

# OpenSensorViewer

## Operations Manual and User Guide

Point of Contact:

Dr. Mike Botts

[mike.botts@botts-inc.com](mailto:mike.botts@botts-inc.com)

Technical Point of Contact:

Nicolas Garay

[nic.garay@botts-inc.com](mailto:nic.garay@botts-inc.com)

Technical Point of Contact:

Drew Botts

[drew@botts-inc.com](mailto:drew@botts-inc.com)

Botts Innovative Research

9668 Madison Blvd, Ste. 103

Madison, AL 35758

Revision	Modifier	Date	Description
A	Nicolas Garay	12/07/2022	Initial Creation

References	Revision

# Table of Contents

Table of Contents3

Overview4

Map6

    Context Sensitive Menu7

Time Controller8

    Archive/Playback Mode8

    Real-time Mode9

Supported Visualizations for Observables10

Observables11

Systems13

Add Server14

Server Management17

Settings19

# Overview

The OpenSensorViewer is an open-source common operating picture (COP) for the representation and visualization of servers, systems, and observations supported by OpenSensorHub. The viewer provides the ability to query capabilities from a configured server, details and description of systems, and automatically receives and creates basic visualizations for observations based on proprietary rules-based-engine service for OpenSensorHub. The viewer is written in react, react-redux, typescript, and makes use of the OpenSensorHub Web Client Toolkit to build visualizations, stream data, handle synchronization, and provides an abstraction API to the most popular geospatial mapping engines: CesiumJS, DeckGL, Leaflet, MapBox, and OpenLayer. By default, OpenSensorViewer uses CesiumJS for full 3D support and integration with 3D-Tiles and Cesium Ion.

This document covers the graphical and user interface elements of the viewer, available functionality for real-time and synchronized archive/playback modes, server management, system management, settings, and observables. It is the intent of the OpenSensorHub team to maintain and continue to add functionality to this open-source project to include enhancements to the interface and types of supported visualizations.

The source repository is hosted on GitHub:

[opensensorhub/osh-viewer: Configurable Viewer for OpenSensorHub \(github.com\)](https://github.com/opensensorhub/osh-viewer)

A prebuilt hosted version can be acquired by cloning and building the v2-upgrade branch in the OpenSensorHub SDK from GitHub:

[opensensorhub/osh-node-dev-template: Development project template to create new add-ons and package them into a deployable OSH node \(github.com\)](https://github.com/opensensorhub/osh-node-dev-template)

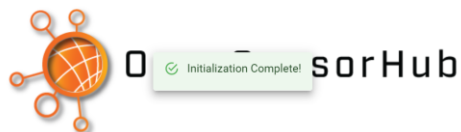
The above SDK version includes a preconfigured services (SW API, Rules-Based-Engine, and default storage) as a turnkey solution for developing and deploying your own IoT/IloT solutions built on OpenSensorHub.

# Splash Screen

The splash screen presents the OpenSensorHub logo. It is presented while the application is loading and has a default timeout of 5 seconds. After 5 seconds the splash screen is cleared and the display transitions to the map and time management view.

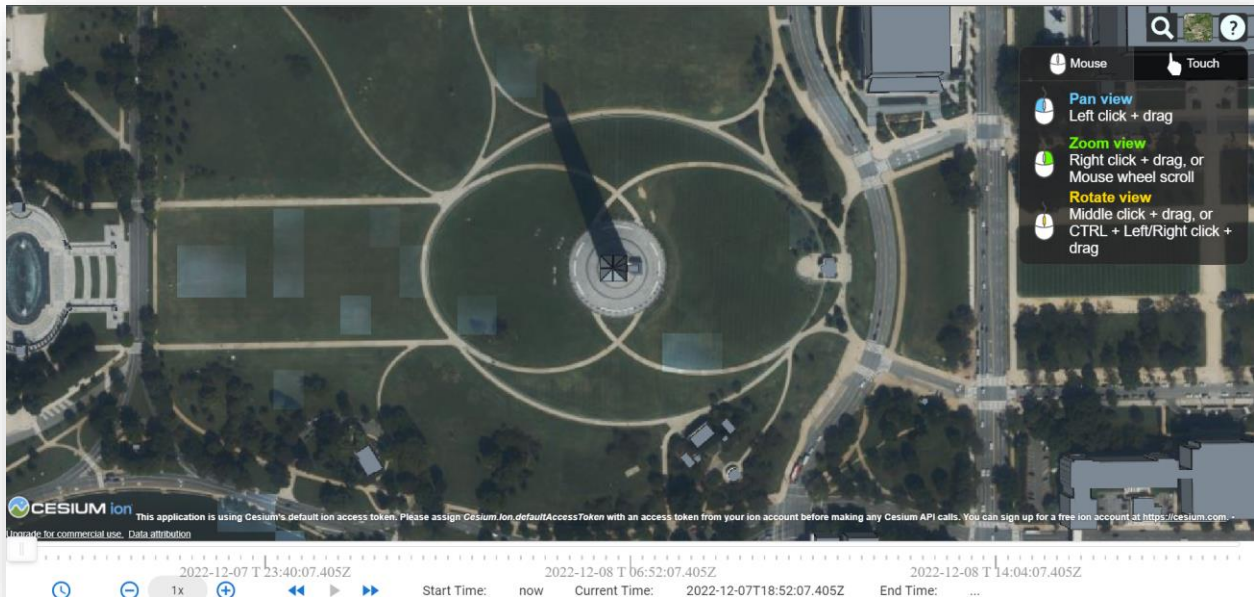


Upon initial launch, the application will setup the IndexedDB within the browser for the application to manage the configured servers. Upon refresh or subsequent loads, this IndexedDB is read and the application is automatically configured with systems and observations as provided by the configured servers. If during initialization, communication with a server fails a failure notification will be displayed, otherwise a notification that initialization succeeded will be presented, this may occur before the splash screen times out.



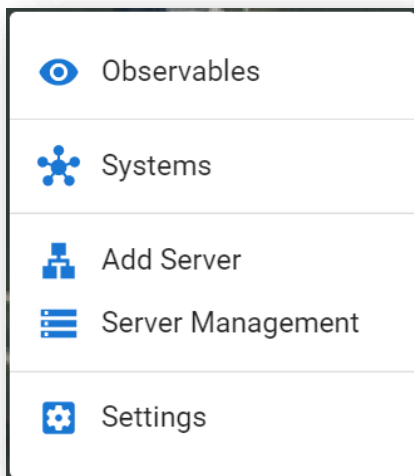
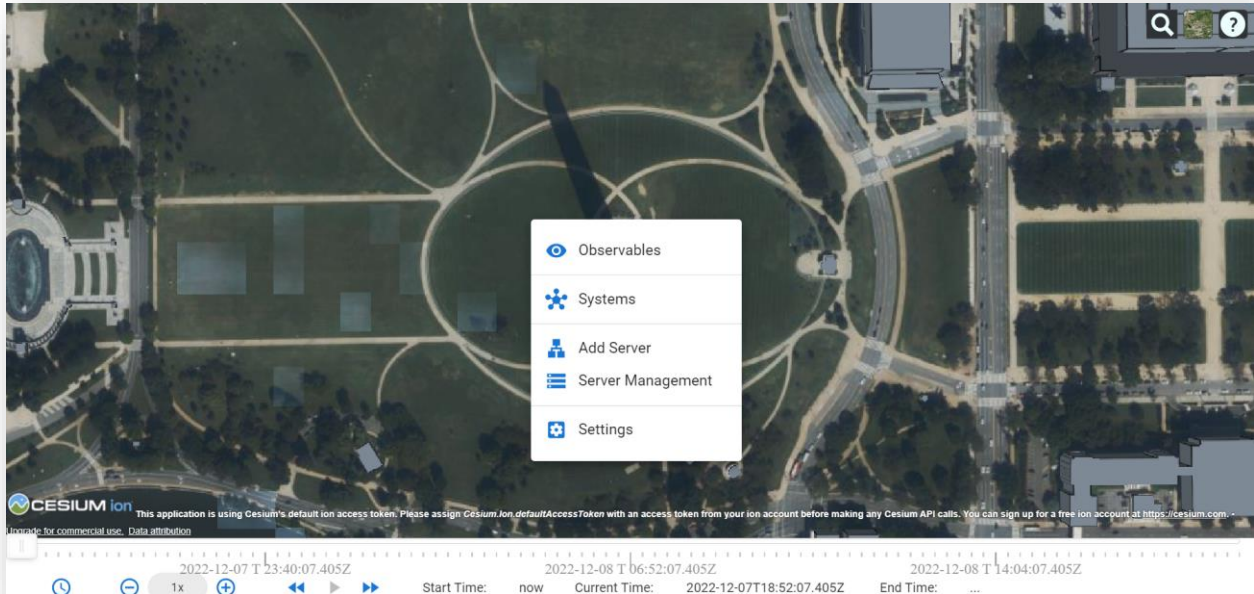
# Map

The default map is the CesiumJS 3D map which can optionally be enhanced by the use of 3D Tiles served via Cesium Ion. Map navigation operations such as tilt, pan, and zoom can be performed using a computer mouse or touchpad via gestures. For specific controls please refer to navigation help button and on-screen navigation instructions.



## Context Sensitive Menu

The context sensitive menu (CSM) can be invoked by performing a right mouse click (or equivalent gesture) anywhere on the map.



The options available on the CSM are as follows:



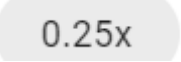





- Observable – opens the observables dialog
- Systems – opens the systems dialog
- Add Server – opens the form to configure a new server endpoint
- Server Management – opens the server management dialog
- Settings – opens the settings dialog

# Time Controller


The default mode for the time controller is Archive/Playback mode. The time scale presents the 24-hour period from the time the application is initialized if no servers, systems, and observables are present. Otherwise, the time line will show the earliest and latest time for which observations can be presented as a collection of all observations available across all servers.

## Archive/Playback Mode



	When pressed switches Time Controller to real-time mode
	Reduces the playback speed by 0.25 to a minimum of 0.25
	Indicates current playback scale factor setting
	Increases the playback speed by 0.25 to a minimum of 0.25
	Rewind current time by 10 seconds
	Play button, enabled when observables are selected in the observable panel, when pressed begins streaming data from selected time at desired speed and is replaced by the pause button.
	Pause button, stops the streams at current time when pressed and is replaced by the play button.
	Advance current time by 10 seconds




	Time slider, enabled when observables are selected in the observable panel, updates the Start Time and is updated as playback proceeds with Current Time value. Shows progression of time relative to earliest start time and latest available time.
Start Time:	Displays the earliest start time as ISO UTC time
Current Time:	Displays current time as ISO UTC time, synchronized with the time slider
End Time:	Displays the last available time as ISO UTC time

## Real-time Mode

In real-time mode the time controller is disabled, only allowing the option to switch to archive/playback mode



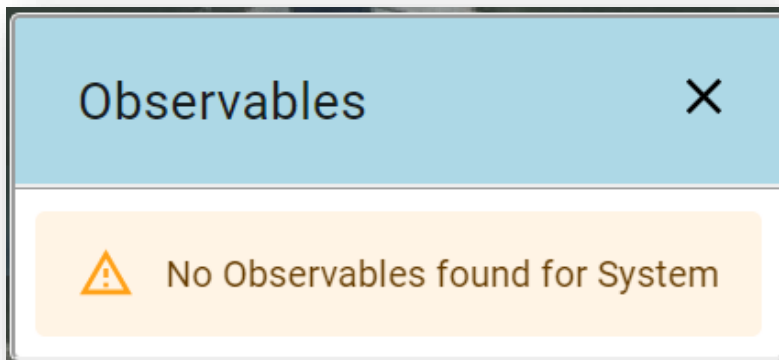
	When pressed switches time controller to archive/playback mode
LIVE	Indicates that the application is currently operating in real-time mode. Selecting or turning on any observables will immediately begin streaming live observations as they become available.

# Supported Visualizations for Observables

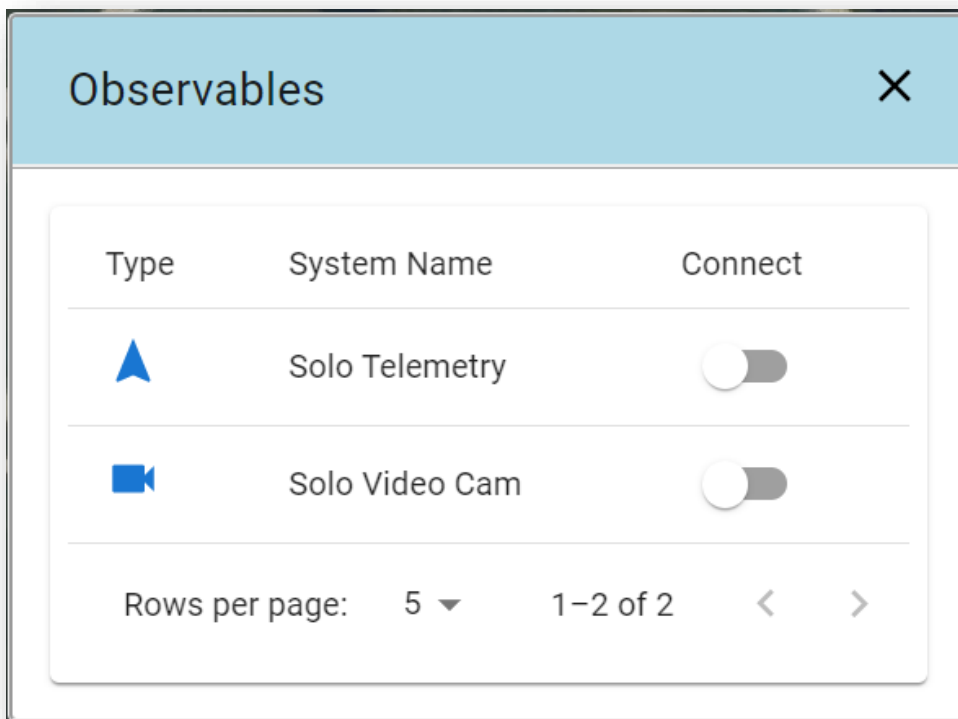
The following are the current list of supported visualizations:

- Position, Location, Identification – Map Markers with polyline trails of historical position up to a maximum number of reported points (default 200)
- Video Streams – Presented within dialogs
- Image – Static images presented within a dialog, updated when the static image changes as provided by the system
- Draping – terrain draped imagery, useful in visualizing geo-rectified video streams for example from a drone flying overhead
- Areas of Interest – Polygon bounding a region

## Observables

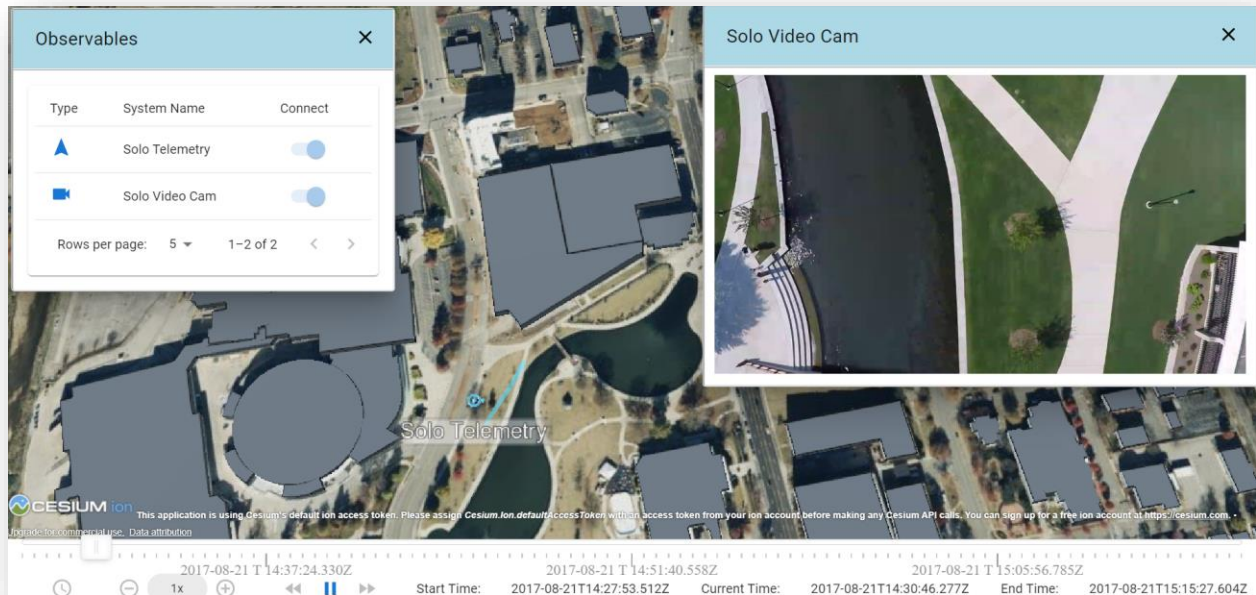


If no observables for systems are found or there are no systems available the Observables dialog will present a warning.



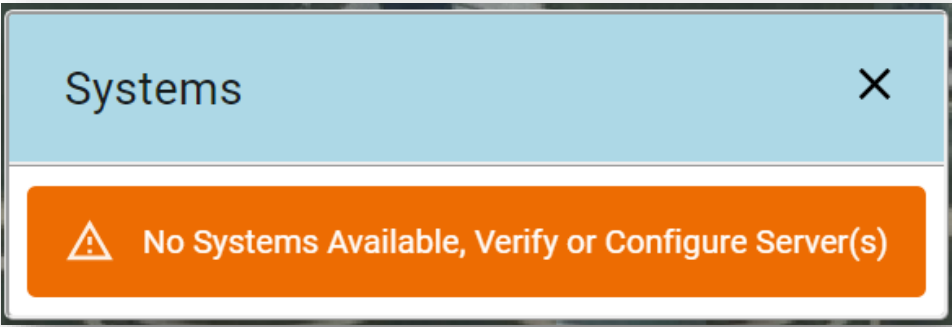
If observables are available, they will be presented in a paginated format. The user is able to select 5, 10, or 15 entries per page and overflow will be presented on a subsequent page. Each observable entry specifies a type, the name of the system it is associated with, and a switch to “connect” the stream.

In archive/playback mode, toggling the switch on assigns the observable to be managed by the time controller and the visualization will be visible when the user presses play and data is received for the observable. In addition, if in archive/playback mode and actively streaming data the switches for all observables become disabled. Switches are re-enabled when streaming is paused. In the example below we can see synchronized position, orientation, and video stream from 3DR Solo in archive/playback mode. The position and orientation data is joined to produce a 3D icon showing the elements location while a separate view is created in a dialog window showing the video stream.

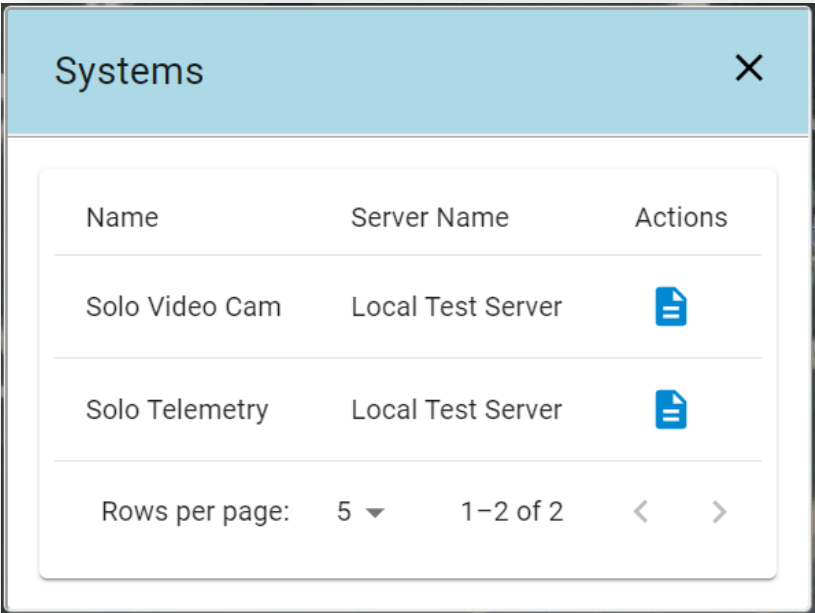


In real time mode. Toggling the switch establishes a connection with the hosting server and begins streaming data. The corresponding visualization is presented when data becomes available.

# Systems



If no servers are configured or the configured servers do not have any systems that are shareable then the Systems dialog will present a warning.



If systems are available, they will be presented in a paginated format. The user is able to select 5, 10, or 15 entries per page and overflow will be presented on a subsequent page. Each system entry specifies the name of the system, the server it is associated with, and an action to display in a new window or tab the system specifications.

	Opens a new window or tab to present the system information to the user. The system information is a request on the hosting server for information describing the system such as the spec sheet and associated data streams.
--	--

# Add Server

Adding a server is a simple operation requiring the user to provide a friendly name for the server, the servers address including either http or https and the port number, as well as user name and password.

The server must be configured with the rules-based engine (currently known as Discovery) service and an instance of the SensorWeb API service.

The OpenSensorHub instances can be served securely with TLS using HTTPS or simply with HTTP, so it is important to specify the protocol as part of the address even if hosted locally.

Examples:

Unsecure - <http://localhost:8282>

Secure – <https://localhost:443>

If either the friendly name, username, or password are left blank the form will notify the user of the error. If the address does not resolve to a valid URL, the form will notify the user of the error. The form must have no errors in order to properly connect to the server and retrieve necessary information. The error notification takes the form of highlighting the field in red if it is incomplete or incorrect.

Configure New Server

Friendly Name

Server Address

User Name

Password

✓ ADD SERVER

✕ CANCEL

Configure New Server

Friendly Name  
Local Test Server

Server Address  
http://192.168.1.140:8282

User Name  
admin

Password  
.....

✓ ADD SERVER

✕ CANCEL

Configure New Server

Friendly Name  
Local Test Server

Server Address

admin

Password  
.....

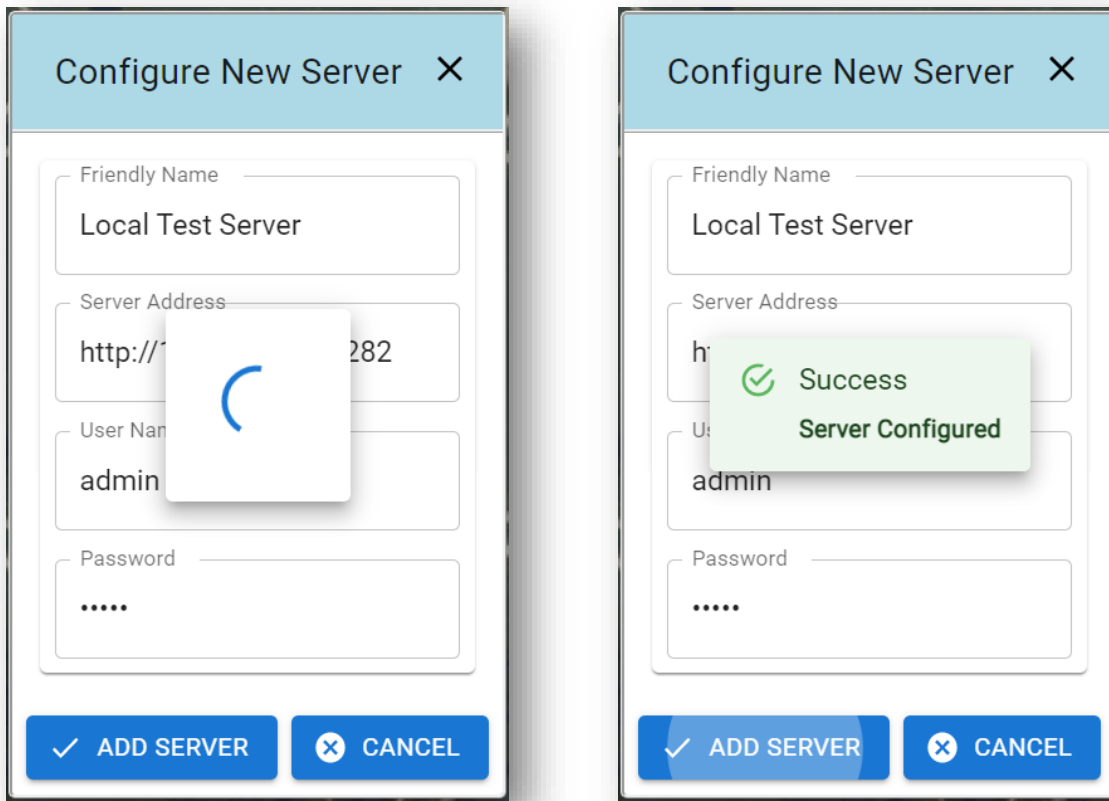
✓ ADD SERVER

✕ CANCEL

Failed

Invalid Server Configuration or Server not Responding

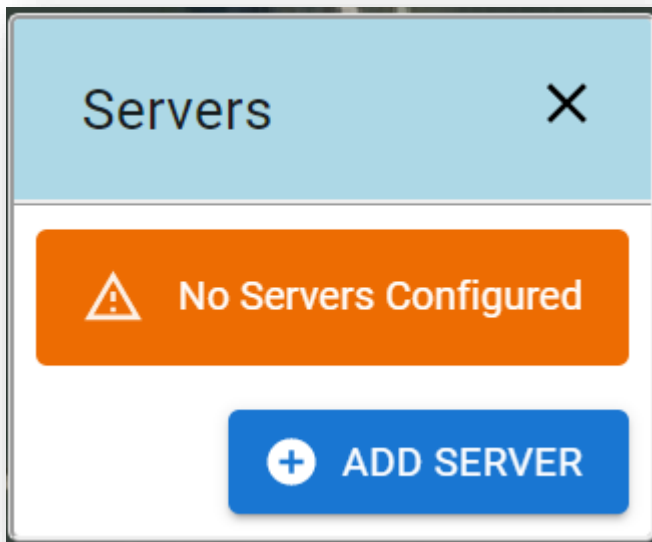
If there is an error communicating with the server then a popup will display a notification informing that the server configuration is not correct or the server is not responding.



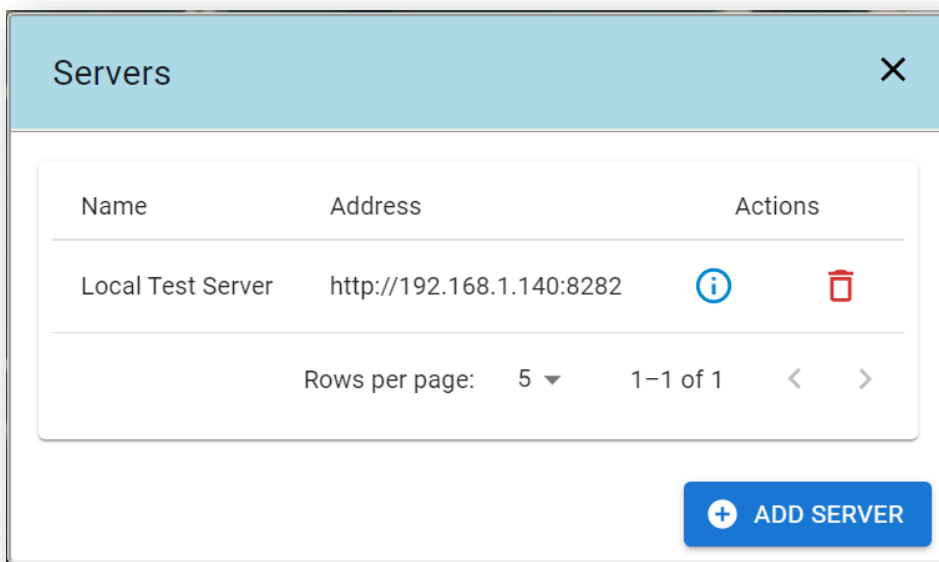
While connecting to the server and retrieving necessary information the user may see a progress circle popup. Upon successful configuration a popup will be displayed indicating that configuration is complete and server is configured.





## Server Management

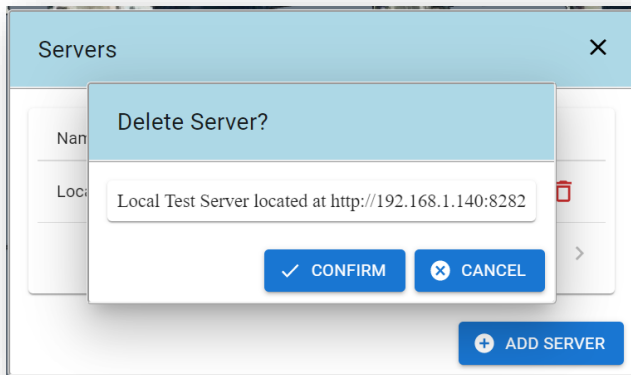


If no servers are configured the Servers dialog will present a warning.



If servers are available, they will be presented in a paginated format. The user is able to select 5, 10, or 15 entries per page and overflow will be presented on a subsequent page. Each server entry specifies a friendly name, the server address, and actions that can be taken on the server.

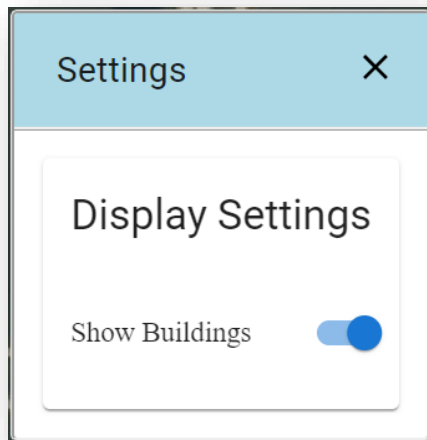
	Information, when pressed will open a new tab or window and display the result of requesting the SensorML Capabilities description from the target server.
	Delete the server, upon pressing it will prompt the user to confirm the deletion of the server.



If the user wishes to delete a server a confirmation dialog is presented. Pressing confirm button will delete the server and corresponding systems and observations. Pressing cancel will return the user to the Servers dialog with no changes applied.

# Settings

The settings dialog displays the configurable settings for the application. At present time, it only supports turning on and off the OpenStreetMap buildings 3D tile set. This option allows the user to toggle them on (visible) or off (not visible).



A view with buildings showing...



Same view with buildings not showing.