

Andover Controls Infinet Driver for Tridium Niagara

User Guide

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1 Introduction

Infinet is a communication protocol for Andover Controls (now part of Schneider Electric) Infinity programmable controllers ¹. Infinet controller family includes:

- Ethernet network controllers, such as bCX1 and NetController 2 (CX9680). These devices act as global strategy controllers, protocol gateways, email servers and field controller interfaces with up to 127 field controllers per RS-485 port. They can also be equipped with add-on IO modules. Network controller models:

ACX5720	ACX5721	ACX5740	ACX5741	CX9200	CX9300
CX9400	CX9401	CX9410	CX9411	CX9680	CX9681
CX9702	CX9900	CX9901	CX9924	CX9940	CX9960
b4920	bCX4000	bCX4020	bCX4040	bCX9600	bCX9640

- RS-485 field controllers, such as i2800. There are freely programmable controllers with various numbers of IO points. There are original Infinity and newer Infinity 2 field controllers, including series:
 - Display unit (DCX)
 - Access controllers (ACX)
 - Local controllers (LCX, i26xx, i280x, i281x)
 - Terminal controllers (TCX, i285x, i286x, i288x)
 - Lighting controllers (LCX89x)
 - System controllers (SCX, i2920)

DCX250	ACX700	ACX701	ACX780	ACX781	LCX800
LCX800i	LCX810	TCX840	TCX841	TCX842	TCX843
TCX844	TCX845	TCX846	TCX847	TCX848	TCX849
TCX850	TCX851	TCX852	TCX853	TCX855	TCX860
TCX861	TCX862	TCX863	TCX864	TCX865	TCX866
TCX867	TCX868	TCX869	TCX870	LCX890	LCX891
LCX892	LCX898	SCX900	SCX920	i2608	i2616
i2624	i2800	i2804	i2810	i2814	i2850
i2851	i2853	i2865	i2866	i2867	i2885
i2886	i2887	i2888	i2889	i2920	

Infinet driver for Tridium Niagara uses the same communication protocol as Andover BMS software Continuum Cyberstation. The driver connects to network controllers via TCP/IP interface, so no extra cabling is required. Controller software should not be modified, all devices and points are discovered automatically. Niagara points are displayed with names, descriptions, units and precision, which greatly simplifies the integration process.

In addition to building control, Andover Infinity family also includes access control devices. Note: the current revision of Infinet driver does not support access-specific objects, like door, personnel, area. If your project requires them, e-mail us to discuss.

For more information about Andover Continuum hardware and software refer to [Schneider Electric website](#).

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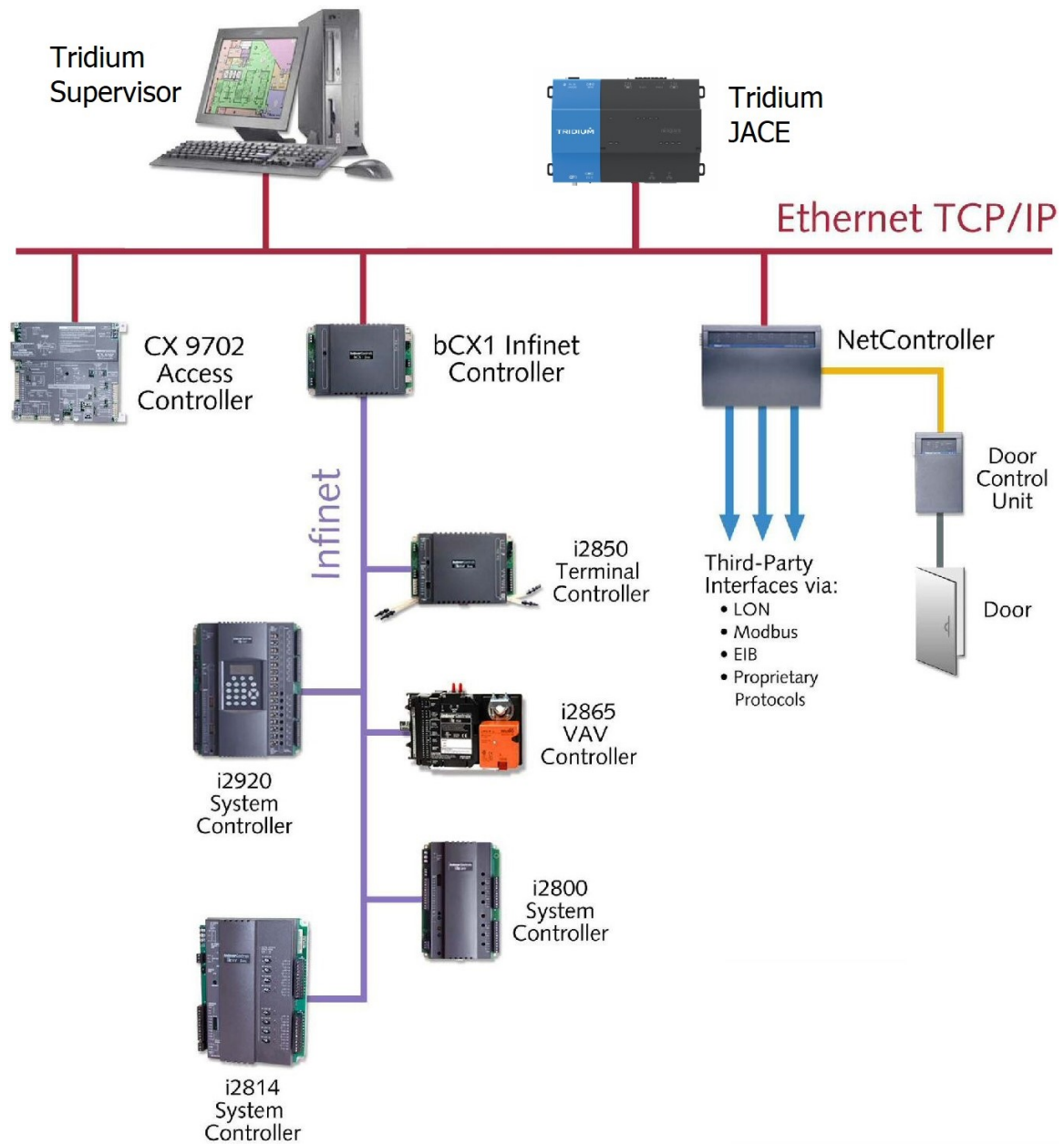


Figure 1: Infinet architecture

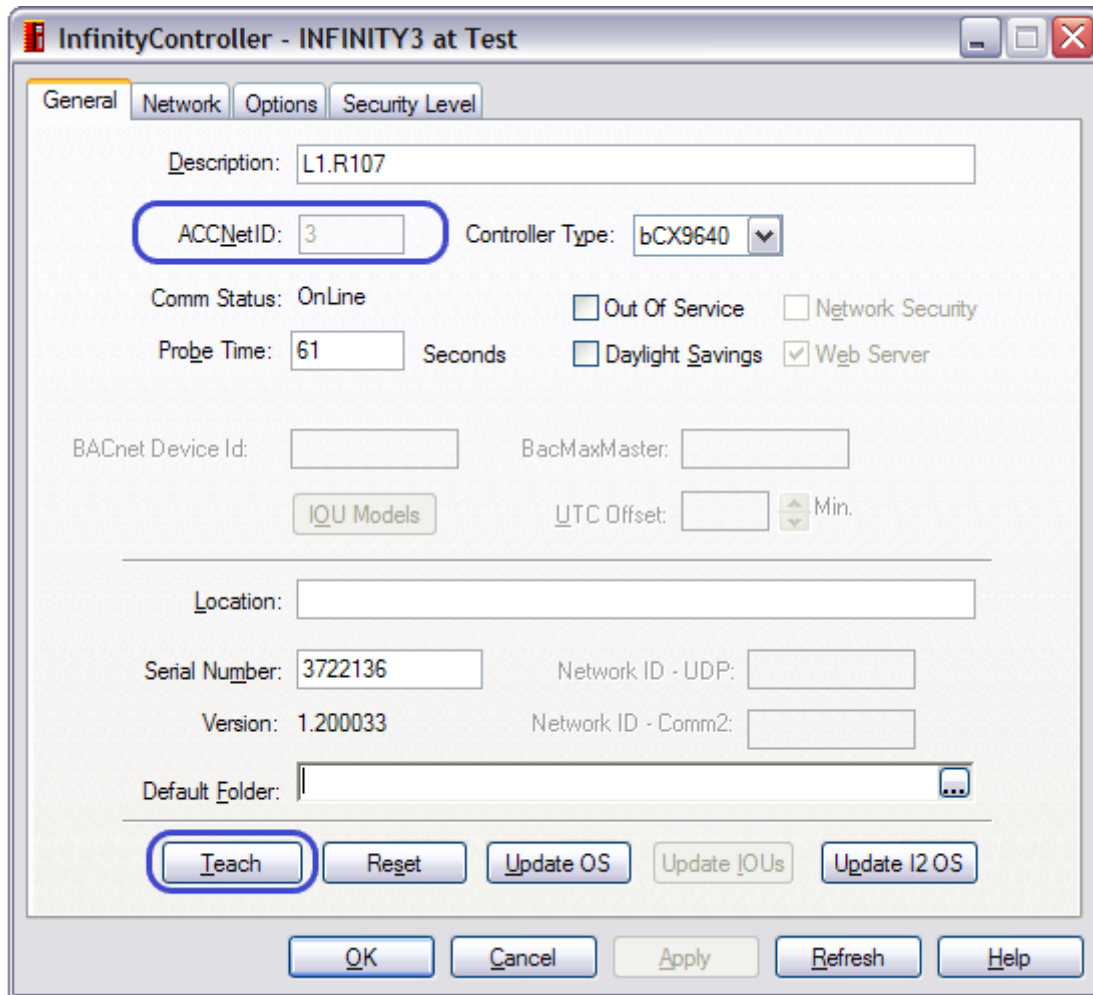


Figure 2: Teaching network controller

2 Requirements

- Niagara framework host such as Supervisor, Jace 8000 or any other Niagara-compatible device
- Infinet driver module and license
- IP address and network address of the primary network controller

3 Primary Network Controller

To discover all network and field devices automatically, the driver requires that you designate one Infinity network controller as the *Primary Controller*. The driver gets information about the network through this controller during device discovery. The primary controller must have had the network *taught* to it before the integration. This is done through the *Teach* function in the Continuum Cyberstation.

In addition to IP address (displayed on the Network tab), it is necessary to determine *network id* number, sometimes called *ACCNet ID*. It can be found in Cyberstation or on the controller web page.

4 Quick Start

1. Copy `infinet.jar` (AX) or `infinet-rt.jar` (N4) module to Niagara /modules folder of your PC and restart the software.
 - a. If the driver will be hosted on PC: restart Supervisor station.
 - b. If the driver will be hosted on JACE: import the module with all its dependencies into JACE and restart it.
2. Add **Infinet Network** to the station. Note: do not confuse it with Infinity Network.
3. Enter license code in **License** property under **Infinet Network**.
4. Enter primary controller **Ip Address** and **Network Id** under **Infinet Network / Comm Config / Primary Address**.
5. **Discover** devices – you should be able to see available network controllers and, under them, field controllers.
6. Add discovered devices to the station.
7. Open device **Points** extension and **Discover** points.
8. Add points to the station. By default, all points are added as read-only – change type to writable if required.

5 Infinet Network

Infinet Network contains many standard Niagara properties, as well as a few driver-specific ones:

- **License** – the code which allows the driver to run on your host.
- **Comm Config / Primary Address** – IP address and network id of the primary IP controller.
- **Comm Config / Response Timeout** – the number of milliseconds Niagara waits for controller response. Default 500ms value can be increased in case of timeout errors.
- **Comm Config / Retry Count** – how many times Niagara repeats requests if there is no response from the controller.
- **Tuning Policies** – policies defining polling rate and point writing logic. Initially, there are three policies with the following polling rates:
 - **Fast** – 5 seconds
 - **Default** – 10 seconds
 - **Slow** – 30 seconds
- **Poll Scheduler** – specifies polling rates and displays network communication metrics. This information is helpful to see if the network is “healthy”.

In most cases only **License** and **Comm Config / Primary Address** values shall be changed.

After Infinet network properties are set, **Infinet Device Manager** view is used to start **Discover** devices. The discovery process can be tracked with a progress bar and the found devices can be seen by pressing » button.

6 Infinet Device

After the device discovery, the top pane displays all found network controllers. Field controllers are located underneath and can be seen by pressing + symbol. Each found controller is displayed with the name, IP address, network id, device model, serial number and description. If the controller is known to the primary network controller, but the driver cannot establish communication with it, then the description field will show *Offline*.

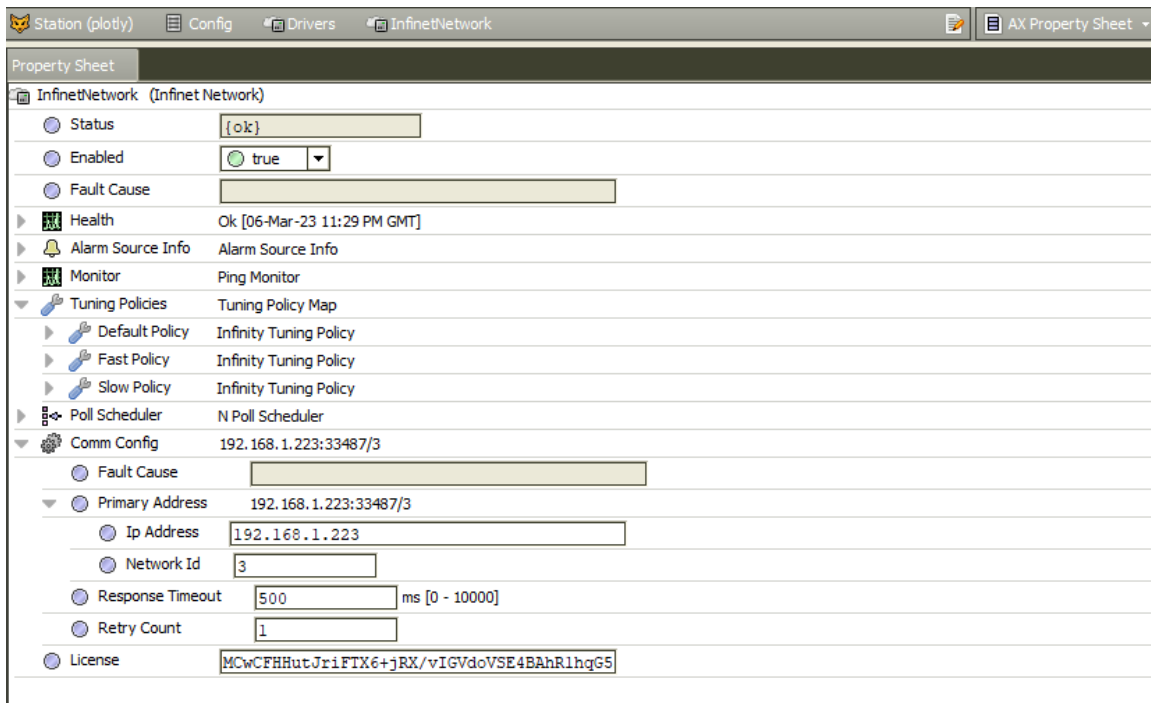


Figure 3: Infinet network properties

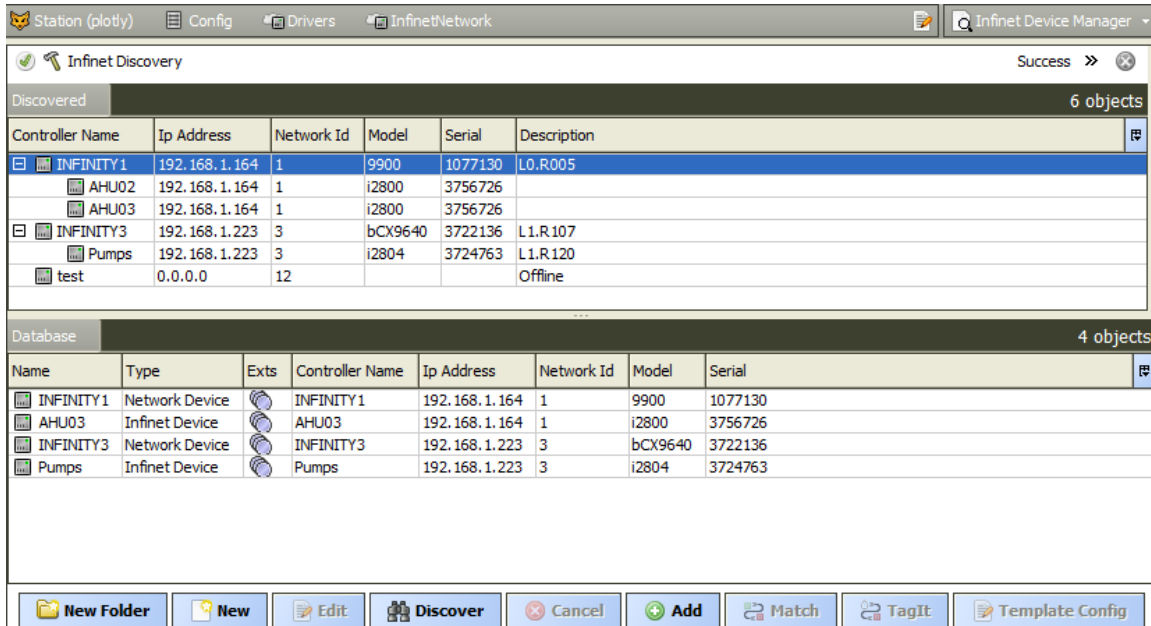


Figure 4: Infinet devices

Devices are added to Niagara by dragging from the top pane or by selecting and pressing **Add** button. There are two types of devices: **Network Device** (IP controller) and **Infinet Device** (field controller). Properties **Controller Name**, **Ip Address** and **Network Id** identify the device on Infinet network and allow Niagara to communicate with it. Although it is possible to create a device manually with **New** button, it is recommended to use device discovery to ensure these properties are set correctly. Property **Name** can be any string and properties **Model** and **Serial** are read from the device for informational purposes.

7 Infinet Points

Infinet points are discovered automatically in **Infinet Point Manager** view. Each discovered point has the following properties:

- **Point Name** – how the point is called in Infinity controller.
- **Point Type** – Input, Output, Numeric (software variable), String or System Variable. System Variables are built-in points for device information like date, time and controller memory size.
- **Elec Type** – IO configuration.
- **Channel** – IO terminal number.
- **Value** – real-time point value.
- **Units** – physical units.
- **Format** – display format.
- **Description** – point description.

Properties **Units**, **Format** and **Description** are only displayed if they are configured in the controller.

Points are added to Niagara by dragging from the top pane or by selecting and pressing **Add** button. Each added point contains the following properties:

- **Name** – any string to identify the point in Niagara.
- **Point Name** – string to address the point in the controller. Shall not be changed.
- **Type** – Niagara point type: Boolean, Numeric, Enum or String Point. The recommended point type is automatically determined by the driver, but it can be changed during point creation. Infinity software variables can also be created as writable points, so they could be changed from Niagara. IO point override is not supported by the driver yet.
- **Tuning Policy Name** – allows to assign polling rate from the tuning policy.

Driver automatically assigns point facets – units and precision – based on **Point Type**, **Elec Type**, **Units** and **Format**.

8 FAQ

8.1 I can't establish communication, what shall I check?

- Try to ping the primary network controller IP from Niagara network.
- Check if the license is valid and is not expired. Restart the station if expired.
- In case the driver is deployed on Supervisor, check if the computer firewall allows traffic to UDP port 33487.
- Check if the primary controller IP address and network id in Niagara are the same as in the primary controller.
- Try another network controller as a primary controller.

The screenshot shows the Infinet Point Manager interface. At the top, there are tabs for Station (plotly), Config, Drivers, InfinetNetwork, Pumps, Points, and Infinet Point Manager. Below the tabs, there are two main sections: 'Discovered' and 'Database'.

Discovered (63 objects):

Point Name	Point Type	Elec Type	Channel	Value	Units	Format	Description
Pmp01HeldOn	Output	Digital	2	nan		###	Pump Held On
Pmp01SS	Output	Digital	1	nan		###	Pump Enable
Pmp01VFDHz	Output	Voltage	5	nan	Hz	###.###	VFD Speed Control
AlmMastComm	Numeric			nan		###	Master Comm Alarm Status
AlmRst	Numeric			nan	On/Off	###	
av1	Numeric			20.00	Pa	###.###	
CHWHBRcv1	Numeric			nan		###	

Database (9 objects):

Name	Type	Out	Point Name
Pmp01ChwDiffPr01	Numeric Point	250.0 kPa {ok}	Pmp01ChwDiffPr01
Pmp01Flt	Boolean Point	false {ok}	Pmp01Flt
Pmp01Freq	Numeric Point	50.0 {ok}	Pmp01Freq
Pmp01InHandPos	Boolean Point	true {ok}	Pmp01InHandPos
Pmp01InOffPos	Boolean Point	true {ok}	Pmp01InOffPos
Pmp01RunSts	Boolean Point	false {ok}	Pmp01RunSts
SecPmp01Mns	Boolean Point	true {ok}	SecPmp01Mns
SecPmp01UPS	Boolean Point	false {ok}	SecPmp01UPS
Temp01	Numeric Point	nan {ok}	Temp01

At the bottom of the interface, there is a toolbar with buttons: New Folder, New, Edit, Discover, Cancel, Add, Match, and TagIt.

Figure 5: Infinet points

- By default, Infinity network controllers communicate via UDP protocol, but it can be changed in Cyberstation controller Network tab. If TCP or TCP/UDP is selected, change it back to UDP.
- Enable Infinet logs (right-click on Station => Spy => logSetup, change all Infinet.* logs to ALL), try to discover devices and send the contents of Application Director to support@baudrate.io.

8.2 Does the driver supports Xdriver devices?

Andover Xdrivers are software modules, which can be deployed in Infinity network controllers to support third-party protocols, such as Modbus. Network controller with Xdriver can read and write values from non-Infinity devices via IP or serial interface.

Infinet driver for Niagara communicates with Infinity network controllers and discovers all points, including the ones created for Xdriver. Niagara can see all Xdriver points and Xdriver functionality is fully supported.

8.3 Differences between Infinet driver and Infinity driver?

Tridium Infinity driver allows Niagara to connect to Andover NetController via serial RS-232 port and to read points from its service console. This driver does not work with newer Infinity devices, it requires service port configuration, can only access field devices connected to one NetController and its performance is low due to limited RS-232 speed.

Baudrate Infinet driver communicates via Ethernet, uses the same protocol as native Andover software, and can access all network and field controllers. Infinity controllers shall not be reconfigured, and no extra cabling is required. Niagara can be installed on the same LAN or remotely. Driver performance is high due to Ethernet speed.