

EcoStruxure Augmented Operator Advisor

Runtime

User Manual

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

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A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

Document Scope

This document describes the EcoStruxure Augmented Operator Advisor Runtime and the built-in EcoStruxure Augmented Operator Advisor Manager.

Read the EcoStruxure Augmented Operator Advisor Quick Start Guide for an overview of EcoStruxure Augmented Operator Advisor before using this document.

It is recommended that you undertake an EcoStruxure Augmented Operator Advisor training course before using the product.

Validity Note

This document is valid for Version 2.7 of EcoStruxure Augmented Operator Advisor.

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- Samsung Galaxy™ is a registered trademark of Samsung Electronics Co Ltd.
- Intel® Core™ is a registered trademark of Intel Corporation.
- Linux® is a registered trademark of Linus Torvalds.

Related Documents

Title of Documentation	Reference Number
EcoStruxure Augmented Operator Advisor Quick Start Guide	EIO0000003000 (ENG) EIO0000003001 (FRE) EIO0000003002 (GER) EIO0000003003 (SPA) EIO0000003004 (ITA) EIO0000003005 (CHS) EIO0000003032 (JPN) EIO0000003563 (KOR)
EcoStruxure Augmented Operator Advisor Builder User Manual	EIO0000003006 (ENG) EIO0000003007 (FRE) EIO0000003008 (GER) EIO0000003009 (SPA) EIO0000003010 (ITA) EIO0000003011 (CHS) EIO0000003033 (JPN) EIO0000003564 (KOR)
EcoStruxure Augmented Operator Advisor App User Manual	EIO0000003598 (ENG) EIO0000003599 (FRE) EIO0000003600 (GER) EIO0000003601 (ESP) EIO0000003602 (ITA) EIO0000003603 (CHS) EIO0000003604 (JPN) EIO0000003605 (KOR)

You can download these technical publications, the present document and other technical information from our website www.se.com/en/download/.

Product Related Information

The application of this product requires expertise in the design and operation of control systems.

▲ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop.
- Separate or redundant control and monitoring paths must be provided for critical control functions.
- System control and monitoring paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- EcoStruxure Augmented Operator Advisor must not be used as a primary means of monitoring critical control functions.
- Each EcoStruxure Augmented Operator Advisor implementation must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

▲ WARNING

UNINTENDED EQUIPMENT OPERATION

- Allow only authorized personnel with expertise in the design and operation of control systems to program, install, alter, and apply this product.
- Follow local and national safety codes and standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

FALSE SCENE DETECTION

- Use tags in situations where similar equipment and/or environments could result in false scene detection.
- Attach tags firmly to the equipment with sufficient protection against damage or deterioration of the tag.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

UNAUTHORIZED OPERATOR ACCESS

- Keep user names and passwords secret.
- Protect tablet and runtime device access with a password or other security mechanism.
- Do not share access with others.
- Change default passwords upon first connection.
- Regularly update passwords.
- Apply relevant local IT rules.
- Do not save confidential information in post-its or notebooks.
- Do not attach confidential or sensitive user documents in projects.

Failure to follow these instructions can result in equipment damage.

Introduction

Introduction to EcoStruxure Augmented Operator Advisor Runtime

EcoStruxure Augmented Operator Advisor Runtime is installed on a Harmony HMIG5U2 Open Box PC, Harmony iPC / Industrial PC, or standard Windows PC (see EcoStruxure Augmented Operator Advisor, Quick Start Guide).

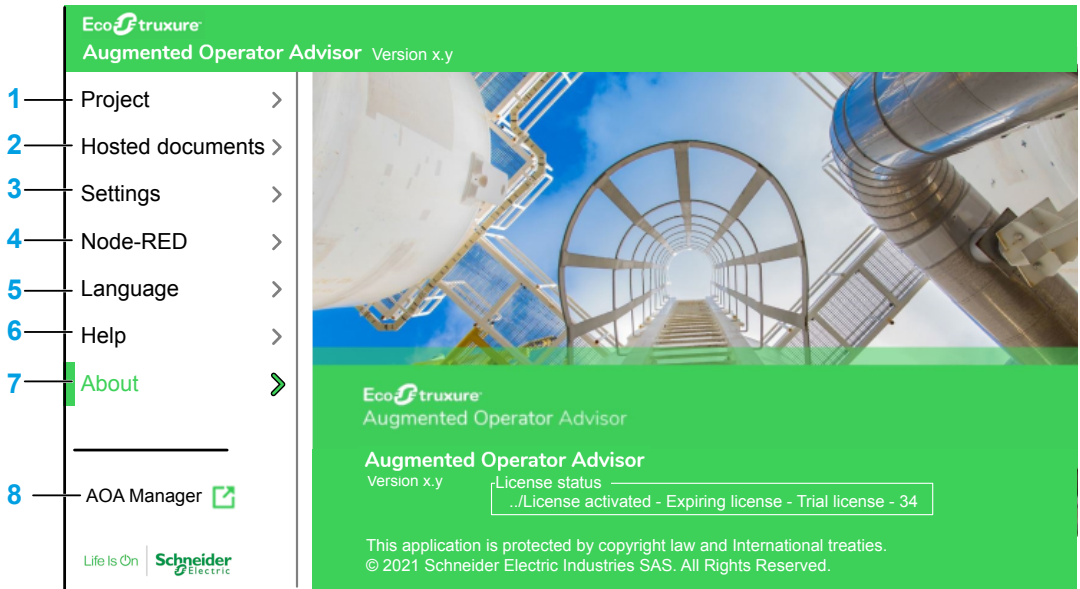
The EcoStruxure Augmented Operator Advisor Runtime gathers together all the information to be displayed in the points of interest and sends it to be displayed by the EcoStruxure Augmented Operator Advisor App. It also manages the database containing the photographs of scenes and equipment contained in the uploaded project.

The following prerequisites must be satisfied before installing the EcoStruxure Augmented Operator Advisor Runtime:

- Microsoft .NET Framework version 4.6.1 or later must be installed.
- The physical access to the runtime device must be secured by installing it in a closed cabinet inside your site or building.
- The EcoStruxure Augmented Operator Advisor Runtime must be installed only by a user with administrator rights on the runtime device.
- All folders and files installed and used by the software must be stored in a location where administration rights are required.
- The hard drive on which EcoStruxure Augmented Operator Advisor Runtime is installed must be encrypted to secure the user database, for example, using BitLocker.
- Only authorized users are allowed to deploy the project. Setup permissions to restrict the access to the project data folder on the runtime device.
- Before installing the software on Windows 7 embedded system (WES), make sure that the EWF protection feature is disabled and that Microsoft Redistributable KB2999226 has been manually installed.

NOTE: The EWF protection feature must remain disabled after installation, otherwise all user data and notes and procedure history will be deleted.

EcoStruxure Augmented Operator Advisor Runtime Interface



1. **Project** — import the built .zip file of a project, created in EcoStruxure Augmented Operator Advisor Builder. The information of the imported project is displayed.
2. **Hosted documents** — import a .zip file to host documents in the EcoStruxure Augmented Operator Advisor Runtime, or configure a remote access to the documents location. The number of imported documents or the URL address of their location is displayed.
3. **Settings** — configure the port settings of the EcoStruxure Augmented Operator Advisor Runtime
4. **Node-RED** — configure the connection with Node-RED
5. **Language** — select the language of the EcoStruxure Augmented Operator Advisor Runtime
6. **Help** — consult the user documentation for EcoStruxure Augmented Operator Advisor
7. **About** — the product version and information about the license are displayed
8. Access to EcoStruxure Augmented Operator Advisor Manager, page 14

Adding Hosted Documents

In the **Hosted documents** tab, you can add the hosted documents, imported previously in EcoStruxure Augmented Operator Advisor Builder.

Two ways of adding hosted documents are available, depending on the location where they are stored — local and remote.

Local documents are stored in the EcoStruxure Augmented Operator Advisor Runtime. This way they are always accessible to the EcoStruxure Augmented Operator Advisor App without filling up the tablet storage. Use this option if you do not have an IT infrastructure to host your documents.

If you have an IT infrastructure, you can use the **Remote documents** option to configure a redirection or a proxy to your file server.

Prerequisites: Before adding hosted documents, set up and update your corporate antivirus protection on the runtime device and file server, to ensure that the imported documents are not malicious.

To import **Local documents** from the .zip file imported in EcoStruxure Augmented Operator Advisor Builder:

1. Launch the EcoStruxure Augmented Operator Advisor Runtime and click the **Hosted documents** tab.
2. Select **Local documents**.
3. Click **Browse** and select the .zip file to be imported.
4. Click **Apply**.

Result: The number of imported documents is displayed.

To configure the access to your **Remote documents**:

1. Launch the EcoStruxure Augmented Operator Advisor Runtime and click the **Hosted documents** tab.
2. Select **Remote documents**.
3. Select **Redirection** or **Proxy**, and enter the URL address of the documents location.
4. Click **Apply**.

Using EcoStruxure Augmented Operator Advisor Manager

The EcoStruxure Augmented Operator Advisor Runtime includes the EcoStruxure Augmented Operator Advisor Manager, which gets installed automatically when the EcoStruxure Augmented Operator Advisor Runtime is installed (see EcoStruxure Augmented Operator Advisor, Quick Start Guide).

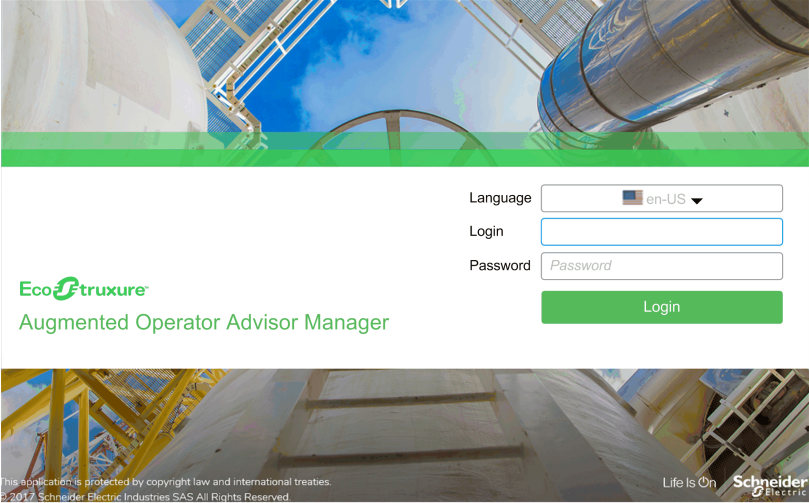
Using the EcoStruxure Augmented Operator Advisor Manager software you can:

- Manage users credentials (runtime/manager and operators) and view a list of all users (added, deleted or modified) in **USERS** tab.
- View a list of all procedures that are completed by operators in the EcoStruxure Augmented Operator Advisor App in **PROCEDURES** tab.
- View a list of all notes in scenes that are created by operators in the EcoStruxure Augmented Operator Advisor App in **NOTES** tab.

Launching the EcoStruxure Augmented Operator Advisor Manager

Before launching the EcoStruxure Augmented Operator Advisor Manager, make sure the EcoStruxure Augmented Operator Advisor Runtime is installed on your runtime device, your firewall is configured and the port check is successfully completed (see EcoStruxure Augmented Operator Advisor, Quick Start Guide).

To launch the EcoStruxure Augmented Operator Advisor Manager:

Step	Action
1	<p>Open the EcoStruxure Augmented Operator Advisor Runtime and click AOA Manager.</p> <p>Result: The EcoStruxure Augmented Operator Advisor Manager opens.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • The license is activated on launching the software for the first time and the number of days left on the license is displayed if trial version is used. • You must leave the EcoStruxure Augmented Operator Advisor Runtime running in the background. If EcoStruxure Augmented Operator Advisor Runtime is not running, then you will not be able to log in to EcoStruxure Augmented Operator Advisor Manager.
2	<p>Log in using the default user name and password (admin/admin).</p> 
3	<p>In the window that opens, enter a new admin password following the instructions.</p> <p>NOTE: Record the password in a safe location and provide appropriate protection.</p>

User Management

Overview

There are three types of users of EcoStruxure Augmented Operator Advisor:

- Builder users
- Runtime/Manager administrators
- Operator users

Builder users are those who will access EcoStruxure Augmented Operator Advisor Builder. Users without credentials can sign-up in the builder login screen.

Runtime/Manager administrators are those who are responsible for configuring users and security settings using the EcoStruxure Augmented Operator Advisor Manager. Runtime/Manager administrators must have administrator rights (maximum security level).

Operator users are those who will use the EcoStruxure Augmented Operator Advisor App. Based on their user rights (security level) they will have access to different objects in the app. In the builder project, objects are attributed with a security level numerical value. Operator users with a security level numerical value equal to or greater than the objects security level may view and interact with the object. Otherwise, the object is hidden or not accessible.

NOTE:

- The EcoStruxure Augmented Operator Advisor Manager can manage (create / modify / delete) the users (Runtime and Operator) only. You cannot create Builder users.
- You cannot delete Admin group.

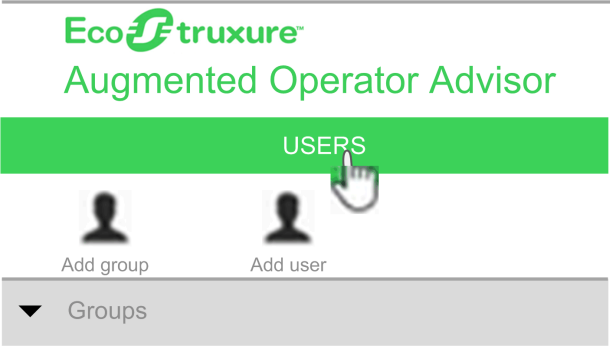
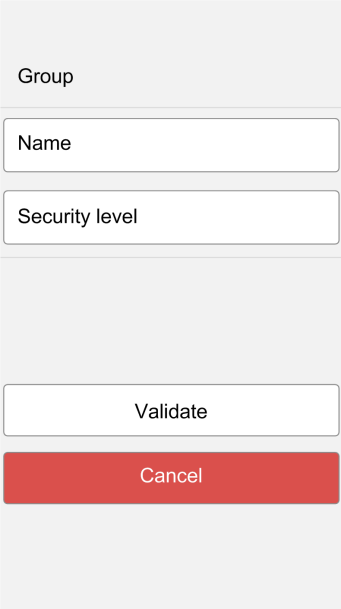
Creating Operator Users

The EcoStruxure Augmented Operator Advisor Manager on the runtime device is used to create / modify / delete operator users and configure security settings for them.

NOTE: Only users with admin rights can login to the EcoStruxure Augmented Operator Advisor Manager software.

This procedure explains how to create users in the EcoStruxure Augmented Operator Advisor Manager:

Step	Action
1	If not already running, launch EcoStruxure Augmented Operator Advisor > Augmented Operator Advisor from the list of installed Windows programs. Result: The EcoStruxure Augmented Operator Advisor window opens.
2	Launch AOA Manager .
3	Log in using the user name and password.
4	Click the USERS tab.

Step	Action
	
5	Click Add group to create a new user group. All users must belong to a group.
6	<p>Give the group a name and enter a security level.</p> <p>The security level is a number from 0 to 65535. Higher numbers have more security rights. Admin rights correspond with maximum security level 65535. All users within a group have the security level of the group.</p> <p>Click Validate to confirm the creation of the group.</p> 

Step	Action
7	Click Add user to create a new user.
8	<p>Enter a user name and password.</p> <p>Also choose the group to which the user belongs.</p> <p>Click Validate to confirm the creation of the user.</p> <div data-bbox="315 354 655 954" style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <p>User</p> <input type="text" value="Name"/> <input type="password" value="New password"/> <input type="password" value="Re-type password"/> <hr/> <p>Group</p> <div style="border: 1px solid #ccc; padding: 2px;">Group ▼</div> <hr/> <p>More</p> <input type="checkbox"/> Expert mode </div> <p>Validate</p> <p>Cancel</p> <p>NOTE: You can give expert rights to a user by selecting the Expert Mode check box. An Expert user can go to any step in a procedure whereas a non-expert user must follow the steps in the correct order.</p>

Changing the Runtime/Manager User Password

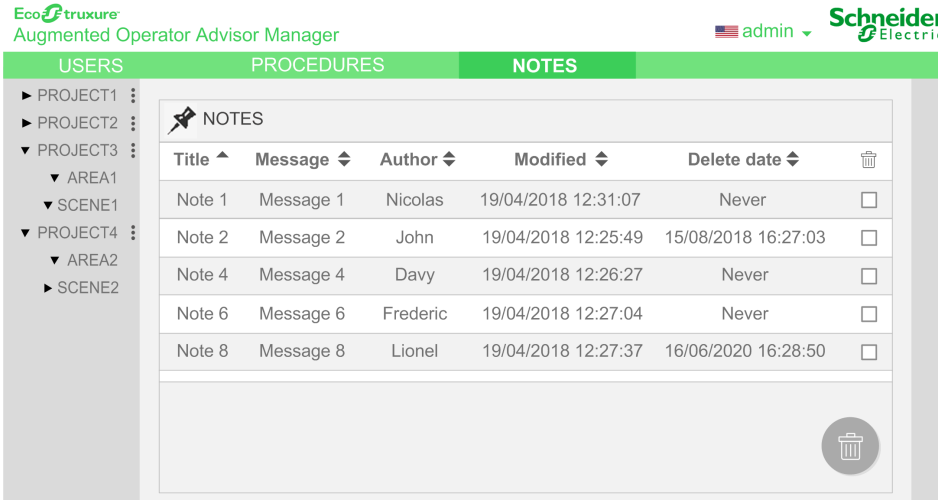
Click the details of the Runtime/Manager user, available on the top right corner of the page, and select the **Profile** from the drop-down list to change the password.

Notes Management



Notes Tab

In this tab, you can see the list of all Notes created by the operators in the App. Operators can create their own Notes in scenes or sub-scenes when running the App on their tablet

device. The information entered by the operators into the Notes may be of use in order to make improvements to your project.



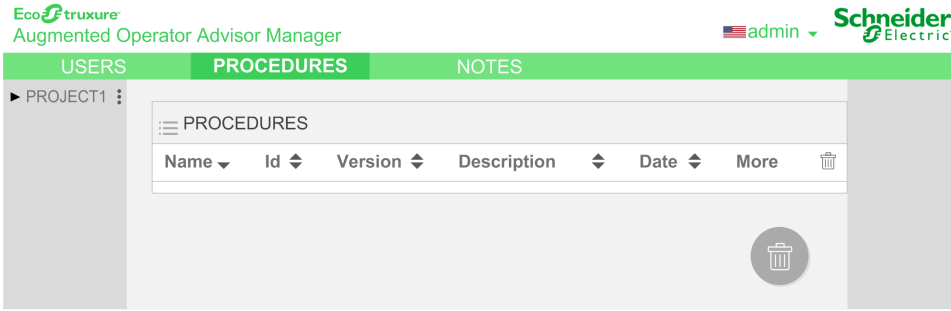
NOTE:

- You can change the order of the listing using the arrows in each column.
- You can export a listing by clicking the  icon to the right of the required project name, in the left sidebar, and select **Export...** The export is stored in .csv format, using the comma as separator.
- You can delete a listing entry in the report using the  icon.
- The listing is limited to the most recent 1000 entries.



Procedures Management

Procedures Tab

In this tab, you can see a report of all procedures followed by the operators in the EcoStruxure Augmented Operator Advisor App. You can see the name and version of the project, as well as the date and time that the procedures were followed, the individual steps taken, and the name of the user who followed the procedure.



NOTE:

- You can change the order of the listing using the arrows in each column.
- You can export a listing by clicking the  icon to the right of the required project name, in the left sidebar, and select **Export...** The export is stored in .csv format, using the comma as separator.
- You can delete a listing entry in the report using the  icon.
- The listing is limited to the most recent 1000 entries.

Using Node-RED

Node-RED Management

Introduction

Node-RED is an open source, visual programming tool that requires few or no programming skills. It uses pre-programmed, reusable blocks of code called nodes. Nodes are wired together to create flows of data. You can connect Node-RED flows to points of interest to display SQL database values in your augmented reality applications.

If you are going to use Node-RED, download it from nodered.org and install it on the runtime device.

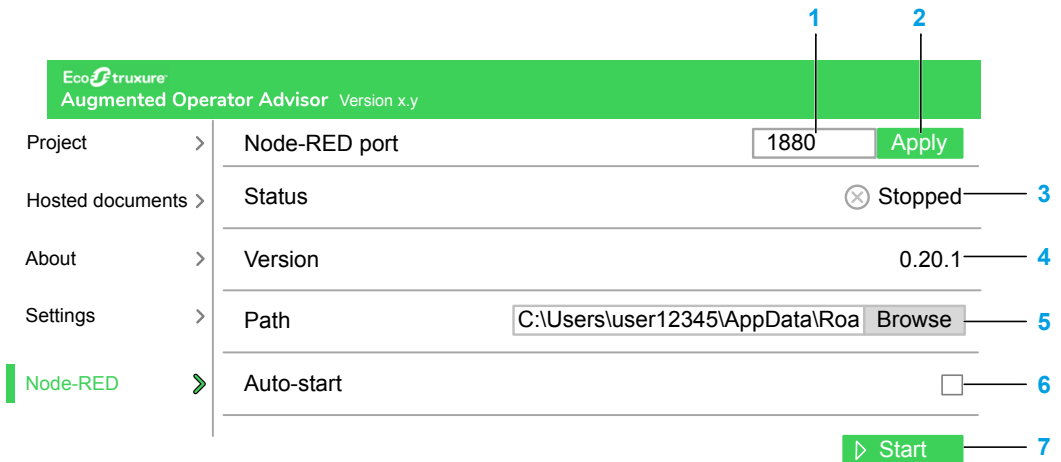
The EcoStruxure Augmented Operator Advisor Runtime is compatible with the Node.js 10.x LTS, as recommended by Node-RED.

EcoStruxure Augmented Operator Advisor nodes can be found in **Start > EcoStruxure Augmented Operator Advisor > Runtime Nodes Folder**

Configuration and setup of user authentication is done directly in Node-RED. Refer to Node-RED documentation for more information.

Settings

In the Node-RED tab of EcoStruxure Augmented Operator Advisor Runtime, you can configure the connection between Node-RED and EcoStruxure Augmented Operator Advisor Runtime.



- 1 The port number defined during the installation of Node-RED on the runtime device.
- 2 Click to apply the port number if you modified it.
- 3 **Started/Stopped**. Shows if Node-RED is running.
- 4 Shows the Node-RED version, being used.
- 5 Enter the path where the used Node-RED version is located on the runtime device.
- 6 Optionally, select this checkbox if you want to start Node-RED automatically the next time EcoStruxure Augmented Operator Advisor Runtime is started (the **Path** field must be correctly entered).
- 7 **Start/Stop**. Click to start or stop Node-RED manually (the **Path** field must be correctly entered).

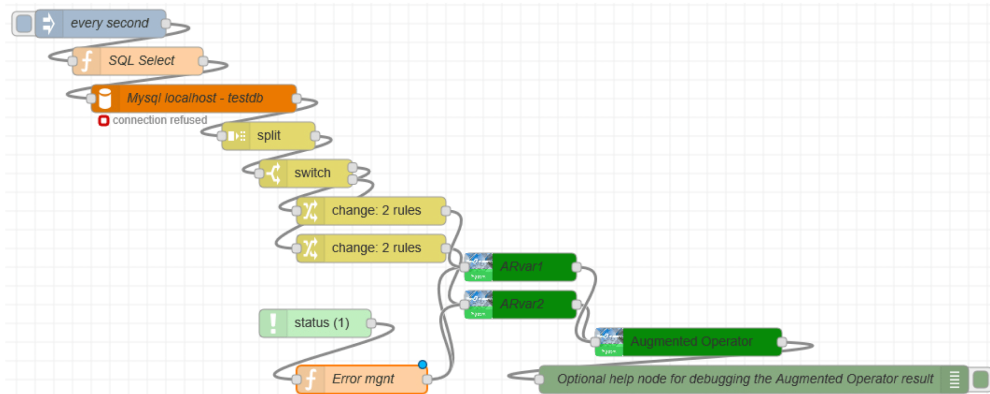
Samples to Integrate Data from a MySQL Database into EcoStruxure Augmented Operator Advisor

Overview

MySQL data can be integrated in EcoStruxure Augmented Operator Advisor. Two samples of how to do this are provided here.

Beginner Sample

The sample below illustrates the integration of SQL variables in EcoStruxure Augmented Operator Advisor. After the SQL invocation, the MySQL database returns a two row array containing a variable name and the associated value. Each variable name that comes from the MySQL database is associated to an EcoStruxure Augmented Operator Advisor variable.



Deploying the Beginner Sample Flow in Node-RED

To deploy this flow in Node-RED:


First, copy the following code.

```
[{"id":"90aecf00.2d5e3","type":"debug","z":"4a407662.78a494","name":"Optional help node for debugging the Augmented Operator result","active":true,"tosidebar":true,"console":false,"complete":"statusCode","x":830,"y":500,"wires":[]}, {"id":"56ad79c5.7a0d98","type":"Augmented-Operator-server","z":"4a407662.78a494","arserverport":"8082","arservermethod":"PUT","arserverbufferinterval":"0","x":760,"y":460,"wires":[["90aecf00.2d5e3"]]}, {"id":"93b1903e.49d6d","type":"Augmented-Operator-variable","z":"4a407662.78a494","arservervarnamespace":"","arservervarname":"ARvar2","arserverdatatype":"String","arservervalueType":"msg","arservervalue":"payload","x":580,"y":420,"wires":[["56ad79c5.7a0d98"]]}, {"id":"f6f6007e.2ccff","type":"Augmented-Operator-variable","z":"4a407662.78a494","arservervarnamespace":"","arservervarname":"ARvar1","arserverdatatype":"String","arservervalueType":"msg","arservervalue":"payload","x":580,"y":380,"wires":[["56ad79c5.7a0d98"]]}, {"id":"cc9333f9.d89d8","type":"change","z":"4a407662.78a494","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"payload.value","tot":"msg"}, {"t":"set","p":"topic","pt":"msg","to":"","tot":"str"}],"action":"","property":"","from":"","to":"","reg":false,"x":420,"y":360,"wires":[["93b1903e.49d6d"]]}, {"id":"3ffbe32c.1d252c","type":"function","z":"4a407662.78a494","name":"Error mgnt","func":"var msg1 = {}; \nvar msg2 = {}; \nif (msg.status.text == \"connection refused\" || msg.status.text == \"Error"}]
```

```

\" || msg.status.text == \"ETIMEDOUT\" || msg.status.text == \"not
yet connected\" || msg.status.text == \"ER_ACCESS_DENIED_ERROR\")
{\\n    msg1.ar_datamodel_quality = \"bad\";\\n    msg1.ar_datamodel_
name = \"ARvar1\";\\n    msg1.ar_datamodel_value = \"\";\\n    msg1.
ar_datamodel_type = \"String\";\\n    msg2.ar_datamodel_quality =
\"bad\";\\n    msg2.ar_datamodel_name = \"ARvar2\";\\n    msg2.ar_
datamodel_value = \"\";\\n    msg2.ar_datamodel_type = \"String\";\\n
return [msg1, msg2];
\\n}\", \"outputs\":2, \"noerr\":0, \"x\":400, \"y\":460, \"wires\":
[[\"f6f6007e.2ccff\"], [\"93b1903e.49d6d\"]], {\"id\": \"5f0845cd.
f3e794\", \"type\": \"change\", \"z\": \"4a407662.78a494\", \"name\": \"\", \"rules\":
[{\"t\": \"set\", \"p\": \"payload\", \"pt\": \"msg\", \"to\": \"payload.
value\", \"tot\": \"msg\"},
{\"t\": \"set\", \"p\": \"topic\", \"pt\": \"msg\", \"to\": \"\", \"tot\": \"str\"}], \"ac-
tion\": \"\", \"property\": \"\", \"from\": \"\", \"to\": \"\", \"reg\":
false, \"x\":420, \"y\":320, \"wires\": [[\"f6f6007e.2ccff\"]]},
{\"id\": \"1fd8516b.749863\", \"type\": \"switch\", \"z\": \"4a407662.78a494\", \"na-
me\": \"\", \"property\": \"payload.name\", \"propertyType\": \"msg\", \"rules\":
[{\"t\": \"eq\", \"v\": \"sqlVar1\", \"vt\": \"str\"},
{\"t\": \"eq\", \"v\": \"sqlVar2\", \"vt\": \"str\"}], \"checkall\": \"false\", \"out-
puts\":2, \"x\":350, \"y\":280, \"wires\": [[\"5f0845cd.f3e794\"], [\"cc9333f9.
d89d8\"]]}, {\"id\": \"4b5f5f41.
bc5f9\", \"type\": \"status\", \"z\": \"4a407662.78a494\", \"name\": \"\", \"scope\":
[\"5bc4cfc.4e291f\"], \"x\":360, \"y\":440, \"wires\": [[\"3ffbe32c.1d252c\"]]},
{\"id\": \"f654da85.781e58\", \"type\": \"split\", \"z\": \"4a407662.78a494\", \"na-
me\": \"\", \"splt\": \"\", \"x\":310, \"y\":240, \"wires\": [[\"1fd8516b.749863\"]]},
{\"id\": \"5bc4cfc.4e291f\", \"type\": \"mysql\", \"z\": \"4a407662.78a494\", \"-
mydb\": \"f330429e.16cc\", \"name\": \"Mysql localhost -
testdb\", \"x\":230, \"y\":200, \"wires\": [[\"f654da85.781e58\"]]},
{\"id\": \"1325a0b0.35b78f\", \"type\": \"function\", \"z\": \"4a407662.78a494\", \"-
name\": \"SQL Select\", \"func\": \"msg.topic=\\\"select name,value from
testtable where name in ('sqlVar1', 'sqlVar2')\\\";\\nreturn
msg;\", \"outputs\":1, \"noerr\":0, \"x\":170, \"y\":160, \"wires\":
[[\"5bc4cfc.4e291f\"]]}, {\"id\": \"b5677935.
c8f01\", \"type\": \"inject\", \"z\": \"4a407662.78a494\", \"name\": \"every
second\", \"topic\": \"\", \"payload\": \"\", \"payloadType\": \"date\", \"repeat\": \"\", \"-
crontab\": \"\", \"once\": false, \"x\":130, \"y\":120, \"wires\":
[[\"1325a0b0.35b78f\"]]},
{\"id\": \"f330429e.16cc\", \"type\": \"MySQLdatabase\", \"z\": \"\", \"-
host\": \"127.0.0.1\", \"port\": \"3306\", \"db\": \"testdb\", \"tz\": \"\"}]

```

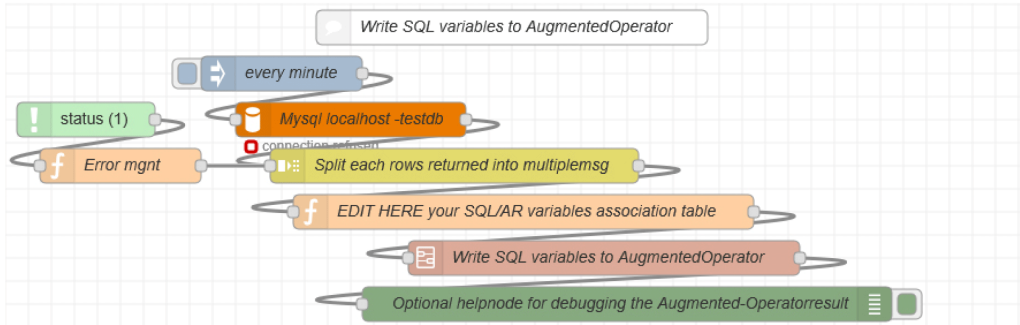
In Node-RED, in the top right of the screen, click the  icon, then choose **Import > Clipboard** to paste the code.

If you copied the example code from a PDF file, you will need to remove any line breaks before advancing to the next step.

Click **Import** to create the flow.

Intermediate Sample

The sample below illustrates the integration of SQL variables in EcoStruxure Augmented Operator Advisor. This sample differs from the previous one because it enables the integration of a multitude of SQL variables without adding new nodes.



Deploying the Intermediate Sample Flow in Node-RED

To deploy this flow in Node-RED:

First, copy the following code.

```
[{"id":"82287384.fcd2e8","type":"subflow","name":"Write SQL variables to Augmented Operator","info":"","in":[{"x":40,"y":80,"wires":[{"id":"860c4ff9.0252f"}]}],"out":[{"x":460,"y":160,"wires":[{"id":"fc909389.37f018","port":0}]}],{"id":"860c4ff9.0252f","type":"function","z":"82287384.fcd2e8","name":"Variable producing","func":"\nif (! msg.SQLARassociationTable[msg.payload.name]){\n    node.error(\"Error: The variable SQL:'\" + msg.payload.name + '\" does not exists in SQL to AR association table!\");\n} else{\n    //Setup the msg specific entry ('ar_datamodel_name', 'ar_datamodel_type', 'ar_datamodel_value') for AR variable producing:\n    msg.ar_datamodel_name = msg.SQLARassociationTable[msg.payload.name].name;\n    msg.ar_datamodel_type = msg.SQLARassociationTable[msg.payload.name].type;\n    msg.ar_datamodel_value = msg.payload.value;\n    msg.topic = msg.payload.name;\n    return msg;\n}\n\nnode.error(\"Could not send the msg properly. Please check your flow!\");\nreturn msg;","outputs":1,"noerr":0,"x":170,"y":80,"wires":[[{"b39542af.112ba8"}]},{"id":"b39542af.112ba8","type":"Augmented-Operator-variable","z":"82287384.fcd2e8","arservervarnamespace":"","arservervarname":"","arserverdatatype":"String","arservervalueType":"msg","arservervalue":"payload","x":230,"y":120,"wires":[[{"fc909389.37f018"}]},{"id":"fc909389.37f018","type":"Augmented-Operator-server","z":"82287384."}
```

```


fcd2e8", "arserverport": "8082", "arservermethod": "PUT", "arserverbufferinterval": "0", "x": 320, "y": 160, "wires": [[]],
{"id": "e94fdc14.677f9", "type": "mysql", "z": "ac2dce00.6e948", "mydb": "2f8ee0b8.083b", "name": "Mysql localhost - testdb", "x": 350, "y": 160, "wires": [{"3cc7c810.d30728"}]},
{"id": "dd8448f7.41a148", "type": "inject", "z": "ac2dce00.6e948", "name": "every minute", "topic": "select name,value from testtable where name in ('sqlVar1', 'sqlVar2')", "payload": "", "payloadType": "date", "repeat": "", "cronatab": "", "once": false, "x": 290, "y": 120, "wires": [{"e94fdc14.677f9"}]},
{"id": "537d55bf.43727c", "type": "debug", "z": "ac2dce00.6e948", "name": "Optional help node for debugging the Augmented Operator result", "active": true, "console": "false", "complete": "statusCode", "x": 590, "y": 320, "wires": []}, {"id": "3cc7c810.d30728", "type": "split", "z": "ac2dce00.6e948", "name": "Split each rows returned into multiple msg", "spl": "", "x": 440, "y": 200, "wires": [{"ce0e683e.de3758"}]}, {"id": "ce0e683e.de3758", "type": "function", "z": "ac2dce00.6e948", "name": "EDIT HERE your SQL/AR variables association table", "func": "//Set of Augmented Operator Advisor types:\n//=====Do not change Begin.=====\\nconst AR_TYPES= {\\n\\\"String\\\": \\\"String\\\", \\n\\\"WString\\\": \\\"WString\\\", \\n\\\"Boolean\\\": \\\"Boolean\\\", \\n\\\"Int8\\\" : \\\"Int8\\\", \\n\\\"Int16\\\" : \\\"Int16\\\", \\n\\\"Int32\\\" : \\\"Int32\\\", \\n\\\"UInt8\\\" : \\\"UInt8\\\", \\n\\\"UInt16\\\" : \\\"UInt16\\\", \\n\\\"UInt32\\\" : \\\"UInt32\\\", \\n\\\"Float\\\" : \\\"Float\\\", \\n\\\"Double\\\" : \\\"Double\\\", \\n\\\"SByte\\\" : \\\"SByte\\\", \\n\\\"Byte\\\" : \\\"Byte\\\", \\n\\\"Time\\\" : \\\"Time\\\", \\n\\\"Date\\\" : \\\"Date\\\", \\n\\\"DateTime\\\": \\\"DateTime\\\", \\n\\\"TimeOfDay\\\": \\\"TimeOfDay\\\"\\n};\\n//=====Do not change End.=====\\n\\n/*Association table that associates SQL variables with AR ones:\\nOne entry per variables. Each entry must follow this model:\\n\\\"SQL_variable_name\\\": {\\n name:\\\"AR_variable_name\\\", \\n type: AR_TYPES[\\\"<types>\\\"] // <= choose <types> under AR_TYPES\\n \\n }, \\n \\n i.e: The folowing association table contains two entry:\\nIn this exemple:\\n-Entry 1: The SQL variable \\\"sqlVar1\\\" is associated to an AR variable \\\"ARvar1\\\" of type \\\"String\\\"\\n-Entry 2: The SQL variable \\\"sqlVar2\\\" is associated to an AR variable \\\"ARvar2\\\" of type \\\"Int32\\\"\\n*/\\nmsg.SQLARassociationTable = {\\n //-----Entry 1 begin-----\\n \\\"sqlVar1\\\": {\\n name:\\\"ARvar1\\\", \\n type: AR_TYPES[\\\"String\\\"]\\n }, \\n //-----Entry 1 end-----\\n //-----Entry 2 begin-----\\n \\\"sqlVar2\\\": {\\n name:\\\"ARvar2\\\", \\n type: AR_TYPES[\\\"Int32\\\"]\\n }\\n //-----Entry 2 end-----\\n};\\n\\n\\n//=====Do not change from here=====\\nreturn msg;\", \"outputs\": 1, \"noerr\": 0, \"x\": 500, \"y\": 240, \"wires\": [{"4837af90.ab286"}]}],

```

```

{"id":"5d8695ae.320bdc","type":"comment","z":"ac2dce00.6e948","name":"Write SQL variables to Augmented Operator","info":"","x":490,"y":80,"wires":[]},{ "id":"78478719.cb0c78","type":"status","z":"ac2dce00.6e948","name":"","scope":["e94fdc14.677f9"],"x":120,"y":160,"wires":[["576d2b7b.725b64"]]}, {"id":"576d2b7b.725b64","type":"function","z":"ac2dce00.6e948","name":"Error mgnt","func":"if (msg.status.text == \"connection refused\" || msg.status.text == \"Error\" || msg.status.text == \"ETIMEDOUT\" || msg.status.text == \"not yet connected\" || msg.status.text == \"ER_ACCESS_DENIED_ERROR\"){\n msg.payload = [{name: \"sqlVar1\",value:\"\"},{name: \"sqlVar2\",value:\"\"}];\n msg.ar_datamodel_quality = \"bad\";\n return msg; \n}\n","outputs":1,"noerr":0,"x":150,"y":200,"wires":[["3cc7c810.d30728"]]}, {"id":"4837af90.ab286","type":"subflow:82287384.fcd2e8","z":"ac2dce00.6e948","x":490,"y":280,"wires":[["537d55bf.43727c"]]}, {"id":"2f8ee0b8.083b","type":"MySQLdatabase","z":"","-host":"127.0.0.1","port":"3306","db":"testdb","tz":""}]

```

In Node-RED, in the top right of the screen, click the  icon, then choose **Import > Clipboard** to paste the code.

If you copied the example code from a PDF file, you will need to remove any line breaks before advancing to the next step.

Click **Import** to create the flow.

Sample to Write Data from EcoStruxure Augmented Operator Advisor into a MySQL Database

Overview

Data, represented as variables, can be retrieved from EcoStruxure Augmented Operator Advisor to update specific rows in a specific table into a MySQL database.

Glossary

A

area:

An area is a zone within each site or building (such as production lines, plant rooms, storage areas, workshops, laboratories, and office areas) that you want to monitor using EcoStruxure Augmented Operator Advisor. If you have the appropriate license type, you can create an area for each part of the site to monitor within an EcoStruxure Augmented Operator Advisor project.

augmented reality:

Technology that superimposes a computer-generated image on a user view of the real world, providing a composite view of the image with points of interest superimposed.

D

document browser:

Documents attached to an area, a scene, or a point of interest can be displayed in the document browser, in a split screen.

E

EcoStruxure Operator Terminal Expert:

EcoStruxure Operator Terminal Expert is human machine interface (HMI) configuration software that enables you to create and edit application panels to control automation systems for Harmony GTU terminal (Premium and Open boxes) and Harmony industrial PCs (Panel and Box).

I

IIoT:

Industrial Internet of Things. The application of IoT to the manufacturing industry. Also called the Industrial Internet or Industry 4.0.

IoT:

Internet of Things. A network of intelligent devices that collect and share data.

N

Node-RED:

Node-RED is an open source, visual programming tool that requires few or no programming skills. Instead, it uses pre-programmed, reusable blocks of code called nodes. Nodes can be wired together to create flows of data.

P

point of interest:

A point of interest is a position in an area, scene or subscene for which additional diagnostic or technical information is available. Various types of points of interest can be defined, including technical documentation, design drawings, information contained in a spreadsheet, and the real-time values of process variables generated.

procedure:

A procedure is a set of task steps that the operator must carry out in a predefined order to complete the task.

process variable:

A process variable is the measured value of a particular part of a process being monitored or controlled, for example, temperature, pressure level, or flow rate.

project:

An EcoStruxure Augmented Operator Advisor project is made up of areas, scenes and procedures. Build the project and then copy it to the EcoStruxure Augmented Operator Advisor Runtime. The operator can then access the project on a tablet running the EcoStruxure Augmented Operator Advisor App.

S

scene:

A scene corresponds to an image overlaid with points of interest.

SQL:

Structured Query Language.

subscene:

A part of a scene, typically a close up view of a particular area of the scene. A subscene can contain its own points of interest.

T

tag:

A two-dimensional matrix. Tags can be printed and attached to items of equipment that are physically identical or very similar. The tags are scanned as part of a scene by the EcoStruxure Augmented Operator Advisor App and the correct points of interest for the item of equipment displayed.

Training mode:

In **Training mode**, you can test a procedure or train operators to use procedures in the EcoStruxure Augmented Operator Advisor App, without needing to recognize the scene. **Training mode** allows you to skip steps, to go through them in a different order, or to complete the procedure by directly jumping to the last step.

U

URI:

Uniform Resource Identifier. This is used to point to an object such as a file, and defines which application is used to open it. This may require the installation of third party applications.

V

variable:

A variable is a type of a point of interest that is replaced by the real-time value of a software object from a process or database, for example, a system bit, when the scene containing the variable is displayed on the tablet.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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