

Designo™ PX

System controllers

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

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

- 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 Designo 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...

Use

- The system controllers support the integration of Designo 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.

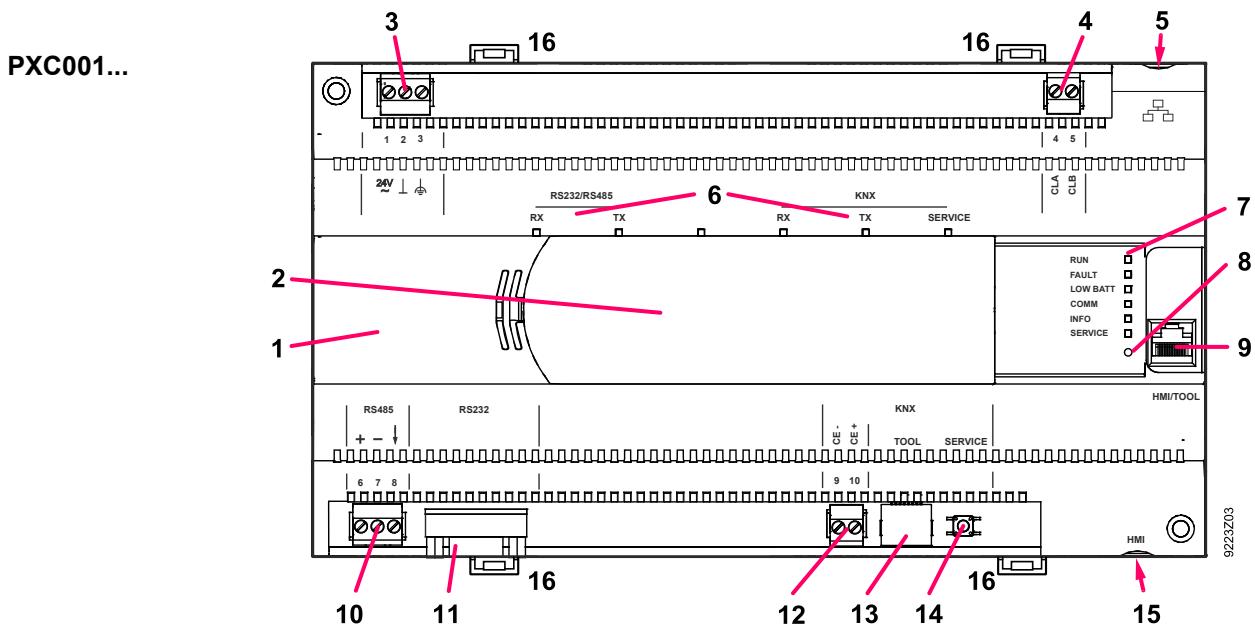
- The functionality is available immediately after inserting.
- The functionality disappears approx. 1 minute after unplugging.

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.



1	Plastic housing
2a	Front cover
2b	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 operator unit and tool (RJ45, 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 operator unit or PX KNX tool
16	Slider for mounting on DIN rail

PXA40-RS...



Terminal blocks

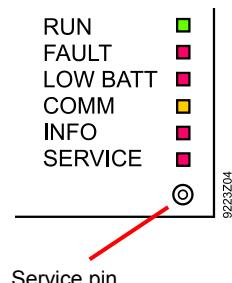
The terminal blocks are removable for easy wiring.

LED indicators

Communication

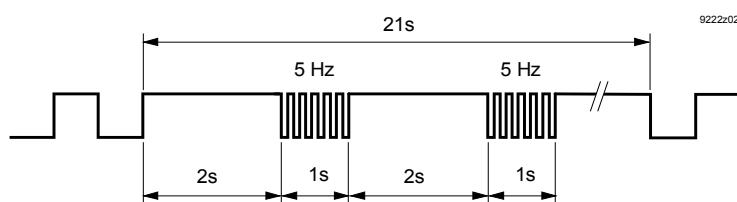
RS232/RS485: RX (Green) : TX (Yellow)
KNX: RX (Green) TX (Yellow) Service (Red)

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 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 (not available for PX KNX).

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).

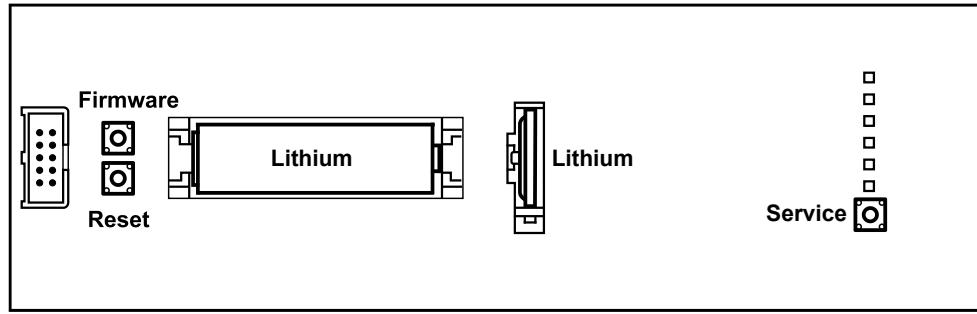
Prerequisite: A node setup of the controller has been conducted and no application is loaded or it was deleted in the CFC by clear/reset (communication settings remain – which would not be the case when restart erasing by pressing the reset key).

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



9223Z02

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: min. 10 years.
- Life span with battery operation (cumulative): up to 1 month.
- 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: min. 10 years.
- Life span with battery operation (cumulative): up to 1 month.
- 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.

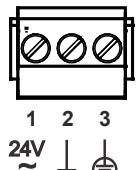
Technical data

General device data	Operating voltage	AC 24 V ± 20%
	Rated voltage	AC 24 V
	Safety extra-low voltage SELV or Extra-low voltage PELV	HD 384
	Operating frequency	50/60 Hz
	Energy consumption	Max. 3.5 VA
	External fusing (compulsory)	External fuse protection for secondary current: Slow blow fusible link Max. 10 A, circuit breaker Max. 13 A type C, or transformer with secondary 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 operation (cumulative): 1 month
	Battery Backup of realtime clock Lithium CR2032 (field replaceable) Battery backup for SDRAM 1 x FR6/AA Lithium (field replaceable)	Without load: 10 years Battery operation (cumulative): 1 month Without load: 10 years
Interfaces, communication		
Building Level Network	PXC001.D	PXC001-E.D
	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) • Tool (RJ45)	--
	• PXM10 (RS232) • PXM20 (BACnet/LonTalk) (RJ45)	• PXM10 (RS232)
Local Communication (HMI)	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 (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 Baud rate, data bits / stop bit(s), parity Cable type Cable length	RS485, (electrically isolated) As for RS232 (depends on software) Standard RS bus cable Max. 1200 m
Plug-in screw terminal		Solid or stranded conductors 0.25...2.5 mm ² or 2 x 1.5 mm ²
Simple cable lengths, cable types	Connection cable Ethernet and PXM20-E Cable type Connection cable LONWORKS bus Cable type	Max. 100 m Standard at least CAT5 UTP (Unshielded Twisted Pair) or STP (Shielded Twisted Pair) See Installation Guide CA110396 CAT5
Housing protection standard Protection class	Protection standard Protection class	IP 20 to IEC 60529 III to EN 60730
Ambient conditions	Normal operation Environmental conditions Temperature Humidity Mechanical conditions Transport Environmental conditions Temperature Humidity Mechanical conditions	To IEC 60721-3-3 Class 3K5 0...50 °C 5...95 % r.h. (non-condensing) Class 3M2 To IEC 60721-3-2 Class 2K3 -25...70 °C 5...95 % r.h. (non-condensing) Class 2M2
Standards, directives and approvals	Product standard   	EN 60730-1 CM1T9223xx CM1T9222en_C1 Certificate
AMEV: Supports profiles AS-A and AS-B to AMEV directive "BACnet in public buildings"		BACnet 2011, V1.1
Document download	http://www.hqs.sbt.siemens.com/gip/general/ dlc/dlc_mobile_direct.asp?PXC001	
Environmental compatibility	The product environmental declaration CM1E9223 contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal)	ISO 14001 (Environment) ISO 9001 (Quality)
Dimensions Weight	See "Dimensions" Without / with packaging PXC001.D, PXC001-E.D PXA-40-RS1, PXA40-RS2	0.635 kg / 0.731 kg 0.048 kg / 0.060 kg

Pin assignment

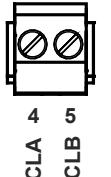
Supply plug



Plug-in screw terminal block

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

LonWORKS plug (PXC001.D)

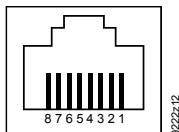


Plug-in screw terminal block

- 4 CLA LonWorks Data A
- 5 CLB LonWorks Data B

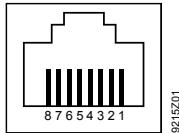
Ethernet plug (PXC001-E.D.)

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



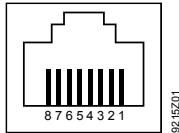
- | | |
|-------------|-------------|
| 1. Tx+ | 5. Not used |
| 2. Tx - | 6. Rx - |
| 3. Rx + | 7. Not used |
| 4. Not used | 8. Not used |

"HMI" plug (PXC001-E.D.)



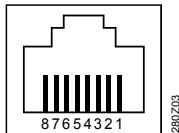
- | | |
|---------------|-------------|
| 1. Unoccupied | 5. Not used |
| 2. Unoccupied | 6. Not used |
| 3. G0, GND | 7. COM1/TxD |
| 4. G/Plus | 8. COM1/RxD |

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



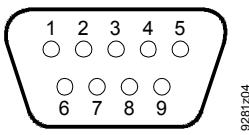
- | | |
|--------------------------|---------------|
| 1. LONWORKS Data A (CLA) | 5. Not used |
| 2. LONWORKS Data B (CLB) | 6. Not used |
| 3. G0 / GND | 7. COM1 / TxD |
| 4. G / Plus | 8. COM1 / RxD |

Tool plug (KNX)



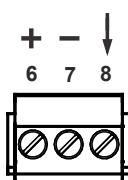
- | | |
|-------------------|-------------|
| 1. KNX data (CE+) | 5. Not used |
| 2. KNX data (CE-) | 6. Not used |
| 3. Not used | 7. Not used |
| 4. Not used | 8. Not used |

RS232 plug serial



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

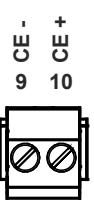
RS485 plug



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

