Schneider Electric EcoStruxure Driver for Tridium Niagara

User Guide

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niagara4

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1 Introduction

The Schneider Electric series of controllers for EcoStruxure[1] Building Operation – also known as SmartStruxure, SmartX, and Struxureware – includes modular AS-P and non-modular AS-B models of automation stations. They are very powerful IP devices with native I/O, multiple communication ports, and a built-in web server that can be used as stand-alone controllers or as part of a building management system under the supervision of Enterprise Server software.

The EcoStruxure driver for Tridium Niagara enables communication with automation stations and Enterprise Servers. It can read and write not only real-time points, but also complex data structures: point properties, histories, and alarms. Now system integrators can combine the best features of the two most powerful building management systems on the market.

2 Requirements

- Niagara-powered device with software v4.8 or later, such as JACE, Supervisor, or their OEM versions [2]
- EcoStruxure driver license
- Access to EcoStruxure configuration via **Building Operation Workstation**. You will need to know the EcoStruxure system login and password in order to do that.

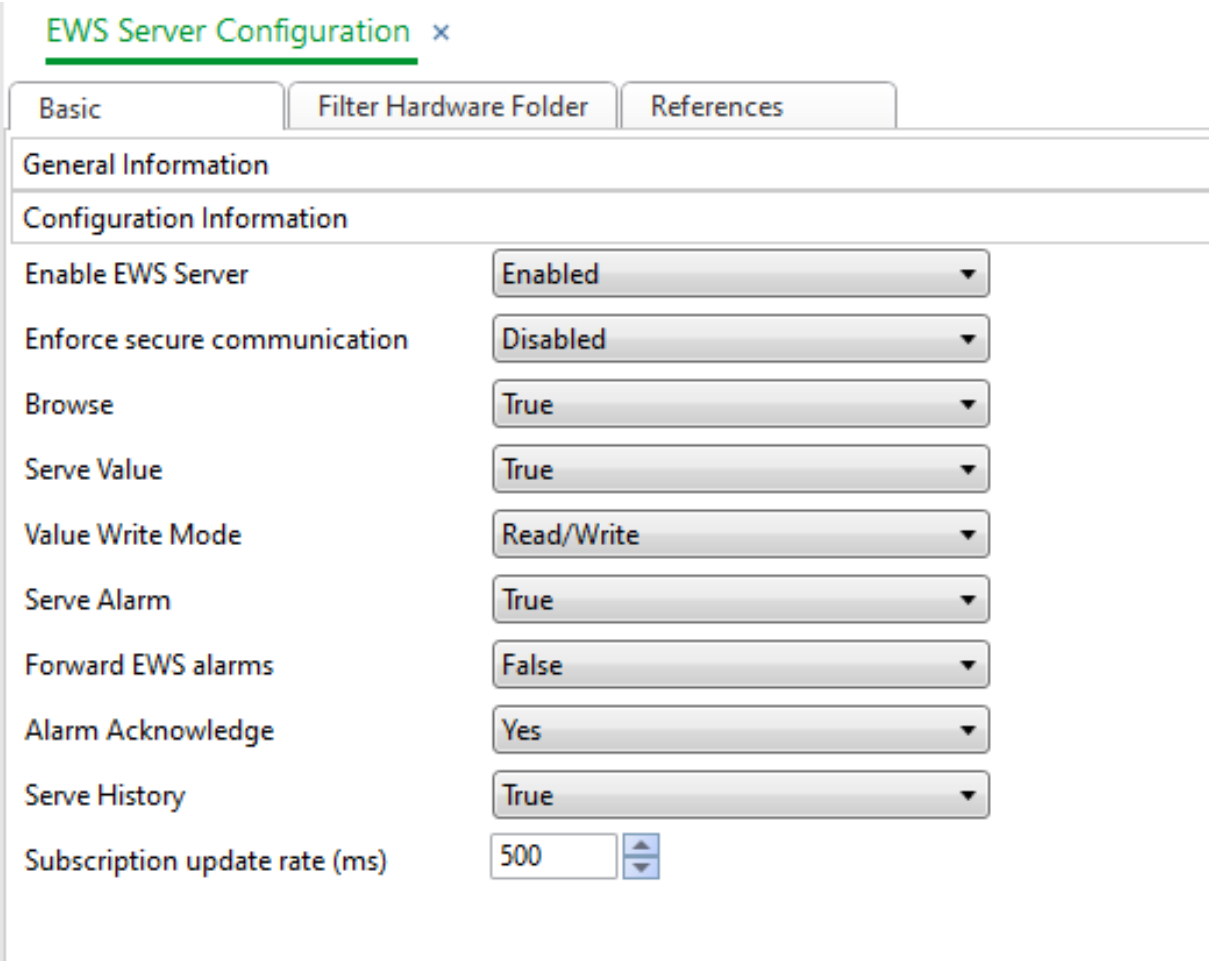
3 Quick Start

1. Copy ecoStruxure-rt.jar module to 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: import the module with all its dependencies into JACE and restart it.
2. Configure the EcoStruxure Automation Server: enable EWS Server and note the HTTP port.
3. Add **EcoStruxure Network** to the station.
4. Enter license code in **License** property under **EcoStruxure Network**.
5. Add **EcoStruxure Device** under the network. Enter the device IP address, port, login, and password.
6. Open device **EcoStruxure Point Manager** and **Discover** points.
7. Add discovered points to the station for monitoring and control.

[1] All trademarks or registered trademarks are the property of their respective owners
[2] If support for older Niagara versions is required, please contact the vendor

4 EWS Server Configuration

In **Building Operation Workstation** navigate to **EcoStruxure Web Services** and from there to **EWS Server Configuration**. Set the settings as shown on the screenshot below.



5 Digest Authentication

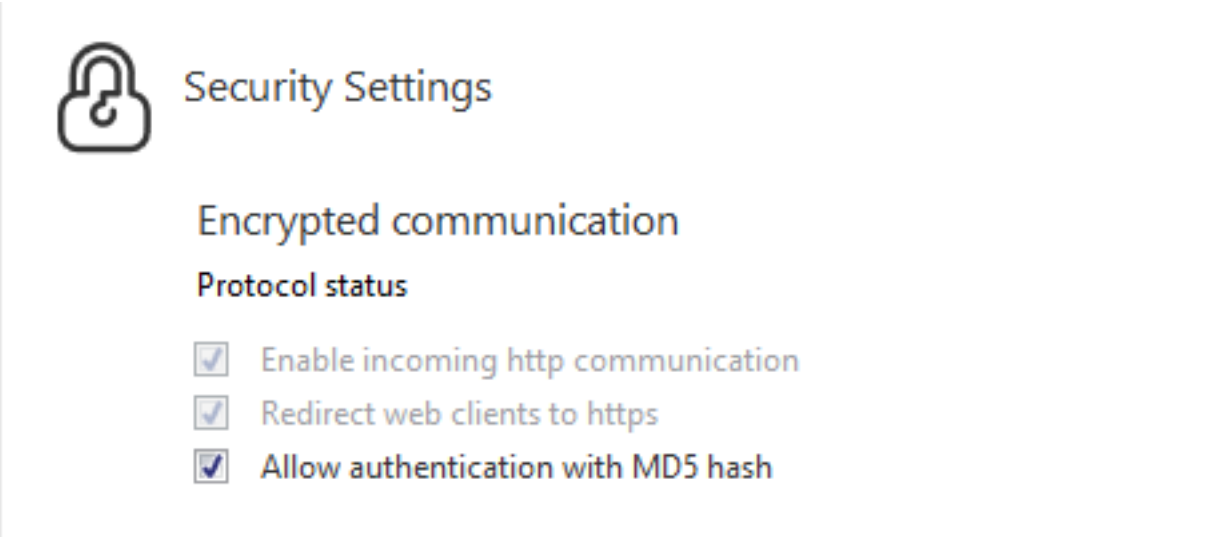
The driver communicates with the EWS server using HTTP Digest authentication. Since driver version **2.3.6** the algorithm is negotiated automatically from the server's challenge – **MD5**, **MD5-sess**, **SHA-256**, and **SHA-256-sess** are all supported. No EcoStruxure-side authentication change is required.

Driver versions before 2.3.6 supported MD5 only. If you are running one of these and the device stays offline with HTTP 401 Unauthorized even though the credentials are correct, either upgrade the

driver or allow MD5 on the EcoStruxure server. The location of the setting depends on the EcoStruxure Building Operation (EBO) version:

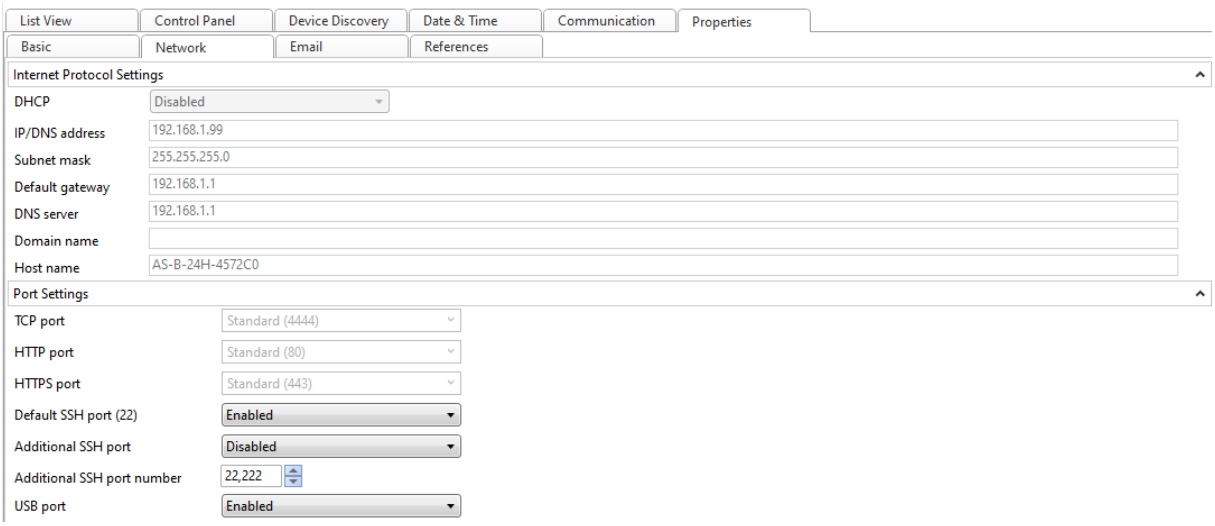
- **Older EBO versions**: In **Building Operation Workstation**, open **Control Panel** and navigate to **Security Manager**. Tick **Allow authentication with MD5 hash**.
- **Newer EBO versions (3.x, 2024+)**: In the System Tree, select the EcoStruxure BMS Server, open the **Control Panel** tab, and click **Security Settings**. The toggle is labeled **Disable MD5 Hash** and must be **unchecked** (i.e. MD5 must be allowed). Note that this is now a per-server setting rather than a global one.

Note that the reverse direction is different. When Niagara is used as an **EcoStruxure Server** (see the Firewall section), the Niagara-hosted EWS server authenticates incoming clients with **MD5 only**; an external EWS client that requires SHA-256 cannot authenticate against it.



6 Port Check

Port of the Automation Server can be found in **Building Operation Workstation** under **Properties**, **Network** menu. You will need to use the **HTTP Port** for the connection via Niagara.



7 EWS Server Debug

In order to check that the EWS server on the Automation Server is operational, navigate to the following page in your web browser:

http://ipAddress:port/EcoStruxure/DataExchange?wsdl

(e.g., http://192.168.1.99:80/EcoStruxure/DataExchange?wsdl).

Once the correct login and password have been entered you will be able to see Web Services version (e.g., EcoStruxure Web Services V1.2). If you are able to see that it means that Automation Server is configured correctly.

Other EcoStruxure products publish the same web service under a different address. **Power Monitoring Expert** uses:

http://ipAddress/EWS/DataExchange.svc?wsdl

Whichever address answers in the browser is the one the device must post to – set it with the **Ews Profile** / **Ews Path** properties described in the Devices section.

8 Network

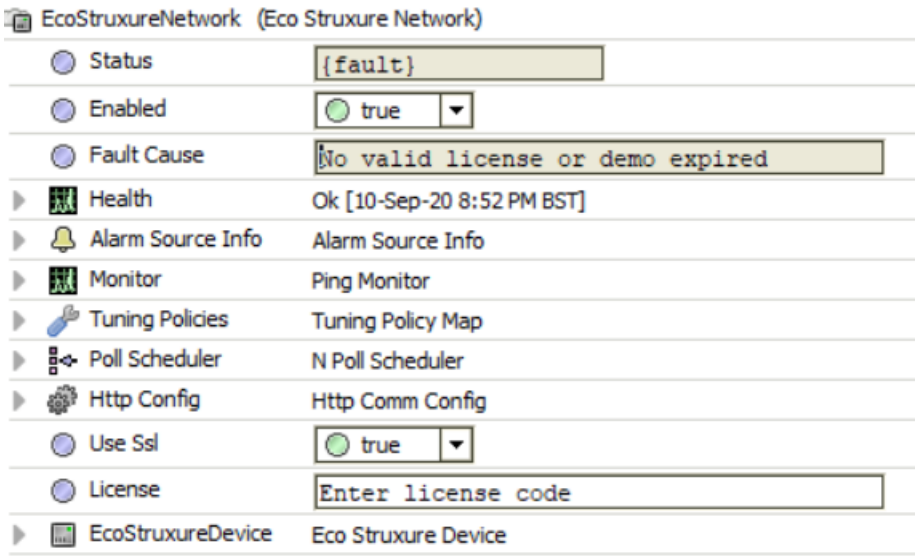
Network properties:

- **License** – the code that allows the driver to run on your host.

In most cases only the **License** property needs to be configured at the network level.

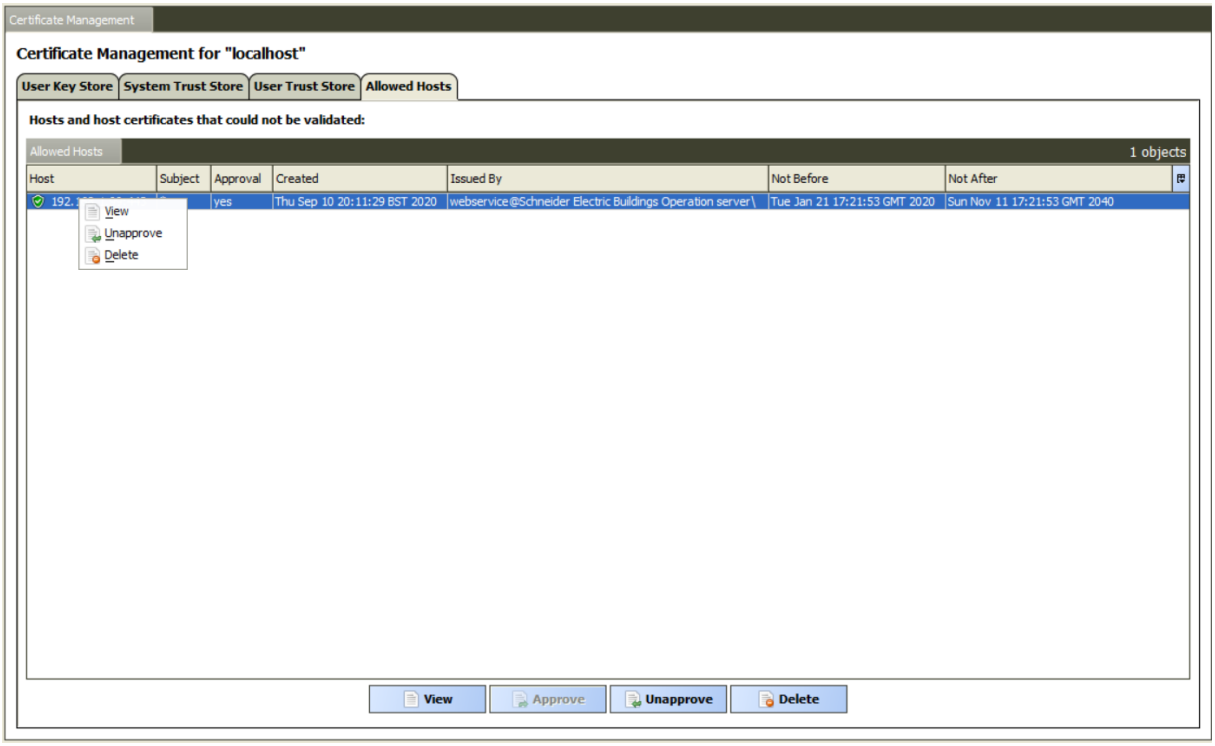
To start communication between Tridium Niagara and EcoStruxure devices, make sure Tridium Niagara and EcoStruxure are in the same Ethernet network.

1. Install **ecoStruxure.jar** or **ecoStruxure-rt.jar** and all dependent modules via Software Manager
2. Start the station and add a new **EcoStruxure Network**
3. In the network **Properties** enter the license number and press **Save**



By default the SSL communication is disabled. In order to enable it:

1. Set **Use Ssl** flag under network to **true**
2. Try to ping the device, it will fail due to Niagara security features
3. Go to the **Certificate Manager** and you will see your communication entity under the **Allowed Hosts** section, right click to approve it



9 Firewall

This applies only when the driver is used as an **EcoStruxure Server** – that is, when Niagara publishes its own data as EcoStruxure Web Services for an external EcoStruxure client to read. Normal device polling (Niagara reading from EcoStruxure automation servers) is outbound and needs no firewall changes.

A JACE 9000 running Niagara 4.15 or later enables a built-in host firewall that blocks all incoming traffic by default. Because an external EWS client connects **into** Niagara over HTTP(S), this firewall must be opened for the station's Web Service port before the client can reach the server.

On this platform, add a **FirewallPortHelper** component from the **net** palette to the station and configure it to allow the station's Web Service port – by default **TCP 80** for HTTP or **TCP 443** for HTTPS (use the port configured in the station's **WebService**). No firewall configuration is required on other platforms, such as older JACE models or a Supervisor / PC host.

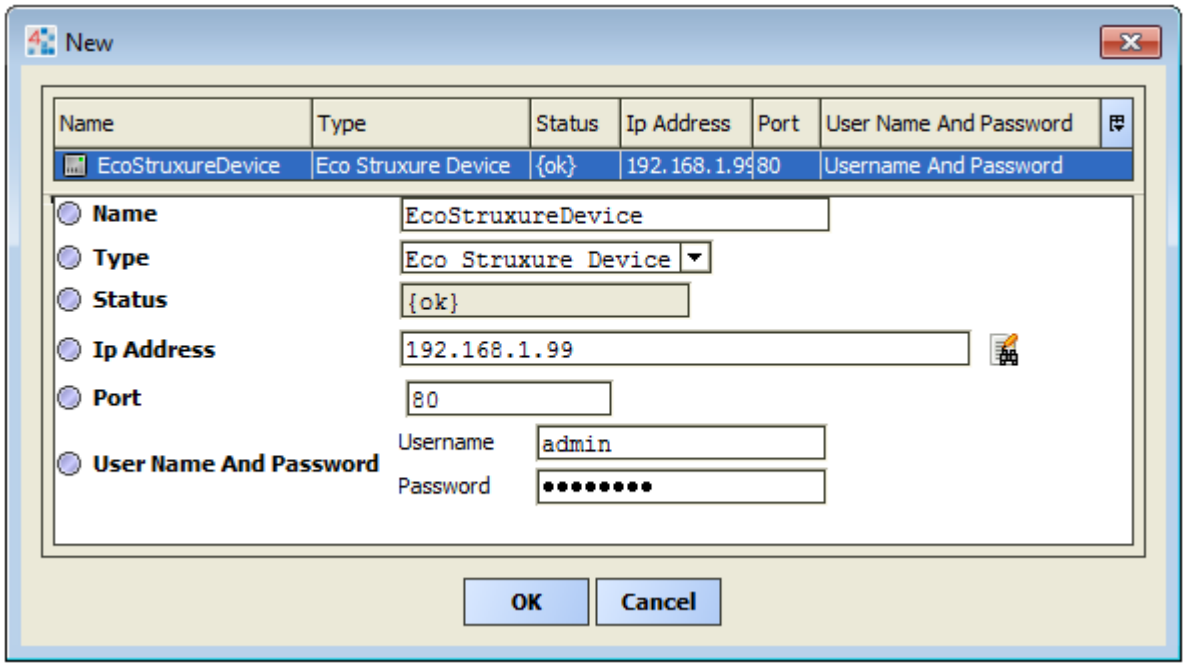
10 Devices

Open the **Device Manager** and press **New** to add the **EcoStruxure Device**. Enter the relevant IP address, port (443 for SSL and 80 for non-SSL), login, and password. If the device is shown offline, right-click on the device and ping it. If the device is still offline, check the EcoStruxure configuration as described in the EWS Server Configuration section.

Device properties:

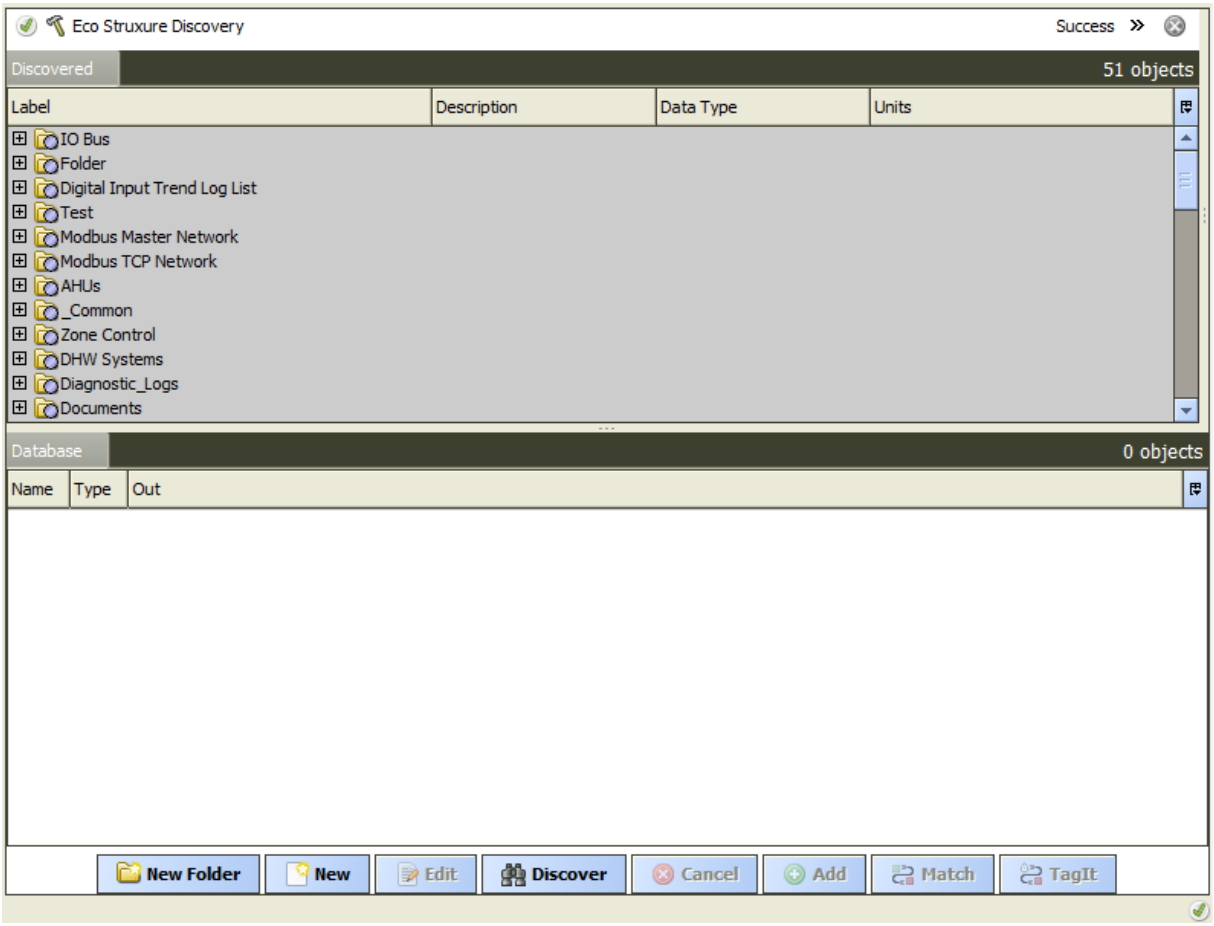
- **Ip Address** – IP address of the EcoStruxure Automation Server.
- **Port** – HTTP port number (80 for non-SSL, 443 for SSL).
- **Login** – EcoStruxure system username.
- **Password** – EcoStruxure system password.
- **Use Ssl** – whether to use SSL/HTTPS for secure communication.
- **Ews Profile** – which EcoStruxure product the device talks to. Selecting a profile fills **Ews Path** with the endpoint that product publishes: **Ebo** for Building Operation (`/EcoStruxure/DataExchange?`), **Pme** for Power Monitoring Expert (`/EWS/DataExchange.svc`). Selecting **Custom** leaves the path alone so you can type your own.
- **Ews Path** – the URI the SOAP requests are posted to. It is set for you by **Ews Profile** and only needs changing for a server that publishes EWS somewhere else; editing it by hand switches **Ews Profile** to **Custom**.

Leave both at their defaults for a normal Building Operation automation server. If you paste a full URL into **Ews Path**, the driver keeps just the path part, and a blank field falls back to the profile default.



11 Point Discovery

Open device **EcoStruxure Point Manager** and click **Discover** to start point discovery.



The discovered points will mimic the **Building Operation Workstation** data tree structure. Niagara will find all available folders, points, their types, units, and attributes. Every folder can be expanded; by pressing the **+**, Niagara will discover the next layer of the EcoStruxure folder. Please note that even if the folders are empty, the **+** will still be shown. If during the discovery there were changes to the EcoStruxure data tree, you can press the **Discover** button again to restart the discovery from the root level.

12 Points

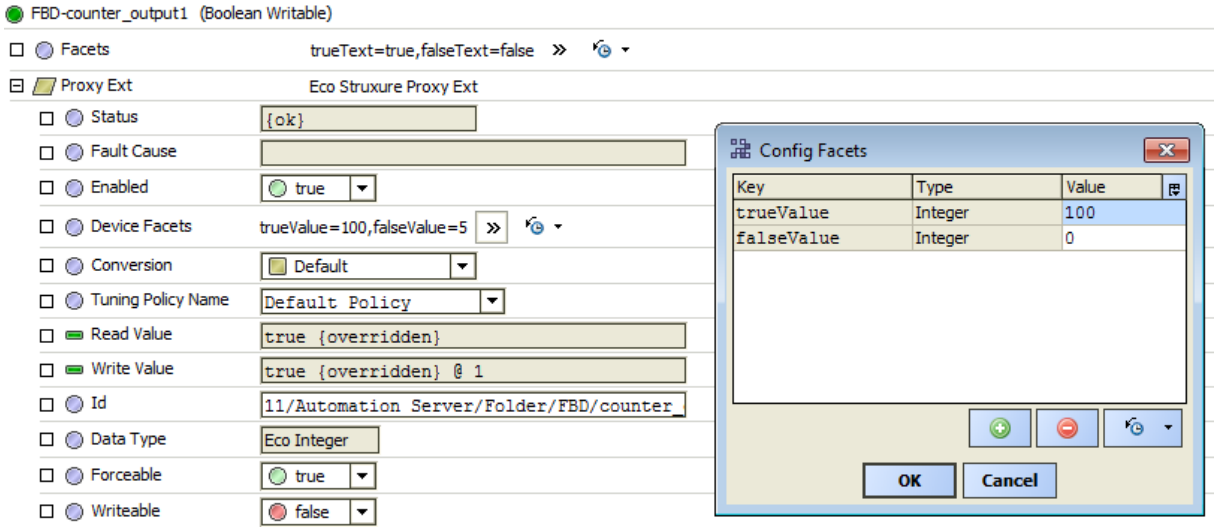
Every EcoStruxure point extension contains the following properties:

- **ID** – the unique ID of the EcoStruxure point.
- **Data Type** – EcoStruxure point data type.
- **Writable** – point can be forced when the Writable parameter is “true”.

- **Forceable** – point can be forced when the Forceable parameter is “true”. If Forceable is “true” it is possible to write to the point even if Writable is “false”.

All the above parameters are set automatically for the points created via the point discovery.

Please note that some of the EcoStruxure points can be discovered as Integer type while in the EcoStruxure environment they are represented as Boolean (e.g., Sigma controller values). In this case, when the points are added it is possible to change a point type to boolean and set the correct **trueValue** and **falseValue** device facets under the point extension. In order to understand correct **trueValue** and **falseValue** it is possible to import point as Numeric Point and monitor the values changing them from the EcoStruxure environment, example values can be 0 and 1 or 0 and 100.



13 Point Addressing

Each EcoStruxure point is addressed by its **ID** – the unique object identifier used by EcoStruxure Web Services. The ID follows the object’s position in the Building Operation data tree, so a discovered point keeps the same path structure that you see in **Building Operation Workstation**.

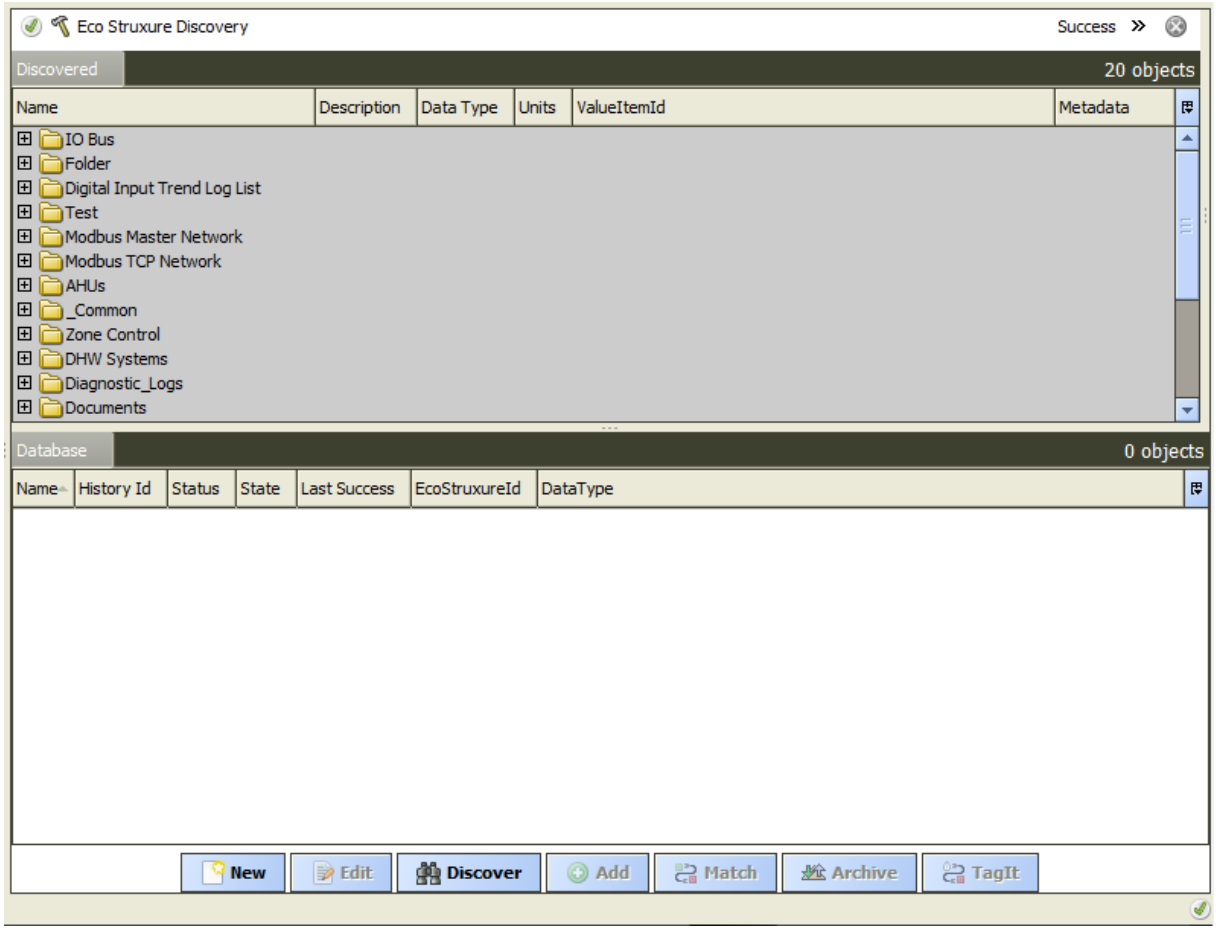
- When points are created through discovery, the **ID** is set automatically and must not be changed.
- To add a point manually, set the proxy extension **ID** to the exact EWS object identifier and set the matching **Data Type**. An incorrect ID makes the point read *fault*.

The parent device is addressed separately by its **Ip Address** and **Port** (see the Devices section).

14 History Discovery

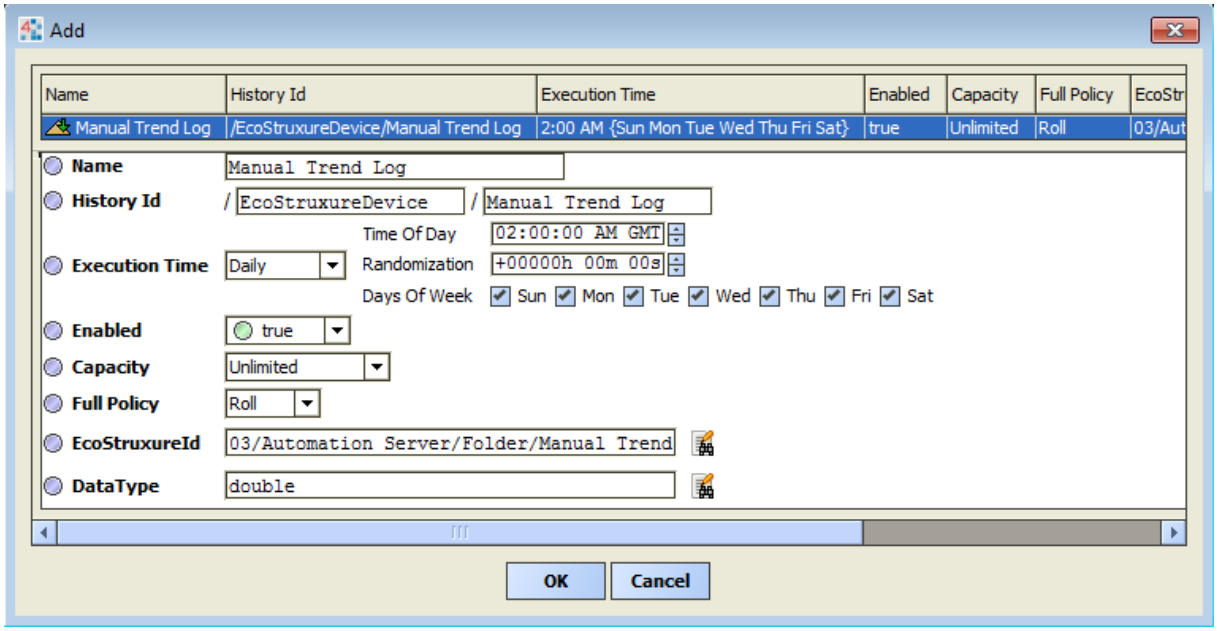
Every EcoStruxure device in Niagara has History extension, which contains History Imports – components, which connect generic EcoStruxure histories with Niagara histories.

Open device **EcoStruxure History Manager** and click **Discover** to start history discovery.



Niagara will discover histories in a similar way as described in the point discovery section.

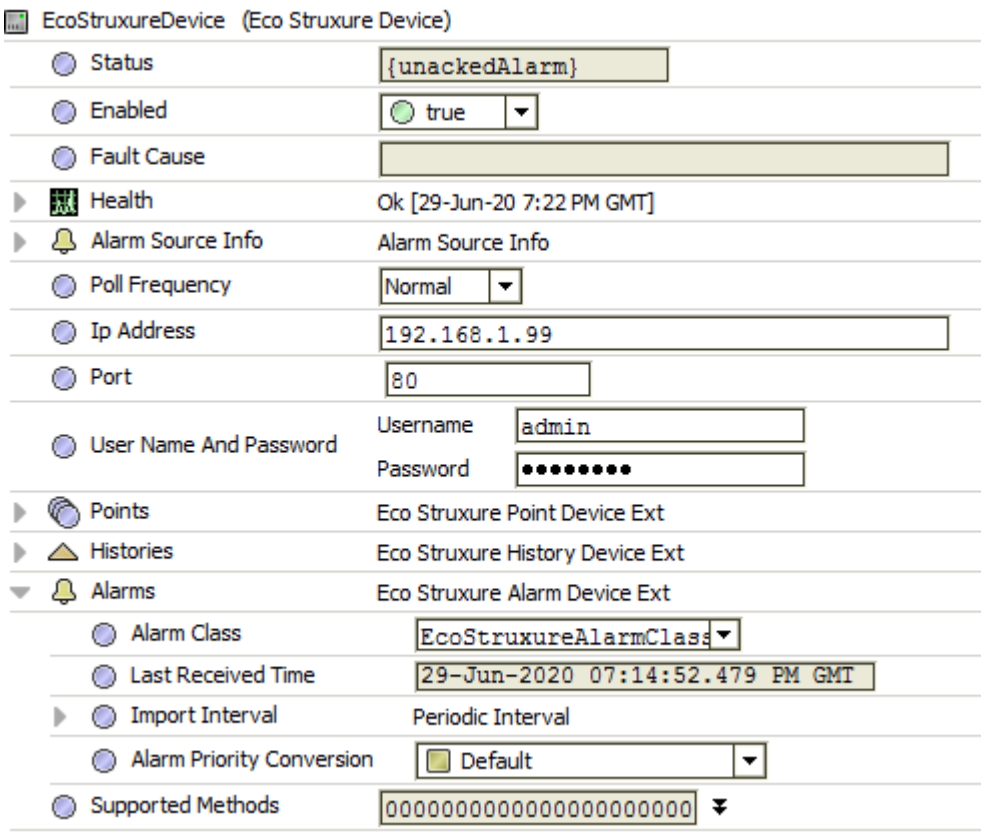
In order to import the history press **Add**. You can modify **Name** and **History ID**. Please do not modify **EcoStruxureId** and **dataType**.

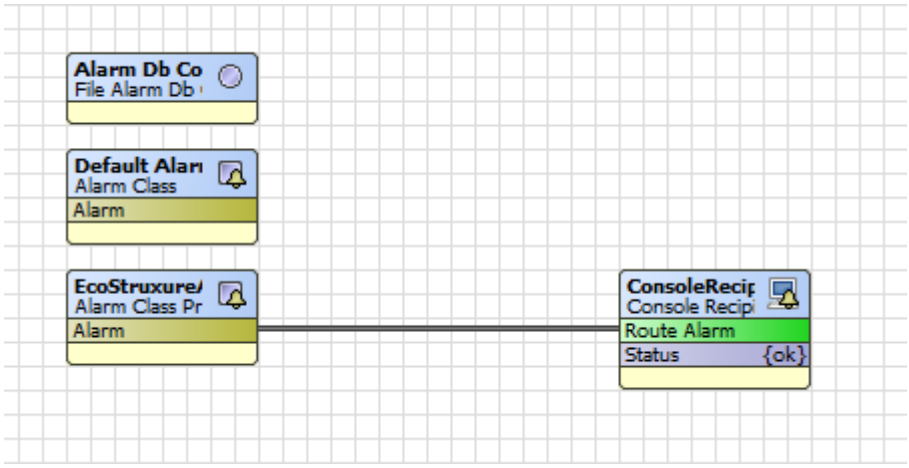


After the history has been added press **Archive** and the history data will be imported into Niagara.

15 Alarm Import

Every EcoStruxure device in Niagara has an Alarm extension. In order to enable periodic alarm import, please configure the Import Interval. In order to collect alarms in Niagara with the same alarm priorities as in EcoStruxure please add the EcoStruxureAlarmClass to the AlarmService as per screenshot.


EcoStruxureDevice (Eco Struxure Device)
Status
{unackedAlarm}
Enabled
true
Fault Cause
Health
Ok [29-Jun-20 7:22 PM GMT]
Alarm Source Info
Alarm Source Info
Poll Frequency
Normal
Ip Address
192.168.1.99
Port
80
User Name And Password
Username
admin
Password
Points
Eco Struxure Point Device Ext
Histories
Eco Struxure History Device Ext
Alarms
Eco Struxure Alarm Device Ext
Alarm Class
EcoStruxureAlarmClass
Last Received Time
29-Jun-2020 07:14:52.479 PM GMT
Import Interval
Periodic Interval
Alarm Priority Conversion
Default
Supported Methods


Alarm Db Co
File Alarm Db
Default Aları
Alarm Class
Alarm
EcoStruxure/
Alarm Class Pr
Alarm
ConsoleRecip
Console Recipi
Route Alarm
Status
{ok}

16 FAQ

16.1 Device is shown as offline

- Check that the EWS Server is enabled in **Building Operation Workstation** (see EWS Server Configuration section).
- Verify the IP address and port in the device properties match the Automation Server settings.
- Open `http://ipAddress:port/EcoStruxure/DataExchange?wsdl` in a browser to confirm the EWS server is responding.
- If that address returns **404 Not Found** in the browser as well, the server publishes EWS elsewhere: Power Monitoring Expert uses `http://ipAddress/EWS/DataExchange.svc?wsdl`. Set **Ews Profile** to **Pme**, or to **Custom** with the path your server answers on. A device whose **Ews Path** is wrong reports `EcoStruxureDevice send failed: HTTP 404 Not Found`.
- If the device stays offline with HTTP 401 Unauthorized although the credentials are correct, see the **Digest Authentication** section. Driver 2.3.6 and later negotiate MD5 or SHA-256 automatically; earlier versions support MD5 only and need MD5 enabled on the EcoStruxure server.
- Verify login and password are correct.
- If using SSL, ensure the certificate has been approved in **Certificate Manager**.

16.2 Points are not updating

- Verify the device is online (device status should show **ok**).
- Check that the EcoStruxure point exists and is accessible in **Building Operation Workstation**.
- If the point was recently added or renamed in EcoStruxure, run **Discover** again.

16.3 Cannot write to a point

- Verify the point's **Writable** or **Forceable** property is set to "true" in the proxy extension.
- Ensure the EcoStruxure user account has write permissions.
- Check that authentication credentials are configured in the device properties.

16.4 History import is empty

- Verify the history exists and contains data in **Building Operation Workstation**.
- Check the **EcoStruxureId** and **dataType** properties – do not modify these after import.
- Press **Archive** to manually trigger the import.