OpenSensorHub

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Connecting to a Node

Connecting to a node requires the operator to know either the IP address or Uniform Resource Locator (URL) for the server hosting the particular node port. To connect to an OpenSensorHub node enter the following in the Web Browser’s address bar:

http://[IP_ADDRESS]:[PORT]/sensorhub/admin

or

[URL]:[PORT]/sensorhub/admin

The default port is 8181 but may be changed through the admin panel (see Network for configuration). Note that if the node is being served through https the default port will be different (likely, 443) but does not need to be specified, for example:

https://[IP_ADDRESS]/sensorhub/admin
Module Operations

Start / Stop and Add / Remove Modules

Right click directly on a module in the left column of the Admin Panel to Start, Stop, or Initialize the module. You also have the option to remove the selected module or add a new module. You can check the option to have a module “Auto Start” in the configuration of the module.

You can also add a new module by clicking in the empty space of that column.
Configuring a Sensor Module

To add a new sensor, choose the **Sensors** tab on the left side of the Admin Panel. Right click on the area where the sensors are listed and choose “**Add New Module**”. Choose from a list of available modules and select “**OK**”.

![Image of Sensor Configuration](image-url)
Configure Sensor Settings
Once the new sensor module is added, fill out the required fields within the Configuration tabs on the right of the Admin Panel. Be sure to Apply Changes and Save along this process.

Configure Communication Protocol
Some Sensors require a Communication Protocol to be added and configured. Choose the Communication Provider tab and select Add. A list of installed communication modules will appear, choose the module required to connect your sensor and select OK. Once the new sensor module is added, fill out the required fields within the Configuration tabs on the right of the Admin Panel. Be sure to Apply Changes and Save along this process.
Configuring Storage Modules
OpenSensorHub provides a default Federated Database for storage of the most recent data records from any module generating SWE Common Data within the given node. Configuring storage to archive records produced by a Sensor, Service, or Process module it is necessary to configure a database for the specific module’s data.

To configure storage modules, select the **Databases**, right click within the tab’s visible area and select **Add New Module**.

Upon selecting **Add New Module** a modal popup dialog is presented providing the options for storage modules to configure
Select **Real-Time Observation Database** and click on the **OK** button.

Configure the properties for the Real-Time Observation Storage by overriding the **Module Name**, **Description**, and **Database Number** fields. Each database must have a DB number specified, typically these are auto populated when the database module is added. If you would like this storage module to start automatically when the node starts, check the **AutoStart** option. If the **Process Events** option is not checked then no data records from the associated **Sensor**, **Process**, or **Service** module will be recorded.

Next select the + next to the **Procedure UIDs** field. This will cause a modal dialog to be displayed listing the current active modules to select as data sources for data records to store. Optionally, you can specify module as the source of data records through the **Manual Entry** field by providing the procedure’s UID which can be retrieved from the respective module’s configuration panel.
Select the **Database Config** tab of the storage configuration panel.

Click the **Add** button and select the **H2 Historical Obs Database** option to configure the database settings. The H2 Historical Obs Database is the default storage database for OpenSensorHub. Click the **OK** button to proceed and configure the database settings.

Configure the properties for the H2 Historical Obs Database by overriding the **Module Name**, **Description**, **Database Number** and **Storage Path** fields. The db number field can be the same value as the parent Realtime Observation Storage parent module. Make sure you set the Storage Path field to the location on non-volatile storage (drive, volume, etc.) where the database itself will be created, e.g. `./db/[storagename].dat`. 
In addition you may select the **Automatic Purge Policy** configuration tab and click on the **Add** button to specify retention and purge parameters for stored data records in this database instance.

Finally, remember to click the **Apply Changes** button for the configuration to take effect and the **Save** button to store the current configuration for this instance of the OpenSensorHub node.
The following screenshot illustrates a configured storage module populated with data records.
Configuring Processing Modules
To add a new processing module, choose the **Processing** tab on the left side of the Admin Panel. Right click on the area where the processes are or will be listed and choose “**Add New Module**”. Choose from a list of available modules and select “**OK**”.

![Diagram of OpenSensorHub with Processing tab highlighted](image.png)
The selected processing module will be added and its configuration options presented. At a minimum the **Module Name** and **Description** fields should be updated. The SensorML field allows one to specify a SensorML document defining the process to be executed, including inputs, outputs, parameters, etc.

Again, ensure that once configured you **Apply Changes** and **Save** the configuration.
Configuring Service Modules

SOS Service

Sensor Observation Service is the mechanism by which clients can request sensor data from OpenSensorHub nodes via Sensor Web Enablement requests. This service is preconfigured to start up when a node is deployed but its configuration should be reviewed and updated as necessary.

General

General configuration settings provide information necessary to expose the service to clients and include options for handling time outs for requests.

Capabilities Info

This tab allows for a node administrator to provide contact information and other pertinent information made available when a SWE GetCapabilities request is made to the node.
Virtual Sensor Group

Exposed Resources
Security
This tab presents the security options for the service, specifically whether access control and authentication are enabled for the service.

Custom Data Providers
Custom Formats
This tab allows for the administrator to configure and designate custom encodings. This allows the node to provide extended data encoding capabilities when responding to requests for data. If a configured encoding is requested the data is processed and re-encoded into the requested encoding scheme.

Test Links
Test links provide sample requests that can be made against a node based on capabilities exposed. In the case of SOS they allow for the verification and illustration of the SensorML descriptions as well as observations provided by the configured sensor and process modules generating the various registered outputs.
SPS Service

Sensor Observation Service is the mechanism by which clients can request sensor data from OpenSensorHub nodes via Sensor Web Enablement requests. This service is preconfigured to start up when a node is deployed but its configuration should be reviewed and updated as necessary.
General
General configuration settings provide information necessary to expose the service to clients and include options for handling time outs for requests.

Capabilities Info
This tab allows for a node administrator to provide contact information and other pertinent information made available when a SWE GetCapabilities request is made to the node.

Virtual Sensor Group
Exposed Resources

Security
This tab presents the security options for the service, specifically whether access control and authentication are enabled for the service.
Custom Connectors
Network

The network panel allows configuration of network parameters including the endpoint (/sensorhub), http and https ports, keystores, and method to use in authentication. By default the node is configured to be served via http port 8181.
Security

Add / Manage Users and Privileges

Users
Select Users on the left side of the Admin Panel. Then, choose the Users tab under Configuration.

Here you can edit existing users ID, Name, Passwords and predefined Roles. By selecting the green “+” you can add new users.

Once changes are made choose **Apply Changes** and **Save**.

Roles
Select Users on the left side of the Admin Panel. Then, choose the Roles tab under Configuration.
Here you can edit or add predefined roles to apply to different users. You can add or remove what type of permissions are controlled by selecting the “+” or “x” to the right of the Permissions table. If adding, select the drop down arrow and choose what type of permissions you’d like to add.

To Allow or Deny specific permissions, right click on the right side of the Permissions table change permission status.

Once changes are made choose **Apply Changes** and **Save**.