Siemens Desigo PX Driver for Tridium Niagara

User Guide

baudrate.io

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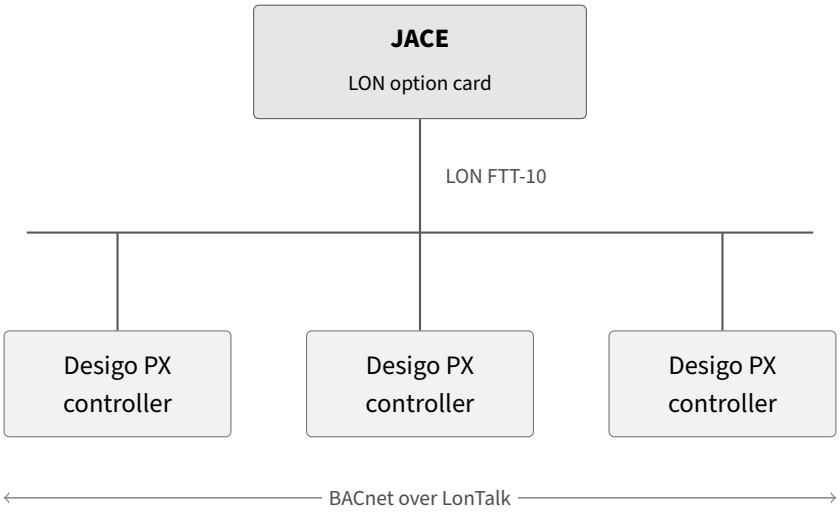
1 Introduction

The Siemens[1] Desigo PX driver for Tridium Niagara enables direct communication with Desigo PX controllers via BACnet over LonTalk protocol. It is purpose-built for retrofit projects where older Desigo PX controllers require a modern Niagara front-end, preserving existing field-level infrastructure while unlocking Niagara visualization, control, and analytics capabilities.

Communication is via BACnet over LonTalk, which transports BACnet messages across the LonWorks FTT-10 physical layer. This hybrid approach leverages LonTalk robustness while exposing standard BACnet object models. Each object is self-describing, including name, status, present value, and engineering units, significantly simplifying mapping and binding within Niagara.

1.1 Typical Topology

The JACE connects to the Desigo PX network through the LON option card. The PX controllers sit on a LonWorks FTT-10 trunk, and BACnet messages are carried over LonTalk across that trunk.



2 Requirements

- Niagara-powered device with software v4.8 or later, such as JACE, Supervisor, or any OEM version
- Desigo PX driver module and license
- Tridium BACnet driver license
- Tridium LonWorks driver license

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- Standard LON option card on the JACE
- Siemens Desigo PX controllers on a LonWorks FTT-10 network

Both the **bacnet** and **lonworks** modules must be installed and licensed. The Desigo PX driver is a link layer for the BACnet stack and uses the LON network for transport, so it cannot run without both of them.

2.1 Driver Versions

The driver is supplied as **desigo.zip**, which contains two builds of the same module:

- **N4.8+** – for Niagara 4.8 through 4.14.
- **N4.15+** – for Niagara 4.15 or later.

Each folder holds a file named desigo-rt.jar, and both install as the same **desigo** module, so only one of them can be present on a host. Install the build that matches the Niagara version of the platform that hosts the driver.

Two builds are needed because Niagara 4.15 changed the BACnet driver interface that the Desigo PX driver plugs into. The builds are otherwise identical and share the same configuration, so a station keeps working unchanged when the host is upgraded and the module is replaced with the matching build.

3 Quick Start

1. Open **desigo.zip** and select the folder that matches the Niagara version of the target platform: **N4.8+** for Niagara 4.8 through 4.14, or **N4.15+** for Niagara 4.15 or later.
2. Copy desigo-rt.jar from that folder to the Niagara /modules folder and restart the software.
    a. If the driver is hosted on PC: restart Supervisor station.
    b. If the driver is hosted on JACE: restart JACE from the platform.
3. Ensure the LON option card is installed and configured on the JACE.
4. Open the station in Workbench and navigate to **Station > Config > Drivers**.
5. Press **New** and add a **Lon Network**. This network is the transport used by the driver and must exist before the Desigo network can start.
6. Under the Lon Network, open the **Lon Netmgmt** component and set **Domain Id** to length 1 and value **49**. Desigo PX controllers use LON domain 49.
7. Navigate back to **Station > Config > Drivers**.
8. Open the **Palette** and locate the **desigo** palette.

9. Drag and drop **DesigoNetwork** from the palette onto the **Drivers** container in the station.
10. Enter license code in **License** property under **DesigoNetwork**.
11. Navigate to **DesigoNetwork > Local Device** and set **Object Id** to the BACnet device instance number you want the station to use.
12. Navigate to **DesigoNetwork > Bacnet Comm > Network > DesigoPort** and set **Network Number** to the BACnet network number of the LON trunk.
13. Expand **DesigoPort > Link** and set the **Lon Network** property to the Lon Network created in step 5. Save the changes.
14. Restart the station so that the license and the link configuration take effect.
15. Right-click on **DesigoPort** and invoke the **Enable** action to enable the port.
16. Double-click **DesigoNetwork** to open the **Bacnet Device Manager** and press **Discover** to find all controllers on the LON trunk.
17. Select the desired controllers and press **Add**. In the **Add** dialog, set **Type to Add** to **Desigo Device** and press **OK** to import them into the station.
18. Expand a device, double-click on **Points** to open the **Bacnet Point Manager**, and press **Discover** to find all points.
19. Select the desired points and press **Add**.
20. Verify the result: the device **Status** should show **ok**, and the added points should show values rather than **null** or a stale marker.

4 Desigo Network

The Desigo Network manages the BACnet stack and the LON connection to Desigo PX controllers. A station supports a single BACnet network, so there is one Desigo Network regardless of how many trunks are connected. Each LonWorks FTT-10 trunk is represented by its own port beneath it.

Network properties:

- **License** – the code that allows the driver to run on your host.
- **Monitor** – ping monitor that verifies the devices are reachable.
- **Bacnet Comm** – the BACnet stack, containing the client, server, transport, and network layers.
- **Local Device** – the BACnet device object that represents the station on the Desigo network. Its **Object Id** must be a device instance number that is unique on the network.
- **Tuning Policies** – the BACnet tuning policy map that governs how points are read and written.

In most cases only **License**, **Local Device > Object Id**, and the Desigo Port settings need to be changed.

4.1 Desigo Port

The Desigo Port is the BACnet network port that carries BACnet messages over LonTalk. It is located under **DesigoNetwork > Bacnet Comm > Network > DesigoPort**. One port corresponds to one LonWorks FTT-10 trunk, and further ports can be added to serve additional trunks.

Port properties:

- **Network Number** – the BACnet network number assigned to the LON trunk.
- **Link** – the **Desigo Link** that performs BACnet over LonTalk encapsulation.
- **Poll Service** – the BACnet poll service that defines the polling rates used by devices and points:
  - Fast Rate: 1 second
  - Normal Rate: 5 seconds
  - Slow Rate: 30 seconds
- **Max Devices** – maximum number of devices supported on the port.
- **Port Id** – identifier of the port within the BACnet stack. It must be unique, because it determines the object identifier of the BACnet Network Port object exported for this port.
- **Port Info** – descriptive text for the port.

Port actions:

- **Enable** – enable the port so that it starts communicating.
- **Disable** – disable the port.

4.2 Desigo Link

The Desigo Link binds the BACnet stack to a Niagara LON network.

Link properties:

- **Lon Network** – selects which Lon Network in the station is used for transport. The list is populated with the names of all Lon Networks present in the station, so several ports can run over separate LON trunks on the same host.

The link derives its BACnet MAC address from the subnet and node address of the **Local Lon Device** of the selected Lon Network. If the selected Lon Network is missing when the station starts, the port reports a fault and communication does not begin.

5 Desigo Devices

Devices represent individual Desigo PX controllers. During discovery, all controllers on the LON trunk are automatically found with their device names, device instance numbers, vendor names, and models.

The **Add** dialog of the Bacnet Device Manager lists every BACnet device type installed on the host, so **Type to Add** must be set to **Desigo Device**. A controller added as a plain **Bacnet Device** still communicates, but it does not have the **Read Property Multiple** property described below.

Device properties:

- **Address** – BACnet address of the controller, consisting of the network number and the MAC address. On a LON trunk the MAC address is the subnet and node address of the controller.
- **Poll Frequency** – polling rate for this device: Fast, Normal, or Slow, corresponding to the **Poll Service** rates.
- **Read Property Multiple** – enables the use of the BACnet ReadPropertyMultiple service for this controller. It is disabled by default, so the driver reads one property per request. Enable it only on controllers that genuinely support the service, because it reduces the number of requests and speeds up polling.
- **Use Cov** – subscribes to change-of-value notifications instead of polling, where the controller supports it.
- **Max Poll Timeouts** – number of consecutive poll timeouts allowed before the device is marked down.

Supported models:

PXC12.D	PXC12-T.D	PXC22.D	PXC22-T.D
PXC36.D	PXC36-T.D	PXC12	PXC12-T
PXC22	PXC22-T	PXC36	PXC36-S
PXC52	PXC10-TL	PXC50.D	PXC100.D
PXC200.D	PXC64-U	PXC128-U	PXC00.D
PXC00-U	PXC-NRUF	PXR11	PXR12

6 Desigo Points

Points are automatically discovered with their metadata including object names, alarm states, and engineering units. The driver supports both poll and change-of-value (COV) subscription modes.

Each point proxy extension is configured with:

- **Object Id** – BACnet object identifier that addresses the object in the controller, for example analogInput:1.
- **Property Id** – BACnet property read from the object, normally Present Value.
- **Property Array Index** – index within the property when the property is an array, or -1 when it is not.

The proxy extension also reports the state of the point. These are read-only and cannot be edited:

- **Data Type** – BACnet data type of the property, as reported by the controller.
- **Read Status** – how the value is currently read, for example Polled when the point is polled, or unsubscribed when it is not being read at all.
- **Write Status** – whether the point is readonly or Writable.

Point actions:

- **Force Read** – read the current value of a point immediately.
- **Force Write** – write the current value to a writable point immediately.
- **Subscribe Cov** – subscribe to change-of-value notifications for the point.
- **Ack Alarm** – acknowledge an alarm reported by the object.

Writable points are written at a BACnet priority level, so a point can be commanded and later released back to the controller logic through the standard Niagara priority array.

7 Tuning Policy

Tuning policies are defined under **DesigoNetwork > Tuning Policies** and control how each point is read and written.

Tuning policy properties:

- **Poll Frequency** – default polling rate applied to points that use this policy.
- **Use Cov** – subscribes to change-of-value notifications instead of polling.
- **Use Confirmed Cov** – requests confirmed rather than unconfirmed COV notifications.
- **Cov Subscription Lifetime** – lifetime of the COV subscription, in minutes, before it is renewed.
- **Accept Unsolicited Cov** – accepts COV notifications that the station did not subscribe to.

If COV proves unreliable on a controller, set **Use Cov** to false so that the points revert to polling.

8 Schedules

Schedule objects are accessible directly from PX controllers, enabling time-based automation without additional configuration. Schedules are imported through the **Schedules** extension of a device, which discovers the BACnet schedule and calendar objects in the controller and maps them to Niagara schedule components.

9 Histories

Trend log objects in the controllers are imported through the **Trend Logs** extension of a device. Press **Discover** in that extension to find the BACnet trend log objects in the controller, and add the ones to archive. Each imported trend log becomes a Niagara history that is populated from the records held in the controller, so data logged while the station was offline is still collected once the connection is restored.

10 Alarms

The driver supports alarm reception and acknowledgment from Desigo PX controllers. Alarms are received through the **Alarms** extension of a device and mapped to Niagara alarm sources with their original priority, text, and state information. Individual alarms can also be acknowledged from a point with the **Ack Alarm** action.

A Desigo PX controller only sends alarms to stations it knows about, so the station must be registered as a recipient before any alarm arrives. Add the device instance configured in **DesigoNetwork > Local Device > Object Id** to the recipient list of the Notification Class object in the controller that reports the alarms. Without that entry the **Alarms** extension stays empty even though the device is online.

11 Time Synchronization

The driver supports time synchronization between the Niagara station and Desigo PX controllers to ensure consistent timestamping across the system.

Time synchronization is configured on **DesigoNetwork > Local Device**:

- **Time Synchronization Recipients** – the devices that receive local time synchronization messages.

- **Utc Time Synchronization Recipients** – the devices that receive UTC time synchronization messages.
- **Time Synchronization Interval** – how often the messages are sent, entered as a duration.

Synchronization can also be triggered manually with the **Send Time Synch** action on the **Local Device**, or by selecting one or more devices in the **Bacnet Device Manager** and pressing the **TSynch** button.

12 FAQ

12.1 What is the difference between the Desigo PX and Desigo CC drivers?

The Desigo PX driver communicates directly with PX controllers via BACnet over LonTalk. The Desigo CC driver communicates with the Desigo CC management station via its web services API. Use the PX driver for direct controller access; use the CC driver for integration with the full Desigo CC suite.

12.2 Do I need a LON option card?

Yes. The Desigo PX driver requires a standard LON option card installed on the JACE for FTT-10 communication with the PX controllers.

12.3 Why do I need a Lon Network as well as the DesigoNetwork?

The Desigo PX driver is a BACnet link layer, and it uses a Niagara Lon Network for transport. The Lon Network owns the LON option card and the Local Lon Device, and the **Desigo Link** binds to it through its **Lon Network** property. Without a Lon Network in the station the port reports a fault and no communication takes place.

12.4 Can I connect more than one LON trunk to the same station?

Yes, but with one DesigoNetwork and several ports. A station supports only one BACnet network, and adding a second DesigoNetwork fails at start with a *Duplicate BacnetNetwork* error. Multiple trunks are configured as multiple ports under the single BACnet stack:

1. Add one **Lon Network** per trunk, each with **Domain Id** set to 49.
2. Under **DesigoNetwork > Bacnet Comm > Network**, right-click the existing **DesigoPort** and select **Duplicate** to create one port per trunk.
3. On each port, set a unique **Network Number** and a unique **Port Id**.

4. On each port, set **Link > Lon Network** to the Lon Network of that trunk.
5. Invoke the **Enable** action on each port.

12.5 Which module version do I need?

Check the Niagara version of the platform that hosts the driver. Use the **N4.8+** build for Niagara 4.8 through 4.14, and the **N4.15+** build for Niagara 4.15 or later. If the host is upgraded to Niagara 4.15 later, replace the module with the **N4.15+** build and restart the platform. The station configuration does not need to change.

12.6 The module does not work after a Niagara upgrade

The build does not match the host. The **N4.8+** module does not run on Niagara 4.15 or later, and the station log reports that the Desigo port cannot start. The **N4.15+** module cannot be installed on Niagara 4.14 or earlier, and the platform reports a missing bacnet dependency. Install the build that matches the Niagara version of the host.

12.7 Can I use this driver with PXC controllers that have BACnet/IP?

No. This driver specifically targets BACnet over LonTalk communication. For PXC controllers with native BACnet/IP, use the standard Niagara BACnet driver.

12.8 I cannot discover any controllers

First establish whether the controllers are visible at the LON layer at all. Open the Lon Network, go to the **Lon Device Manager**, and press **Discover**. This discovery runs over the LON network alone and does not involve the Desigo driver, so it separates a transport problem from a driver problem.

If the Desigo PX controllers do not appear in the LON discovery, the problem is on the LON side, and an incorrect domain is the most likely cause:

- Check that **Domain Id** in the **Lon Netmgmt** component is set to length 1 and value 49. Desigo PX controllers only answer on their own domain, so a wrong domain produces an empty discovery even though the wiring is correct.
- Verify the LON option card is installed and properly configured on the JACE.
- Check that the JACE is connected to the correct LonWorks FTT-10 trunk.
- Ensure the controllers are powered and communicating on the LON network.

If the controllers do appear in the LON discovery but not in the **Bacnet Device Manager**, the problem is in the Desigo network configuration:

- Check that the **Lon Network** property of the **Desigo Link** points to the correct Lon Network.
- Check that **Network Number** is set on **DesigoPort**.
- Check that **DesigoPort** is enabled with the **Enable** action.
- Check the license is valid and the station was restarted after the license was entered.

12.9 Point discovery returns no objects or fails

Check **Read Property Multiple** on the device. The driver leaves it disabled by default, precisely because some Desigo PX controllers advertise support for the BACnet ReadPropertyMultiple service but do not handle it correctly. If it was enabled to speed up polling and discovery then stopped working, set it back to false so that the driver reads one property per request.

If **Read Property Multiple** is already false, check that the device is online and that its **Address** matches the controller found by the discovery.

12.10 Points are not updating

- Verify the device is online (device status should show **ok**).
- If using COV subscriptions, check that the controller supports COV for the selected point type.
- Set **Use Cov** to false in the tuning policy to switch to polling if COV is unreliable.
- Check the **Poll Frequency** of the device and of the point tuning policy.