# **SIEMENS**



# Desigo V6.0

# BACnet Router PXG3.M and PXG3.L Engineering and configuration

Engineering

PDF help

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### 2 BACnet router PXG3.M/L

This document handles the following topics:

#### **XWP Engineering**

BACnet-Router used on the Desigo building automation and control network should be engineered as a rule in XWP (network configurator). This ensures a conflict-free network configuration.

Typical network configuration:

See: Engineering a router (XWP)  $[\rightarrow 7]$ 

Other typical uses of the BACnet router are displayed based on network topologies. See: Network with NAT router (examples) [ $\rightarrow$  18]

As an engineering example we depict the connection of two building automation and control networks over a private IT-LAN or the Internet. See: Engineer network with NAT router (example) [ $\rightarrow$  19]

#### Node setup and configuration

The created router configuration is loaded to the router using the SSA-DNT program. The SSA-DNT program is launched directly from XWP. See: Configuring router (Node Setup) [ $\rightarrow$  13] SSA-DNT program functions are described. See: SSA-DNT program description [ $\rightarrow$  30]

#### Online

BACnet routers can be configured, operated, and monitored online. The local website on the router is used here. The web pages and their functions are described.

See: Changing a router configuration online  $[\rightarrow 16]$ 

Notes:

- The operating system language setting in Regional Settings determines the user interface language of SSA-DNT.
- The web page language can be set on each web page (top right).

### 3 Engineering a router (XWP)

The networks and the BACnet routers PXG3.M/L are engineered in Desigo XWP. The following example illustrates how an BACnet/IP network is connected to a BACnet MS/TP network and/or a BACnet/LonTalk network.



The following table illustrates the relevant settings of the example.

Networks (specified by the network managers)					
LAN	IP network (private)	Name: Range: Gateway:	LAN 192.168.1.x/24 192.168.1.254		
NET01	BACnet/IP network	Name: Network number: Subnet mask: Standard gateway:	NET01 1 255.255.255.0 192.168.1.254		
NET02	BACnet MS/TP network	Name: Network number: Baud rate	NET02 2 76800		
NET03	BACnet/LonTalk network	Name: Network number:	NET03 3		

BACnet router PX	BACnet router PXG3.L					
Name	BNR01					
1.Port	LonTalk					
	Segment	SEG01 [LonTalk]				
	Node ID	100 (default)				
	Subnet ID	1 (default)				
2.Port	UDP/IP					
	Segment	SEG01 [UDP/IP]				
	IP address	192.168.1.100				
	UDP port number	BAC0 [0xBAC0]				
	Support BDT	True				
	Support FDT	False				

3.Port	MS/TP		
	Segment	SEG01 [MS/TP]	
	Address	0 (default)	
	Max Master	Largest master-device address value. (default: 127)	
Device number	XWP assigned an available device number. (default: 1)		
Password	Min. 6 characters		

#### Creating the network topology in XWP

Three different BACnet networks are created in XWP:

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



#### Add and configure BACnet/IP network

- 1. Add and rename new BACnet network.
- 2. Define network number. (e.g. 1)

Tree View 📮	ą	Properties		
Internetwork 3 Sites INET [Internetwork] INET [Internetwork] INET01 [BACnet Network 01]		General     Name     Description     System     Number     Max NPDU Length     Remote Area Name     Transport Protocol	NET01 BACnet Network 01 1 228 Undefined	

- 3. Add and rename new UDP/IP segment.
  - ⇒ Max NPDU length is set for UDP/IP: 1497
- 4. Enter subnet mask and default gateway. (e.g. 192.168.1.254)

Tree View 🛛	4	Properties		
🔍 Internetwork 🏠 Sites		▲ General		
	- 16	Name	SEG01	
INET [Internetwork]		Description	UDP/IP Segment 01	
E- NET01 [BACnet Network 01]		▲ System		
Internetwork % Sites     INET [Internetwork]     INET [Internetwork]     NET01 [BACnet Network 01]     SEG01 [UDP/IP Segment		IP Addresses from	0.0.0.0	
		IP Addresses to	0.0.0.0	
		Subnet Mask	255.255.255.0	
		Default Gateway	192.168.1.254	

#### Add and configure BACnet MS/TP network

- 1. Add and rename new BACnet network.
- 2. Define network number. (e.g. 2)



- 3. Add and rename new MS/TP segment.
  - ⇒ Max NPDU length is set for MS/TP: 501
- 4. Define Baud rate. (e.g. 76800)

Tree View 📮	<b></b>	Properties	
Internetwork INET [Internetwork] INET [Internetwork] INET01 [BACnet Network 01] INTER SEG01 [UDP/IP Segment INET02 [BACnet Network 02] INTER SEG01 [MS/TP Segment] INTER SEG01 [MS/TP		General     Name     Description     System     Baud rate	SEG01 MS/TP Segment 01 76800

#### Add and configure BACnet/LonTalk network

- 1. Add and rename new BACnet network.
- 2. Define network number. (e.g. 3).

Tree View म	<b></b>	Properties		
Internetwork INET [Internetwork] INET [Internetwork] INET01 [BACnet Network 01] INET02 [BACnet Network 02] INET02 [BACnet Network 02] INET03 [BACnet Network 03] INET03 [BACnet Network 04] INET03 [BACnet Networ		General     Name     Description     System     Number     Max NPDU Length     Remote Area Name     Transport Protocol	NET03 BACnet Network 03 3 228 Undefined	

- 3. Add and rename new LonTalk segment.
  - ⇒ Max NPDU length is set for LonTalk: 228
    - ⇒ The default value for LonTalk can be taken over.

Free View 📮		Properties		
Internetwork  Sites      INET [Internetwork]      NET01 [BACnet Network 01]      SEG01 [UDP/IP Segment      NET02 [BACnet Network 02]      SEG01 [MS/TP Segment      NET03 [BACnet Network 03]		4	General Name Description System Channel ID Domain ID Domain ID Length	SEG01 LonTalk Segment 01 0 0x49 1

#### Create router configuration in XWP

In XWP, create one BACnet router and connect it to the networks.

#### Create and configure the BACnet router

1. Add and rename new BACnet router PXG3.L. (e.g. BNR01)

Tree View P	Properties	
Internetwork 3 Sites INET [Internetwork] BINB01 IPXG Router 011	General     Type     Name     Description	PXG3.L BNR01 PXG Bouter 01
NET01 [BACnet Network 01]     NET01 [BACnet Network 01]     SEG01 [UDP/IP Segment 01]     SEG02 [MS/TP Segment 01]     NET03 [BACnet Network 03]     SEG03 [I on Talk Segment 01]	Panel Author Location	<none> <none></none></none>
	System Option Modules Ports 1. Port	<none> (3) LonTalk</none>

#### 2. Configure 1.Port (LonTalk):

4	System	
	Option Modules	<none></none>
4	Ports	(3)
	▲ 1. Port	LonTalk
	Segment	SEG01 [LonTalk Segment 01] on NET03 [BACne
	Node ID	100
	Subnet ID	1
	Neuron ID	00000000000

- Node-ID: 100 (default)
- Subnet-ID: 1 (default)
- 3. Configure 2.Port (UDP/IP):

The UDP/IP port is on the LAN side (e.g. 2.Port). The corresponding Ethernet connection on the device is: 1 呂 or 呂 2

System	
Option Modules	<none></none>
Ports	(3)
1. Port	LonTalk
⊿ 2. Port	Udp/IP
Segment	SEG01 [UDP/IP Segment 01] on NET01 [BACne
IP Address	192.168.1.100
Use DHCP	False
UDP Port Number	0xBAC0
Support BDT	True
Support FDT	False
Public NAT IP address	0.0.0.0
BDT	(1)
Ethernet Address	00000000000
<ul> <li>Web port</li> </ul>	
Host name	
DNS server 1	0.0.0.0
DNS server 2	0.0.0.0
Domain	
Allow HTTP connection	False
HTTP port number	80
HTTPS port number	443

- **Segment:** Select segment for BACnet/IP network.
- IP-Address: Enter the IP address for the BACnet router. (e.g. 192.168.1.100)
- UDP port number: Enter the UDP port number for the BACnet/IP network. (e.g. BAC0)

Notes: The UDP port number BAC0[47808] is entered as "0xBAC0".

- Support BDT: True (enabled).

#### 4. Configure 3.Port (MS/TP):

Pro	perties	
۵	System	
	Option Modules	<none></none>
۵	Ports	(3)
	▷ 1. Port	LonTalk
	2. Port	Udp/IP
	⊿ 3. Port	MS/TP
	Segment	SEG01 [MS/TP Segment 01] on NET02 [BACnet
	Address	0
	Max Master	127
	Max Info	10
	Slave proxy	False
	Auto slave discovery	False

- Segment: Select segment for MS/TP network. The Baud rate is inherited from MS/TP segment 01.
- Address: 0 (default)
- Max.Master: Largest master-device address value. (default: 127)
- 5. Access password: Enter router password. Min. 6 characters Note: Set up a different password for each project (no country-wide passwords).

User strong passwords:

- Use capital letters
- User lowercase letters
- Use numbers
- Use special characters
- At least 8 characters per password

	perues		
👌 Internetwork 🏠 Sites 🛛 🖉 🖉	General		
	Туре	PXG3.L	
	Name	BNR01 PXG Router 01	
BNR01 [PXG Router 01]	Description		
🖃 📴 NET01 [BACnet Network 01]	Panel	<none></none>	
A SEG01 [UDP/IP Segment 01]	Author	<none></none>	
	Location		
NET02 [BACnet Network 02]	System		
SEG02 [MS/TP Segment 01]	Option Modules	<none></none>	
- VET03 [BACnet Network 03]	Ports	(3)	
SEG02 II on Talk Sogment 011	▲ 1. Port	LonTalk	
	Segment	SEG01 [LonTalk Segment 01]	
	Node ID	100	
	Subnet ID	1	
	Neuron ID	00000000000	
	⊿ 2. Port	Udp/IP	
	Segment	SEG01 [UDP/IP Segment 01]	
	IP Address	192.168.1.100	
	Use DHCP	False	
	UDP Port Number	0xBAC0	
	Support BDT	True	
	Support FDT	False	
	Public NAT IP address	0.0.0.0	
	BDT	(1)	
	Ethernet Address	00000000000	
	⊿ Web port		
	Host name		
	DNS server 1	0.0.0.0	
	DNS server 2	0.0.0.0	
	Domain		
	Allow HTTP connection	False	
	HTTP port number	80	
	HTTPS port number	443	
	4 3 Port	MS/TP	
	Segment	SEG01 IMS/TP Segment 011 o	
	Address		
	Max Master	127	
	Max Info	10	
	Slave prov	Falce	
	Auto slave discovery	False	
	SNMP	1030	
	Enabled	False	
	Bead Community	1000	
	System Version	Desigo V5 1	
	Firmware version	Longo to. I	
	Serial number		
	Device Name	BNR01	
	Device ID	0-02100801	
	Device ID Made	Predefined	
	Device number	1	
	Access Password		
	Device Instance Number	1050625	
	Max APDILL as ath	200	
	ITC time amphaniation method	200	
	OTC time synchronization master		
	Givi i time zone	GMT+UT:UU Benin, Rome	

#### The BACnet router configuration is not created.



### 4 Configuring router (Node Setup)

The router configuration created in XWP is loaded to the router using the SSA-DNT program.

#### Create network connection to router

- ▷ The router is operational and **unconfigured**.
- ▷ The commissioning laptop is connected to the router (via LAN or USB cable). See: Connecting the cable to the IP device  $[\rightarrow 37]$
- ▷ A network connection (via USB or LAN) is configured. See: Configuring a network connection [→ 38]
- XWP is connected to the same physical segment (LON or IP) as the automation station.
- 1. Open the XWP project in Network Configurator.
- 2. Right-click the router in the Network Configurator. Select Node Setup.
  - ⇒ The SSA DNT program starts. The task Set up node is active (left column).

🛅 Setup & Service Assistant - Set up node, update firmware	
File Tools Help	
Set up node Setect network interface: Local Area Connection - Reallek, PDIe GBE Family C. V IP settings: Salect IP: 139.16.76.53 V Connect Password:	
Select device configuration	
Location Device name Device type Address and port Serial number Device instance numb	er
Update Intervance	sch > 8 Service As
	>
Configure/Load divice Clear divice Planh LED Scen m	stwork
Time stamp Log entry	
Connection closed	),;

See also: SSA-DNT program description [ $\rightarrow$  30]

- The password for the router configuration is automatically applied (top right). A background password query is carried out when accessing the device.
- **3.** Configure the network connection:
  - Select the configured network interface.
  - Select the configured IP address.
  - Click Connect.
  - The LAN or USB network connection is established (log entry). The status of the network connection is displayed (lower left hand side of the pane).
  - ➡ For a USB network connection, the connected device is listed immediately in the Select device on network table and can be configured without additional identification.

- 4. Click Network scan.
  - $\Rightarrow$  The network is scanned (log entry).
- ⇒ The discovered devices (room automation stations, routers, etc.) are displayed. (Select device on network table).
- ➡ Unconfigured devices are displayed with Message = Unconfigured and device instance number = 4194303.
- Note: An active firewall may prevent access to the device. Either the corresponding firewall pane is displayed or no devices are found with Network scan. Not even the service pin triggers a reaction. Check with your network administrator for detailed procedures.

#### Configuring a router

- Set the filter criteria for the network (e.g. PXG3.L). (Select device on network table).
- **2.** Select the router. Identify the router in the following ways:
  - Press the service pin on the device.
     The device sends out an identification signal.
     Highlight the device of the last ID signal.

OR

- Select the router. Click Flash.
   The flash command is outputted to the highlighted device to identify it. An LED of the device flashes for about 10 seconds.
- **3.** Select the device configuration for the router. (**Select device configuration** table).
- 4. Check to see if the identified router (highlighted) should be configured as per

the selected device configuration (highlighted also).

	fife											
,	[	Netzwerkverbindung Netzwerkschnittstelle v	vählen: LAN-Verbin	dung 2 - D-Link D	DUB-E100 USB 2.0 Fas	t Ethernet Adaj 💌	IP-Einstellunger	IP wählen: 193	.168.111.1	Trennen	Sicherhe Passwor	ait <b> •••••</b>
ten	G	ierätekonfiguration	wählen									
	Γ	Ort		Gerätename	(	ierätetyp	,	Adresse und Port	Seri	ennummer	Ge	eräteinstanznummer
	P		E	3NR01	P	KG3.M	1	92.168.111.10.47808			10	1
-p												
	G	Corist im Notsmork m	Shlan					Filterkriterien fü	Netzwerk:	Alle Geräte		<ul> <li>Aktualisieren</li> </ul>
	6	àerät im Netzwerk w	vählen		1	1		Filterkriterien fü	Netzwerk:	Alle Geräte		Aktualisieren
	6	Gerät im Netzwerk w Meldung	a <b>hlen</b> Gerätestatus	Ort	Gerätename	Gerätetyp	Firmware-Version	Filterkriterien fü	Seriennumme	Alle Geräte	Geräteinsta	Aktualisieren     URL Setup & Service Assista
	6	iterät im Netzwerk w Meldung Dekonfiguriert	Figure Constants	Ort	Gerätename Default Name	Gerätetyp PXG3.M	Firmware-Version FW=0.0.0.138.5	Filterkriterien fü Adresse und Port 169.254.25.28:47808	Netzwerk: Seriennummer 519	Alle Geràte MAC-Adresse 00:A0:03:04:00:9C	Geräteinsta 4194303	Aktualisieren URL Setup & Service Assista http://169.254.25.28
	G	aerät im Netzwerk w Meldung Dekonfiguriert	Gerätestatus Download erford	Ort	Gerätename Default Name	Geratetyp PKG3.M	Firmware-Version FwI=0.0.0.138;5	Filterkriterien fü Adresse und Port 169.254.25.28:47808	Setiennumme 519	Alle Geräte MAC-Adresse 00.A0:03:04:00:9C	Geräteinsta 4194303	Aktualisieren     Aktualisieren     URL Setup & Service Assista     http://169.254.25.28
	G	äerät im Netzwerk w Meldung Dekonfiguriert	Fählen Gerätestatus Download erford	Ort	Gerätename Default Name	Geräketyp PXG3.M	Firmware-Version FW=0.0.0.138;5	Filterkniterien fü Adresse und Port 169.254.25.28:47808	Seriennumme 519	Alle Geräte MAC-Adresse 00-A0:03:04:00:9C	Geräteinsta 4194303	Aktualisieren URL Setup & Service Assiste http://163.254.25.28
	6	äerät im Netzwerk w Meldung ▶ Dekonfiguriert	vählen Gerätestätus Download erford	Ort	Gerätename Default Name	Gerätetyp PKG3.M	Firmware-Version FW=0.0.0.138:5	Filterkulterien fü Adresse und Port 169.254.25.28:47808	Setiennumme 519	Alle Geräte MAC:Adresse 00:A0:03:04:00:9C	Geräteinsta 4194303	Aktualisieren  URL Setup & Service Assiste http://163.254.25.28
	G	Serät im Netzwerk w Meldung Dekonfiguriert	rählen Geräkestatus Download erford	Ont	Gerätename Default Name	Gerätetyp PKG3.M	Firmware-Version FW=0.0.0.138:5	Filterkitterien fü Adresse und Port 163 254 25 28:47908	Seriennumme 519	Alle Geriðe MAC-Adresse 00-A0:03:04:00:9C	Geräteinsta 4194303	Aktualisieren URL Setup & Service Assiste Inter//163.254.25.28
	G	Serät im Netzwerk w Meldung Dekonfiguriert	vählen Geräkestatus Download erford	Ort	Gerätename Default Name	Gerähetyp PNG3.M	Firmware-Version FW=0.00.138:5	Filterkitteien fü	Seriennumme 519	Alle Geriðe MAC-Adresse 00-A0:03:04:00:9C	Geräteinsta 4194303	Aktualsieren URL Setup 1. Service Assiste http://163.254.25.28
	G	Serät im Netzwerk w Meldung Dekonfiguriert	Ablen Gerökestakus Download erford	Ort	Gerätename Default Name	Geräletyp PKG3M	Firmware-Version FW=0.00.138.5 Genat konfig	Filterkitteien fü	Seriennumme 519 Gerät löschen	Ale Gerèle MAC-Adresse OD-A0.03:04:00:9C File File	Geräteinsta 4194303 ash-LED	Aktualkieren      URL Setup 1. Service Assista      Http://163.254.25.28      Netzwerk-Scon
	G	Seriðt im Netzwork w Meldung Dekonfiguriert	vählen Gerekestatus Download erford	Dit	Getalename Default Name	Geräletyp PXG3.M	Firmware-Version FW-0.0.0.1385 Gerät konfig	Filterkittelen fü	Seriennumme 519 Gerät löschen	Alle Geräte  MAC-Adresse  00-A0.03 04-00 SC  Fk	Geräteinsta 4194303 ash-LED	Aktualkieren URL Setup 1: Service Assiste Here.//163.254.25.28
	Zeitte	ierät im Netzwerk w Meldung Dekonfiguriet	xahlen Gerätestatus Download enford	Dit	Geiðlename Default Name	Gerätetyp PKG3.M	Firmware-Version FW-0.0.0.1385 Gerät konfig	Fillerkittelen fü	Seriennumme 519 Gerät föschen	Alle Gerale ( MAC-Adesse 00-A0.03-04-00-9C Fk	Geräteinsta 4194303 ash-LED	Aktualkieren URL Setup & Service Assiste Http://160.254.25.29
F	Zeitste	ieriät im Netzwork w Meldung Dekoniguriert	kahlen Gerätestatus Download enford	Ort	Genatename Defauit Name	Geratetyp PXG3.M	Firmware-Version Fw/=0.0.0.138.5 Gerät konfig	Filedistein fü	Netzverk: Seriennumme 513 Gerät föschen	Alle Gerale ( MAC-Adesse 00-A0.03-04-00-SC	Geräteinsta 4194303 asth-LED	Aktualisieen UPL Setup & Service Assista IND://150.254.75.20
	22eittee	ierät im Netzwork w           Meldung           Dekonfiguriert           01201214-24-08           01.201214-31-38	kählen Gerähestatus Download erford Logehitag Gerähkonfigurätion Offen? Verbindurg	Ort	Getillename Default Name	0 0 0 0 2-D-Livk DUB-E10	Firmware-Version Fw/=0.0.0.138:5 Genät konfig 00 USB 2.0 Fast Eth	Filedszteien fü	: Netzverk: Seriennumme 519 Gerät löschen	Alle Gerale  MAC-Adesse  00-A0:03:04:00:9C  Fk  92:168,111.1	Geräteinsta 4194303 astr-LED	Akkalaiseen UFL Setup 1. Service Ausitat     Hes.//169.254.25.28

Note: You can only use Configure/load device if the following conditions are met:

- The identified device is NOT configured. (Delete first any existing configuration, see below).
- Device type and serial number of the identified device and the engineered device configuration match.

- 5. Click Configure/load device. Wait until configuration is complete.
  - ⇒ Configuration is started (log entry).
  - ⇒ The device is restarted.
  - $\Rightarrow$  The values in the tables are updated.
  - Successful configuration is displayed (log entry).
  - ➡ Configure/load device requires about 2 to 4 minutes (including device restart).
- **6.** Check the router configuration online.

See: Changing a router configuration online  $[\rightarrow 16]$ 

Notes:

- Multiple devices can be configured in sequence using a LAN connection to the device. You do not need to wait each time for a complete configuration.
- Conversely, in the event of a USB connection, connection to other routers on the network is interrupted if the directly connected router restarts.
- An additional password prompt is displayed in the log window when the password is invalid (window top right). Note the following password rules: Minimum 6 characters, case-sensitive. The factory password is not accepted.

#### Deleting an existing configuration

- 1. Select a router. (Select device on network table).
- 2. Click Delete device.
  - ➡ Beginning and end of a procedure is displayed in the log window (takes about 1 to 2 minutes).
  - ⇒ Table Select device on network is updated (Device status = unconfigured, Device status = Download required, Device name = Default Name, Device instance number = 4194303).

 $\Rightarrow$  The router no longer is configured (factory setting).

Notes:

- An additional password prompt is displayed in the log window when the password is invalid (window top right).
- Multiple routers can be deleted in sequence using a LAN connection to the router. You do not need to wait for deletion to complete.
- Conversely, in the event of a USB connection, connection to other routers on the network is interrupted if the directly connected router restarts.

#### See also

- Configuring router (Node Setup) [ $\rightarrow$  13]
- Defining proxy server settings  $[\rightarrow 41]$

### 5 Changing a router configuration online

Each router has a web server. Use SSA-DNT or a browser (e.g. Internet Explorer >V10) to access the homepage of the router (URL). The router configuration can be read and edited online.

#### Establishing a web connection to a router (web server)

- $\triangleright$  The router is configured. The device is connected.
- ▷ The SSA-DNT program was launched from XWP.
- 1. Click Network scan in SSA-DNT.
  - ⇒ The discovered devices are displayed in the Select device on network table.
- 2. Click the link to the router. (Select device on network table; URL Setup & Service Assistant column).
  - ⇒ The project password (window top right) is checked. If necessary, another password query is displayed.
  - ⇒ The router overview page (homepage) opens.

	Overview   Statistics   File transfer   Save and log out Device and network configuration				
<ul> <li>Device state</li> <li>Settings</li> </ul>					
	Object name	BNR01			
	Model name	PXG3.L			
	Local date	12.06.2012			
	Local time	09:42:55			
	System status	Operational			
	Firmware revision	FW=01.00.23.446;SBC=10.10;			
	Serial number	610			
	Clear device				

- **3.** Select a subpane in the left navigation pane.
  - ⇒ The device and network settings are displayed.

3 Device state 3 Settings		Search			
	Device properties	ouron.			
	Device setting				
	Object identifier	0x208756A			
	Object name	BNR01			
	Description	PXG Router 01			
	Model name	PXG3.L			
	LON Setting[blon]				
	Network number	3			
	Domain ID	0x49 1			
	Subnet ID				
	Node ID	1			

- 4. Change the properties as required.
- 5. Select Save and log out in the upper navigation pane.

#### Notes:

- All entries are executed directly in the SSA and regularly saved every 30 minutes in non-volatile memory on the device. It is immediately saved with **Save and log out**. No data is saved on the commissioning laptop.
- The web page language can be set on each web page (top right).

#### Web connection using a browser

If you know the IP address of the device, you can enter the address in the browser or save it under Favorites. This opens the homepage without SSA DNT, but you must still enter the password.

Possible security issues If the factory-set password is still set, enter a new password for the router by reconfiguring the router. See Configuring router (Node Setup) [ $\rightarrow$ 13]

Check your proxy server settings for the browser if the status page does not open. See: Defining proxy server settings  $[\rightarrow 41]$ 

### 6 Network with NAT router (examples)

The following is a listing of various BACnet network configuration that integrate a management station (Desigo Insight or CC) over a router (NAT, BACnet).

#### Foreign device to single private LAN



#### BACnet Broadcast Management Device to single private LAN



### 7 Engineer network with NAT router (example)

The following example illustrates how to connect two BACnet/IP networks over a private IT-LAN with NAT. NAT devices are used where the public IP address must be static, e.g. IP routers such as ADSL modems. We strongly recommend VPN tunneling with BACnet NAT for security reasons.



The two BACnet/IP networks  $\mbox{CCC}$  and  $\mbox{DDD}$  are connected to one another over the private IT-LAN (LAN0).

BACnet/IP networks **AAA** and **BBB** are used, which form a common network from a technical standpoint (restriction in XWP: The same UDP port **BAC1** and same network number **111**).

BACnet routers **BNR01** and **BNR02** set up the connection over the NAT devices **NAT-Router A** and **NAT-Router B**.

The following table illustrates the relevant settings of the example.

Networks (	Networks (Network managers specify the information)				
LAN0	IP network (IT-LAN, private) or IP network (Internet, public)				
LAN1	IP network (private)	Range Gateway	192.168. <b>1</b> .x/24 192.168. <b>1</b> .254		
LAN2	IP network (private)	Range Gateway	192.168. <b>2</b> .x/24 192.168. <b>2</b> .254		
AAA	BACnet/IP network	UDP Network number	BAC <b>1</b> 111		
BBB	BACnet/IP network	UDP Network number	BAC <b>1</b> 111		
CCC	BACnet/IP network	UDP Network number	BAC <b>2</b> 333		
DDD	BACnet/IP network	UDP Network number	BAC <b>2</b> 444		

NAT-Router					
	NAT-Router A	NAT-Router B			
Public IP address (static IP, provided by NAT router)	76.33.197.15	83.125.55.13			
Port forwarding to BACnet router (must be configured on each NAT router)	UDP(xBAC1) 192.168. <b>1</b> .1	UDP(xBAC1) 192.168. <b>2</b> .1			

Desigo XWP is used to configure the networks and BACnet routers. The following table provides the relevant settings as an overview (example):

BACnet router PXG3.L					
	BNR01		BNR02		
Port	<b>2.Port</b> (LAN0 side)	<b>4.Port</b> (LAN1 side)	<b>2.Port</b> (LAN0 side)	<b>4.Port</b> (LAN2 side)	
Segment	SEG_AAA	SEG_CCC	SEG_AAA	SEG_DDD	
IP address	192.168. <b>1</b> .1	192.168. <b>1</b> .1	192.168. <b>2</b> .1	192.168. <b>2</b> .1	
UDP port number	BAC1	BAC <b>2</b>	BAC1	BAC <b>2</b>	
Support BDT	True	True	True	True	
Support FDT					
NAT IP address (public)	76.33.197.15 (NAT router A)		83.125.55.13 (NAT router B)		
BDT	76.33.197.15 (NAT router A) 83.125.55.13 (NAT router B)	192.168. <b>1</b> .1	83.125.55.13 (NAT router B) 76.33.197.15 (NAT router A)	192.168. <b>2</b> .1	

The first UDP/IP port is on the LAN0 side (e.g. 2.Port). The corresponding Ethernet connection on the device is:  $1 \ge 1$ 

The second UDP/IP port is on the LAN1/2 side (e.g. 4.Port). The corresponding

Ethernet connection on the device is: 居2

Variant: The BACnet/IP network  $\mbox{CCC}$  or  $\mbox{DDD}$  can be defined as MS/TP network or LonTalk network.

NOTICE
Open ports leave open the possibility that communication can be interrupted or misused. Unauthorized access to customer plants can result in system faults or the loss of automation stations.
Possible consequences: High costs for troubleshooting and poor reputation. 1. Open only those ports on a firewall (e.g. external switch) that are absolutely necessary for BAC systems. All other post must remain closed. 2. Only enable SNMP on the router if it is used.

#### Creating the network topology in XWP

Four BACnet/IP networks are created in XWP: AAA, BBB, CCC, DDD One UDP/IP segment is created on each BACnet/IP network. Important: The two BACnet/IP networks AAA and BBB form a common network from a technical viewpoint and must have the same network number.



#### Add and configure BACnet/IP network (AAA: LAN0 side)

- 1. Add and rename new BACnet network. (e.g. AAA)
- 2. Define network number. (e.g. 111)



- 3. Add and rename new UDP/IP segment. (e.g. SEG\_AAA)
- 4. Enter subnet mask and default gateway. (e.g. LAN1: 192.168.1.254)



#### Add and configure BACnet/IP network (BBB: LAN0 side)

- 1. Add and rename new BACnet network. (e.g. BBB)
- 2. Define network number. Important: Same network number as network AAA.



- 3. Add and rename new UDP/IP segment. (e.g. SEG\_BBB)
- 4. Enter subnet mask and default gateway. (e.g. LAN2: 192.168.2.254)



Add and configure BACnet/IP network (CCC: LAN1 side)

- 1. Add and rename new BACnet network. (e.g. CCC)
- 2. Define network number. (e.g. 333).



- 3. Add and rename new UDP/IP segment. (e.g. SEG\_CCC)
- 4. Enter subnet mask and default gateway. (e.g. LAN1: 192.168.1.254)



#### Add and configure BACnet/IP network (DDD: LAN2 side)

- 1. Add and rename new BACnet network. (e.g. DDD)
- 2. Define network number. (e.g. 444).

Tree View 🛛 🗘	<b></b>	Pro	perties	
Internetwork Sites INET [Internetwork] INET [Internetwork] SEG_AAA [BACnet Network AAA] SEG_AAA [UDP/IP Segment AAA] SEG_BBB [UDP/IP Segment BBB] SEG_BBB [UDP/IP Segment BBB] SEG_BBB [UDP/IP Segment CCC] SEG_CCC [UDP/I	Se	4	General Name Description System Number Max NPDU Length Remote Area Name Transport Protocol	NET_DDD BACnet Network DDD 444 228 Undefined

- 3. Add and rename new UDP/IP segment. (e.g. SEG\_DDD)
- 4. Enter subnet mask and default gateway. (e.g. LAN2: 192.168.2.254)

Tree View 4	<b></b>	Properties	
Internetwork  Sites INET [Internetwork] NET_AAA [BACnet Network AAA] SEG_AAA [UDP/IP Segment AAA] NET_BBB [BACnet Network BBB] SEG_BBB [UDP/IP Segment BBB] NET_CCC [BACnet Network CCC] SEG_CCC [UDP/IP Segment CCC] NET_DDD [BACnet Network DDD] SEG_DDD [UDP/IP Segment DDD]	Sy	<ul> <li>General Name Description</li> <li>System IP Addresses from IP Addresses to Subnet Mask Default Gateway</li> </ul>	SEG_DDD UDP/IP Segment DDD 0.0.0.0 255.255.255.0 192.168.2.254

#### Create router configuration in XWP

In XWP, two BACnet routers, **BNR01** and **BNR02** are created and connected to the networks.

Important: Each BACnet router requires an additional UDP/IP port.

The first UDP/IP port defines the LAN0-side interface (e.g. 2.Port). Ethernet device connection: 1 译

The second UDP/IP port defines the LAN1/2-side interface (e.g. 4.Port). Ethernet device connection: 品 2

#### Create and configure the first BACnet router

- 1. Add and rename new BACnet router. (e.g. BNR01)
- 2. Configure 2.Port (UDP/IP port on the LAN0 side):



- Segment: Select segment for network AAA (LAN0 side). (e.g. SEG\_AAA)
- IP address: Enter the IP address for the BACnet router BNR01. (e.g. 192.168.1.1)
- UDP port number: Enter common UDP port number of the networks AAA and BBB (LAN0 side). (e.g. BAC1)
   Notes: The UDP port numbers for 2.Port (LAN0 side) and 4.Port (LAN1 side) must be different. The port number BAC1[47809] is entered as "0xBAC1".
- Support BDT: True (enabled).
- Public NAT IP address: Public address of router NAT-Router A. (e.g. 76.33.197.15)
- Set up additional BDT entry for NAT router B:

Click **BDT** ... in the entry field. BACnet router **BNR01** is already entered.

	Lucation							
ľ.	System							
	Option Modules		UDP-IP-Port					
Ľ	Ports		(3)					
	▷ 1. Port		LonTalk					
	⊿ 2. Port		Udp/IP					
	Segment		SEG_AAA [UDP/IP Segment AAA] on NET_AAA [BACnet Network AA/					
	IP Address		192.168.1.1					
	Use DHCP		False					
	UDP Port Nu	imber	0xBAC1					
	Support BDT		True					
Support FDT		False						
	Public NAT 1	P address	76.33.197.15					
	BD I Ethernet Add	Iress	(2) 000000000000					
	dit BDT 🔫							
	New BBN	ID Reference	IP Address	UDP Port Number	Broadcast Mask	Hidden		
	Edit BNF	R01 [PXG Router A]	76.33.197.15	0xBAC1	255.255.255.255	No		
	<no< td=""><td>ine&gt;</td><td>83.125.55.13</td><td>0xBAC1</td><td>255.255.255.255</td><td>No</td></no<>	ine>	83.125.55.13	0xBAC1	255.255.255.255	No		
	Remove	/	1					
	Public IP-ad	dress of NAT-F	Router B					

Create new entry for **NAT router B** with the public address and UDP port number. (e.g. 83.125.55.13 and 0xBAC1)

- 3. Set up addition BACnet UDP/IP port.
  - Click **Option module** ... in the entry field.
  - Select UDP-IP port. Add.

Tree View 4	Properties				
Internetwork       Sites         INET [Internetwork]       INET [Internetwork]         INET [Internetwork]       INET_AAA [BACnet Network AAA]         INET_BBB [BACnet Network BBB]       SEG_AAA [UDP/IP Segment AAA]         INET_BBB [BACnet Network BBB]       SEG_BBB [UDP/IP Segment BBB]         INET_CCC [BACnet Network CCC]       SEG_CCC [UDP/IP Segment CCC]         INET_DDD [BACnet Network DDD]       SEG_DDD [UDP/IP Segment DDD]	Properties  General Type Name Description Panel Author Location  System Option Modules  Add Option Module  Type Descri UDP-IP-Port Additic UDP-IPv6-Port Additic	PXG3.L BNR01 PXG Router A <none> <none> <none> intermediate the second second</none></none></none>			

- ⇒ The additional port **4.Port** is set up.
- 4. Configure 4.Port:
  - Segment: Select segment for network CCC (LAN1 side). (e.g. SEG\_CCC)
  - IP address: Enter the IP address for the BACnet router BNR01. Same address as in 2.Port. (e.g. 192.168.1.1) Note: The only way to correct an incorrect address entry after the fact is to delete the router and create is again.
     UDP port number: Enter the UDP port number for network CCC (LAN1 side). (e.g. 0xBAC2) Notes: The UDP port numbers for 2.Port (LAN0 side) and 4.Port (LAN1 side) must be different.
  - Support BDT: True (enabled).

- entered. Properties ⊿ 4. Port Udp/IP SEG\_CCC [UDP/IP Segment CCC] on NET\_CCC [BACnet Network CCC] Segment IP Address 192.168.1.1 Use DHCF False UDP Port Number 0xBAC2 True Support BDT Support FDT BDT False ... (1) Edit BDT -X New... BBMD Reference IP Address UDP Port Number Broadcast Mask Hidden BNR01 [PXG Router A] 192.168.1.1 0xBAC2 255.255.255.255 No Edit Remove Close
- 5. Access password: Enter router password. Min. 6 characters

 BDT: No entry required. The BACnet router IP address BNR01 is already entered.

- Tree View п 4 Properties General 😪 Internetwork 🏠 Sites 4 PXG3.L Туре E-Q INET [Internetwork] BNR01 BNR01 [PXG Router A] Description **PXG Router A** 🖶 🐈 NET\_AAA [BACnet Network AAA] <None> Panel Author <None> SEG\_AAA [UDP/IP Segment AAA] Location E- NET\_BBB [BACnet Network BBB] 4 System SEG\_BBB [UDP/IP Segment BBB] UDP-IP-Port **Option Modules** E- NET\_CCC [BACnet Network CCC] . Ports (4) ▷ 1. Port LonTalk SEG\_CCC [UDP/IP Segment CCC] ▲ 2. Port Udp/IP - NET\_DDD [BACnet Network DDD] SEG\_AAA [UDP/IP Segr Segment SEG\_DDD [UDP/IP Segment DDD] IP Address 192.168.1.1 Use DHCP False UDP Port Number 0xBAC1 Support BDT True Support FDT False 76.33.197.15 Public NAT IP address BDT (2) 0000000000000000 Ethernet Address ▲ Web port Host name 0.0.0.0 DNS server 1 DNS server 2 0.0.0.0 Domain Allow HTTP connection False HTTP port number 80 HTTPS port number 443 > 3. Port MS/TP 4 4. Port Udp/IP SEG\_CCC [UDP/IP Segr Segment IP Address 192.168.1.1 Use DHCP False UDP Port Number 0xBAC2 Support BDT True Support FDT False BDT (1) 000000000000000 Ethernet Address ▲ SNMP Enabled False Read Community System Version Desigo V6.0 Firmware version Serial number BNR01 Device Name Device ID 0x02100801 Device ID Mode Predefined Device number 1 Access Password 1050625 Device Instance Number Max APDU Length 1476 UTC time synchronization master <Undefined> GMT time zone GMT+01:00 Berlin, Rom
- ⇒ The **BNR01** configuration is created.

#### Create and configure second BACnet router

Configure in the same way as for BACnet router BNR01.

- 1. Add and rename new BACnet router. (e.g. BNR02)
- 2. Configure 2.Port (UDP/IP port on the LAN0 side):
  - Segment: Select segment for network BBB (LAN0 side). (e.g. SEG\_BBB)
  - IP address: Enter the IP address for the BACnet router BNR02. (e.g. 192.168.2.1)
  - UDP port number: Enter common UDP port number of the networks AAA and BBB (LAN0 side). (e.g. BAC1)
     Notes: The UDP port numbers for 2.Port (LAN0 side) and 4.Port (LAN2 side) must be different.
  - Support BDT: True (enabled).
  - Public NAT IP address: Public address of router NAT router B. (e.g. 83.125.55.13)
  - Set up additional BDT entry for NAT router A:

Click **BDT** ... in the entry field. BACnet router **BNR02** is already entered.

Pro	perties				8				
4	General								
	Туре	PXG3.L							
	Name	BNR02 PXG Router B <none></none>							
	Description								
	Panel								
	Author	<none></none>							
	Location								
4	System								
	Option Modules	<none></none>							
4	Ports	(3)							
	▷ 1. Port	LonTalk							
	a 2. Port	Udp/IP			11111				
	Segment	SEG_BBB [UDP/IP Segment BBB] on NET_BBB [BACnet Network BBB							
	IP Address	192.168.2.1							
	Use DHCP	False							
	UDP Port Number	0xBAC1							
	Support BDT	True							
	Support FDT	False							
	Public NAT IP address	83.125.55.13							
_	BDT	(1)							
Ed	Jit BDT				×				
	New V BBMD Reference	IP Address	UDP Port Number	Broadcast Mask	Hidden				
	Edit BNR02 [PXG Router B]	83.125.55.13	0xBAC1	255.255.255.255	No				
	<none></none>	76.33.197.15	0xBAC1	255.255.255.255	No				
	Public address of NAT-R has to be entered man	outer A ually.			Close				

Create new entry for NAT router A with the public address and UDP port

number. (e.g. 76.33.197.15 and 0xBAC1)

- 3. Set up addition BACnet UDP/IP port.
  - Click **Option module** in the entry field.
  - Select UDP-IP port. Add.
  - ⇒ The additional port **4.Port** is set up.
- 4. Configure 4.Port:
  - Segment: Select segment for network DDD (LAN2 side). (e.g. SEG\_DDD)
  - IP address: Enter the IP address for the BACnet router BNR02. Same address as in 2.Port. (e.g. 192.168.2.1).

Note: The only way to correct an incorrect address entry after the fact is to delete the router and create is again.

UDP port number: Enter the UDP port number for network DDD (LAN2 side). (e.g. 0xBAC2)
 Notes: The UDP port numbers for 2.Port (LAN0 side) and 4.Port (LAN2

side) must be different.

- Support BDT: True (enabled).
- BDT: The BACnet router IP address BNR02 is already entered.
- 5. Run a network check.
  - ⇒ The following error message can be ignored since a double use was set up no purpose:

"Network 'AAA [BACnet network AAA (LAN0) -> Property 'Network number' is already used by another network."

"Network 'BBB [BACnet network BBB (LAN0) -> Property 'Network number' is already used by another network."

⇒ The **BNR02** configuration is created.

Tree View 4	<b>म</b>	Properties
Tree View 4  Tree View 7  Tree 7  Tr	<b>7</b>	Properties         Image: General Type       PXG3.L         Type       PXG3.L         Name       BNR02         Description       PXG Router B         Panel <none>         Author       <none>         Location          System       Option Modules         UDP-IP-Port</none></none>
SEG_BBB [UDP/IP Segment BBB]		Ports         (4)           1. Port         Lon Talk           2. Port         Udp/IP           Segment         SEG_BBB [UDP/IP S           IP Address         192.168.2.1           Use DHCP         False           UDP Port Number         0xBAC1           Support BDT         True           Support FDT         False           Public NAT IP address         83.125.55.13           BDT         (2)           Ethemet Address         00000000000           Web port         Host pame
		Nos name       DNS server 1     0.0.0.0       DNS server 2     0.0.0.0       Domain     False       Allow HTTP connection     False       HTTP port number     80       HTTPS port number     443       ▶ 3. Port     MS/TP       ▲ 4. Port     Udp/IP       Segment     SEG_DDD [UDP/IP S       IP Address     192.168.2.1       UDP Port Number     0xBAC2       Support BDT     True       Support FDT     False       BDT     (1)
		Ethemet Address     00000000000       Image: SNMP     False       Enabled     False       Read Community     System Version       System Version     Desigo V6.0       Firmware version     Serial number       Device Name     BNR02       Device ID     0x02100802       Device ID Mode     Predefined       Device Instance Number     2       Access Password     Device Instance Number       Device Instance Number     1050626       Max APDU Length     1476       UTC time synchronization master     CUndefined>       GMT time zone     GMT+01:00 Berlin, F

### 8 SSA-DNT program description

The SSA DNT (Discovery and Node Setup Tool) includes the following program elements.

#### Menu

Menu	Function
File > Close	Close the SSA-DNT program.
Tools > Options	Path to the folder containing the firmware images. Additional file selection: Activates an input row in the Firmware update window to manually select the firmware file.
Tools > Add new PXG3 configuration.	Opens the <b>Add router configuration</b> window. A new device configuration can be created for a specified device type (router).
Help > Contents	Opens the PDF help. Select the language for the PDF help via the operating system's <b>Regional and Language Options</b> .

#### Taskbar (left, vertical)

Button	Function
Set up node	Opens the <b>Set up node</b> window.
Updating firmware	Goes to the <b>Update firmware</b> window.
	The entry field opens if no firmware library definition file is found.
Remote load	Goes to the Connect to subnetwork window.

	Net	work connection								Securi	ity	
	Sel	ect network interfa	ace: Local Arr	a Connection 2 -	D-Link DUB-E100	USB 2. 🗹 📔 IP sett	ings Select I	P: 192.168.251.10	Discon	nect Passw	vord:	
up node	Sele	ect device confi	iguration									
		Location		Device name		Device type	Address	and port	Serial number		Device instan	ce number
		Room 1	4	VD_1		PXC3.E72A	192.168.	251.1:47808			301	
odate		Room 2	1	- 4D 7		PXC3.E72	192.168.	251.2:47808	ES222		302	
ware	>	Room 3	1	VD_08		PXC3.E72A	192.168.	251.1:47808			303	
	>		1	vD_13		PXC3.E72A	192.168.	253.1:47808			331	
		Message	Device status	Location	Device name	Device type	Firmware version	Address and port	Serial number	MAC address	Device inst	Setup & Service A
	•	Message Configured	Device status Operational	Location Room 1	Device name AD_1	Device type PXC3.E72A	Firmware version FW=0.2.0.3230a;	Address and port 192.168.251.1:47808	Serial number ES248	MAC address 00:10:03:FE:43:2E	Device inst 301	Setup & Service /
	•	Message Configured Configured	Device status Operational Operational	Room 1 Room 2	AD_1 AD_7	Device type PXC3.E72A PXC3.E72	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a;	Address and port           192.168.251.1:47808           192.168.251.2:47808	Serial number ES248 ES222	MAC address 00:10:03:FE:43:2E 00:10:03:FE:43:2E	Device inst 301 302	Setup & Service / http://192.168.25 http://192.168.25
	<b>)</b>	Message Configured Configured	Device status Operational Operational	Location Room 1 Room 2	Device name AD_1 AD_7	Device type           PKC3.E72A           PKC3.E72           PKC3.E72	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a;	Address and port 192.168.251.1:47808 192.168.251.2:47808	Serial number ES248 ES222	MAC address 00:10:03:FE:43:2E 00:10:03:FE:43:2E	Device inst 301 302	Setup & Service A http://192.168.25 http://192.168.25
	• •	Message Configured Configured	Device status Operational Operational	Location Room 1 Room 2	Device name AD_1 AD_7	Device type           PXC3.E72A           PXC3.E72           PXC3.E72A	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a;	Address and port 192.168.251.1:47808 192.168.251.2:47808	Serial number ES248 ES222	MAC address 00:10:03:FE:43:2E 00:10:03:FE:43:2E	Device inst 301 302	Setup & Service / http://192.168.25 http://192.168.25
	• •	Message Configured Configured	Device status Operational Operational	Location Room 1 Room 2	AD_1 AD_7	PxC3.E72A PXC3.E72A PXC3.E72 PXC3.E72A	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a;	Address and port 192.168.251.1:47808 192.168.251.2:47808	Serial number ES248 ES222	MAC address 00:10:03:FE:43:2E 00:10:03:FE:43:2E	Device inst 301 302	Setup & Service A http://192.168.25
	*	Message Configured Configured	Device status Operational Operational	Location Room 1 Room 2	AD_1 AD_7	Device type PXC3.E72A PXC3.E72 PXC3.E72A	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a;	Address and port 192.168.251.1:47808 192.168.251.2:47808	Serial number ES248 ES222	MAC address 00:10:03:FE:43:2E 00:10:03:FE:43:2E	Device inst 301 302	Setup & Service / http://192.168.25
	> > <	Message Configured Configured	Device status Operational Operational	Location Room 1 Room 2	AD_1 AD_7	Device type PXC3E72A PXC3E72 PXC3E72A	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a; FW=0.2.0.3230a; Figure/Load device	Address and port 192.168.251.1:47808 192.168.251.2:47808 Clear device	Serial number ES248 ES222	MAC address 00:10:03:FE:43:2E 00:10:03:FE:43:2E Flash LED	Device inst 301 302	Setup & Service / http://19216825 http://19216825 Scan network
	> > <	Message Configured Configured	Device status Operational Operational	Location Room 1 Room 2	Device name AD_1 AD_7	Device type PXC3E72A PXC3E72 PXC3E72A Con	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a; FW=0.2.0.3230a; figure/Load device	Address and port 192.168.251.1:47808 192.168.251.2:47808 192.168.251.2:47808	Serial number ES248 ES222	MAC address 00:10:03/FE:43:2E 00:10:03/FE:43:2E Flash LED	Device inst 301 302	Setup & Service / http://192168.25 http://192168.25 Scan network
	) ) ) (	Message Configured Configured	Device status Operational Operational	Location Room 1 Room 2	Device name	Device type PXC3E72A PXC3E72 PXC3E72A Con	Firmware version FW=0.2.0.3230a; FW=0.2.0.3230a;	Address and port 192.168.251.1:47808 192.168.251.2:47808 192.168.251.2:47808	Serial number ES248 ES222	MAC address 00.10.03FE:43.2E 00.10.03FE:43.2E Flash LED	Device inst 301 302	Setup & Service / http://192168.25 http://192168.25 Scan network
Ţ	▶ ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ► ►	Message Configured Configured	Device status Operational Operational Uperational Uper	Location Room 1 Room 2	Device name           AD_1           AD_7	Device type PXC3E72A PXC3E72 PXC3E72A Con	Firmware version FW=0.2.0.3230a, FW=0.2.0.3230a, FW=0.2.0.3230a,	Address and port 192.168.251.1:47808 192.168.251.2:47808 Clear device	Serial number ES248 ES222	MAC address 00:10:03FE:43:2E 00:10:03FE:43:2E Flash LED	Device inst 301 302	Setup & Service / http://192168.25 http://192168.25 Scan network

#### Set up node window

Network connection	
Select the network interface.	Select a configured network interface. See also:Connecting the cable to the IP device $[\rightarrow 37]$
IP settings	Open the pane <b>Network connections</b> with the existing network connections and wizard for new connections. See also:Configuring a network connection [→ 38]
Select IP.	Select a configured IP address for the network interface.
Connect Disconnect	Connects/disconnects a network connection (IP).

Safety	
Password	Project password to access the IP device.
	The project password is checked automatically when a connection is established (as project manager).

The **Select device configuration** table shows the available device configurations. The device configurations for a TRA project are read from Pack & Go. The device configuration for the router can be created in SSA-DNT (Tools > Add new PXG3... configuration).

Select device configuration	
Location	Engineered description of the device's mounting location.
Device name	Engineered device name.
Device type	Engineered device type.
Address and port	Engineered IP address and UDP port.
Serial number	Device serial number saved in the project.
Device instance number	Engineered device instance number.

Right-click a cell to display the following context menu.

Context menu	
Find the proper serial number.	The network is searched for a device with the serial number in this line and displayed in table <b>Select device on network</b> .
Find the proper device type.	The network is searched for all devices with the the device type from this line and displayed in table <b>Select device on network</b> .

The **Select device on network** table (Desigo TRA only, no Desigo V5 automation stations) displays all IP devices (room automation stations, routers, etc.) on the (IP) network.

The table values are updated upon a network scan, after pressing the service button on the device, or by configuring the device.

Select device on network				
Message	Device status messa	Device status message.		
	Configured	Device is configured.		
	Unconfigure	Device has the factory setting (status after the command <b>Delete device</b> ).		
	Service pin pressed.	The service pin from this device is pressed.		
	Time set Configuring Restarting	Device runs the command <b>Configure/load device</b> .		
	Authentication failed	Password check failed (status after the command <b>Delete device</b> ).		
Device state	Device status.			
	Ready for operation	Device is operational.		
	Receive wink.	Device executes command <b>Flash</b> .		
	Download required	Device has the factory setting (status after the command <b>Delete device</b> ).		
Location	Description of the device's mounting location (configured).			
Device name	Device name (configured).			
Device type	Device type (specific to the device).			
Firmware version	Firmware version of the device (device-specific).			
Address and port	Engineered IP address and UDP port (configured).			
Serial number	Serial number (specific to the device).			

Select device on network					
MAC address	MAC address (device-specific).				
Device instance number		Device instance number (configured).			
	4194303	Device not configured.			
URL Setup & Service Assistant	http://	Device homepage address (device-specific).			

The filter limits the network search to the selected device type.

Filter	
Filter criteria for the network.	Device type selection.
Refresh	Searches for the selected device type on the network and lists the devices in the <b>Select device on network</b> table.

Button	
Read back	Reads the configuration parameters of the selected IP device and saves them to a file. (Only web interface PXG3 W100 at this time).
Configure/load device	Configure both network (node setup) and device. Load the configuration data (for field bus and field devices) in the room automation station. Prerequisite: The device is not configured, device type and serial number match. See: Changing a router configuration online [ $\rightarrow$ 16] See: Configuring router (Node Setup) [ $\rightarrow$ 13]
Delete device	Delete network configuration, device configuration, and configuration data in the device (factory setting). See: Changing a router configuration online [ $\rightarrow$ 16] See: Configuring router (Node Setup) [ $\rightarrow$ 13]
Flashing	Makes the LED on the room automation station flash. See: Changing a router configuration online $[\rightarrow 16]$ See: Configuring router (Node Setup) $[\rightarrow 13]$
Scan network	Scan the (IP) network to discover all IP devices (room automation stations, routers, etc.) and display them in the <b>Select device on network</b> table (Desigo TRA only, no Desigo V5 automation stations). See: Changing a router configuration online [ $\rightarrow$ 16] See: Configuring router (Node Setup) [ $\rightarrow$ 13]

#### Log window

Shows the individual steps carried out in the program.

Status display (lower left hand edge of pane).

Shows the connection status between commissioning computer and network (IP).

#### "Update firmware" window

🛄 Setup & Servic	e Assistant - Set up no	de, update firmware					
File Tools Hel	)						
Set up node	Select device type	×			Password:		
	Select firmware ver	sion					
	Firmware version	n	File name	Release info	Release info		
	► FW=0.2.0.3230a	a,	PXC3.E72A_V0.2.0.3230a.fmwz	Release Notes PXC3E	72A FW V0.2.0.3230a EN.doc		
firmware							
	Select firmware file	manually			Browse		
	Мессала	Device status	Device tupe   Firmware version   Address and not	Serial number MAC addre	ess Device inst UBL Setur & Servi		
	<			Load firm	Iware Scan network		
	Time stamp	Log entry					
	1 27.01.2012 15:48:41	Firmware library definition file FWDMetaData.xml no	t found. Specify the firmware library root path via Tools -> Options.				
	27.01.2012 15:48:49 27.01.2012 15:48:51 27.01.2012 15:48:51	Network discovery started Firmware library definition file FWDMetaData.xml no	t found. Specify the firmware library root path via Tools -> Options.				
Open connection: I	letwork interface = Local Are	a Connection 2 - D-Link DUB-E100 USB 2.0 Fast Ether	net Adapter; IP = 192.168.251.10		,;;		

Filter	
Select device type	Searches for the selected device type on the network and lists the devices in the <b>Select device on network</b> table.
	The selectable device types are dependent on whether or not a firmware file exists for the device type. (Tools > Options)

Safety		
Password	Project password to access the IP device.	
	The project password is checked automatically when a connection is established (as project manager).	

Select firmware version				
Firmware version	Firmware version in the firmware image.			
File name	File name for the firmware image.			
Release info	Release information for the firmware image.			

The entry field **Select firmware file manually** must be enabled via **Tools > Options: Additional file selection**.

Select firmware file manually			
Entry field	Path for the firmware file.		
Browse	Browse button to locate the firmware file.		

8

The **Select device on network** table (Desigo TRA only, no Desigo V5 automation stations) displays all IP devices (room automation stations, routers, etc.) on the (IP) network.

Button	
Loading firmware	Loads the firmware in the selected device. Start and end of loading are logged in the log file. See: Updating firmware
Scan network	Scan the (IP) network to discover all IP devices (room automation stations, routers, etc.) and display them in the <b>Select device on network</b> table (Desigo TRA only, no Desigo V5 automation stations).

#### Log window

Shows the individual steps carried out in the program.

Status display (lower left hand edge of pane).

Shows the connection status between commissioning computer and network (IP). Shows the connection status between commissioning computer and network (IP).

#### Remote load window

Setup & Service A	ssistant - Node einricht	en, Firmware aktu	ialisieren					_ 0
Datei Extras Hil	fe							
Node einrichten	Gerätekonfiguration	n wählen					Sicherheit Passwort	
	Ort		Gerätename	Gerätetyp	Adresse und Port	Seriennummer	Geräte-Instanznummer	7
Firmware aktualisieren								
Remote load		-	_	_		11	1	
					Load device	Zurücklesen	Setup and Service Assistant	
Z	eitstempel	Logeintrag						
	29.10.2012 08:12:47 29.10.2012 08:46:30 29.10.2012 12:44:38	Firmware-Bibliothe Firmware-Bibliothe Firmware-Bibliothe	ksdefinitionsdatei FWDMe ksdefinitionsdatei FWDMe ksdefinitionsdatei FWDMe	taData.xml nicht gefunden. Legen S taData.xml nicht gefunden. Legen S taData.xml nicht gefunden. Lenen S	ie den Root-Pfad für die Firmware-Bibliothek ü ie den Root-Pfad für die Firmware-Bibliothek ü ie den Root-Pfad für die Firmware-Bibliothek ü	ber Extras -> Optionen fest. ber Extras -> Optionen fest. ber Extras -> Optionen fest		
erbindung geschlose	en			Cogorio				_

Safety	
Password	Project password to access the IP device. The project password is checked automatically when a connection is established (as project manager).

Select device configuration	
Location	Engineered description of the device's mounting location.
Device name	Engineered device name.
Device type	Engineered device type.
Address and port	Engineered IP address and UDP port.
Serial number	Device serial number saved in the project.
Device instance number	Engineered device instance number.

Button	
Loading a device configuration	Starts loading the device configuration in the selected IP device. Start and end of loading are logged in the log file. See: Configuring and reading back via IP connection
Read back	Reads the configuration parameters of the selected IP device and saves them to a file. (Only web interface PXG3 W100 at this time). See: Configuring and reading back via IP connection
Setup & Service Assistant	Opens the homepage of the IP device. See: Configuring and reading back via IP connection

#### Log window

Shows the individual steps carried out in the program.

Status display (lower left hand edge of pane).

Shows the connection status between commissioning computer and network (IP).

### 9 Connecting the cable to the IP device

Use a LAN or USB cable to connect the commissioning laptop to the IP device (e.g. room automation station, router, ...).

#### LAN cable

The LAN cable connects the commissioning laptop with the network (IP) in two ways:

- The LAN cable is plugged in **directly** to the device.
- The LAN cable is plugged in at another location on the network (IP).



Note: If 24 V power supply to an automation station is interrupted, the switch function of this automation station automatically stops, and IP communication to other automation stations in the communication chain is interrupted.

- ▷ LAN cable RJ45 is available (Category 5 or higher).
- 1. Plug in the LAN cable to the commissioning laptop and IP device.
- Configure the network connection in the SSA DNT. See: Configuring a network connection

#### USB cable

The USB cable **directly** connects the commissioning laptop to the IP device. The IP device establishes the additional connection to the network (IP). This has the following effect: The connection between the commissioning laptop and the network (IP) is interrupted (e.g. during configuration, etc.) if the IP device is restarted.

- ▷ USB cable is available (type A plug on one end and type B on the other).
- USB driver RNDIS is installed or exists locally (load via V5, ACS, BIM tool or Internet).
- 1. Plug in the USB cable to the commissioning laptop and IP device.



- If no USB driver is installed and the Internet is connected, locate the right USB driver and install it using the wizard.
- Enter the storage location in the wizard if the driver is saved locally.
- A new USB IP network connection (Siemens USB Remote NDIS Network Device...) is created.
- 2. Configure the network connection. See: Configuring a network connection

### 10 Configuring a network connection

The commissioning laptop requires a unique IP address in the IP network. In addition, the commissioning laptop and the IP devices (room automation station, router, etc.) must be located in the same subnet for SSA-DNT to detect a device using UDB Multicast. For example

192.168.251.10, Subnet mask 255.255.255.0

192.168.251.20, Subnet mask 255.255.255.0

The network connection of the commissioning laptop must be configured accordingly. Automatic IP address assignment by a DHCP server does not satisfy this requirement.

Note:

- The existing IP address with subnet mask is key for **configured** IP devices.
- The IP address with subnet mask (target address) to be configured is key for **unconfigured** IP devices. This ensures that all devices are located in the same subnet following configuration.

#### Configuring the commissioning laptop network connection

In the SSA DNT program, network connection settings can be queried directly via the **IP settings** button (same as Start > Control Panel > Network Connections in the Windows operating system).

#### Prerequisite

• The IP address with subnet mask is known for the commissioning laptop (ask your project manager).

#### Procedure

- **1.** Start program SSA-DNT:
  - Double-click file SSA DNT.exe. or
  - Select Start > Programs > DESIGO Tools > DESIGO SSA-DNT > SSA-DNT.
- 2. In the SSA DNT, click IP settings.
  - ⇒ The **Network connections** pane opens.

🛸 Network Connecti	ions		
File Edit View Fav	vorites Tools Advanced Help		
🕞 Back 🔹 🅑 🝷	🏂 🔎 Search 😥 Folders	B > ×	⊌
Address 🔕 Network Co	nnections		💌 🛃 Go
Name	Туре	Status	Device Name
LAN or High-Speed I	nternet		
🕹 1394 Connection	LAN or High-Speed Inte.	Connected	1394 Net Adapter
🕹 Local Area Connection	LAN or High-Speed Inte.	Connected	Realtek PCIe GBE Family
Wizard	Realtek PCIe GBE Family Controller		

3. Double-click the LAN network interface.

or

Double-click the USB network interface (e.g. SBT USB Remote NDIS Network Device...). See: Connecting the cable to the IP device  $[\rightarrow 37]$ 

⇒ The Status for dialog box opens.

10

4. Click Properties.

Local Area Conn	ection Statu	; ?
General Support		
- Connection		
Status:		Connected
Duration:		01:25:44
Speed:		100.0 Mbps
	Sent —	Received
Packets:	236'869	255'146
Properties	Disable	

5. Select Internet Protocol (TCP/IP).

#### Click Properties.



6. Select Use following IP address.

#### Click Advanced.

Internet Protocol (TCP/IP) Prope	rties 🛛 🤶 🔀				
General					
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.					
Obtain an IP address automatical	y				
Subset the following IP address:					
IP address:	192 . 168 . 251 . 10				
Subnet mask:	255.255.255.0				
Default gateway:					
Obtain DNS server address auton	natically				
Our of the following DNS server addresses and the server addresses of the	dresses:				
Preferred DNS server:					
Alternate DNS server:	· · ·				
	Advanced				

7. Click Add.



8. Enter the IP address (IP address range for Desigo TRA).

Enter the subnet mask (e.g. 255.255.255.0).

Click Add.

Advar	nced TCP/IP Settings	· ?	×
IP Se	ettings DNS WINS	Options	
IF	o addresses		
	IP address	Subnet mask	
	192.168.251.10	255.255.255.0	
	TCP/IP Address	2 🛛	
	Terrir Maaress		
	IP address:	192 . 168 . 251 . 20	
D T	Subnet mask:	255.255.255.0	

- 9. Confirm by clicking OK and close the dialog box.
- ⇒ The network connection was assigned another fixed IP address.

### 11 Defining proxy server settings

Disabling DHCP/APIPA (dynamic addressing) can cause problems when opening a web page, as this disables automatic proxy server configuration. Defining a proxy exception for the APIPA range (e.g. for unconfigured automation station or router 169.254.213.44) can resolve the problem.

#### Defining the APIPA range (e.g. in Internet Explorer)

- 1. Open Microsoft Internet Explorer:
- 2. Select Tools > Internet Options.
- 3. Click the Connections tab.
- 4. Click LAN settings.
- 5. Clear Use automatic configuration script.

L	ocal Area Net	work (LAN) Se	ttings			×
	-Automatic conf	guration				
	Automatic conf use of manual :	iguration may over settings, disable au	ride manu Itomatic co	al settings onfiguratio	. To ensure the n.	1
	Automatical	ly detect settings				
	Use automa	tic configuration s	ript			
	Address	http://proxyconf	-fmo.ch00	1.siemen		
	Proxy server -					
	Use a proxy dial-up or VI	server for your Li N connections).	AN (These	settings w	ill not apply to	
	Address:	01.siemens.net	Port:	85	Advanced N	
	🕑 Bypass	proxy server for lo	cal addres	ises	h	Ĵ

- 6. Click Advanced.
- 7. Enter 169.\*.

	Туре	Proxy address to use	Port
Ğ.			
	HTTP:	proxycont-tmo.ch001.siemens.net	; 85
	Secure:	proxyconf-fmo.ch001.siemens.net	: 85
	FTP:	proxyconf-fmo.ch001.siemens.net	: 85
	Socks:		:
		<i>c</i> "	
Excepti	Use the	a same proxy server for all protocols	
Excepti	Use the	e same proxy server for all protocols e proxy server for addresses beginning w	vith:
Excepti	Do not use	e same proxy server for all protocols e proxy server for addresses beginning w	vith:

- 8. Click OK several times.
- ⇒ The browser no longer applies a proxy server to the indicated address range.

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