O-Insights OPC UA

Set up help/Installation Guide

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About O-Insights OPC UA Driver

O-Insights OPC Driver provides a two-way communication over the OPC UA protocol for transfer of events from Milestone to any third party BMS/SCADA systems and fetches OPC event data from Third-party BMS/SCADA servers into Milestone VMS.

Setup

The set-up file installs the OPC UA driver services on the machine.

Pre-Requisites

Operating System:

- Microsoft® Windows® 8.1 Pro/Enterprise (64 bit) or higher
- Microsoft® Windows® Server 2016 (64 bit): Essentials, Standard or higher

Software:

- Microsoft® .NET 4.8 Framework

CPU:

- Intel® Core™ i3-6100 3.7 GHz or better

RAM

- 8 GB

Hard Disk

- 256GB SSD

Note: The OPC UA driver uses the following ports that should be opened

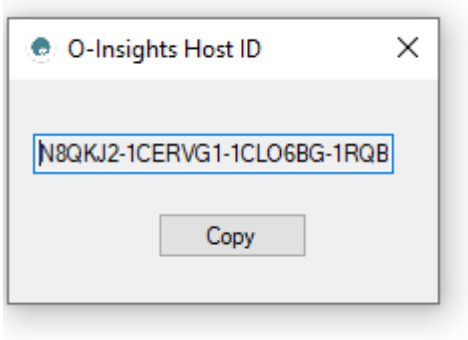
- Port 8090
- Port 8091
- Port 48030

Run Installer

- Run the set-up file to install O-Insights for OPC UA.
- The Typical Install path is C:\Program Files (x86)\O-Insights OPC

Get Host ID for License creation

- If you already have a valid license file for this PC then this step is not needed
- Run the HostID app to fetch the HOSTID of the PC.
    - The HostID app can be located at {InstallDirectory}\HostID.exe
- This HOSTID needs to be provided to generate the product license.



Copy License file

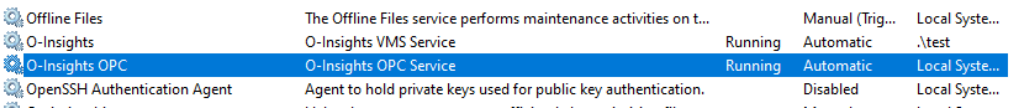
- Copy the License file to the '*License*' folder inside the directory where the product is installed.

Check for Services

The Driver consists of the following windows services:

1. O-Insights Service (O-Insights VMS Service)
2. O-Insights OPC (O-Insights OPC UA Service)

Ensure the account used for O-Insights Service is a valid Milestone Windows account.



Restarting Services

Make sure the services are running. Any change in OPC UA configuration will need the services to be restarted (Start->Search for 'Services' to open the Services app).

Configuration

Milestone as OPC UA Server

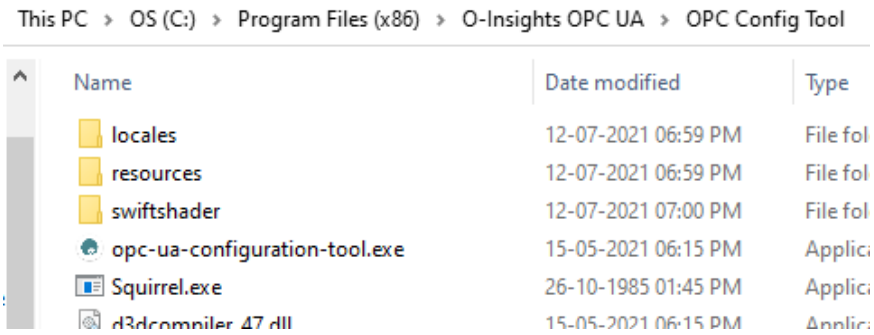
When the driver is configured to run as a Server, Milestone Events and Alarms can be transferred.

OPC UA Server Configuration

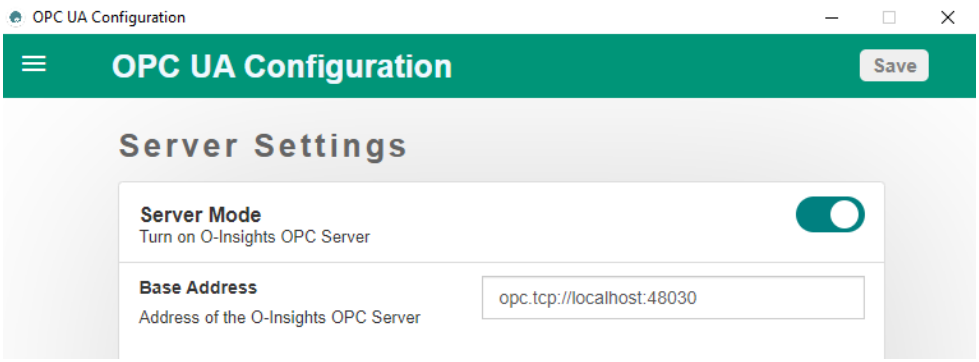
- Stop both the services ("O-Insights Service" and "O-Insights OPC")
- Go to the following directory

  '{InstallDirectory\O-Insights OPC \OPC Config Tool}'

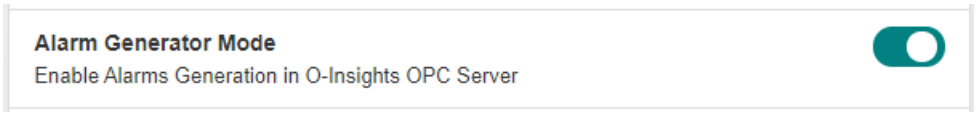
- Run the "opc-ua-configuration-tool.exe".



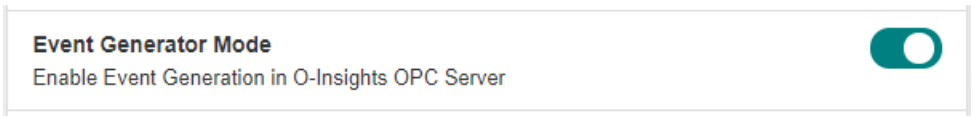
- If you do not want to change the base address of the OPC UA server then you can leave the field unchanged.



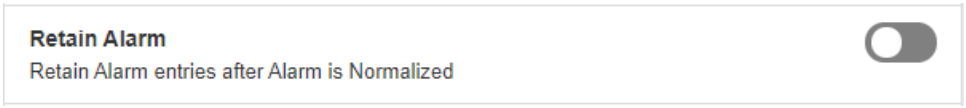
- Milestone Alarms can be sent out as OPC UA notifications by enabling **Alarm Generator mode** in the driver**.** To enable the Alarm Generator mode, toggle the **Alarm Generator mode**.



- To send out Milestone Events as OPC UA notifications, enable Event Generation by toggling the **Event Generator mode**.



- Alarm entries in the Alarm view of the OPC UA Client can be removed once they are normalized. They can be retained by enabling the **Retain Alarm** option.

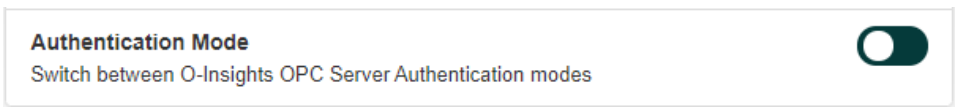


- The OPC UA driver supports the following Authentication Modes.
  - Anonymous
    - Allows OPC UA Clients to connect anonymously to the server.
  - Username/Password
    - Allows the OPC UA Clients to connect using username and password configured in the server.

  The Username/Password mode requires the user to use the following credentials to establish the connection successfully.

  Username: **OPCClientUser**
  Password: **OPCClientUser@1234**

  To set the Authentication modes for the connection, toggle the below option:



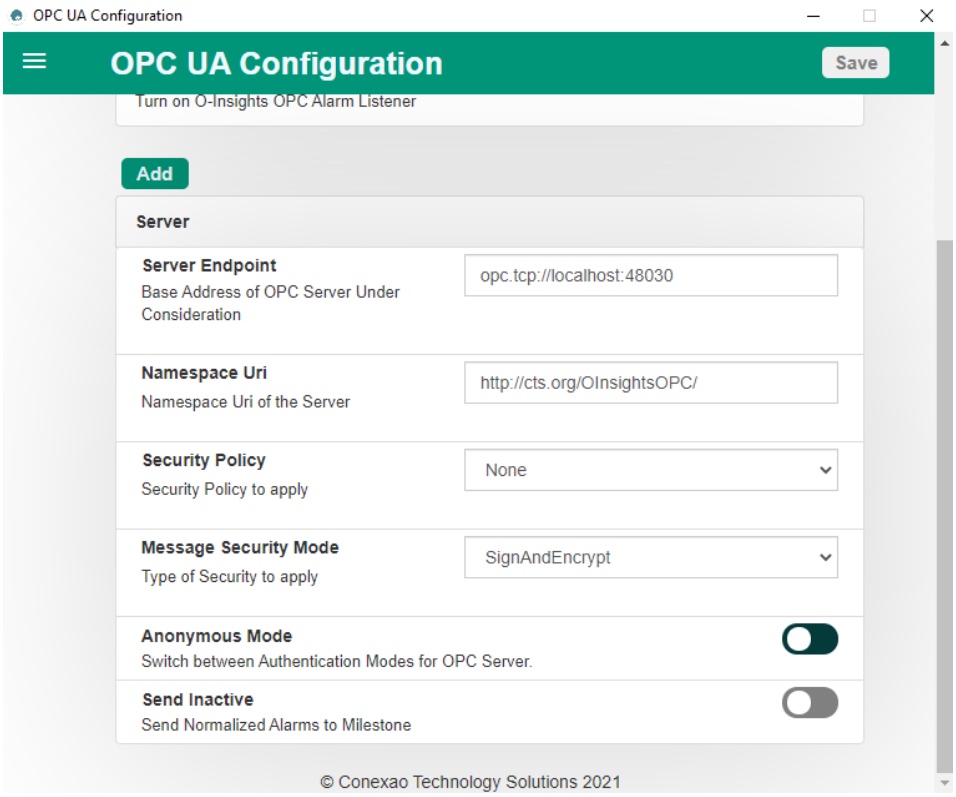
- To save the above options, click on the "**Save**" button at the top-right corner. A success notification will be shown once the settings are saved.
- Now restart the O-Insights OPC UA Service, followed by the O-Insights Service.

Milestone as OPC Client

- The Driver can also run in Client mode and read values of OPC points(Client Alarm Generator Mode) and listens to alarm/events(AEListener Mode) to trigger events in Milestone.

OPC Client Configuration

- To turn "**ON**" the Client mode, go to the Client settings in the menu and toggle the **Client Mode**.
- Now click on the "**Add**" button, and a form for filling server information will appear. You can configure multiple servers.



- Following is the information needed for each of the server for establishing a successful connection.
    - Server Endpoint
        - The base address of the server.
    - Namespace Uri

        - Namespace for nodes defined in the server.
    - Security Policy
        - The Security Policy to use when securing messages.
        - Supports Three policies:
            - Basic256Sha256
            - Aes128_Sha256_RsaOaep
            - None
    - Message Security Mode
        - The type of security to apply to the messages.
        - Supports three modes:
            - SignAndEncrypt
            - Sign
            - None
    - Authentication Mode
        - Two modes:
            - Anonymous: Allows to anonymously connect to the server.
            - Username/Password: Accepts username and password for the connection.
    - Send Inactive
        - Milestone by default will show active alarm entries. But enabling the "**Send Inactive**" option will allow Milestone to show inactive/normalized alarm entries also. To get the normalized Alarm entries in Milestone, toggle the "**Send Inactive**" option.
- To save the above options, click on the "**Save**" button at the top-right corner. A success notification will be shown once the settings are saved.

Read Points, Alarms

- OPC driver can read the point values and based on the alarm data provided to it, it triggers events in Milestone if there is a User Defined Event mapped to the OPC UA point/event in the Alarm.
- To read alarms, first, configure the OPC driver to run in Client Mode. Then, turn "**ON**" the "**Client Alarm Generator Mode**" and save the changes.
- The following is the format of the '*OPC\Client-Config\OPCClient.json*'.

```
[
  {
    "ServerEndpoint": "opc.tcp://localhost:48030",
    "SecurityPolicy": "None",
    "MessageSecurityMode": "None",
    "NamespaceUri": "http://cts.org/OInsightsOPC/",
    "SendInActive": false,
    "UserName": "",
    "Password": "",
    "Nodes": []
  }
]
```

- Add the following Node object to the “Nodes” property under the server to which the point belongs in the json.

    - For Numeric points

```
{
        "NodeId": "Point_One.Storage",
        "EnableAlarm": false,
        "EventName": "Storage Alarm",
        "EventType": "MLSTAlarm",
        "Priority": "High",
        "HighLimit": 30,
        "LowLimit": 10
}
```

    - For Boolean points

```
{
        "NodeId": "Point_One.Status",
        "EnableAlarm": false,
        "EventName": "Disabled Alarm",
        "EventType": "MLSTAlarm",
        "Priority": "High",
        "AlarmValue": false
}
```

        - NodeId – The identifier for a node in the address space of the OPC UA server
        - EnableAlarm – Whether to create alarms for the node (true/false)
        - EventName – Name of the event to be raised associated with the node
        - EventType – The specific type of Event

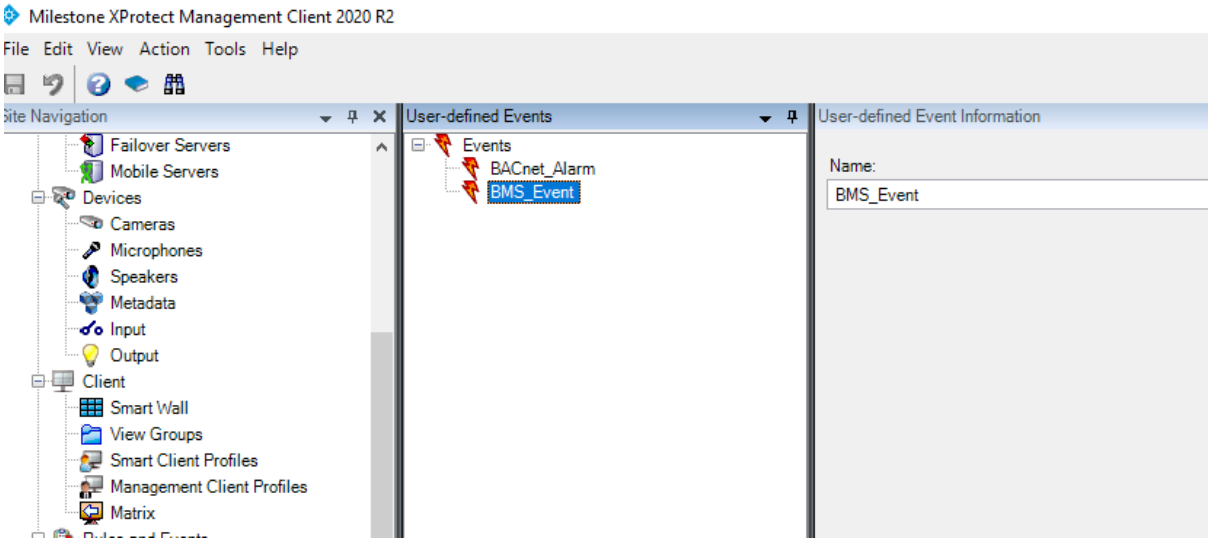
- Priority – Urgency level of the Event (Min, Low, MediumLow, Medium, MediumHigh, High, Max)
- HighLimit – If the node value is greater than or equal to this value then the alarm is generated
- LowLimit – If the node value is lower than or equal to this value then the alarm is generated
- AlarmValue – If the node value(true/false) is equal to this value then the alarm is generated

- Now restart the O-Insights OPC UA Service, followed by the O-Insights Service.

Milestone as OPC UA Alarm/Event Listener

- In Alarm/Event listener mode, the Driver will listen to all alarms and events on OPC and trigger events in Milestone if there is a User Defined Event mapped to the OPC UA point/event in the Alarm.
- To enable the Alarm/Event Listener mode, configure the OPC driver to run in Client mode.
- Once the Client mode is enabled, turn '**ON**' the **AEListener Mode** and save the changes.
- Now restart the O-Insights OPC UA Service, followed by the O-Insights Service.

Note: The **Send InActive** option is applicable only for OPC alarms. For OPC events, Milestone events are always triggered.



- In Milestone, an Alarm can be configured for the following Event to show up in the Alarm Console.

- The Driver can also be configured to Auto Trigger Alarms in Milestone in addition to an Event. The configuration is part of O-Insights Service\OInsights.exe.config

- To Turn on Alarm creation:

  <add key="TriggerAlarms" value="True"/>

- Alarm Properties that can be configured:

  <add key="AlarmType" value="BMS"/>

  <add key="DefaultAlarmMessage" value="BMS Alarm"/>

  <add key="AlarmName" value=""/>

  <add key="AlarmPriority" value="1"/>

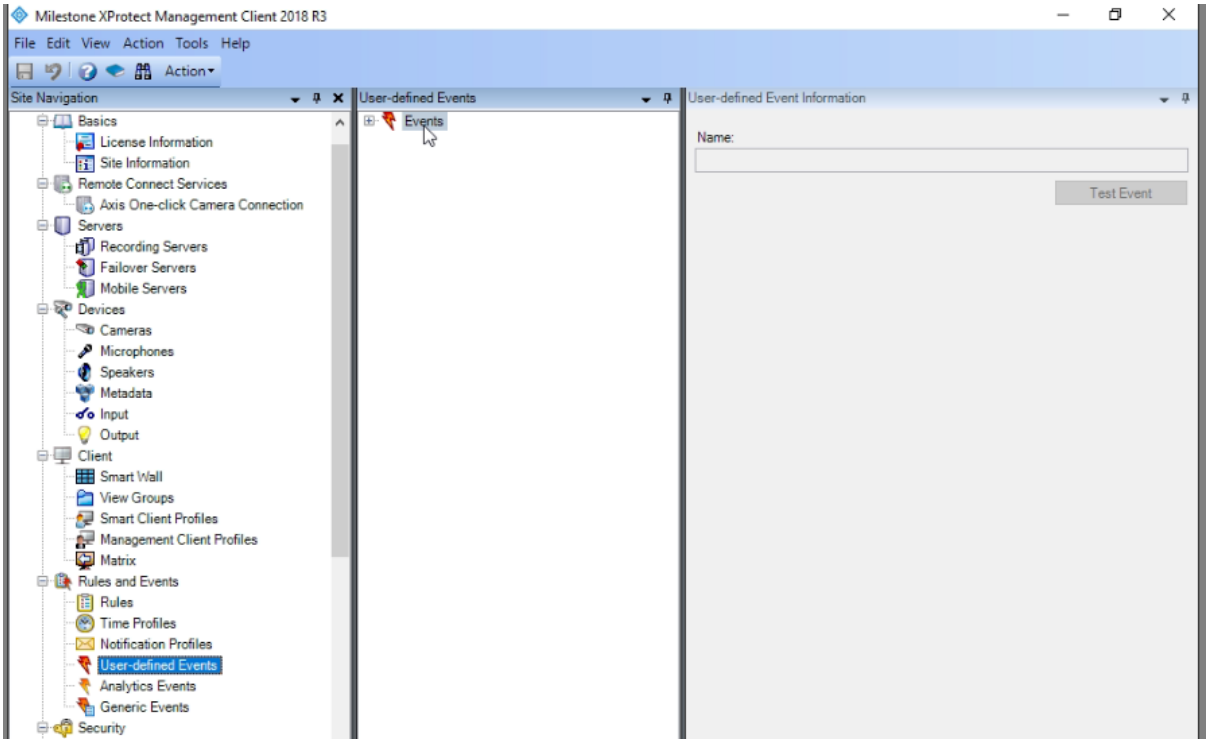
  <add key="AlarmPriorityName" value="High"/>

  <add key="AlarmStateName" value="New"/>

  <add key="AlarmState" value="1"/>

Milestone Configuration

- Go to Rules and Events in Milestone server and select 'User-defined Events' under.



- Right-click on the Events in the middle pane of the window to select and select ‘Add User-defined Event’.

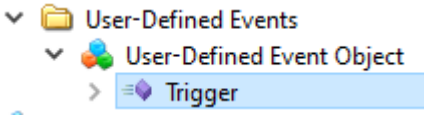
- Enter the name for the user-defined event in the window that pops up and click OK.

- The latest Event will be seen in the middle pane under user-defined events.

Triggering User-Defined Events

The OPC driver supports the method that triggers user-defined events in Milestone.

- The “MLST” folder contains an object named “User-Defined Event Object” which contains the method to be called, namely “Trigger”.



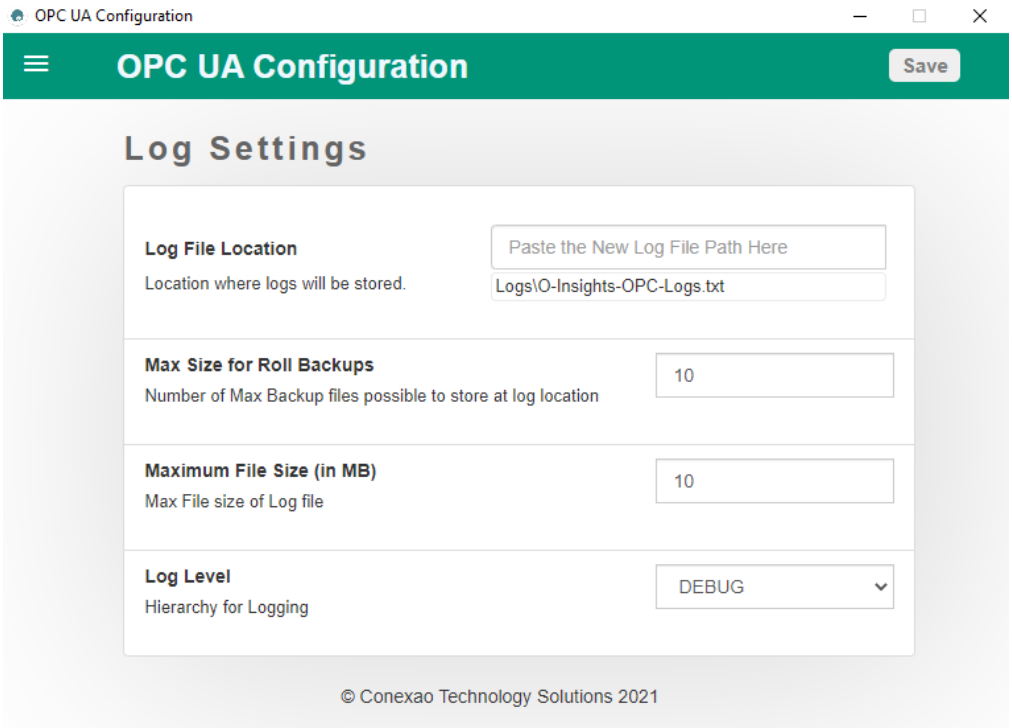
- The method “Trigger” accepts a parameter named “EventName” of the type “String”.

Name	Value	DataType	Description
EventName		String	

- The “EventName” is the name of the user-defined event configured in Milestone.
- Once this method is triggered with the event name, Milestone will show the event notification.

Log Settings

The log settings configuration control the information written to the OPC UA driver log files.



- Log File Location option displays the current log file location. To change it, paste the copied file path in the text field.

- Max Size for Roll Backups controls the number of backup log files that remain on the log path.

- Maximum File Size controls the size of each log file. Accepts values in terms of MBs.

- Log Level field allows changing the log level. It provides four options:
  - Verbose: Prints verbose information.
  - Debug: Prints debug logs.
  - Info: Prints informational logs.
  - Error: Prints Unexpected error logs which might require attention.

FAQ

1. **Can I Configure the Driver to work as Server and Client at the same time?**
   Yes, the Driver can work as both Server and Alarm Listener at the same time.

2. **Can I display the point values the Driver reads from the BACnet servers**
   The Following RESPApi shows all point values:
   http://IP:8091/api/opcclient/getAllPointsData/

   The Following RESPAPi shows specific point values, where *POINTNAME* should be replaced by the desired point name:
   http://IP:8091/api/opcclient/getPointData/?pointName=POINTNAME