.D** only)
6	LED indicators for communication
7	LED indicators for device and system status
8	Service pin (Network identification)
9 *)	RJ45 Interface for PXM10, XWP and PX KNX-Tool (RJ45, PXC001.**D** only) RJ45 interface for PXM20 (PXC001.**D** only)
10	Plug-in screw terminal block (RS485)
11	RS232 interface
12	Plug-in screw terminal block (KNX)
13	RJ45 interface (ETS tool for service use)
14	KNX programming pin
15 *)	RJ45 interface for PXM10, XWP and PX KNX-Tool (PXC001-**E.D** only) RJ45 interface for PXM20 (PXC001.**D** only)
16	Slider for mounting on DIN rail

*) PX KNX does not support the PXM10.

PXA40-RS...

Terminal blocks

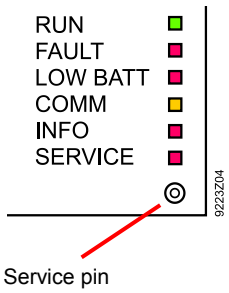
The terminal blocks are removable for easy wiring.

LED indicators

Communication

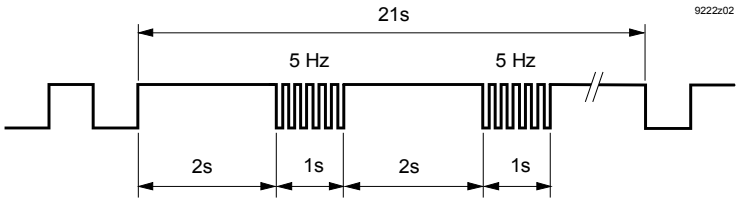
RS232/RS485:	RX (Green) :	TX (Yellow)	
KNX:	RX (Green)	TX (Yellow)	Service (Red)

The other LEDs have the following meaning:



LED	Color	Activity	Function
RUN	Green	Continuously ON Continuously OFF	Power OK No power
FAULT	Red	Continuously OFF Continuously ON Rapid flashing	OK Fault Firmware missing / corrupt
LOW BATT	Red	Continuously OFF Continuously ON	Battery OK Battery empty– replace!
COMM	Red	Continuously ON Continuously OFF Flashing	Connection to switch OK No connection to switch Communication
INFO	Red		Freely programmable
SERVICE (Ethernet, PXC001-E.D)	Red	Continuously OFF Continuously ON Flashing Flashing per wink command *)	OK No connection to switch or DHCP Server No IP address configured Physical identification of system controller after receipt of wink command
SERVICE (LonTalk, PXC001.D)	Red	Continuously OFF Continuously ON Flashing Flashing per wink command *)	LONWORKS node is configured Faulty LONWORKS chip, or service pin currently depressed LONWORKS node is not configured Physical identification of system controller after receipt of wink command

*) Wink command pattern:



Service pin

Identification of the system controller in the IP network or LONWORKS network
See "Commissioning".

Engineering

Workflow

See the PX open documents CM110761.

Bus terminating resistor for RS485

Depending on the bus topology, a 120 Ohm resistor must be connected.

Mounting

The devices can be snapped onto standardized rails.

The power supply, LonTalk, RS485 and KNX connections have plug-in screw terminal blocks. The other interfaces are quick plug-in connections.

Instead of the front cover a PXA40-RS... option module can be fitted on the device.

Commissioning

In order to prevent equipment damage and/or personal injuries always follow local safety regulations and the required safety standards.

Load plant operating program

The plant operating program is downloaded using the CFC from XWP – locally via the automation station's RJ45 interface or via the network (BACnet/IP or BACnet/LonTalk).

Setting parameters and configurations

Use the PX Design tool in XWP for setting the control parameters and the configuration data. Data visible on the network may also be edited with an operator unit PXM20 / PXM20-E (BACnet / LonTalk or BACnet / IP).

Part of the data can also be edited locally using the operator unit PXM10 (PX KNX does not support the PXM10).

Wiring test

Use the Point Test Tool.

Network connection

The network addresses are configured with XWP. For unique identification in the network (BACnet/IP or BACnet/LonTalk), press the Service button with a long, pointed object or send a wink command to the appropriate system controller (service LED blinks).

Force Firmware Download

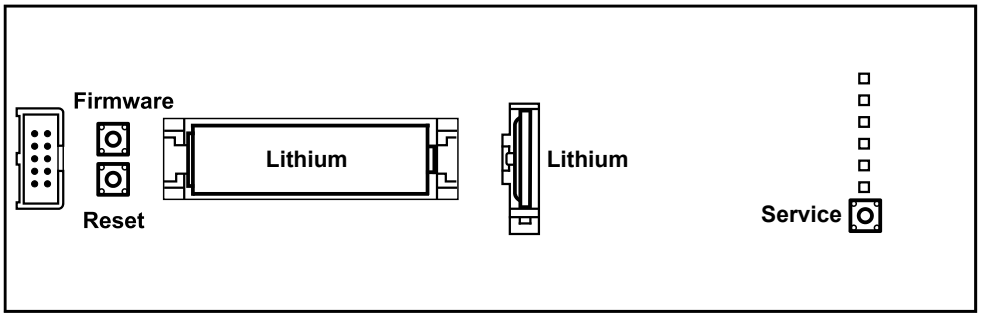
- **Variant via V24:**
  If the **Force Firmware Download Key** is pressed for approx. 10 s during a restart (reset), the current D-MAP program is deleted from the FLASH.
  The system controller waits briefly for the signal to activate the FWLoader and then starts the system controller.
- **IP variant:** (for PXC001-E.D, significantly faster than via V24)
  Press the **Force Firmware Download key** for 5 seconds (without hitting the reset button).
  Prerequisite: A node setup of the controller has been conducted and no application is loaded or it was deleted in the CFC by clear/reset (communication settings remain – which would not be the case when restart erasing by pressing the reset key).

For details see the Firmware Download Tool User's guide, CM110626.

Restart

Press the **Reset button** to force a restart

Position of buttons and batteries



Note

The KNX programming pin is situated next to the KNX terminal block and the KNX tool plug

Maintenance

Battery life

The **real time clock** is backed by a lithium battery type CR2032

- Life span without charge: 10 years.
- Life span with battery operation (cumulative): 10 years.
- After the "Battery low" event [1] the remaining life span under load is several days.

The **trend data** and the **actual parameters** stored in the SDRAM memory are backed by a Lithium battery type FR6/AA AA.

- Life span without charge: 10 years.
- Life span with battery operation (cumulative): min. 2 weeks
- After the "Battery low" event [1] the remaining life span under load is approx. 15 hrs.

1) "Battery low" event: The "LOW BATT" LED lights up when one of the batteries' charge is low, and the automation station automatically sends a system event.

Replacing the battery

To change the battery, remove the front cover. The battery can be removed indefinitely as long as the unit has power. Insert new battery correctly (+ / –).

Caution!

- **Note the special disposal notes on Li batteries.**
- **A wrist-strap and grounding cable must be used to avoid hardware damage through electrostatic discharge (ESD).**

Firmware upgrades

Firmware and operating system stored in non-volatile Flash ROM. Flash ROM memory can be easily updated on the plant, when a new firmware version is available.

Disposal

The devices are classified as waste electronic equipment in terms of the European Directive 2012/19/EU (WEEE) and should not be disposed of as unsorted municipal waste.
The relevant national legal rules are to be adhered to.
Regarding disposal, use the systems setup for collecting electronic waste.
Observe all local and applicable laws.
Lithium batteries: May catch fire, explode or leak. Do not short circuit, charge, disassemble, dispose of in fire, heat above 100°C, or expose to water.
Disposal: Seal battery terminals with tape.

Technical data

General device data	Operating voltage	AC 24 V ± 20% (SELV / PELV) or AC 24 V class 2 (US)
	Safety extra-low voltage SELV or Extra-low voltage PELV	HD 384
	Operating frequency	50/60 Hz
	Energy consumption	Max. 3.5 VA
	External supply line protection (EU)	Fuse slow max. 10 A or Circuit breaker max. 13 A Characteristic B, C, D according to EN 60898 or Power source with current limitation of max. 10 A
Operating data	Processor	Motorola Power PC MPC885
	Storage	64MB SDRAM / 32MB FLASH (96MB total)
	Data backup in event of power failure	
	Battery Backup of realtime clock Lithium CR2032 (field replaceable)	Battery operation (cumulative): 10 years Without load: 10 years
	Battery backup for SDRAM 1 x FR6/AA Lithium (field replaceable)	Battery operation (cumulative): min. 2 weeks Without load: 10 years

Interfaces, communication	PXC001.D	PXC001-E.D
Building Level Network	LonWorks FT5000 Transceiver Twisted Pair, 78 kBit/s (Screw terminals)	BACnet on UDP/IP IEEE802.3, Auto-sensing 10 Base-T / 100 Base-TX (RJ45, shielded)
Local Communication (HMI, Tool)	• PXM10 (RS232) • PXM20 (BACnet/LonTalk, RJ45) • FW Download Tool (RJ45)	--
Local Communication (HMI)	• PXM20 (BACnet/LonTalk) (RJ45)	• PXM10 (RS232) • FW Download Tool (RJ45)
	One PXM10 operator unit and one PXM20 per system controller may be connected. But not twice the same type.	One PXM10 on RJ45
KNX Tool-Interface	RJ45	CE+, CE–

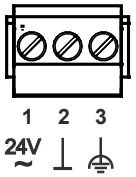
KNX bus	Interface type	KNX (electrically isolated)
	Transceiver	TP-UART
	Bus current	5 mA
	Baud rate	9.6 kbit/s
	Bus topology, bus termination	Refer to KNX manual
RS232 interface	Baud rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (depends on software)
	Data bits	7 or 8 (depending on software)
	Stop bits	1 or 2 (depending on software)
	Parity	None, even or odd (depending on software)
	Flow control	Xon/Xoff, hardware or none (depending on software)
	Cable type	9-core standard screened cable
	Cable length	Max. 3 m

RS485 interface	Interface type	RS485, (electrically isolated)
	Baud rate, data bits / stop bit(s), parity	As for RS232 (depends on software)
	Cable type	Standard RS bus cable
	Cable length	Max. 1200 m
Plug-in screw terminal		Solid or stranded conductors 0.25…2.5 mm2 or 2 x 1.5 mm2
Simple cable lengths, cable types	Connection cable **Ethernet and PXM20-E**	Max. 100 m
	Cable type	Standard at least CAT5 UTP (Unshielded Twisted Pair) or STP (Shielded Twisted Pair)
	Connection cable **LONWORKS bus**	See Installation Guide CA110396
	Cable type	CAT5
Protection data	Housing Protection standard	IP 20 to EN 60529
	Protection class	III to EN 60730-1
Ambient conditions	Normal operation	To IEC 60721-3-3
	Environmental conditions	Class 3K5
	Temperature	0...50 °C
	Humidity	5…95 % r.h. (non-condensing)
	Mechanical conditions	Class 3M2
	Transport	To IEC 60721-3-2
	Environmental conditions	Class 2K3
	Temperature	-25…70 °C
	Humidity	5…95 % r.h. (non-condensing)
	Mechanical conditions	Class 2M2
Standards, directives and approvals	Product standard EN 60730-1	Automatic electrical controls for household and similar use
	Product family standard EN 50491-x	General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)
	Electromagnetic compatibility (Applications)	For use in residential, commerce, light-industrial and industrial environments
	EU conformity (CE)	CM1T9223xx *)
	UL certification (US)	UL916 http://database.ul.com/
	RCM-conformity (EMC)	CM1T9222en_C1 *)
		Certificate
	AMEV: Supports profiles AS-A and AS-B to AMEV directive "BACnet in public buildings"	BACnet 2011, V1.1
Environmental compatibility	Product environmental declaration (contains data on RoHS compliance, materials composition, packaging, environmental benefit, disposal)	CM1E9223 *)
Dimensions	See “Dimensions”	
Weight	Without / with packaging	
	PXC001.D, PXC001-E.D	0.635 kg / 0.731 kg
	PXA40-RS1, PXA40-RS2	0.048 kg / 0.060 kg

*) The documents can be downloaded from http://siemens.com/bt/download.

Pin assignment

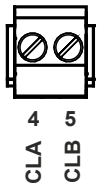
Supply plug



Plug-in screw terminal block

1 AC 24 V (G)
2 Ground (G0)
3 Functional earth

LONWORKS plug (PXC001.D)

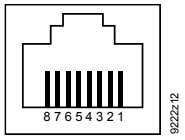


Plug-in screw terminal block

4 CLA LonWorks Data A
5 CLB LonWorks Data B

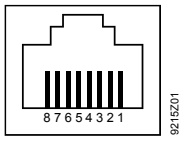
Ethernet plug (PXC001-E.D)

RJ45 socket screened, standard connection in accordance with AT&T256



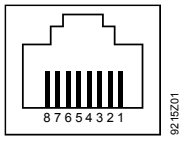
1. Tx+
2. Tx –
3. Rx +
4. Not used
5. Not used
6. Rx –
7. Not used
8. Not used

"HMI" plug (PXC001-E.D)



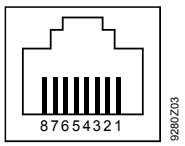
1. **Unoccupied**
2. **Unoccupied**
3. G0, GND
4. G/Plus
5. Not used
6. Not used
7. COM1/TxD
8. COM1/RxD

Plug "HMI" and "HMI/Tool" (PXC001.D)



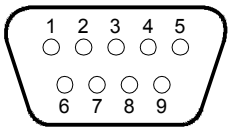
1. **LONWORKS Data A (CLA)**
2. **LONWORKS Data B (CLB)**
3. G0 / GND
4. G / Plus
5. Not used
6. Not used
7. COM1 / TxD
8. COM1 / RxD

Tool plug (KNX)



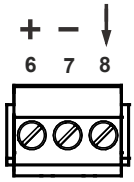
1. **KNX data (CE+)**
2. **KNX data (CE–)**
3. Not used
4. Not used
5. Not used
6. Not used
7. Not used
8. Not used

RS232 plug serial



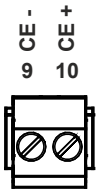
1 DCD Data carrier detect
2 RXD Received data
3 TXD Transmit data
4 DTR Data terminal ready
5 GND Signal ground
6 DSR Data set ready
7 RTS Request to send
8 CTS Clear to send
9 NC Not connected

RS485 plug



Plug-in screw terminal block
6 + B
7 – A
8 ↓ Screen, connected to functional earth

KNX plug

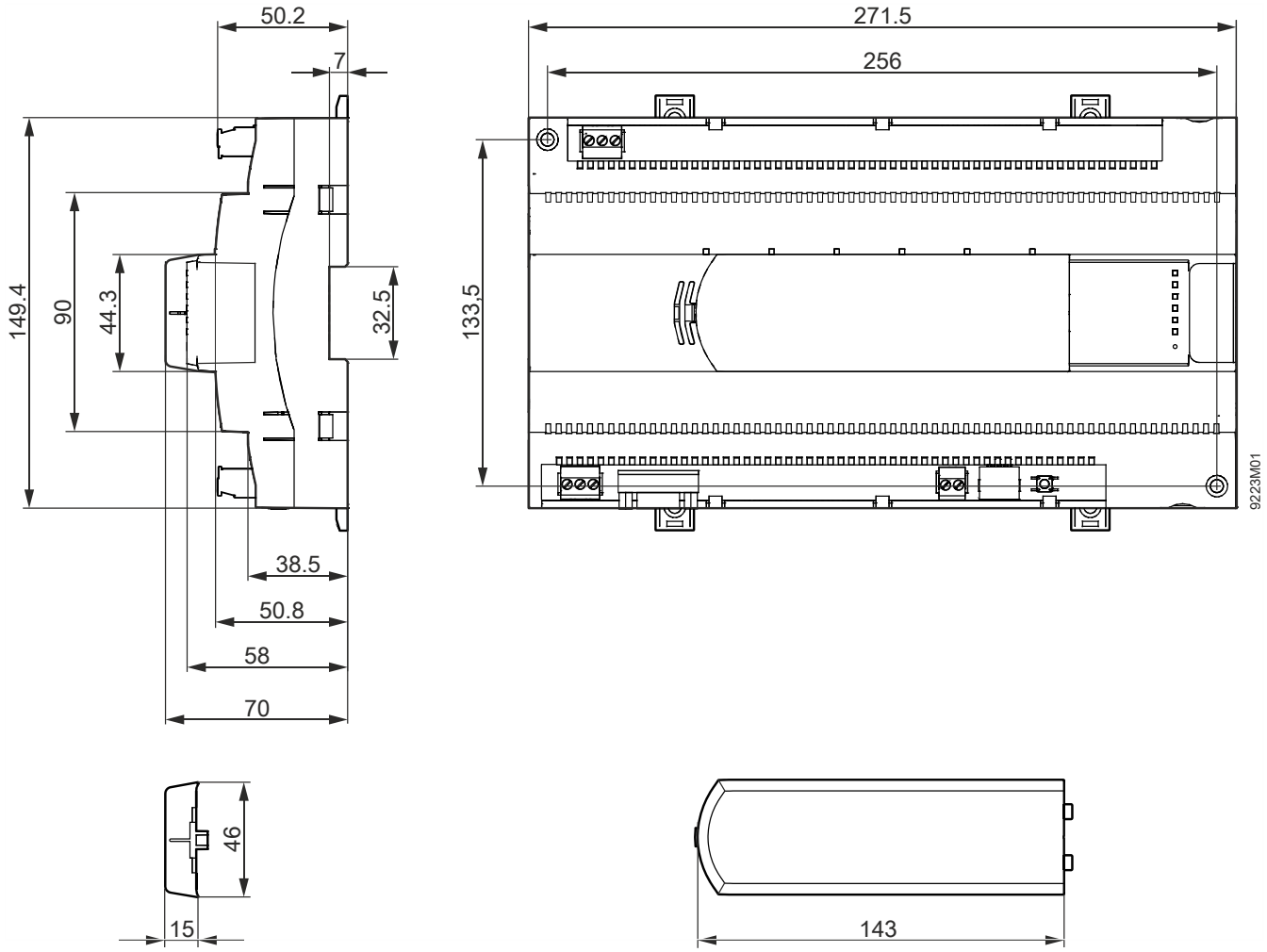


Plug-in screw terminal block

9 (CE–) – KNX data cable
10 (CE+) + KNX data cable

Dimensions

All dimensions in mm



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