



Desigo™ PX

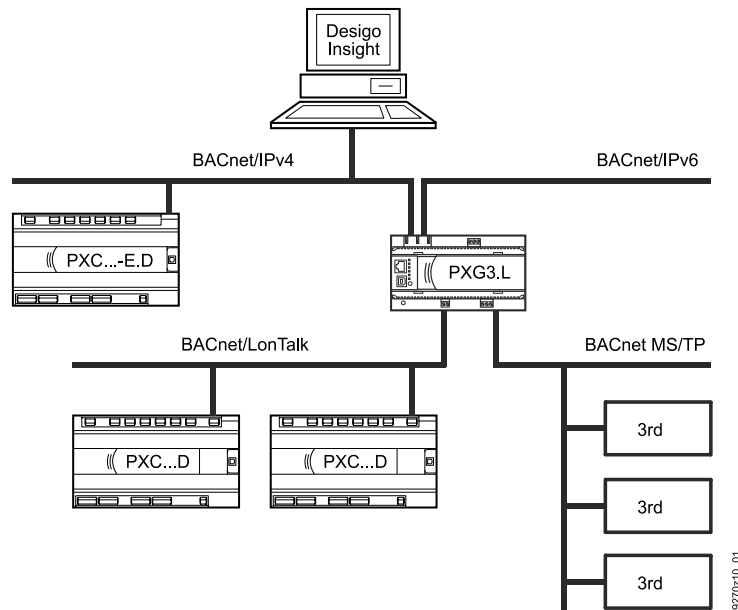
BACnet router for

- BACnet/IP
- BACnet/LonTalk
- BACnet MS/TP

PXG3.L
PXG3.M

- Routing between BACnet/IP , BACnet/LonTalk (PXG3.L only), and BACnet MS/TP
- Supports BACnet/IPv4 and BACnet/IPv6
- Compliant with ANSI/ASHRAE 135-2012 Annex J
- Compliant with ISO 16484-5
- BTL label (BACnet communications passed the BTL test)
- Support for BBMD (BACnet Broadcast Management Device)
- Support for Foreign Device
- Configuration via Xworks Plus or Web browser (via IPv4)
- Access to network statistics via Web browser
- Firmware update via Ethernet and USB Device
- LED indication for Ethernet link and activity
- LED indication for BACnet/LonTalk and BACnet MS/TP (diagnostics)
- 2-port Ethernet switch for low-cost cabling (10/100 baseT)
- BACnet MS/TP (RS-485) baud rates: 9600, 19200, 38400, 76800, 115200
- Plug-in screw terminal blocks for supply, LONWORKS, and MS/TP
- RJ45 plug for PXM20 (LONWORKS)
- Operating voltage: AC 24 V or DC 24 V
- DIN rail mounting
- BACnet MS/TP Slave Proxy
- SNMP (v2), MIB-2
- BACnet NAT

The PXG3... BACnet router connects a BACnet/IP network to a BACnet /LonTalk network (PXG3.L only), and/or a BACnet MS/TP channel. BACnet objects are simultaneously transmitted among any and all networks.



Router functions

Four-way routing

The PXG3... BACnet router transmits BACnet protocol between a BACnet/IPv4 network, a BACnet/IPv6 network, a BACnet/LonTalk network (PXG3.L only), and a BACnet MS/TP channel. BACnet objects are simultaneously transmitted among any and all networks.

BBMD

Broadcast Management Device, used to distribute BACnet Broadcast messages across IP Routers.

Web server

The BACnet Router possesses a Device Object and can be operated by a BACnet Client. Present operating state, date and time as well as statistics on sent packages can be viewed via web server.

MS/TP Slave Proxy

The BACnet router can serve as a Slave Proxy for all slaves that are connected to the MS/TP network. I.e. it sends a I-Am message to all MS/TP slaves, answering a Who-Is message.

SNMP v2

Simple Network Management protocol MIB-2, for monitoring and diagnosing the network interface of the BACnet router.

BACnet NAT

Supports setup of a BACnet network over a NAT device. Additionally, remote access from a public network to BACnet devices in a private network is possible.

Important: the public IP address must be static.

For security reasons we recommend to use VPN tunneling with BACnet NAT.

For details see standard 135-2012 Annex J.

BACnet/IP to BACnet/IP

When routing between BACnet/IP and BACnet/IP within one IP network, the address of the BACnet router must be the same in both BACnet networks. The difference of the BACnet network is done by using different BACnet UDP ports.

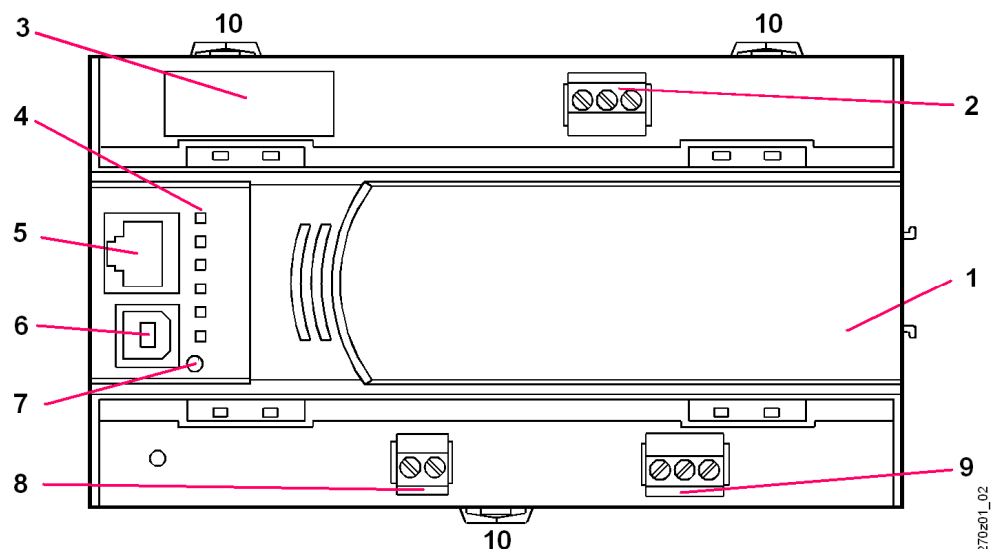
Communication

- The router complies with ANSI/ASHRAE 135-2012 Annex J and ISO 16484-5.
- A 2-port Ethernet switch allows for low-cost cabling via line topology. This is the preferred commissioning medium.
- The LONWORKS network is connected via a 2-pin connection terminal.
- The MS/TP channel is connected via RS485 or a 3-pin connection terminal.
- An RJ45 plug on the device front allows for connecting a PXM20 operator unit (PXG3.L only).
- A USB port is available to connect the tool.

Type summary

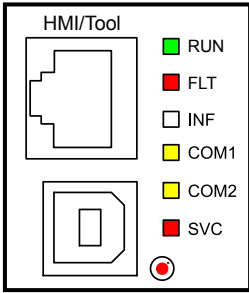
Type (ASN)	Product number (SSN)	Name	Ethernet ports	LONWORKS	MS/TP
PXG3.L	S55842-Z105-A100	BACnet Router Ethernet/IP- LonTalk-MS/TP	2	x	x
PXG3.M	S55842-Z106-A101	BACnet Router Ethernet/IP-MS/TP	2		x

Mechanical design

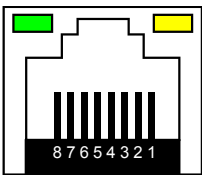


- 1 Plastic housing
- 2 Plug-in terminal block (operating voltage)
- 3 2-port Ethernet switch (with 2 LEDs each for display purposes)
- 4 LEDs for device and system status indication
- 5 RJ45 interface HMI (LONWORKS + supply, PXG3.L only)
- 6 Tool interface (USB Device)
- 7 Service button for identification on network (Ethernet, LONWORKS)
- 8 LONWORKS terminal block (PXG3.L only)
- 9 MS/TP terminal block
- 10 Slider for mounting on DIN rail

LEDs



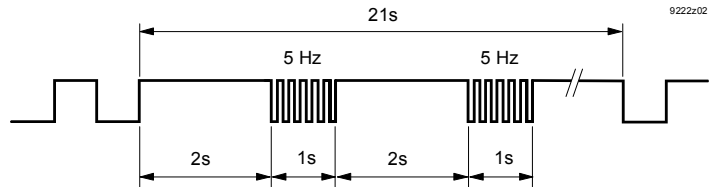
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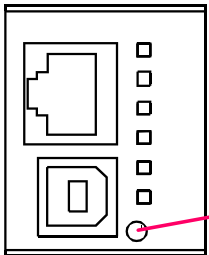
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LED	Color	Activity	Function
RUN	Green	<ul style="list-style-type: none"> • Continuously ON • Continuously OFF • Flashing 	<ul style="list-style-type: none"> • Device ready. • At least one internal power supply out of range. • Start-up of device.
FLT	Red	<ul style="list-style-type: none"> • Continuously OFF • Continuously ON • Flashing 	<ul style="list-style-type: none"> • OK • HW fault or program fault. • Incorrect or corrupt FW.
INF	--	--	(Not used)
COM1	Yellow	• Flashing	• Sends MS/TP packages.
COM2	Yellow	• Flashing	• Sends LONWORKS packages (PXG3.L only).
SVC	Red	<ul style="list-style-type: none"> • Continuously OFF • Continuously ON • Flashing • Flashing per wink command *) 	<ul style="list-style-type: none"> • Configured. • Defective Hardware. • Unconfigured. • Physical identification of the router.
Ethernet 1 / 2	Green	<ul style="list-style-type: none"> • Continuously ON • Continuously OFF • Flashing 	<ul style="list-style-type: none"> • Link active • Link inactive • Network activity
	Yellow	<ul style="list-style-type: none"> • Continuously ON • Continuously OFF 	<ul style="list-style-type: none"> • Link 100 Mbps • Link 10 Mbps

*) Wink command pattern:



Service button



92770z03

Button	Press	Description
1	• Short	Physical identification on the network (Ethernet).
		<p>To reset the device into the factory state please follow these steps:</p> <ol style="list-style-type: none"> 1. Power off device. 2. Power on the device. 3. Wait for all LEDs to light up and turn off again, then push down SVC button. 4. Keep SVC button pressed until the green RUN LED flashes, then release button. 5. Wait for device to fully start up unconfigured (RUN LED on, SVC LED flashes). <p>The device has now lost any password and other settings. Only the IP network settings remain the same as before.</p>

Engineering

- The router does not require programming. It is configured either using Xworks Plus or the Desigo SSA-DNT using Ethernet or USB Device. For details see SSA (Setup & Service Assistant) Commissioning, CA111050).
- Each device has a unique identification number to ensure efficient commissioning. The number is located on a removable barcode label.
- Each device has a unique MAC address.

For more details see document “Ethernet, TCP/IP, MS/TP and BACnet - Principles” (CM110666).

Installation

Ethernet: See installation manual Desigo TRA, CM111043.

LONWORKS: See installation manual RXC, CA110336.

Mounting

The router is designed for mounting on a standard mounting rail or on a wall. Power is supplied by connecting plug-in screw terminal blocks.

Commissioning

To prevent equipment damage and/or personal injuries adhere to local safety regulations and related safety standards.

Maintenance

No maintenance required. A supercap supports the real-time clock (3 days).

Disposal




The devices are considered electronic devices for disposal in terms of the European Directive 2002/96/EC (WEEE) and may not be disposed of as domestic waste.

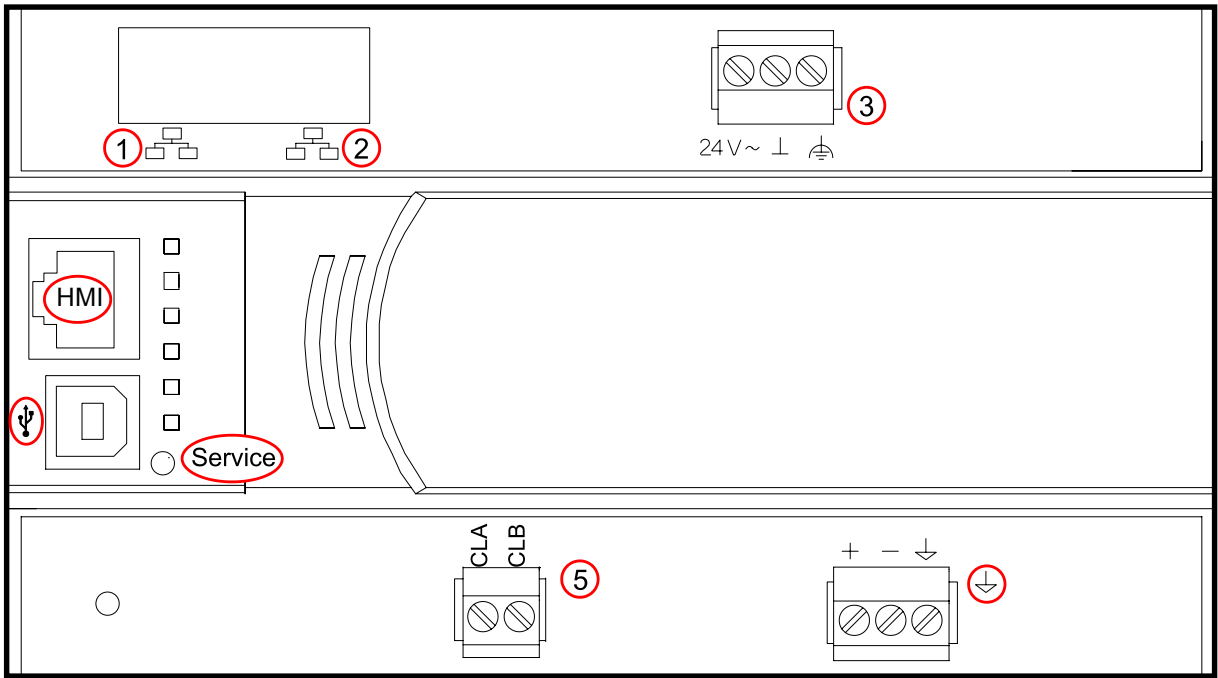
Dispose of the devices via the proper channels.
Observe all local and applicable laws.

Technical data

Operating voltage (24 V~, ⊥, ⚡)	Safety extra-low voltage SELV or protection by extra-low voltage PELV as per HD384	AC 24 V ± 20 % 48...63 Hz
	Half-wave load ⚡ = Technical ground	Symmetric DC 24 V ± 20%
Power consumption	At AC 24 V	Max. 9 VA
	At DC 24 V	Max. 4 W
	Max. permissible transit power AC/DC 24 V (RJ45 interface, HMI)	Max. 0.5 A
	Internal fuse	With PTC
Hardware information	Processor	Atmel ARM9
	Storage	256 MB flash, 64 MB SDRAM
Response to power / communication failure	Energy reserve (Supercap) to support real-time clock (3 days). Data available only if saved to flash memory.	
Ethernet interface	Plug	2 x RJ45, screened
	Interface type	100BaseTX, IEEE 802.3 compatible
	Bit rate	10/100 Mbps, half / full duplex, auto-negotiation
	Protocol	BACnet over UDP/IP
HMI interface	Generic, for HMI (LONWORKS)	RJ45 (PXG3.L only)
USB interface	Plug	Type B (USB device)
	Data rate (USB 1.0 full speed)	12 Mbps
	Galvanic isolation of ⊥	No
	Protective switch against surges and overcurrent	Yes
LONWORKS interface (PXG3.L only)	Interface type	TP/FT-10
	Transceiver	FT 5000 smart transceiver
	Galvanic isolation	Yes
	Bit rate	78 kbps
	Protocol	BACnet over LonTalk
MS/TP interface	Interface type	RS485
	Galvanic isolation	Yes
	Baud rates	9600, 19200, 38400, 76800, 115200
	Protocol	BACnet over MS/TP
Connection terminals, plug-in	Design type	Plug-in screw terminals
	Cu-wire or Cu-strand with wire end sleeve	1 x 0.6 mm dia. to 2.5 mm ² or 2 x 0.6 mm dia. to 1.0 mm ²
	Cu-strand without wire end sleeve	1 x 0.6 mm dia. to 2.5 mm ² or 2 x 0.6 mm dia. to 1.5 mm ²
	Screwdriver	Slot screws Screwdriver, size 1 <i>with shaft dia. ≤ 4.5 mm</i>
	Max. tightening torque	0.6 Nm

Assignment as per EN 60730	Operation of automatic controller	Type 1
	Degree of pollution	2
Housing protection standard	Design type	Protection class III
	Protection type as per EN 60529	
	Front parts in the DIN section	IP30
Environmental conditions	Terminal part	IP20
	Operation	As per IEC 60721-3-3
	Climatic conditions	Class 3K5
	Temperature	-5 ... 50 °C
	Humidity	5...95% r.h.
	Mechanical conditions	Class 3M2
	Transport	As per IEC 60721-3-2
	Climatic conditions	Class 2K3
	Temperature	-25...70 °C
	Humidity	5...95% r.h.
Mechanical conditions	Class 2M2	
Standards, directives, and approvals	Product safety	
	Automatic electrical controls devices for household and similar use	
		EN 60730-1
	Electromagnetic compatibility	
	Immunity (industry & residential)	EN 60730-1
	Emissions (residential)	EN 60730-1
	CE conformity	
	Electromagnetic compatibility	2004/108/EC
	RoHS Directive	2011/65/EU
	C-tick conformity (EMC)	AS/NZS 61000-6-3
	Certifacate	
UL approbation	UL916	
Environmental compatibility	The product environmental declaration CM1E9270 contains data on environmentally compatible product design and assessments (RoHS compliance, materials composition, packaging, environmental benefit, disposal)	ISO 14001 (environment) ISO 9001 (quality)
Color	Housing	RAL 7035 (light-gray)
Dimensions	Housing as per DIN 43880, see dimensions	
Weight	Without/with packaging	286 g / 332 g

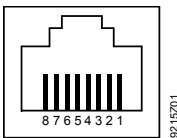
Connection terminals and interfaces



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1, 2		2 x RJ45 interface for Ethernet
3	24 V ~, ⊥, ⚡	AC/ DC 24 V operating voltage
5	CLA, CLB	LONWORKS interface (PXG3.L only)
HMI		RJ45 interface for HMI (PXG3.L only)
	USB	USB tool interface
Service		Service button

RJ45 pin assignment for HMI



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Pin	Name	Description	Pin	Name	Description
1	CLA	LONWORKS A	5	nc	Not connected
2	CLB	LONWORKS B	6	nc	Not connected
3	AC24V_N	AC24V Neutral	7	nc	Not connected
4	AC24V_L	AC24V Line max. 500mA	8	nc	Not connected

LONWORKS pin assignment

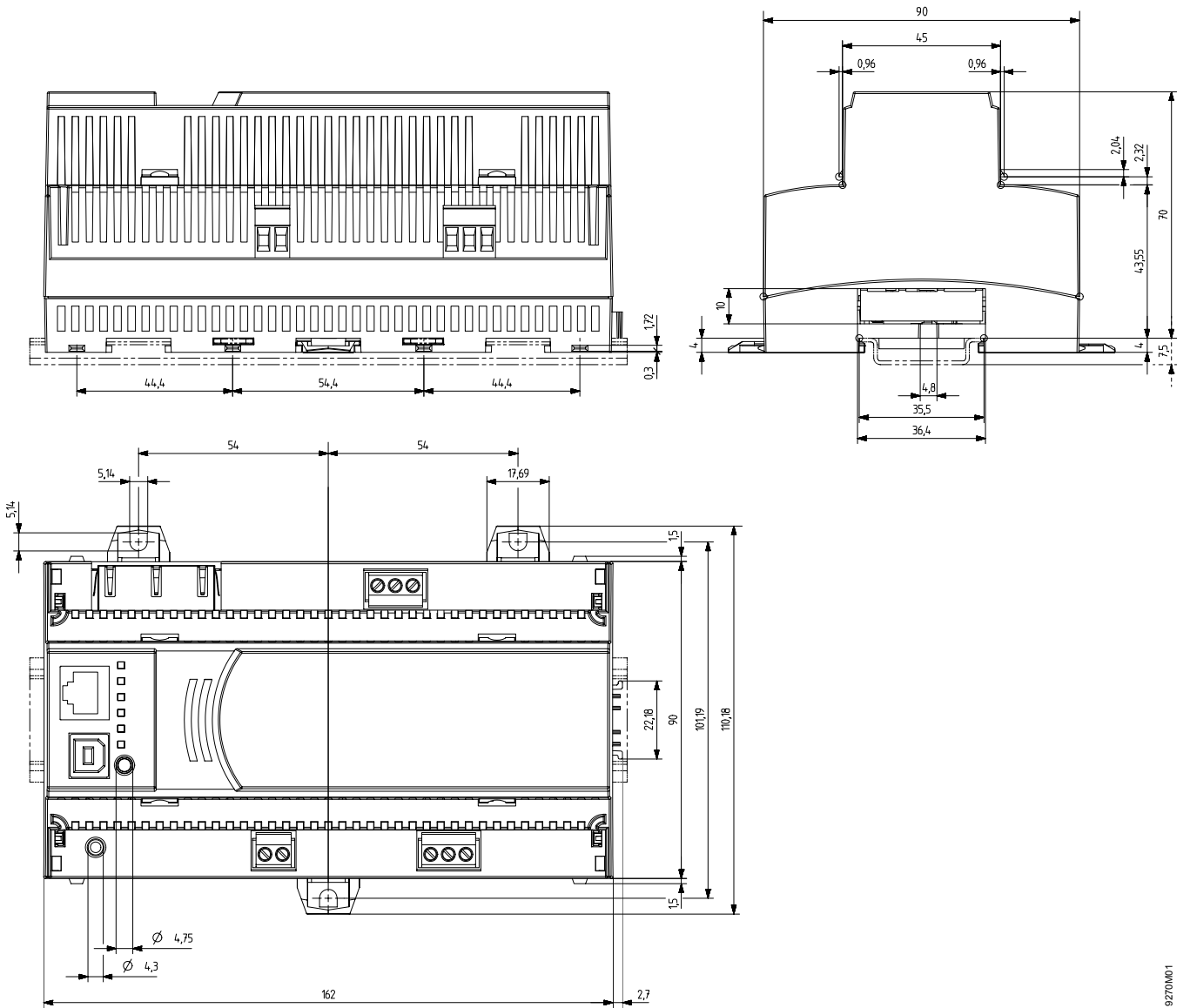
Pin	Name	Description
1	CLA	LONWORKS A
2	CLB	LONWORKS B

MSTP pin assignment

Pin	Name	Description
1	+	B RS485
2	-	A RS485
3	⚡	Ground RS485

Dimensions

All dimensions in mm



9270M01

