Johnson Controls N2 Driver for Tridium Niagara

User Guide

baudrate.io

niagara4

February 22, 2026

Contents

1 Introduction **2**

2 Requirements **2**

3 Quick Start **2**

4 N2 Network **3**

5 Device Discovery **4**

6 Point Discovery **5**

7 Polling and Communication **7**

8 Limitations **7**

9 FAQ **8**

9.1 I cannot discover any devices 8

9.2 Points are not reading 8

9.3 How do I get DDL files for TC controllers? 8

9.4 Can I discover points on TC controllers? 8

1 Introduction

The Johnson Controls[1] N2 driver for Tridium Niagara enables seamless communication between Niagara-based devices and legacy Johnson Controls systems that operate over the N2 protocol. This includes support for both N2 Open and TC series controllers, making it ideal for modernizing existing building automation infrastructure without replacing hardware.

Originally based on the OPTO-22 Optimux protocol and extended by Johnson Controls, the N2 protocol is used to connect a variety of controllers such as FX07, FEC, and TC-series devices. The Baudrate N2 driver ensures reliable serial communication using RS-485 and supports reading and writing point values, including analog, binary, and override operations.

The driver is particularly suited for retrofit applications across commercial, educational, and healthcare environments, enabling centralized control, energy optimization, and operational transparency.

2 Requirements

- Niagara-powered device with software v4.8 or later, such as JACE, Supervisor, or any OEM version
- Baudrate N2 driver module and license key
- RS-485 serial connection to N2 network
- N2-compatible Johnson Controls devices (e.g., FX07, FEC16, TC-9100)

3 Quick Start

1. Install `n2-rt.jar` into the Niagara modules directory on both JACE and Workbench
2. Restart Niagara service
3. Create a new **N2 Network** in your station
4. Set the serial port and baud rate (default 9600) under **Serial Config**
5. Enter a valid license code under the **License** property
6. Select the **N2 Network** in the station and click the **Discover** button
7. Set the address range (e.g., 1–255) and start the discovery job
8. Add discovered devices to the station
9. Open each device's **Points** extension and perform point import or discovery
10. Add relevant points to the station and begin monitoring/control

[1] All trademarks or registered trademarks are the property of their respective owners

4 N2 Network

Each **N2 Network** instance corresponds to one RS-485 bus connection and includes the following key properties:

- **License** – the code that allows the driver to run on your host.
- **Serial Config / Port Name** – COM port name (e.g., “COM1”).
- **Serial Config / Baud Rate** – communication speed, default 9600 bps.
- **Serial Config / Receive Timeout** – time in milliseconds to wait for a device response. Increase for slow or noisy networks.
- **Serial Config / Retry Count** – number of retries on communication failure.
- **Poll Scheduler** – specifies polling rates for periodic data reading:
  - Fast Rate: 5 seconds
  - Normal Rate: 10 seconds
  - Slow Rate: 30 seconds

In most cases only **License** and **Serial Config / Port Name** values need to be changed.

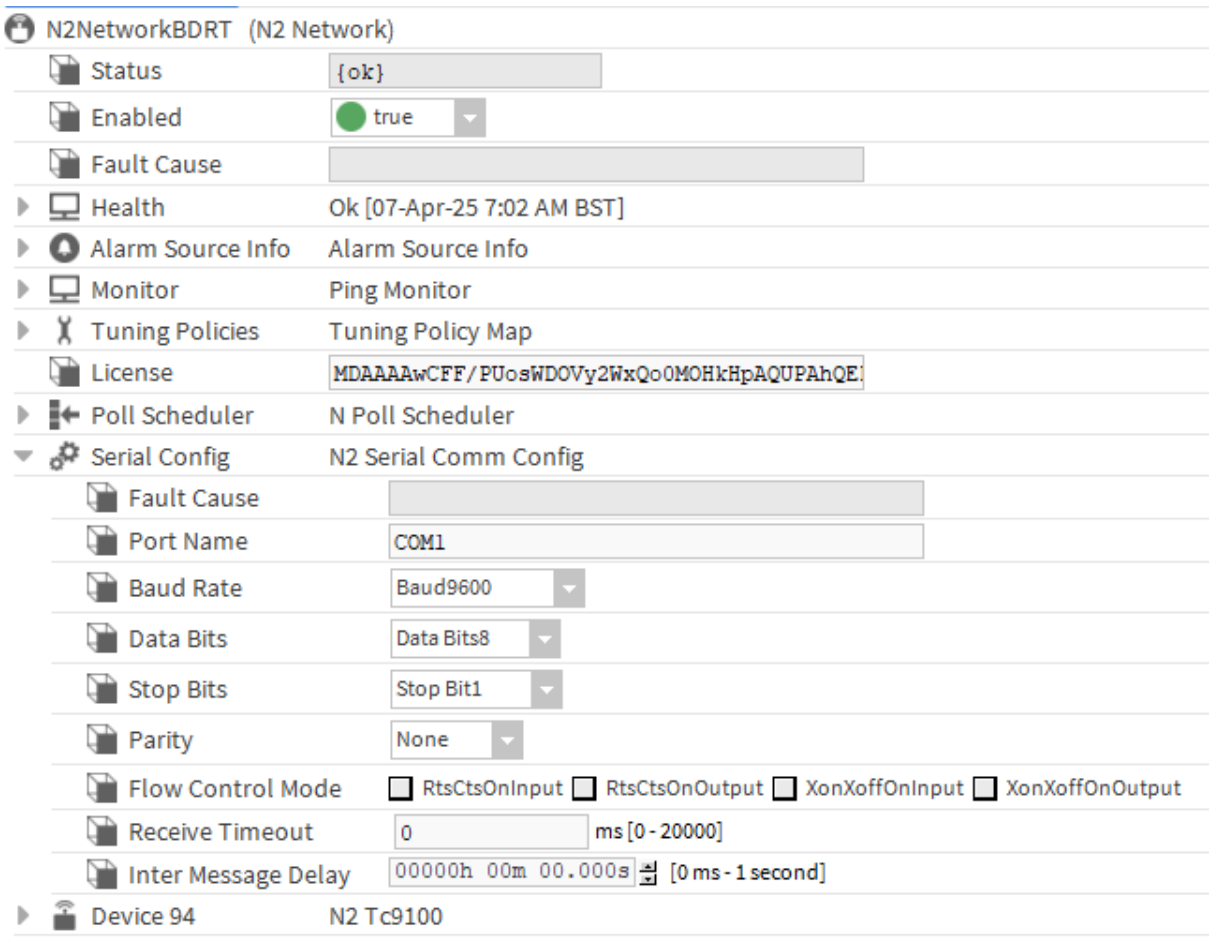

Figure 1: N2 Network Properties

5 Device Discovery

To discover N2 devices:

1. Select the **N2 Network** in the station
2. Click the **Discover** button
3. Configure the address range (e.g., 1–255)
4. Start the discovery job

All responding devices will be listed in the discovery results. Add the desired devices to the station.

Each discovered device is represented as a **BN2Device**. Properties include:

- **Address** – the unique device address on the N2 network (1–255).

- **Poll Frequency** – polling rate for this device: Fast, Normal, or Slow, corresponding to the **Poll Scheduler** rates.
- **Points** – point device extension for managing points and running point discovery.

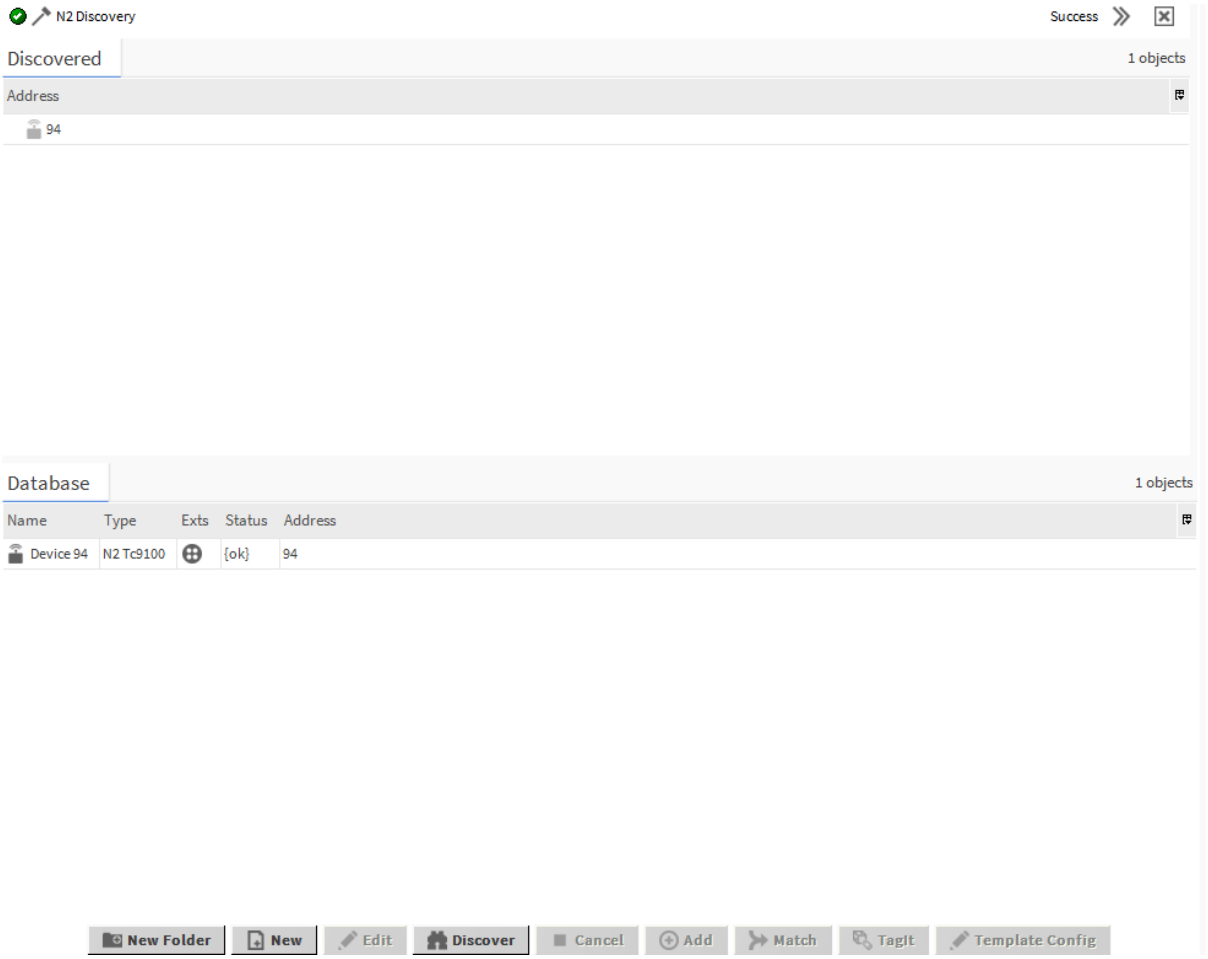

Figure 2: Device Discovery

6 Point Discovery

After adding a device to the station, points must be brought into Niagara either via **Discovery** (for N2 Open devices) or via **Import File** (for TC series controllers). The method depends on the type of device being integrated.

N2 Open Devices

For N2 Open-compatible devices such as **FX07**, **FEC16**, or **FEC26**:

1. Navigate to the device's **Points** extension
2. Click the **Discover** button
3. The driver queries the device and retrieves available point information
4. Select the desired points and add them to the station

Discovered points include address, type (analog/binary), and read/write capabilities. Each added point contains a proxy extension with the following properties:

- **Point Address** – N2 point address within the device. Set during discovery.
- **Point Type** – analog input, analog output, binary input, or binary output.
- **Poll Frequency** – polling rate: Fast, Normal, or Slow, corresponding to the **Poll Scheduler** rates.

Note: Discovery is only supported for N2 Open devices. TC series controllers do not respond to point discovery requests.

TC Series Controllers (DDL Import)

For **TC series** controllers such as **TC-9100** and **TC-9102**, point discovery must be performed via **DDL file import**:

1. Navigate to the device's **Points** extension
2. Click the **Import File** button
3. Choose the appropriate `.ddl` file for the controller

The DDL (Device Definition Language) file contains structured definitions of points including names, types, addresses, and whether the point is readable/writable. Once imported, points are instantiated in the station just like discovered ones.

Where to get DDL files:
DDL files are typically available from the controller manufacturer's software or documentation package. For Johnson Controls TC controllers:

- Use **HVAC PRO**, **GX-9100**, or **ComfortView** tools to export controller definitions
- Consult with your Johnson Controls representative or system integrator for the appropriate files

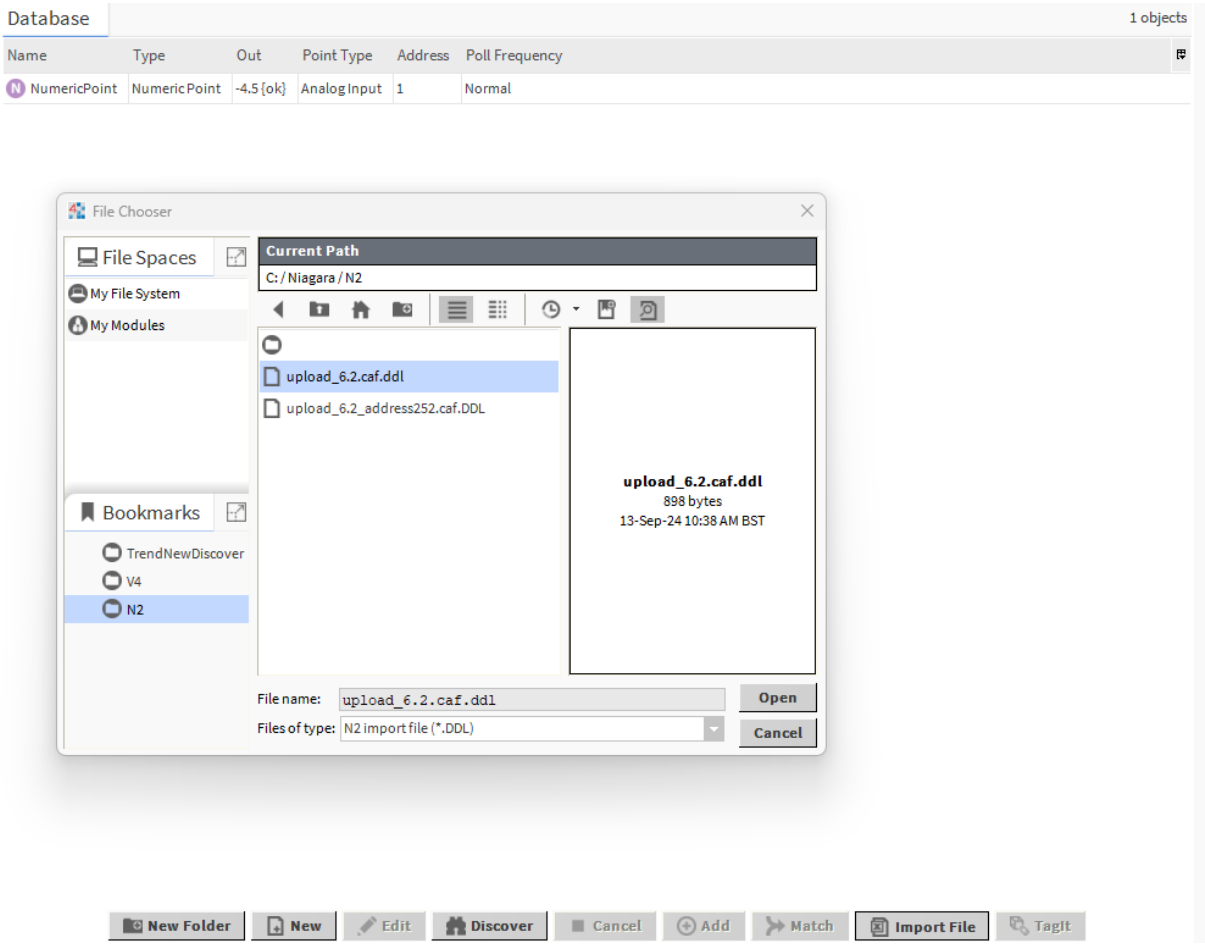

Figure 3: Point Import

7 Polling and Communication

The driver communicates via RS-485 serial using 9600 baud by default. Devices are polled periodically based on the configured scheduler and tuning policies. Communication errors are logged and devices will be marked as faulted if polling fails repeatedly.

Messages are retried automatically if no response is received, and malformed responses are safely ignored.

8 Limitations

- Compatible with N2 Open and TC series controllers only

- No support for schedule, alarm, or history integration
- Use of multiple RS-485 ports requires one **N2 Network** per port

9 FAQ

9.1 I cannot discover any devices

- Check RS-485 wiring and termination resistors at both ends of the bus.
- Verify the COM port name is correct and the port is not in use by another application.
- Ensure devices are powered and have valid unique addresses.
- Verify the baud rate matches the devices on the bus (9600 bps for most N2 devices).
- Check if the license is valid.

9.2 Points are not reading

- Verify the device is online (device status should show **ok**).
- If the device shows **down**, check RS-485 wiring and device address.
- Increase **Receive Timeout** if the network has high latency or long cable runs.

9.3 How do I get DDL files for TC controllers?

DDL files define the point structure of TC series controllers. They can be obtained from **HVAC PRO**, **GX-9100**, or **ComfortView** tools, or from your Johnson Controls representative.

9.4 Can I discover points on TC controllers?

No. TC series controllers do not respond to N2 point discovery requests. Use the **Import File** function with the appropriate DDL file instead.