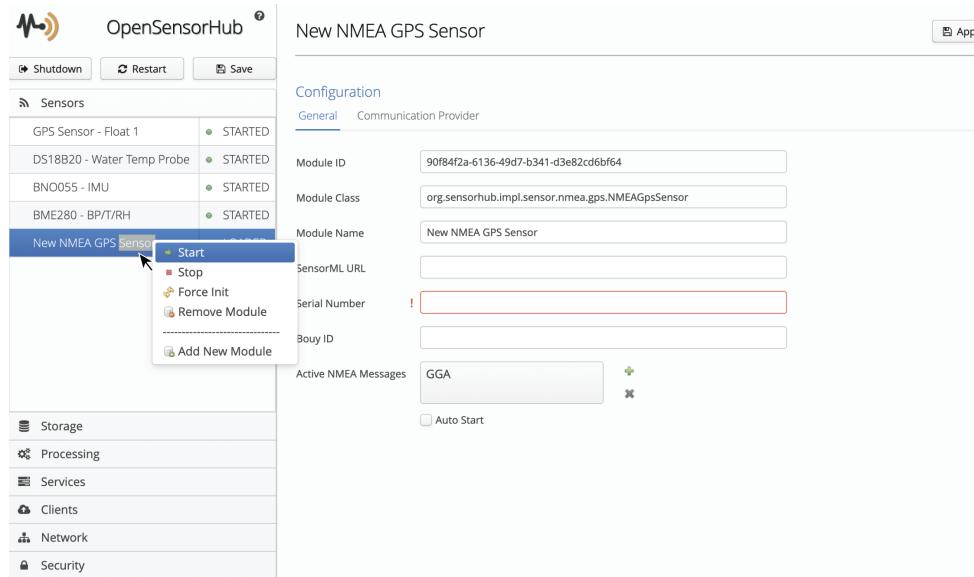


# Node Administration

## General Admin Panel Functionality

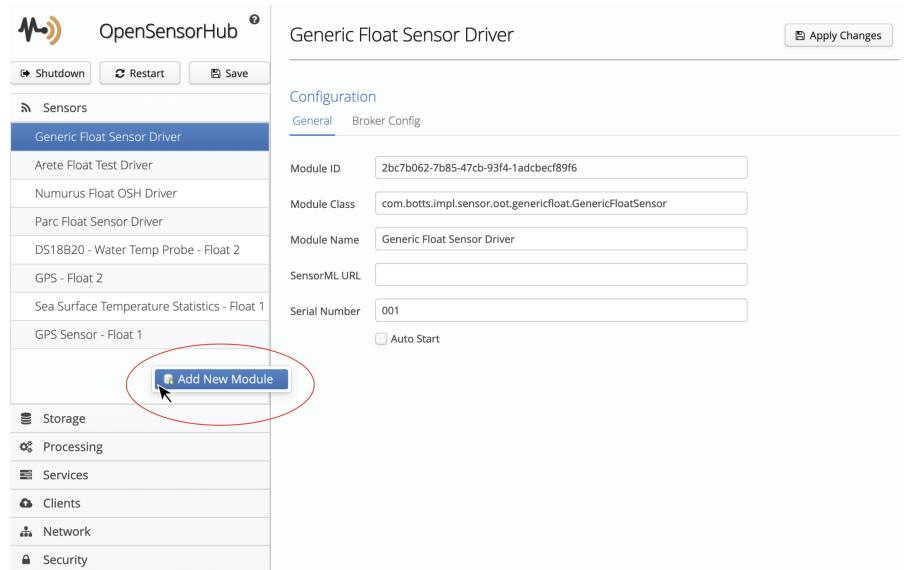
### Start / Stop and Add / Remove Modules

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.



The screenshot shows the OpenSensorHub Admin Panel. On the left, there's a sidebar with categories like Sensors, Storage, Processing, Services, Clients, Network, and Security. Under Sensors, several modules are listed: GPS Sensor - Float 1 (STARTED), DS18B20 - Water Temp Probe (STARTED), BNO055 - IMU (STARTED), and BME280 - BP/T/RH (STARTED). A context menu is open over the 'New NMEA GPS Sensor' module, with options: Start, Stop, Force Init, Remove Module, and Add New Module. The 'Start' option is highlighted with a blue background. To the right, the configuration page for 'New NMEA GPS Sensor' is displayed, showing fields for Module ID (90f84f2a-6136-49d7-b341-d3e82cd6bf64), Module Class (org.sensorhub.impl.sensor.nmea.gps.NMEAAGpsSensor), Module Name (New NMEA GPS Sensor), SensorML URL, Serial Number (!), Bouy ID, and Active NMEA Messages (GGA). An 'Auto Start' checkbox is present at the bottom. There's also an 'Apply' button at the top right.

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



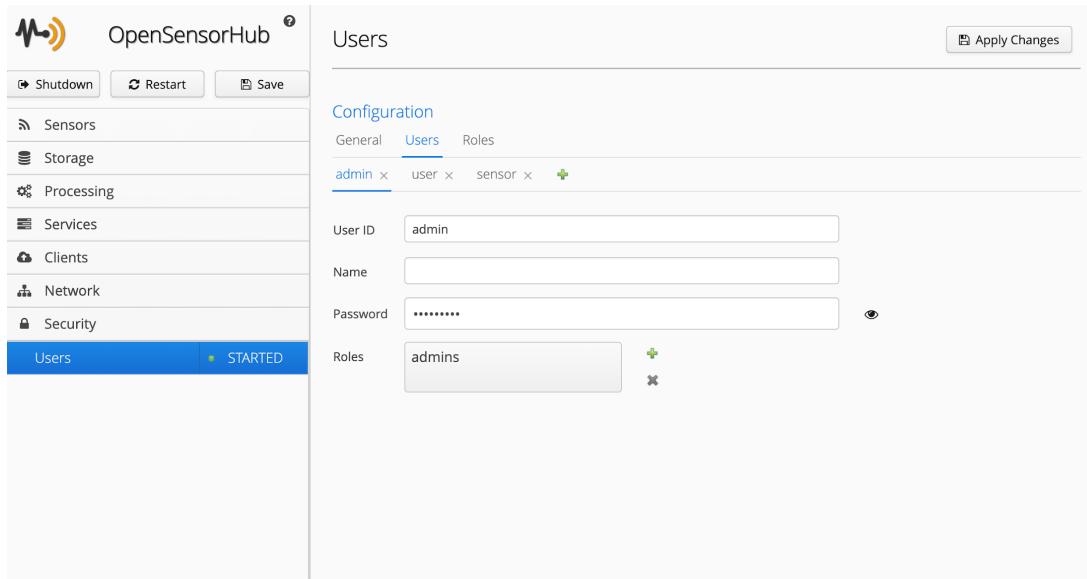
This screenshot shows the OpenSensorHub Admin Panel with a different set of modules in the Sensors list: Arete Float Test Driver, Numururus Float OSH Driver, Parc Float Sensor Driver, DS18B20 - Water Temp Probe - Float 2, GPS - Float 2, Sea Surface Temperature Statistics - Float 1, and GPS Sensor - Float 1. The 'Generic Float Sensor Driver' module is selected. A red circle highlights the 'Add New Module' button located at the bottom of the Sensors list. The configuration page for 'Generic Float Sensor Driver' is shown on the right, with fields for Module ID (2bc7b062-7b85-47cb-93f4-1adcbeef89f6), Module Class (com.bottos.impl.sensor.oot.genericfloat.GenericFloatSensor), Module Name (Generic Float Sensor Driver), SensorML URL, Serial Number (001), and an 'Auto Start' checkbox. An 'Apply Changes' button is at the top right.

## Configuration Hints / Choices

# 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.

The screenshot shows the OpenSensorHub configuration interface. On the left, there's a sidebar with various tabs: Sensors, Storage, Processing, Services, Clients, Network, Security, and Users. The 'Users' tab is selected, indicated by a blue background and a 'STARTED' status indicator. The main area is titled 'Configuration' and has tabs for General, Users, and Roles. The 'Roles' tab is active. It shows three roles: admins, users, and sensors. Below the roles, there's a section for 'Role ID' (set to 'users'), 'Name' (empty), and 'Description' (empty). A large table titled 'Permissions' lists permissions for 'All SOS Services'. The table has two columns: 'Permission Name' and 'Allow/Deny'. Under 'All SOS Services', there are four rows: 'Get' (Allow checked), 'Insert' (Deny (Default)), 'Update' (Deny (Default)), and 'Delete' (Deny (Default)). At the bottom right of the table are '+' and '-' buttons. A 'Save' button is located at the top right of the configuration area.

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.

This screenshot shows the same configuration interface as the previous one, but with a modal dialog open. The dialog is titled 'Enter New Value' and contains a single input field with a dropdown arrow. A dropdown menu is open over the input field, listing three options: 'Admin UI [5cb05c9c-9123-4fa1-8731-ffaa51489678]', 'All SOS Services', and 'SOS Service [5cb05c9c-9e08-4fa1-8731-ff41e246bdc1]'. The first option is highlighted with a blue background. The rest of the interface is dimmed to indicate it's not interactive while the dialog is open.

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

The screenshot shows the OpenSensorHub Admin Panel. On the left, there's a sidebar with icons for Sensors, Storage, Processing, Services, Clients, Network, and Security. The 'Users' tab is selected, showing a status of 'STARTED'. The main area is titled 'Configuration' and has tabs for General, Users, and Roles. Under Roles, a new item 'Item #4' is being configured. The 'Permissions' section lists various sensor-related endpoints under the 'SOS Service' category. For each endpoint, there are 'Allow' and 'Deny' radio buttons; the 'Allow' button is selected for most, except for 'Get Capabilities' which is currently 'Deny'. At the top right of the configuration panel is a 'Save' button.

Once changes are made choose “Apply Changes” and “Save”.

## Add / Configure Sensors

### Add New Sensor

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 installed drivers and select OK.

The screenshot shows the OpenSensorHub Admin Panel with the Sensors tab selected. A specific sensor driver, 'Generic Float Sensor Driver', is highlighted. The configuration details for this driver are displayed: Module ID (2bc7b062-7b85-47cb-93f4-1adcbeef89f6), Module Class (com.botts.impl.sensor.oot.genericfloat.GenericFloatSensor), Module Name (Generic Float Sensor Driver), SensorML URL (empty), Serial Number (001), and an 'Auto Start' checkbox which is unchecked. At the bottom left of the configuration panel is a blue 'Add New Module' button.

The screenshot shows the OpenSensorHub Admin Panel interface. At the top, there's a header with the OpenSensorHub logo, a shutdown/restart/save button, and a title 'Generic Float Sensor Driver'. Below the header is a table titled 'Select Module Type' listing several sensor drivers:

Module Type	Version	Description	Author
Parc Float Sensor Driver	1.0.0	Driver for PARC floats used in retrieving data samples from Kafka providing data feeds to onboard sensors	Botts Innovati
SWE Virtual Sensor	1.4.0	Generic driver for SWE enabled sensors communicating via SOS & SPS standard services	Sensia Softwar
Arete Float Sensor Driver	1.0.0	Driver for Supporting cloud data from Arete Float Network	Botts Innovati
Numurus Float OSH Driver	1.0.0	Driver for Supporting cloud data from Numurus Float Network	Botts Innovati
Generic Float Sensor Driver	1.0.0	Generic Float OpenSensorHub driver providing data feeds to onboard sensors	Botts Innovati

At the bottom right of the table area, there's a link 'Install More Modules...'. Below the table is a large central modal dialog box with a dark background and a light-colored content area. The modal has a title 'OK' at the top center. On the left side of the modal, there's a vertical sidebar with icons for Sensors, Storage, Processing, Services, Clients, Network, and Security. The Sensors icon is highlighted.

## 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.

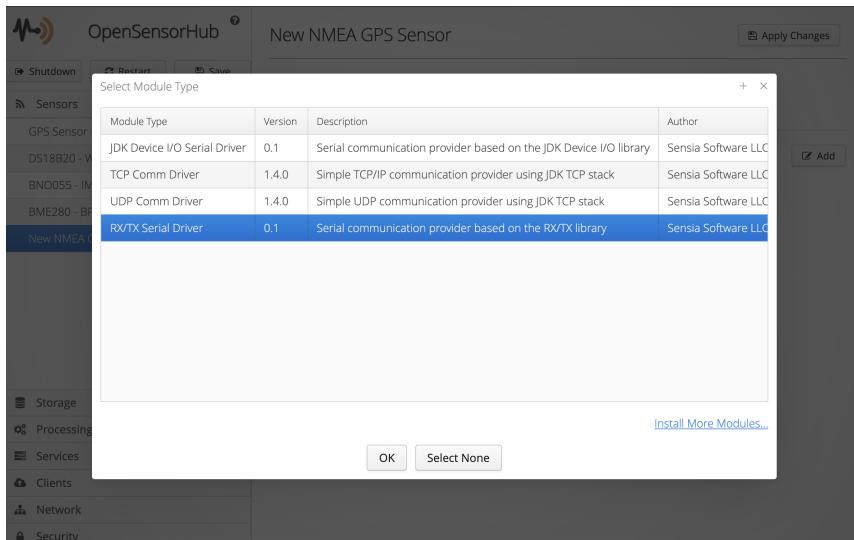
The screenshot shows the OpenSensorHub Admin Panel interface. At the top, there's a header with the OpenSensorHub logo, a shutdown/restart/save button, and a title 'GPS Sensor - Float 1'. Below the header is a table listing sensor modules:

GPS Sensor - Float 1	STARTED
DS18B20 - Water Temp Probe	STARTED
BNO055 - IMU	STARTED
BME280 - BP/T/RH	STARTED

On the left, there's a sidebar with icons for Sensors, Storage, Processing, Services, Clients, Network, and Security. The Sensors icon is highlighted. To the right of the table, there are two tabs: 'General' and 'Communication Provider (UART)'. The 'General' tab is selected, showing fields for Module ID (824f9fec-a57b-4142-b321-093ff543c8b1), Module Class (org.sensorhub.impl.sensor.nmea.gps.NMEAEGpsSensor), Module Name (GPS Sensor - Float 1), SensorML URL, Serial Number (gps1), Bouy ID (OSH-F-1), and Active NMEA Messages (GGA, GSA). There's also a checkbox for Auto Start. Below these fields is a 'Sensor Info' section with the Unique ID: urn:osh:sensor:nmea-gps:gps1. At the bottom, there are 'Outputs' and 'Refresh' buttons.

## 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.



New NMEA GPS Sensor

Configuration

General Communication Provider

GPS Sensor - Float 1	STARTED
DS18B20 - Water Temp Probe	STARTED
BNO055 - IMU	STARTED
BME280 - BP/T/RH	STARTED
New NMEA GPS Sensor	LOADED

OK Apply Changes

New NMEA GPS Sensor

Configuration

General Communication Provider

Provider Class: `org.sensorhub.impl.comm.rxtx.RxtxSerialCommProvider`  Modify

Protocol Options

Port Name	<input type="text"/>
Parity	<input checked="" type="radio"/> PARITY_EVEN <input type="radio"/> PARITY_MARK <input type="radio"/> PARITY_NONE
Baud Rate	<input type="text"/> 9600
Data Bits	<input type="text"/> 8
Stop Bits	<input type="text"/> 1
Receive Timeout	<input type="text"/> -1
Receive Threshold	<input type="text"/> 1

OK Apply Changes

# Add Storage

## Add Storage Module

To add a new storage module, choose the Storage tab on the left side of the Admin Panel. Right click on the area where the storage modules are listed and choose “Add New Module”. Choose the type of storage module that fits the type of data you are planning to connect, then select OK. Fill in the required fields, Apply Changes, and Save.

The screenshot shows the OpenSensorHub Admin Panel. On the left, there is a sidebar with tabs for Shutdown, Restart, Sensors, Storage, Processing, Services, Clients, Network, and Security. The Storage tab is selected. In the main area, a sub-menu for 'GPS Storage' is open, showing its configuration details. The 'General' tab is selected, showing fields for Module ID (72f8cd82-74d7-42e3-afd3-0b883a3de4b2), Module Class (org.sensorhub.impl.persistence.GenericStreamStorage), Module Name (GPS Storage), Data Source ID (824f9fec-a57b-4142-b321-093ff5f543c8b1), and Excluded Outputs. Below these are options for Min Commit Period (10000), Auto Start (unchecked), and Process Events (checked). At the bottom, there is a 'Data Store Content' section with a 'Refresh' button. A large blue button labeled 'Add New Module' is located at the bottom left of the configuration area.

The screenshot shows a modal dialog titled 'Select Module Type'. It lists several storage module types with their descriptions:

Module Type	Version	Description
Real-Time Stream Storage	1.4.0	Wrapper for storing data records pushed by a data source to the selected underlying storage
PERST Record Storage	1.4.0	Datastore for SWE data records (no feature information) based on PERST object database
PERST Observation Storage	1.4.0	Datastore for SWE data records and associated features of interest (FOI) based on PERST object database
PERST Multi-Source Storage	1.4.0	Datastore for SWE data records and FOIs generated by multiple producers (e.g. sensor arrays), based on PERST object data

At the bottom of the dialog, there is a link 'Install More Modules...' and an 'OK' button. The background of the main Admin Panel shows the same Storage configuration screen as the previous screenshot.

## Connect to Sensor Module

If your storage module is going to be streaming from a sensor module, choose the magnifying glass at the end of Data Source ID and then select the sensor module you would like to connect.

The screenshot shows the OpenSensorHub interface with the 'Storage' tab selected in the sidebar. The main panel displays the 'New Real-Time Stream Storage' configuration page. The 'General' tab is active. The 'Module ID' field contains the value '85849f1d-d6a1-456d-9aae-00eac8658fb1'. The 'Module Class' field is set to 'org.sensorhub.impl.persistence.GenericStreamStorage'. The 'Module Name' field is labeled 'New Real-Time Stream Storage'. The 'Data Source ID' field is empty and highlighted with a red border. The 'Excluded Outputs' field is empty. The 'Min Commit Period' is set to '10000'. The 'Auto Start' checkbox is unchecked, while the 'Process Events' checkbox is checked. At the bottom, there are 'Data Store Content' and 'Refresh' buttons, along with an 'Apply Changes' button.

## Storage Configuration

Some storage modules may need extra configuration. Choose the Storage Config tab and select Add. Choose the module type that matches the storage module you are using.

The screenshot shows the OpenSensorHub interface with the 'Storage' tab selected in the sidebar. The main panel displays the 'New Real-Time Stream Storage' configuration page. The 'Storage Config' tab is active. A blue box highlights the 'Add' button, which is located next to the 'General' tab. The 'Data Store Content' and 'Refresh' buttons are also visible at the bottom. The rest of the configuration fields are identical to the previous screenshot.

The screenshot shows the OpenSensorHub interface with the title "New Real-Time Stream Storage". On the left, there's a sidebar with buttons for Shutdown, Restart, and Save. Below that is a section titled "Select Module Type" with a table:

Module Type	Version	Description
PERST Record Storage	1.4.0	Datastore for SWE data records (no feature information) based on PERST object database
PERST Observation Storage	1.4.0	Datastore for SWE data records and associated features of interest (FOI) based on PERST object database
PERST Multi-Source Storage	1.4.0	Datastore for SWE data records and FOIs generated by multiple producers (e.g. sensor arrays), based on PERST object database

At the bottom right of the dialog are "OK" and "Select None" buttons, and a link "Install More Modules...".

The Storage Path includes path to directory and filename of the data file. If the file does not yet exist it will be created when the module is started.

The screenshot shows the OpenSensorHub interface with the title "Orientation Storage". On the left, there's a sidebar with buttons for Shutdown, Restart, and Save. Below that is a section titled "Storage" with a table:

GPS Storage	■ ST
Sea Surface Statistics Storage	● ST
Sea Surface Temperature - Storage	● ST
<b>Orientation Storage</b>	● ST
Environmental - Storage	● ST
New PERST Observation Storage	■ LO
New Real-Time Stream Storage	■ LO

The "Orientation Storage" row is selected. The main panel shows "Configuration" tabs for General, Storage Config (selected), and Automatic Purge Policy. Under "Storage Config", fields include:

- Module Class: org.sensorhub.impl.persistence.perst.BasicStorageImpl
- Module Name: (empty)
- Storage Path: db/float1Orientation.dat
- Memory Cache Size: 1024
- Object Cache Size: 100

Below this is a "Data Store Content" section with a "Refresh" button. It shows "Stream #1: Float Orientation" with a time range from 2020-08-19T21:56:16Z to 2020-08-25T19:39:27Z. A table displays data entries:

Sampling Time	Bouy ID	MO Message Sequence Number	Heading Angle	Pitch Angle	Roll Angle
2020-08-19T21:56:16Z	OSH-F-1	51	1.06	-1.88	0.13
2020-08-19T21:57:17Z	OSH-F-1	52	1.06	-1.88	0.13
2020-08-19T21:58:18Z	OSH-F-1	53	1.06	-1.88	0.13

On the left sidebar, under "Storage", the "Orientation Storage" item is also highlighted.

Once the storage module is started the Data Store Content will be populated with data entries. A bar graph showing the amount of data records along a timeline can be displayed by choosing the graph icon next to "Time Range".

# Configure SOS Service

## Add New SOS Offering

After adding a new Sensor, Storage, or Processing Module you may want to configure your SOS Service to include its data.

### Sensors / Processes

Copy the Unique ID of the sensor or process from its Configuration panel.

The screenshot shows the OpenSensorHub Admin Panel. On the left, there's a sidebar with tabs for Sensors, Storage, Processing, Services, Clients, Network, and Security. The Sensors tab is active, showing a list of modules: GPS Sensor - Float 1 (STARTED), DS18B20 - Water Temp Probe (STARTED), BNO055 - IMU (STARTED), and BME280 - BP/T/RH (STARTED). On the right, the configuration for 'GPS Sensor - Float 1' is displayed under the 'General' tab of the 'Configuration' section. The 'Unique ID' field contains the value '824f9fec-a57b-4142-b321-093ff543c8b1'. This field is circled in red. Other fields include Module Class ('org.sensorhub.impl.sensor.nmea.gps.NMEAAGpsSensor'), Module Name ('GPS Sensor - Float 1'), SensorML URL, Serial Number ('gps1'), Bouy ID ('OSH-F-1'), and Active NMEA Messages ('GGA', 'GSA'). There's also an 'Auto Start' checkbox. At the bottom, there are 'Outputs' and 'Refresh' buttons.

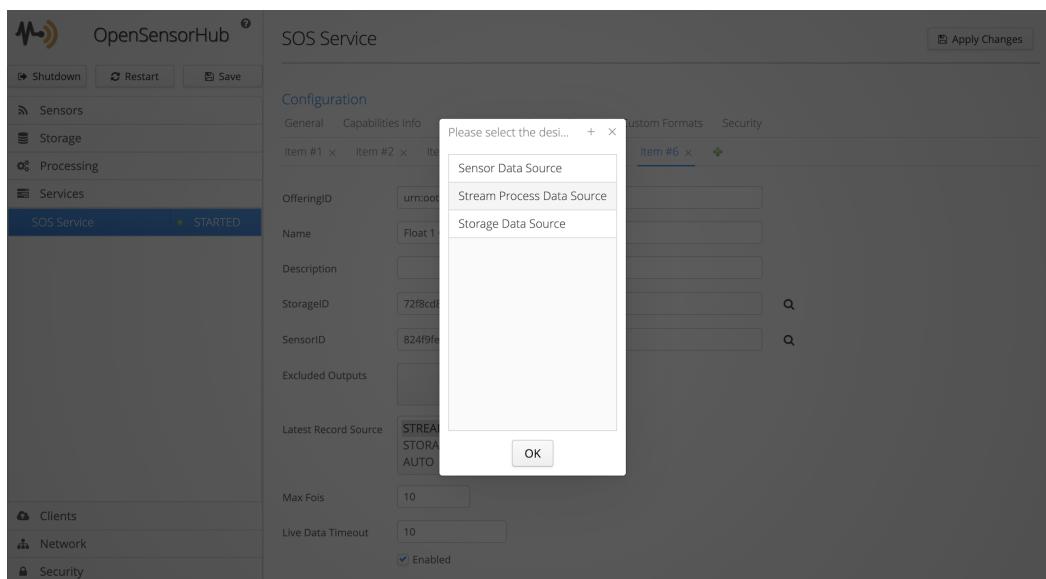
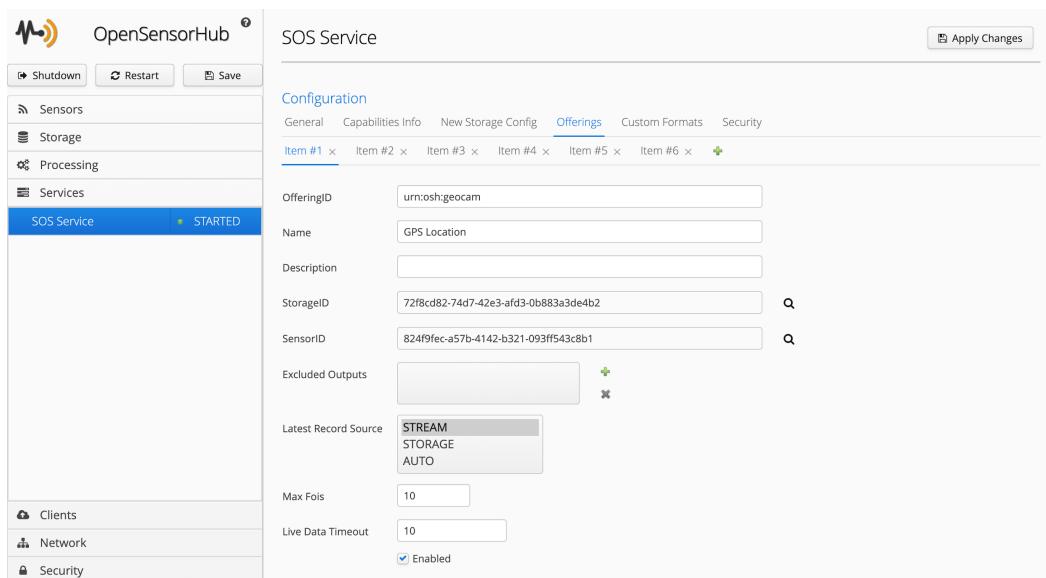
Choose the Services tab on the left side of the Admin Panel and select the SOS Service module.

The screenshot shows the OpenSensorHub Admin Panel with the Services tab selected in the sidebar. The 'SOS Service' module is listed and marked as 'STARTED'. On the right, the configuration for the 'SOS Service' is shown under the 'General' tab of the 'Configuration' section. The 'Module ID' is '5cb05c9c-9e08-4fa1-8731-ff41e246bcd1', 'Module Class' is 'org.sensorhub.impl.service.sos.SOSService', and 'Module Name' is 'SOS Service'. The 'Endpoint' is set to '/sos'. Under the 'Offerings' tab, 'Max Observations Returned' is 100 and 'Max Records Returned' is 100000. Checkboxes for 'Auto Start', 'Enable HTTP GET', 'Enable HTTP POST', 'Enable HTTP SOAP', and 'Enable Transactional' are all checked. At the bottom, there are 'Test Links' and 'Service Capabilities' sections, along with links for GPS Orientation, SST Statistics, Sea Surface Temperature, Float Orientation, Environmental Observations, and Float 1 GPS.

Select the Offerings tab under Configuration and then the “+” at the end of the list of Offerings. Choose what type of module you are adding to the SOS Service and select OK. Paste the Unique ID in Offering ID. Use the magnifying glass next to Sensor ID to choose the correct sensor / process module.

Be sure to check the Enabled box at the bottom of the configuration panel for each Offering you want active.

If you already have a storage module created for the sensor / process you can connect it using the magnifying glass next to Storage ID.



## SOS Test Links

Enabled Offerings will appear at the bottom on the SOS Service page with a list of Test Links for accessing data.

The screenshot shows the OpenSensorHub interface with the following details:

- Top Bar:** Includes a logo, the text "OpenSensorHub", and three buttons: "Shutdown", "Restart", and "Save".
- Left Sidebar:** Lists categories: Sensors, Storage, Processing, Services, and SOS Service. The "SOS Service" item is selected and shows a status of "STARTED".
- Right Panel - Test Links:** A table with two columns:

<b>Sensor Description:</b>	<a href="#">XML</a> <a href="#">JSON</a>
<b>Features of Interest:</b>	<a href="#">XML</a>
<b>IMEI</b>	
Record Description:	<a href="#">XML</a> <a href="#">JSON</a>
Latest Measurements:	<a href="#">RAW</a> <a href="#">JSON</a>
<b>msgID</b>	
Record Description:	<a href="#">XML</a> <a href="#">JSON</a>
Latest Measurements:	<a href="#">RAW</a> <a href="#">JSON</a>
<b>SensorLocation</b>	
Record Description:	<a href="#">XML</a> <a href="#">JSON</a>
Latest Measurements:	<a href="#">RAW</a> <a href="#">JSON</a>
<b>GeodeticLatitude</b>	
Record Description:	<a href="#">XML</a> <a href="#">JSON</a>
Latest Measurements:	<a href="#">RAW</a> <a href="#">JSON</a>
<b>Longitude</b>	
Record Description:	<a href="#">XML</a> <a href="#">JSON</a>
Latest Measurements:	<a href="#">RAW</a> <a href="#">JSON</a>
<b>HeightAboveEllipsoid</b>	
Record Description:	<a href="#">XML</a> <a href="#">JSON</a>
Latest Measurements:	<a href="#">RAW</a> <a href="#">JSON</a>
<b>FixNumSats</b>	
Record Description:	<a href="#">XML</a> <a href="#">JSON</a>
Latest Measurements:	<a href="#">RAW</a> <a href="#">JSON</a>
- Top Right:** A "Apply Changes" button.