



ALTOS

Quick Start Guide

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1. Abbreviations

Abbreviations	Description
ALTOS	Advanced LiDAR Technology Opsys Sensors
CDRH	Center for Devices and Radiological Health
CPU	Central Processing Unit
FDA	Food and Drug Administration
FOV	Field of View
FPS	Frames per Second
Hz	Hertz
LiDAR	Light Detection and Ranging
MFT	Micro-Flash Technology
OEM	Original Equipment Manufacturer
POD	Probability of Detection
ROI	Region of Interest
SNR	Signal to Noise Ratio
SPAD	Single-Photon Avalanche Diode
TRX	Opsys' opto-electronic base module
UDP	User Datagram Protocol - connectionless communication protocol for transporting packets across networks
VCSEL	Vertical-Cavity Surface-Emitting Laser - a type of semiconductor laser diode with laser beam emission perpendicular from the top surface

Table 1: Abbreviations

2. Document Scope

This Quick Start Guide contains the information needed to get started with the ALTOS sensor. The basic information on how to connect to the device, how to login and show the point cloud can be found in the chapters below.

This document relates to firmware version 6.1.x.x and above. For earlier versions of the firmware, version 1.2 of the Quick Start Guide is available. Please contact your Opsys representative for more information or support@opsys-tech.com.

3. ALTOS Evaluation Kit

3.1. Cable connections

The ALTOS can be powered from PoE as well as from an external power source. Figure 1 shows a schematical representation of the two ways of connecting the ALTOS to a network or computer. In the simplest form, a single ethernet cable together with a PoE injector or PoE switch can be used. When using external power, the power cable must be assembled using the provided power connector. More details on the assembly instruction for the cable can be found in the "ALTOS PoE – User Manuel".Manual".

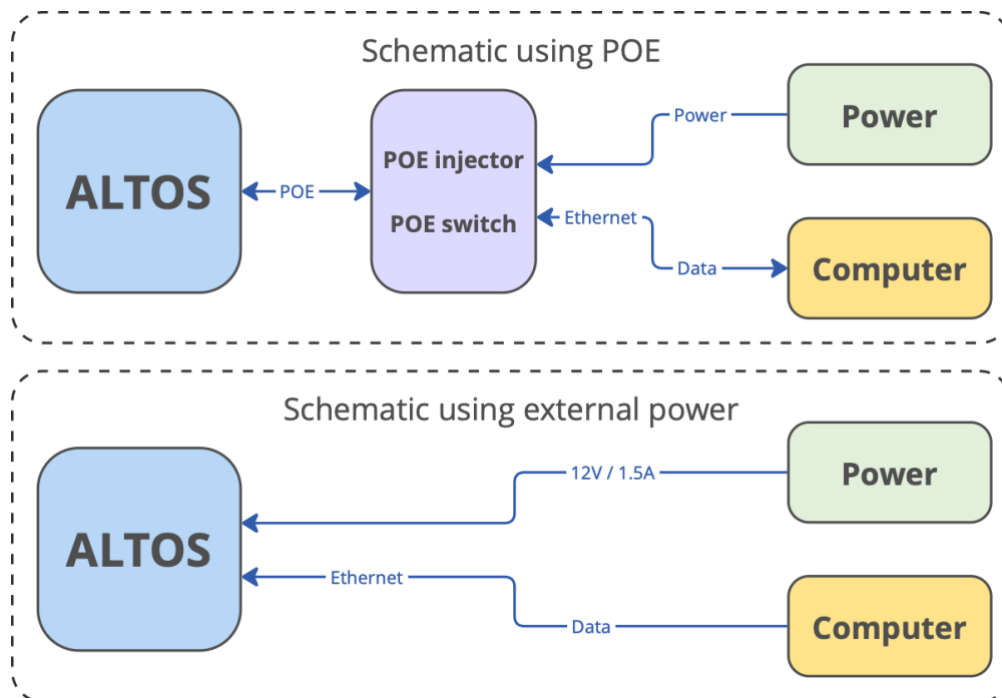


Figure 1: ALTOS cable connections

3.2. Network configuration

The ALTOS comes out of the factory with DHCP enabled, so it can be connected to any network with a DHCP server to receive its IP address. It also has a static IP address configured that can be used when connected to a network without a DHCP server, or when directly connected to a computer. The default static IP is “192.168.100.11”. In this case, the computer connected to the sensor needs to be set with a fixed IP address corresponding to the default ALTOS IP range to communicate with and receive data from the sensor. Table 2 below summarizes the network settings when using the default static IP. Figure 3 shows the default, factory network settings.

- DHCP server: Scan the network for the IP address or configure the ALTOS IP in the DHCP server.
- No DHCP server: Use the static IP 192.168.100.11.

ALTOS IPv4 address	192.168.100.11
Computer IP assignment	Manual
Computer IPv4 address	192.168.100.10
Computer IPv4 mask	255.255.255.0

Table 2: ALTOS network settings summary

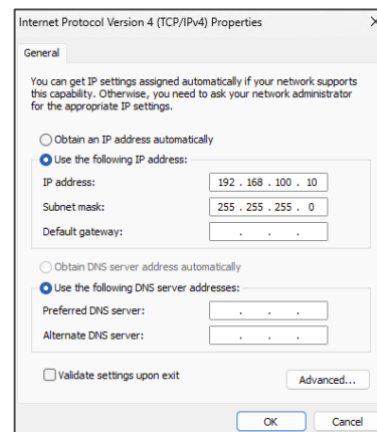


Figure 2: Ethernet adapter settings

Device Network Settings

DHCP Enabled

true

▼

Destination IP Address

127.0.0.1

Destination Port

8888

Device IP

IP address

192.168.100.11

Subnet Mask

255.255.255.0

Gateway

192.168.100.1

Primary DNS Server

208.67.222.222

Secondary DNS Server

208.67.222.220

Figure 3: Default network settings

3.3. Connecting to ALTOS webserver

The ALTOS-GUI is a webserver running on the ALTOS that makes it possible to get information about the sensor, view the point cloud, control its working state, and update the sensor's settings. It can be accessed using a browser while connecting to the IP address of the sensor at port 3000. When using the default static IP address the following address is valid: <http://192.168.100.11:3000/>.

Figure 4 below shows the login page for the ALTOS webserver. The default user credentials can be found in Table 3. The next chapter explains the different user levels available for ALTOS.

ALTOS address	http://192.168.100.11:3000/
Username	admin
Password	admin

Table 3: ALTOS-GUI address and login credentials

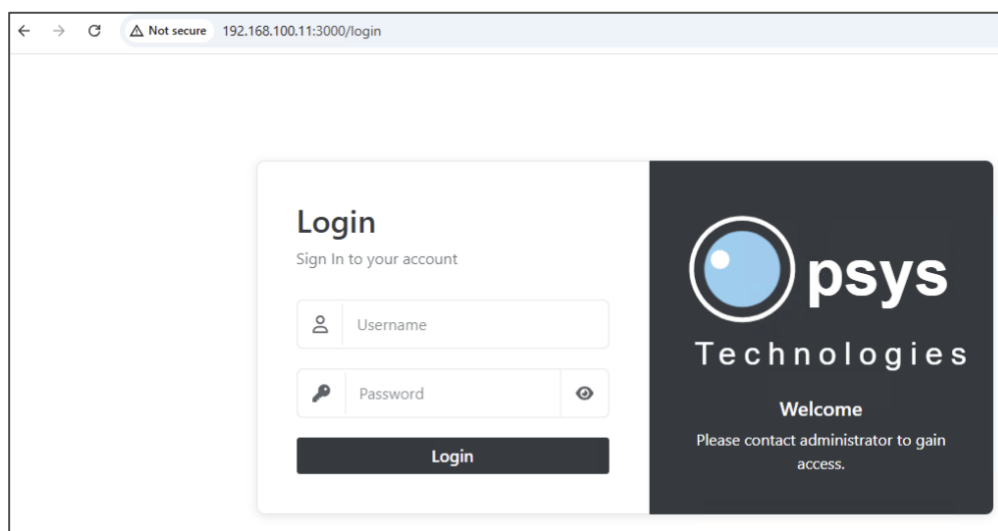


Figure 4: ALTOS-GUI login page

4. ALTOS Control

ALTOS has two ways for controlling the device, changing setting and reading its status. The first way is through the web interface client, ALTOS-GUI. It is an HTTP, web-based GUI in which the different users can login. Different control options and settings can be changed in the interface. The second way is through an API. This API allows all functions and settings to be accessed without the use of a graphical user interface. It allows for easy integration into the end user's system or application.

4.1. ALTOS-GUI

The ALTOS-GUI is a web-based graphical user interface that incorporates all the controls and functions per user level. Therefore, the options and controls available will be different between the two different user accounts. The figures below show the page visible for the administrator after login and a part of the configuration settings that can be updated in the system configuration tab.

The "mainMain" tab contains the sensor information as well as the control buttons to start and pause the sensor's operation. The "device settings" tab contains the configuration parameters for the device like the, including: network settings, time synchronization, frame rate settings and others.

Note that the ALTOS will start up in the last mode it was set. If the sensor was "Running" it will start up in "Running" mode after reboot or power loss. If the sensor was "Paused" it will start in "Paused" mode after reboot or power loss.

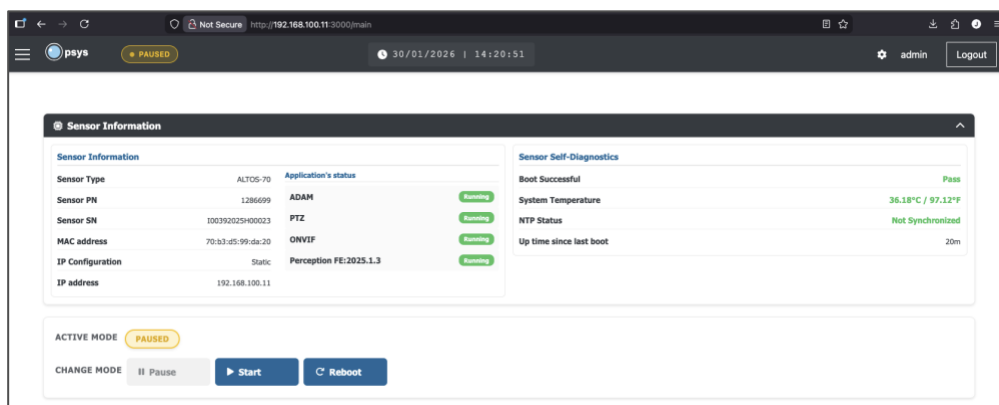


Figure 5: ALTOS-GUI main tab

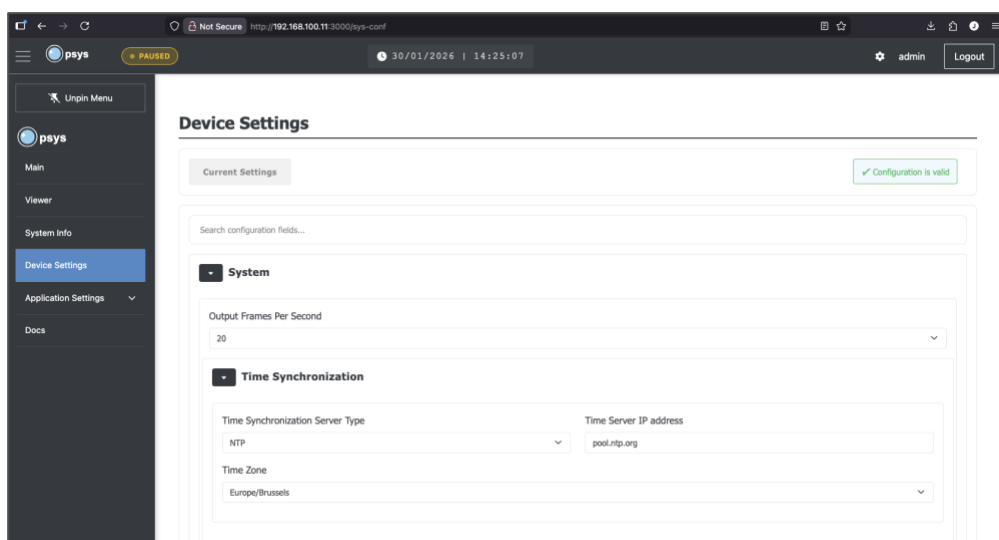


Figure 6: ALTOS-GUI device settings tab

The ALTOS-GUI also contains a point cloud viewer. This facilitates sensor installation as it shows live what the sensor FoV includes. Adjustments can be made on the fly while looking at the viewer.

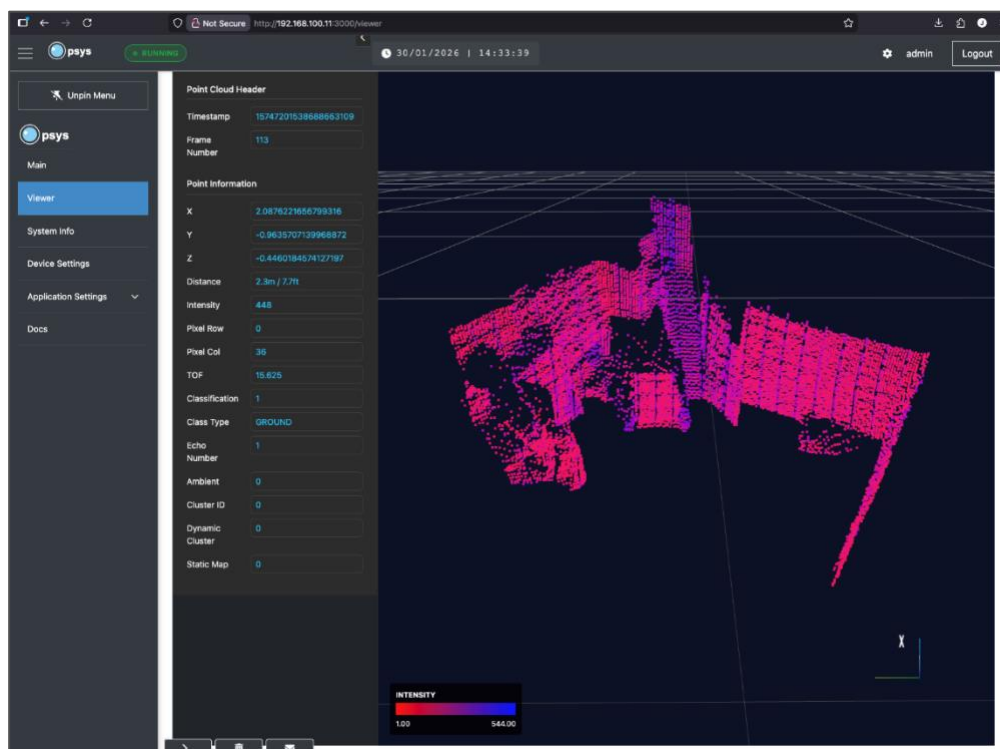


Figure 7: Web point cloud viewer

4.2. ALTOS API

The ALTOS includes an API that can set and read the same information as in the ALTOS-GUI. Similar to the ALTOS-GUI, the different user levels have different functions available. Documentation for this API is available within the ALTOS-GUI web client. When accessing the functions, only the functions available to the current logged in user will be visible. The figures below show how to access the page, what the functions look like and how to execute the examples. The documentation includes examples for all the functions that can be run directly from the page. The examples and documentation on the page can be used to integrate the API commands into the end user application software.

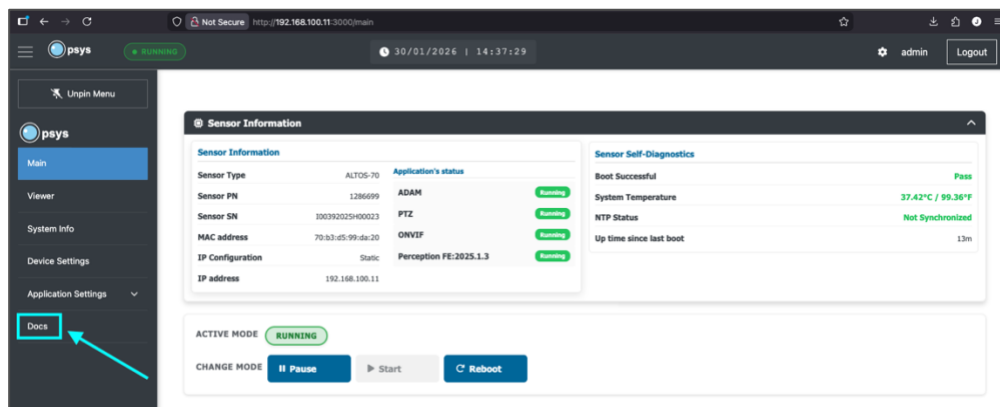


Figure 8: API bring up location

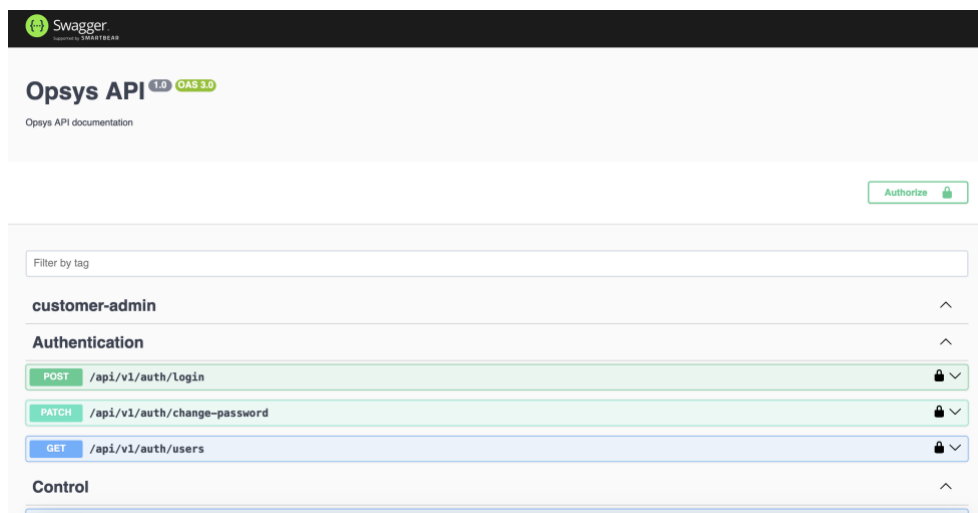


Figure 9: API example (administrator user)

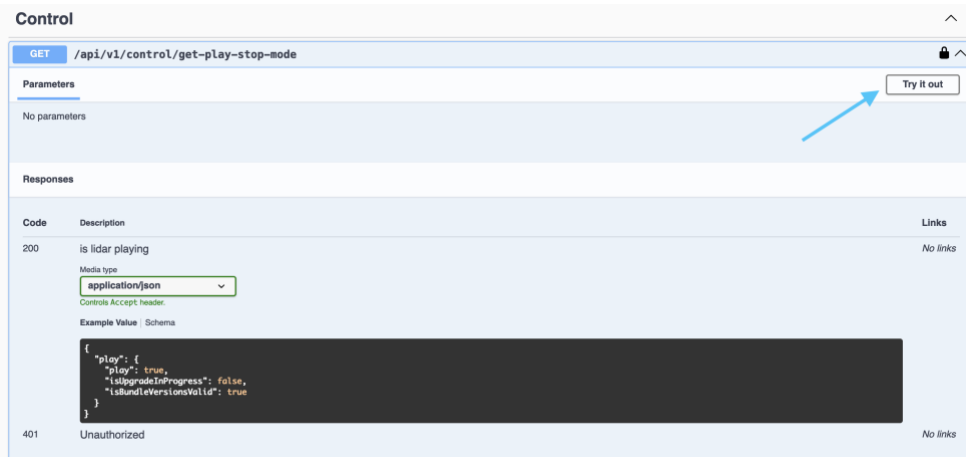


Figure 10: Example of the function get-play-stop-mode

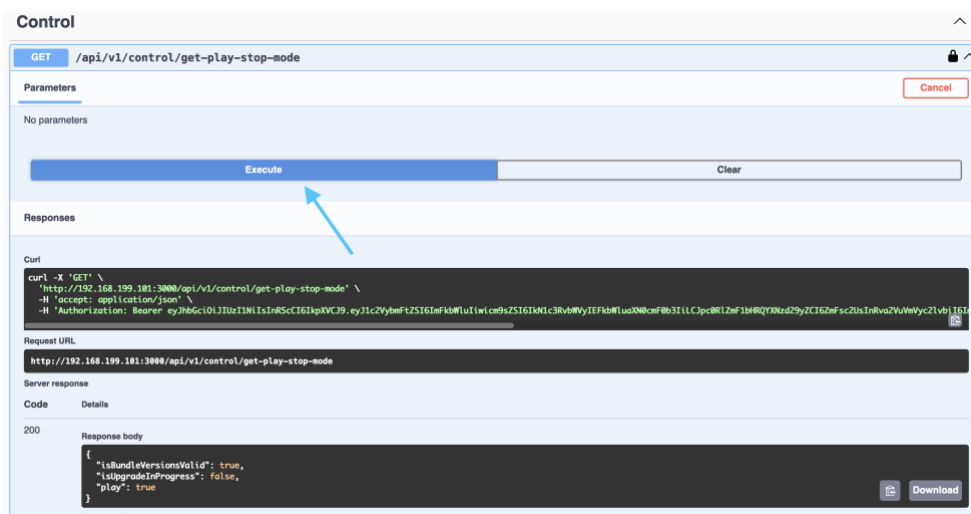


Figure 11: Executing the function and getting the response

5. ALTOS Perception

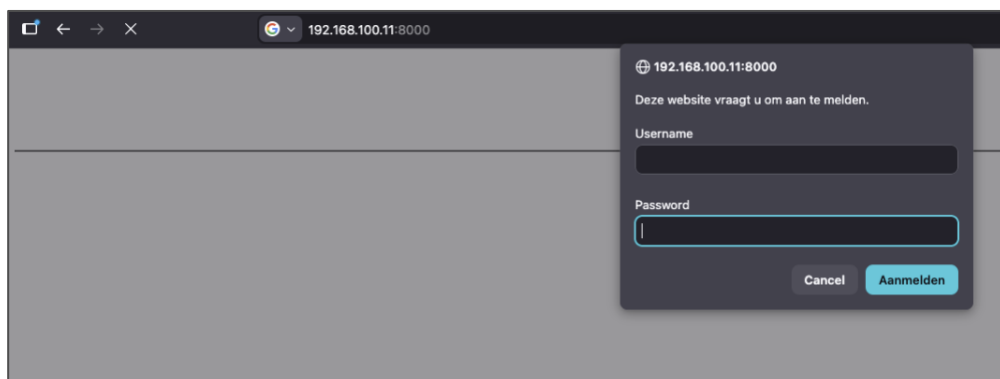
The Flasheye application is running on ALTOS. It can be accessed at port 8000 at the sensor IP address (default static IP: <https://192.168.100.11:8000/>) Connecting to this address loads the perception software. The application visualizes the point cloud and runs the perception and tracking algorithms. It outputs the tracking data, alarms and events to the user using MQTT over ethernet.

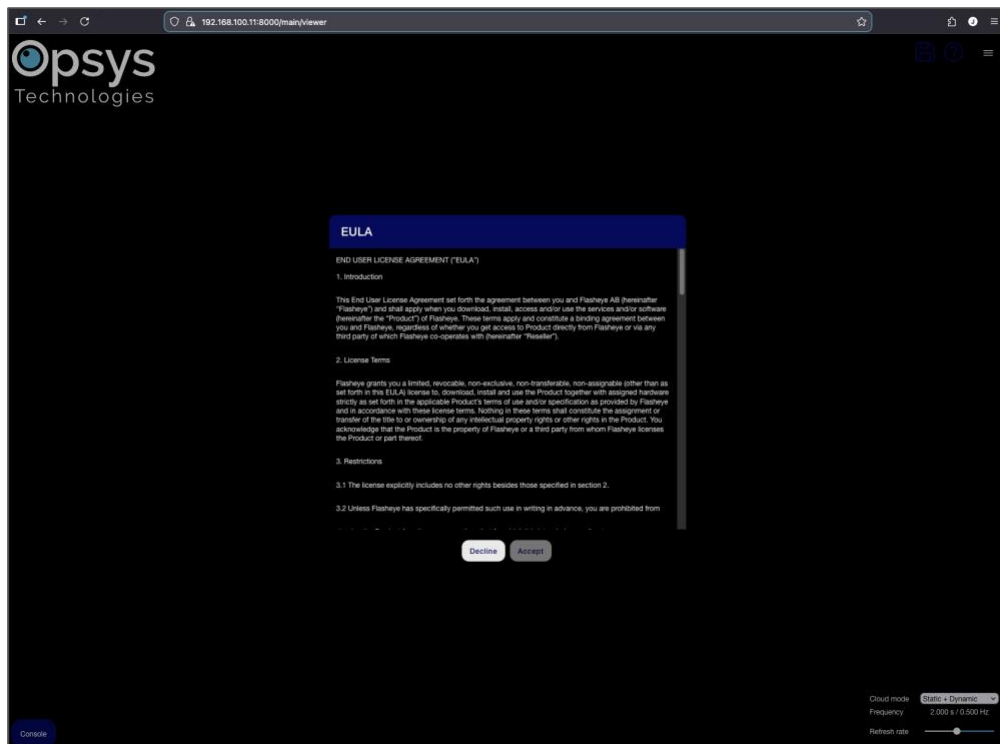
ALTOS perception address	https://192.168.100.11:8000/
Username	admin
Password	admin

Google Chrome is recommended to open the perception application. This browser is used to test all functionality of the perception software. Other browsers might work but compatibility has not been fully tested.

When the perception is enabled onto your device, the webpage at port 8000 will be accessible. If the page fails to load withing 30 seconds after reboot, it means the perception has not been licensed on your ALTOS device. To enable it, please contact your Opsys representative or info@opsys.com. After login and accepting the End-User License Agreement (EULA), the point cloud will be visible. If no point cloud appears, make sure the sensor is in "Running" mode and the network configuration is as in Figure 6.

The pictures below show the steps to get the perception application running.





6. User Levels

The ALTOS includes 2 user levels for the end user and one user level for Opsys administrator access. The Opsys administrator is the highest user level. It is only used to configure advanced settings or trouble shoot the device. Below the Opsys administrator is the customer administrator level. This level is used to set up the device and its configuration. The administrator has the ability to upgrade the device's firmware as well as updating the system configuration.

The second level, below the customer administrator, is the customer user. This access level has very limited rights to change settings. It is intended for operating the sensor, starting and stopping the data output, reading the calibration file, In the following chapters, each level will be described with more details with regards to their available functions.

The ALTOS system provides three user levels: **Opsys Administrator**, **Customer Administrator**, and **Customer User**. The **Opsys Administrator** (opsysadmin) level offers full access for advanced configuration, and troubleshooting, and is used exclusively by Opsys engineers. Below it, the **Customer Administrator** (admin) level manages device setup, configuration, and firmware updates.

The **Customer User (user)** level has limited permissions and is intended for basic operation, such as starting or stopping data output and accessing the calibration file. The following chapters detail the capabilities associated with each user level.

6.1. Default Credentials

The default credentials are indicated in the table below. These usernames are fixed and can therefore not be changed. For security reasons, it is advised to update the customer administrator password. Instructions on how to update the password can be found in the paragraph below.

The default credentials are listed in the table below. Usernames are fixed and cannot be changed. For security, it is recommended to update the Customer Administrator password. Instructions for updating the password are provided in the following section.

Username	Password
admin	admin
user	user

Table 4: Default login credentials

When there have been 3 unsuccessful login attempts, the system will lock itself for 10 minutes for any access. It will not be possible to login to the web client or to use the API. It is possible to change the password for the two user levels in case the password has been forgotten.

After three unsuccessful login attempts, the system will lock for 10 minutes, preventing access to both the web client and the API. If a password has been forgotten, it can be reset for either user level.

Username	Password reset by
user	- admin - opsysadmin
admin	opsysadmin

Table 5: Password reset information

6.2. Password Update

The Customer Administrator can update its own password when logged in. The user cannot change their own password. To change the "user" password, the administrator must initiate the password change. Figure 12 and Figure 13 below show how to change the administrator or user password.

The new password has two requirements with regards to password strength:

- Minimum 8 characters
- At least one special character

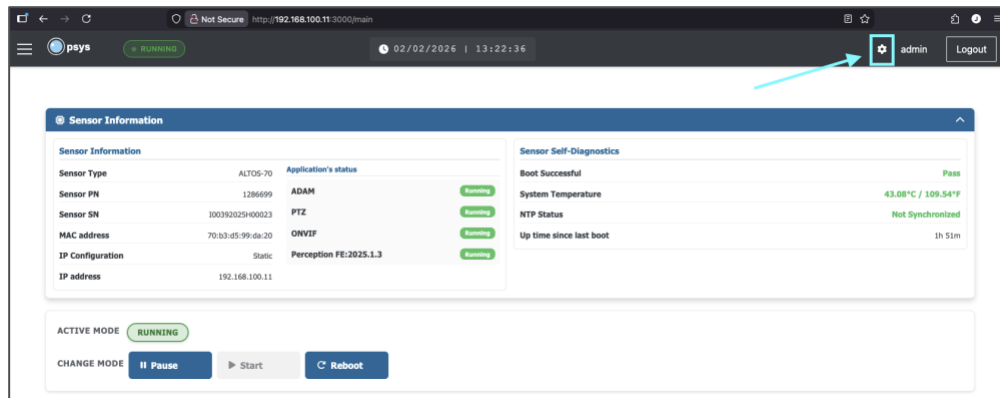


Figure 12: Password update

Change password

Select user

✓ admin

user

Your new password

Repeat password

Confirm

Figure 13: Change password

6.3. Administrator

The administrator account is used to set up the system. It has the following options:

- Read / write of the network configuration
- Read / set system time synchronization configuration
- Firmware update
- Start / stop the data stream
- Read the system data streaming state
- Restart the device
- Read the calibration file
- Access the device logs
- Read the system firmware version
- Change administrator ("admin") and user ("user") password
- Read the system part number and serial number
- Check if the system is ready to stream data
- Enable / disable single echo mode
- Change the system framerate

6.4. User

- Start / stop the data stream
- Read the system data streaming state
- Restart the device
- Read the calibration file
- Check if the system is ready to stream data

7. ALTOS Data

7.1. Calibration file download

When needed, the calibration file can be downloaded from the ALTOS using the API by an external software or via the API examples in the ALTOS-GUI documentation as shown in paragraph 0 above.

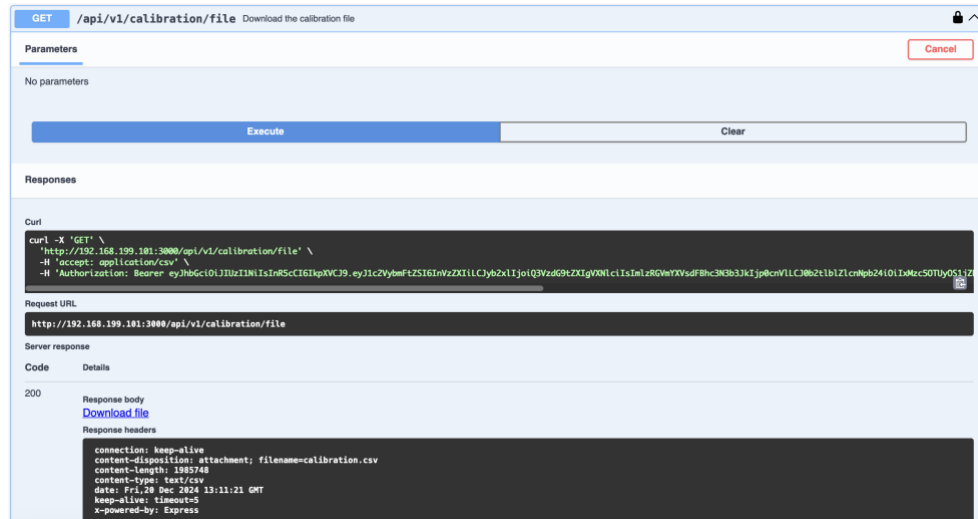


Figure 14: Example calibration file download using API documentation page

8. Network Recovery

ALTOS includes a backup IP address in case there is an issue with the networking, or the ALTOS is not accessible due to a forgotten IP address. This IP address is 172.23.37.11. The ALTOS must be connected directly to the computers network interface or via an unmanaged switch. The computer needs to be configured with a static IP. See the table below for all details regarding the configuration.

ALTOS IPv4 address	172.23.37.11
Computer IP assignment	Manual
Computer IPv4 address	172.23.37.10
Computer IPv4 mask	255.255.255.0

Table 6: ALTOS recovery network settings

9. About Opsys Tech Ltd.

Opsys has developed the world's most advanced solid-state scanning LiDAR sensor. Opsys technology uses fully addressable VCSEL arrays, combined with a single chip addressable CMOS SPAD array. No moving parts allows for 24/7 operation. This gives the benefit of ensuring there are no mechanical failures over time, which increases the LiDAR's lifetime expectancy well beyond any other solution on the market today.

The patented technology provides a 5D point cloud in real time. Opsys sensors provide major cost savings as they are semiconductor-based, and the solution is scalable. The high-performance sensor is already in mass production.

Opsys technology is designed as a Lego brick system to enable complete customization at an affordable price. The ALTOS provides a fully integrated solution to meet the myriad of demands of industry across numerous different sectors, such as Smart Cities, Intelligent Traffic Systems (ITS), Robotics, Smart Factories, AGV and Security (for example in Perimeter Security, Public Safety, Healthcare and Education).

Founded in 2016, the company has major investment, is headquartered in Israel, with offices in USA, APAC, and Europe.

For more info: www.opsys-tech.com

10. Revision History

Date	Version	Description
20/12/2024	Version 1.0	Document creation
23/04/2025	Version 1.1	Added perception quick start chapter
22/04/2025	Version 1.2	Updated perception section
23/04/2026	Version 1.3	Updated to match firmware release 6.1

Table 7: Revision history