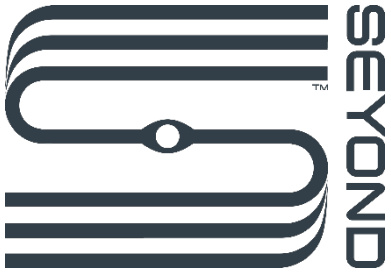


MetaView
Application Note

Table Content

Preface

Product Name

MetaView

Manufacturer

SEYOND

Legal Disclaimer

Overview

This manual provides instructions for the MetaView usage.

Original document

This document is the original document owned by Seyond.

Manual description

Although this document covers instructions to handle the frequent problems, it is still not guaranteed to get all problems fully solved. If you encounter other problems not covered in the manual, please contact Seyond staff in time. This manual will be updated when new information becomes available.

Tel : (650)963-9573
E-mail: info@ seyond.com

Safety notices

Before using the product, please read this manual carefully and strictly follow the relevant instructions.

1 Overview

MetaView is a specified software that provides viewing, recording, and replaying point cloud and other functions to help optimize usage for your Seyond LiDAR. This document is mainly about how to use MetaView.

2 Download and Installation

2.1 Download

The path of installation package is as follows. www.seyond.com/downloads

2.2 Installation

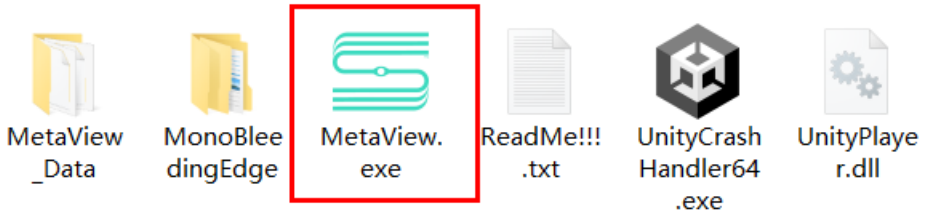
Installation Environment Requirement	Structure
Windows 10 or higher	X86

3 Instructions

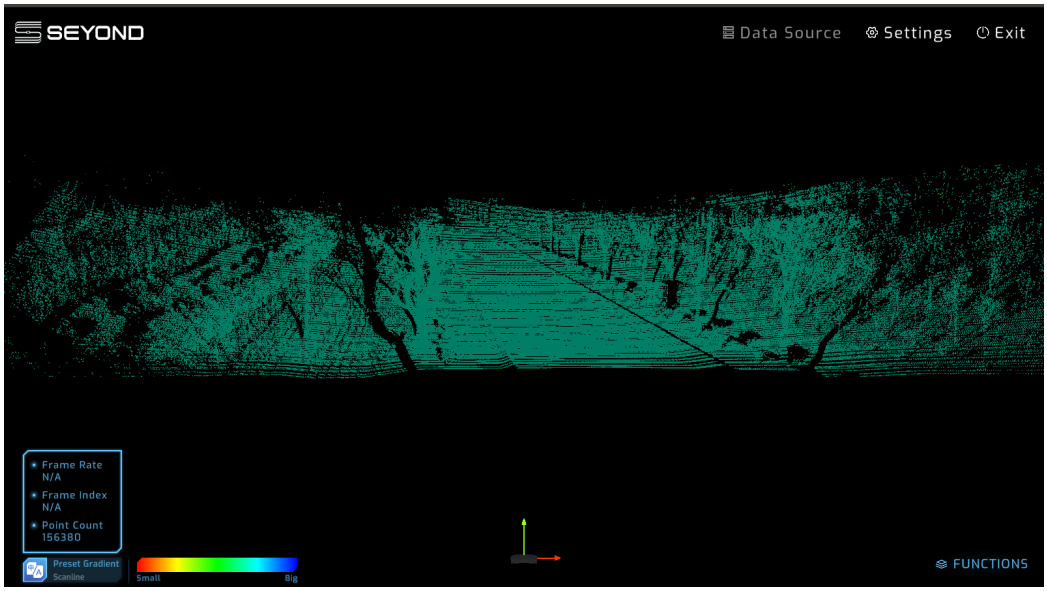
The operations in this chapter are based on the V1.3.5 version of MetaView.

3.1 Get started

1. Unzip the MetaView package. Double-click to start MetaView.



2. (Optional) You could click **FUNCTIONS** > **Starter Tutorial** to learn how to get started with MetaView.



3.2 Add a LiDAR

1. Change the computer IP address so that the computer IP address and LiDAR IP address are in the same network segment.
2. Connect the computer/server to the LiDAR and ensure that the network is connected.
3. Select **Data Source** > **Live Source**. Click **Add New Data Source**.

4. Enter LiDAR IP address and port number. Click  to connect the LiDAR. The default port number of the LiDAR is 8010.

Note

The system does not have a power switch. It will become operational when power is applied.

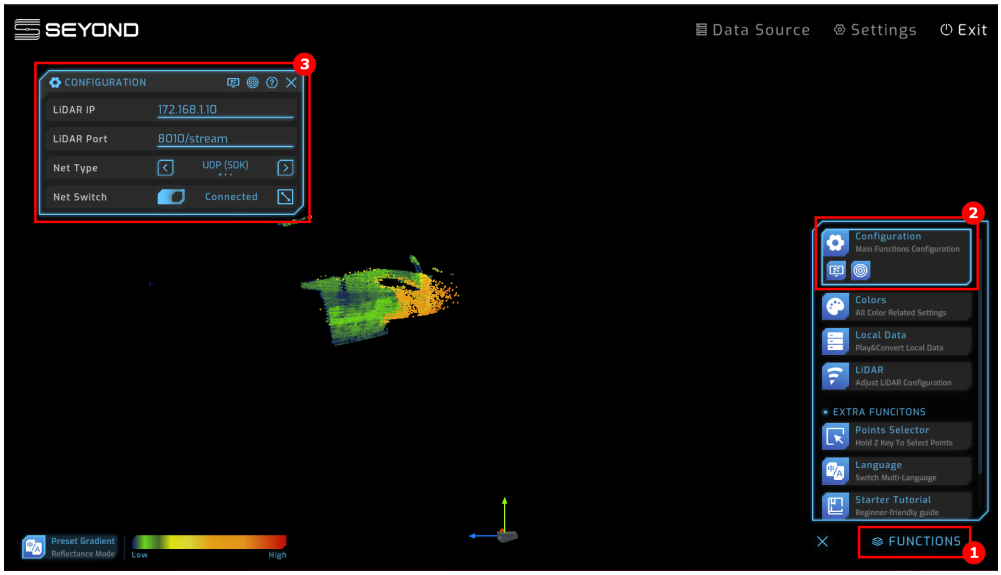
The default Falcon LiDAR IP address is 172.168.1.10.

It is recommended to check the access to the LiDAR IP address by using the ping command. You should make sure that the computer is connected to the LiDAR network.

3.3 LiDAR Configuration

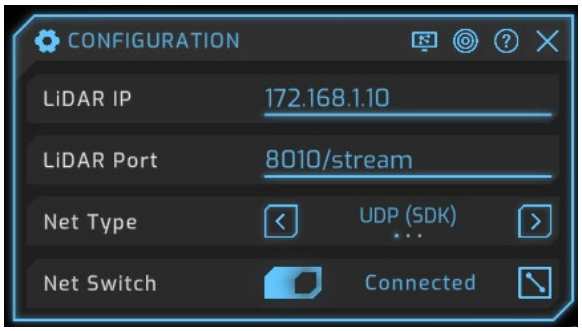
Select **FUNCTIONS > Configuration** to configure the LiDAR network information and set the visual effect of the

point cloud.



3.3.1 Configure LiDAR network information

1. Select **FUNCTIONS > Configuration**. Click  .



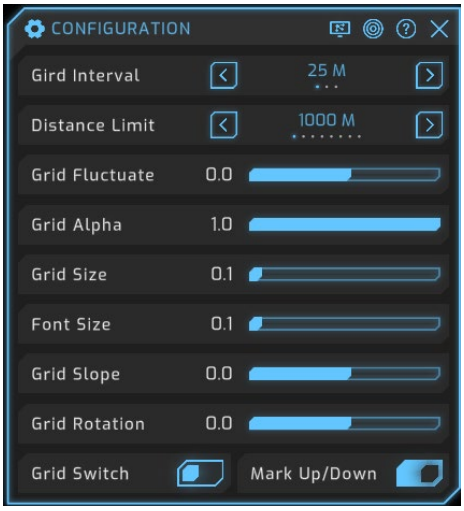
2. You can change the LiDAR network information according to the actual needs.

Table 1 Parameter description

Parameter	Description
LiDAR IP	The IP address of the point cloud source. The default IP address is 172.168.1.10.
LiDAR Port	The port number of the point cloud source. The default value of **<port number>/stream** are usually used to the webSocket connection. Only port number is essential for the UDP and TCP connection. The default port number of the LiDAR is 8010.
Net Type	The network type for the connection between the computer and the LiDAR, including TCP, UDP and webSocket.
Net Switch	The toggle switch for connecting to the point cloud source. Please notice that you should disable the toggle before changing the LiDAR network information.

3.3.2 Configure grid

1. Select **FUNCTIONS > Configuration**. Click  .



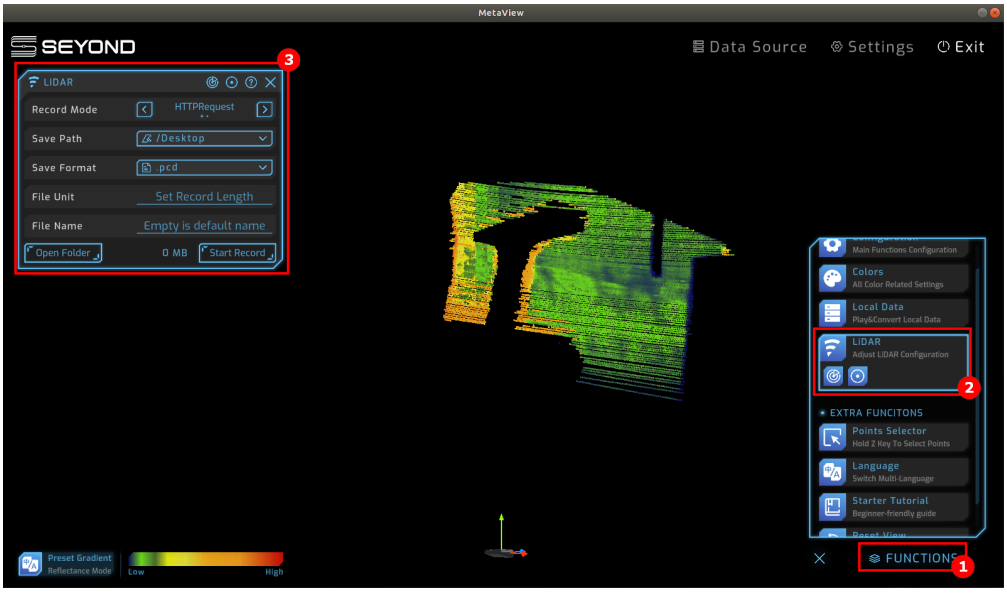
2. You can change the grid configuration according to the actual needs.

Table 2 Parameter description

Parameter	Description
Grid Interval	The interval between adjacent grids.
Distance Limit	The maximum distance between the adjacent grid lines.
Grid Fluctuate	The vertical position of the grid.
Grid Alpha	The transparency of the grid.
Grid Size	The thickness of the grid line.
Font Size	The font size in the grid.
Grid Slope	The vertical angle of the grid.
Grid Rotation	The horizontal angle of the grid.
Grid Switch	Enable or disable the grid
Mark Up/Down	Choose to display the distance marks at the top or bottom of the grid

3.4 LiDAR Control

Select **FUNCTIONS** > **LiDAR** to configure the LiDAR parameter.



3.4.1 Configure LiDAR

Click  to change the LiDAR settings according to your actual situation.

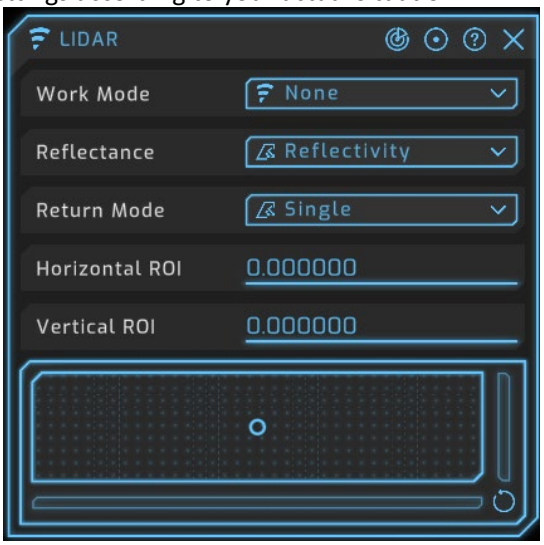


Table 3 Parameter description

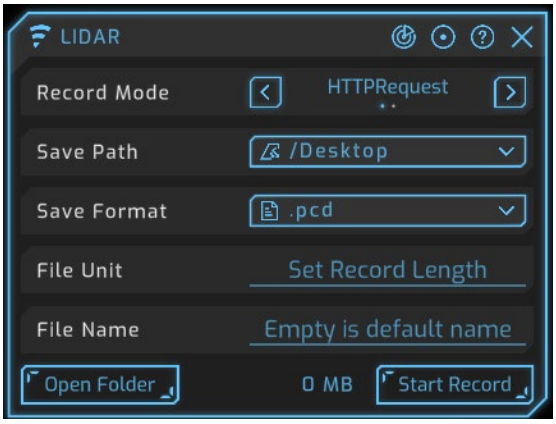
Parameter	Description
Work Mode	The work mode of the LiDAR. • None: The initialization value. • Sleep: The sleep mode. The mode can only be used when the LiDAR is configured to wake from CAN messages. • Standby: The standby mode. In this mode, components such as the laser, polygon and Galvo are disabled. The other internal components continue to function for fast switching to normal mode. • Normal: The normal mode.

	• shortRange: No longer in use • Calibration: The calibration mode. • Protection: The LiDAR will be in protection mode when the laser temperature exceeds the threshold. The LiDAR will return to normal mode after the laser temperature decreases. • Quiet: The quiet mode. In this mode, the noise will be reduced.
Reflectance	Change the reflectance mode of the LiDAR on **Reflectance**. The reflectance can be either **intensity** or **reflectivity**.
Return Mode	Configure the return mode received by the LiDAR when a laser is emitted once. Either single return mode or dual return mode can be selected, and the dual return mode has two options: "strongest + 2 strongest" and " strongest & furthest". The default is single return mode.
Horizontal ROI	The horizontal positions of the ROI center. The unit is degree (°).
Vertical ROI	the vertical positions of the ROI center. The unit is degree (°).

3.4.2 Record point cloud data

You can record LiDAR point cloud data through HTTPResquest and SDK. You can select the format of the recorded point cloud data according to your actual needs. The SDK as the record mode is recommended to prevent point cloud stuttering.

1. Click  . Select the **Record Mode**. Select the save path.
2. Select the file format and size of the data to be recorded.



- Record a file in pcd format.

  Select **.pcd** in **Save Format**. Enter the size of the file in **Frame(s)**.
- Record a file in pcd_binary format.

  Select **.pcd_binary** in **Save Format**. Enter the size of the file in **Frame(s)**.
- Record a file in inno_pc format.

  Select **.inno_pc** in **Save Format**. Enter the size of the file in **Frame(s)** or in **Times**.

  inno_pc is the proprietary format of Seyond point cloud files. The points in inno_pc files are in spherical coordinates.

- Record a file in inno_pc_xyz format.
  Select **.inno_pc_xyz** in **Save Format**. Enter the size of the file in **Frame(s)** or in **Times**.
  inno_pc_xyz is the proprietary format of Seyond point cloud files. The points in inno_pc_xyz files are in Cartesian coordinates.
- Record a file in inno_raw format.
  Select **.inno_raw** in **Save Format**. Enter the size of the file in **MiB**.
  inno_raw is the proprietary format of Seyond point cloud files.
- Record a file in inno_raw_raw format.
  Select **.inno_raw_raw** in **Save Format**. Enter the channel number in **Channel#**.
- Record a file in png format.
  Select **.png** in **Save Format**. Enter the number of pictures in **ImageCount**.
- Record a file in bag format.
  Select **.bag** in **Save Format**. Enter the size of the file in **Frame(s)**.
- Record a file in csv format.
  Select **.csv** in **Save Format**. Enter the size of the file in **Frame(s)**.
- Record a file in yaml format.
  Select **.yaml** in **Save Format**.
- Record a file in pcap format.
  Select **.pcap** in **Save Format**. Enter the recording time of the point cloud file in **Times**.

3. Enter the file name. Click **Start Record** to record the file.

Note

Point cloud data recording starts immediately by default.

The limitation of the file size is subject to change based on the file format.

You need to install the plug-in before recording the pcap file.

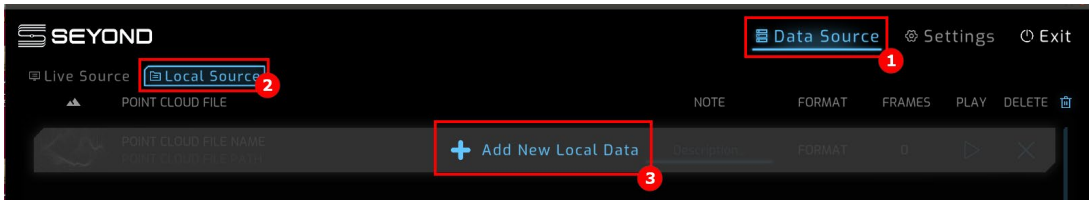
When recording through SDK, the size of the recorded files is limited by the recording time.

3.5 Local Point cloud file management

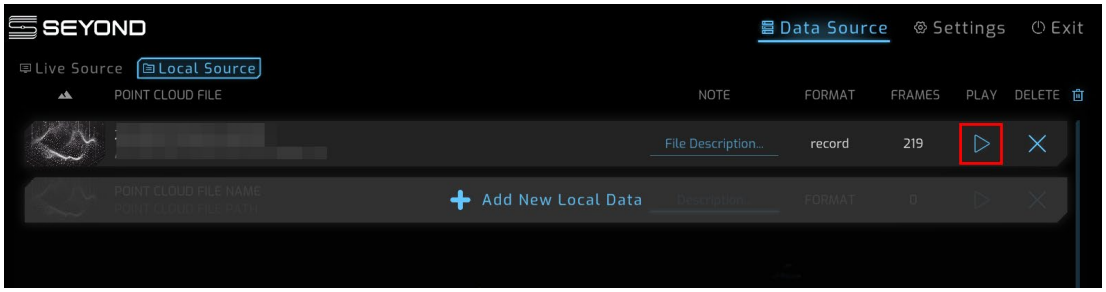
3.5.1 Replay point cloud file

You could replay point cloud data in inno_pc, inno_pc_xyz, pcd, pcap, bag, csv format.

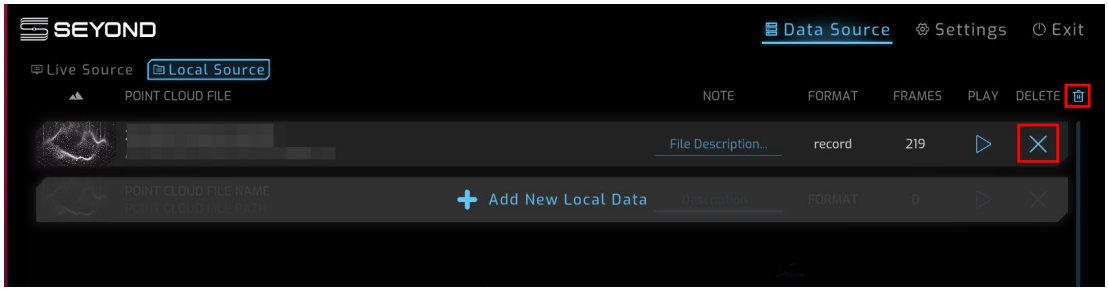
1. Go to **Data Source** > **Local Source**.
2. Click **Add New Local Data** to select the point cloud file in **Open Files**. Click **OK**.



3. Click  to play the file.



4. (Optional) You can click  to delete the selected file, or click  to delete all the local files.



5. You could switch the point cloud file to be recorded ,adjust the playing speed or capture a frame of the file as required.

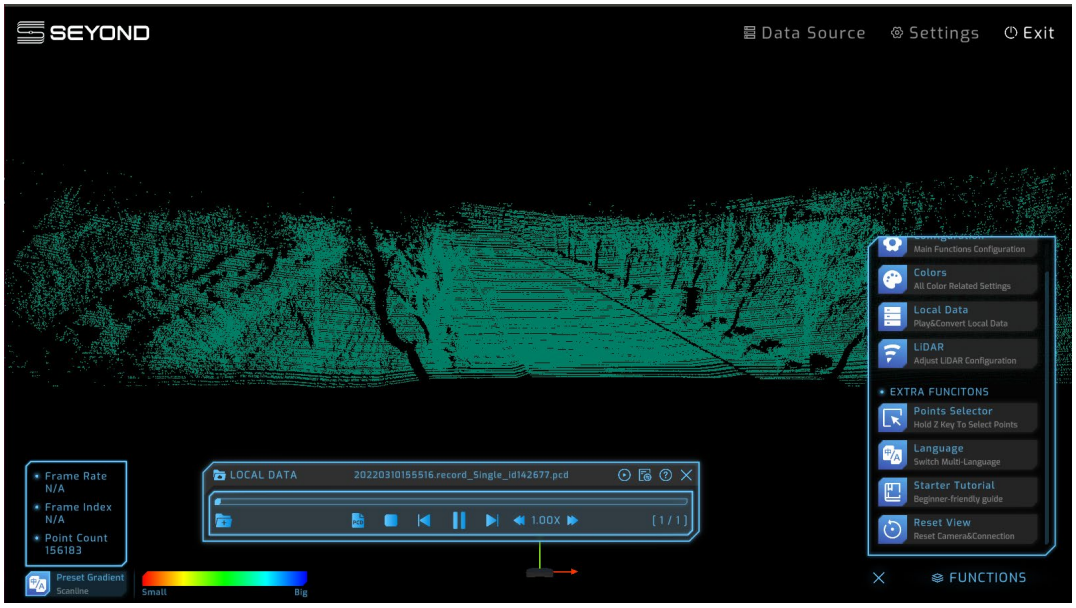
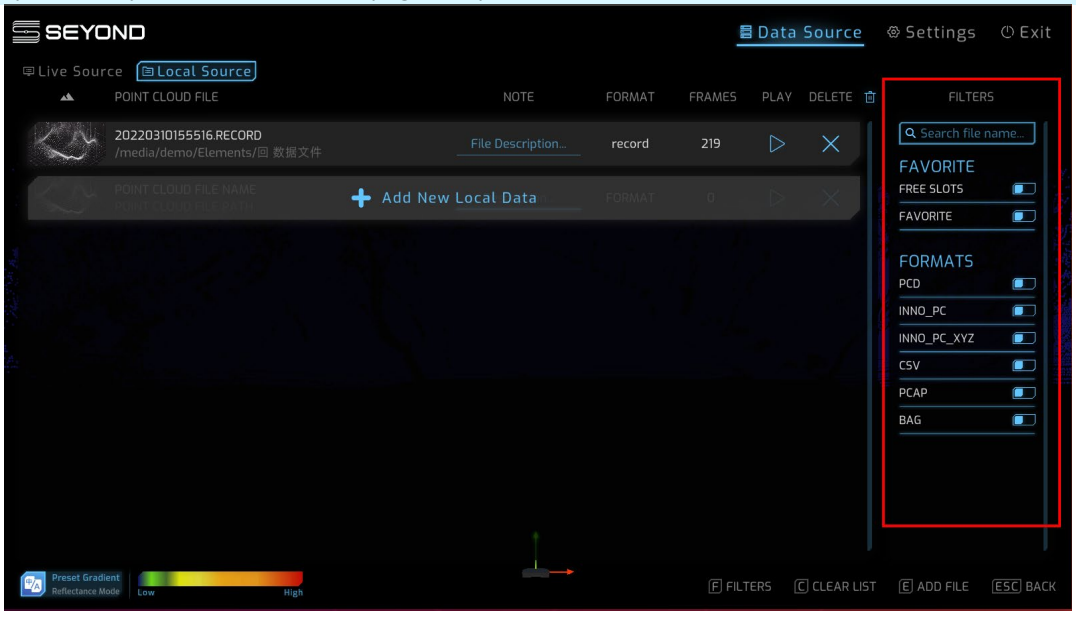


Table4 Button Description

Button	Description
	Save the current frame as a single PCD file.
	Stop playing
	Previous frame
	Play/Pause
	Next frame
	Slower
	Faster
	Open the point cloud file

Note

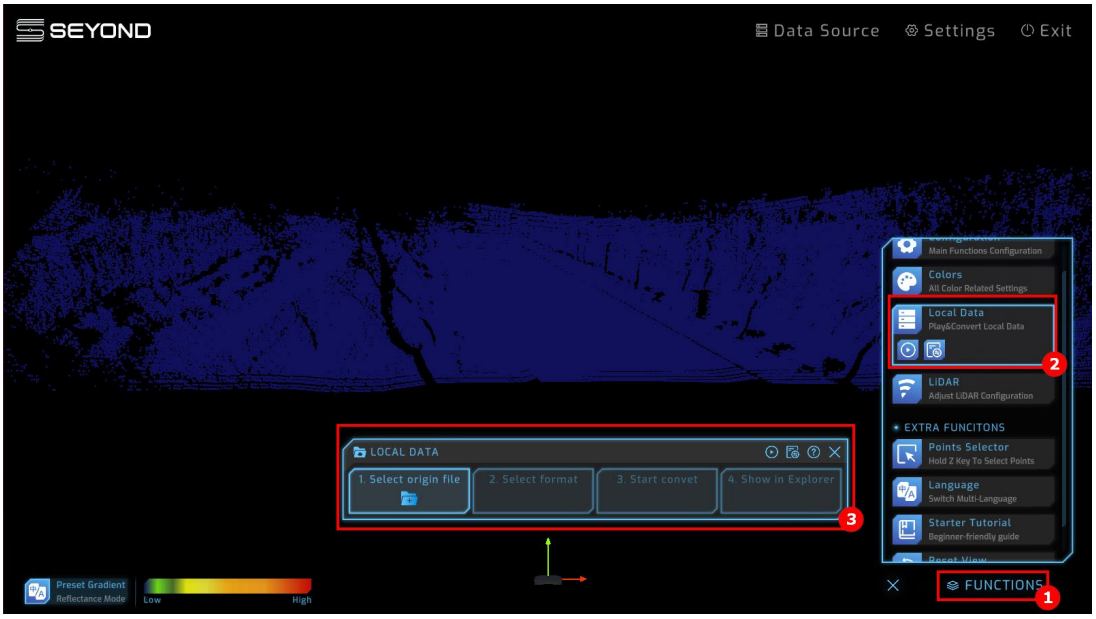
You could press **F** key on the **local source** page to open the filter to search for the needed file.



3.5.2 Point cloud file conversion

You could replay point cloud data in inno_pc, inno_pc_xyz, pcd, pcap, bag, csv and record format.

1. Go to **MAIN FUNCTIONS** > **Local Data**. Click  .



2. Select the origin file, format. Click  to start converting.

Note

You could only convert the point cloud data with high information density to the one with low information density, the reverse is not supported.

3.6 Data analysis

Obtain and analysis point cloud data.

1. Select **FUNCTIONS** > **Points Selector**.
2. Press and hold **Z** key and draw a region to obtain all point cloud data information in this region.

3. Check the point cloud data in the **POINTS SELECTOR**.

4. (Optional) Click  to save the point cloud data information in a csv file.

Note

You can select a maximum of 10000 points at a time.

3.7 Change the Point cloud visual effect

You could change the color of the point cloud to get the better visual effects.

1. Go to **FUNCTIONS** > **Colors**.

2. Click  to set the color configuration, including color mode, color schemes, render mode and type limit.

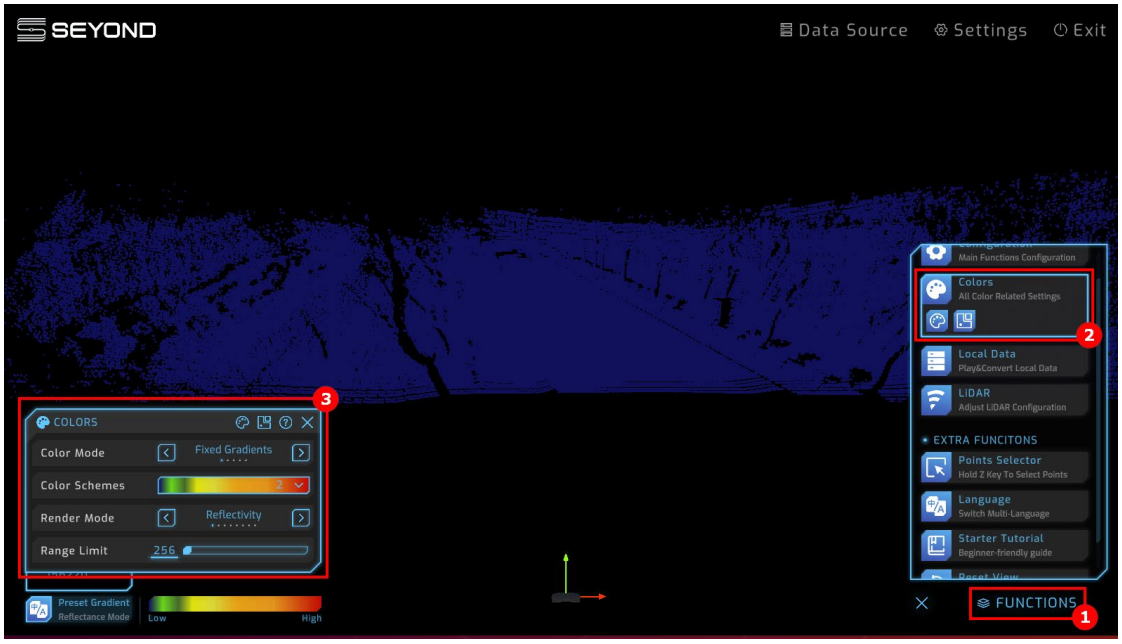


Table 5 Color Mode Parameter description

Parameter	Description
Fixed Gradients	Select a fixed gradient color scheme for point cloud.
Custom Gradients	Customize and select a point cloud color scheme.
Fixed Solid Color	Select a fixed solid color scheme for point cloud.
Custom Multi-type	Not recommended for use. Required for the customized point cloud file.
Camera Render Mode	Not recommended for use. Required for the network camera.

Table 6 Color Scheme Parameter description

Parameter	Description
Fixed Gradient Scheme	Fixed gradient color schemes for point cloud.
Custom Gradient Scheme	Select the color bar to customize the intensity gradient.
Fixed Solid Color Scheme	Fixed solid color schemes for point cloud.
Custom Multi-type Scheme	Not recommended for use. required for the customized point cloud file.
Camera Render Mode Scheme	Not recommended for use. required for the network camera.

Table 7 Render Mode Parameter description

Parameter	Description
Reflectivity	Color the reflectivity field of the point cloud.
Intensity	Color the intensity field of the point cloud.
Distance	Color the point cloud based on to its distance from the origin.

Channel	Color the point cloud based on its channel field. (if the field exists)
Scanline	Color the point cloud based on its scanline field. (if the field exists)
Index	Color the point cloud based on its index field. (if the field exists)
ROI	Color the point cloud based on its ROI field. (if the field exists)
Facet	Color the point cloud based on its facet field. (if the field exists)

Table 8 Type Limit Parameter description

Parameter	Description
Min/Max	The upper and lower limits for coloring the point cloud in the intensity/reflectivity mode.

3. Click to set the pixel size, including the basic pixel size, N-ROI scale and distance scale.

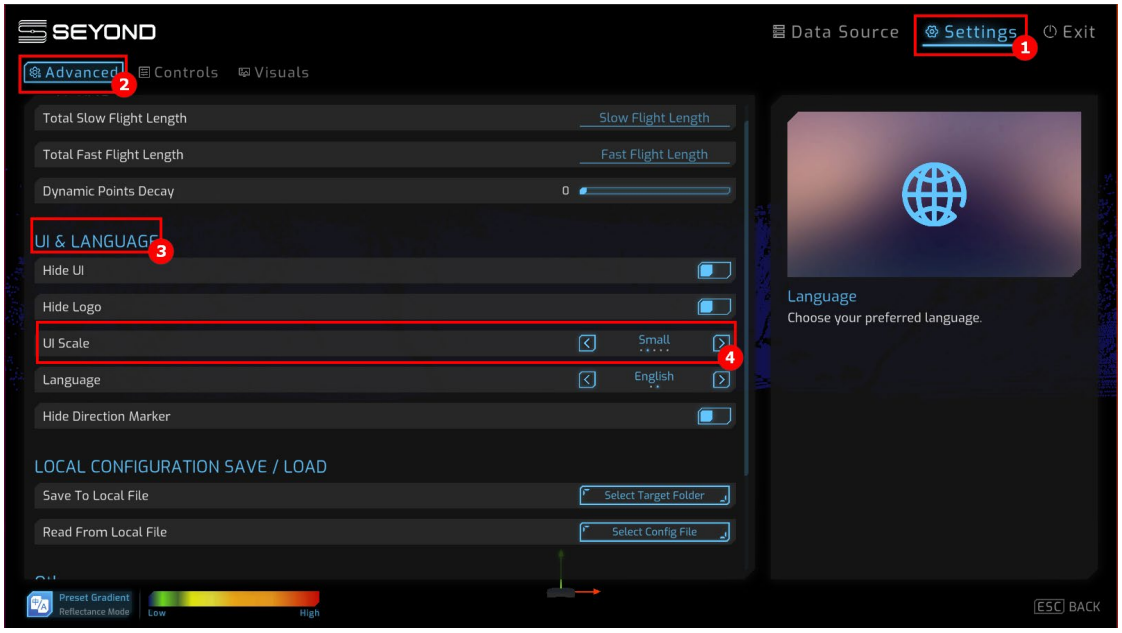
Table 9 Pixel Size Parameter description

Parameter	Description
Basic Pixel Size	Scale the size of all the pixels.
N-ROI Scale	Scale the pixel size in the non-ROI region
Distance Scale	Distance-dependent scale the point cloud based on origin distance

3.8 System configuration

3.8.1 Configure interface

1. Go to **Settings** > **Advanced** > **UI & LANGUAGE**.



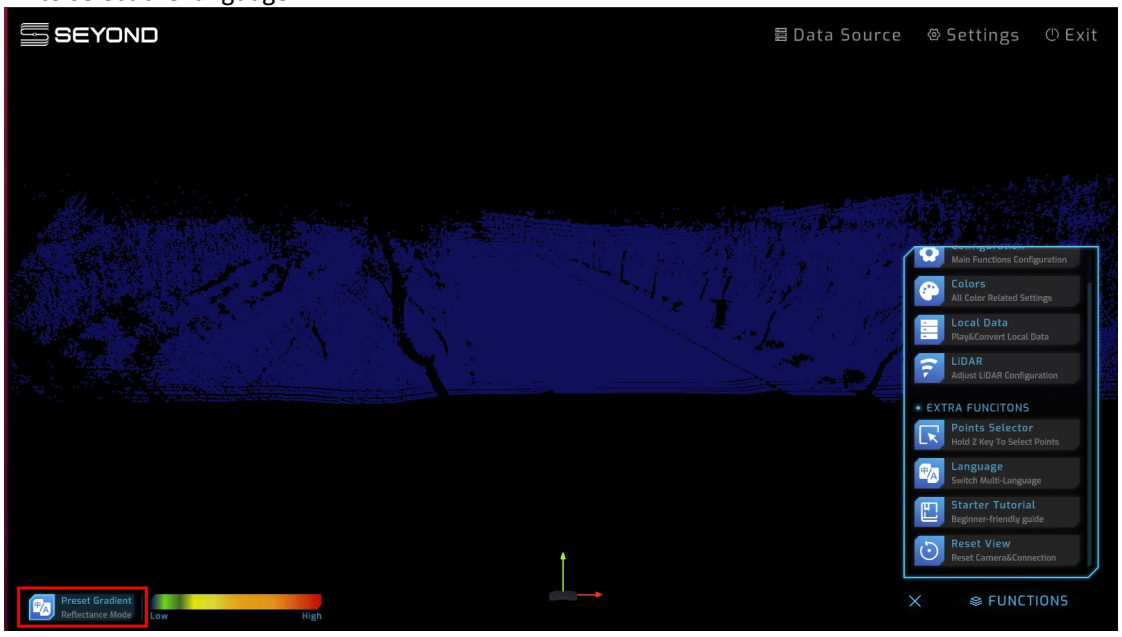
2. Change the interface scale according to the actual needs.

3.8.2 Select language

There are three ways to select the language.

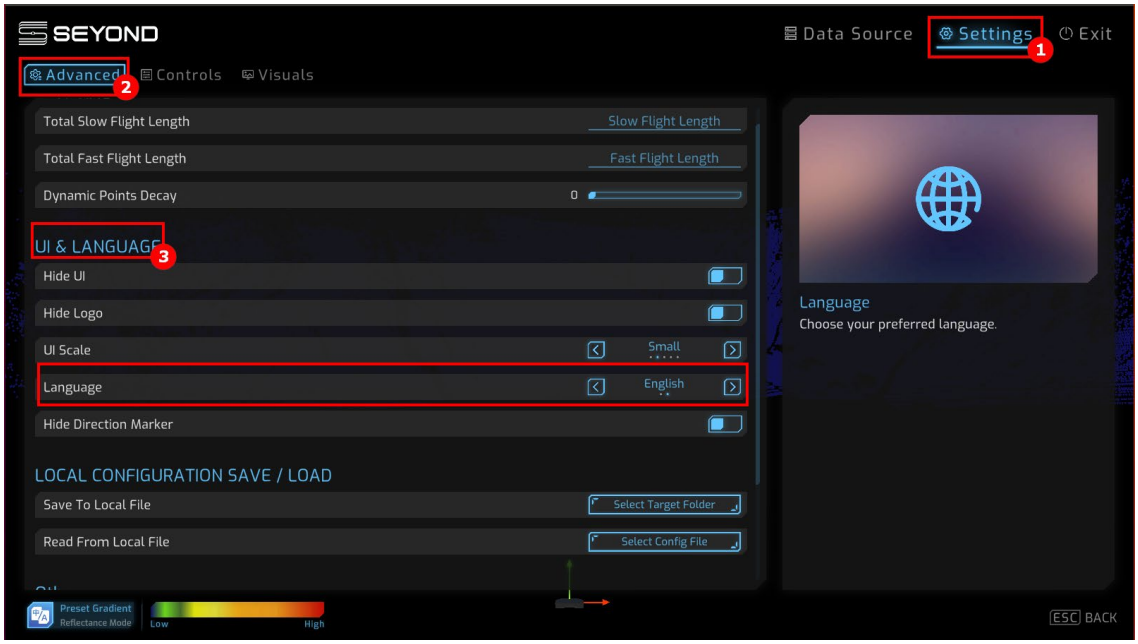
Method 1:

Click  to select the language.



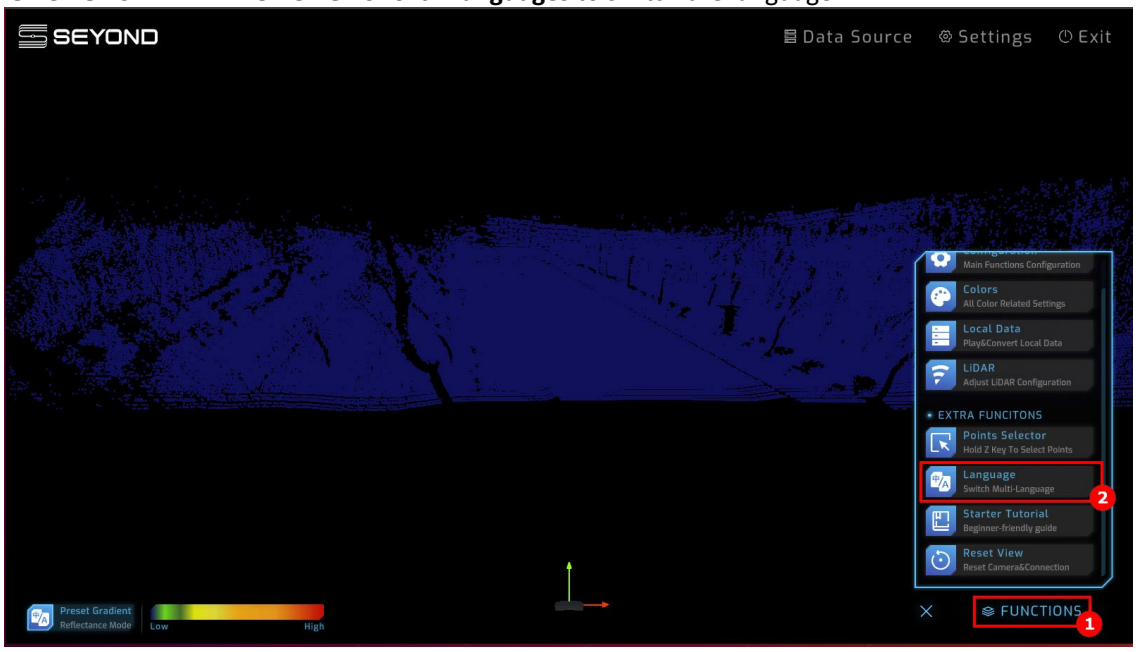
Method 2:

Go to **Settings** > **Advanced** > **UI & LANGUAGE** and select the language.



Method 3:

Go to **FUNCTIONS** > **EXTRA FUNCTIONS**. Click **Languages** to switch the language.

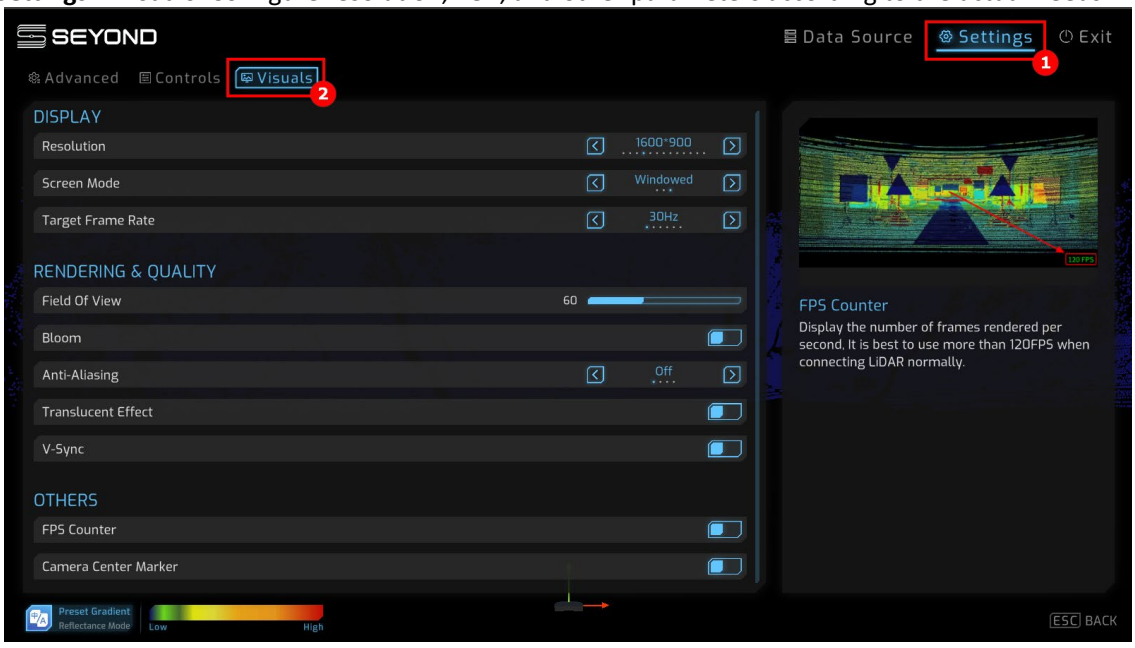


3.8.3 Control settings

Go to **Settings** > **Controls**. Set the controller sensitivity and the shortcut key according to the actual needs.

3.8.4 Set visual effect

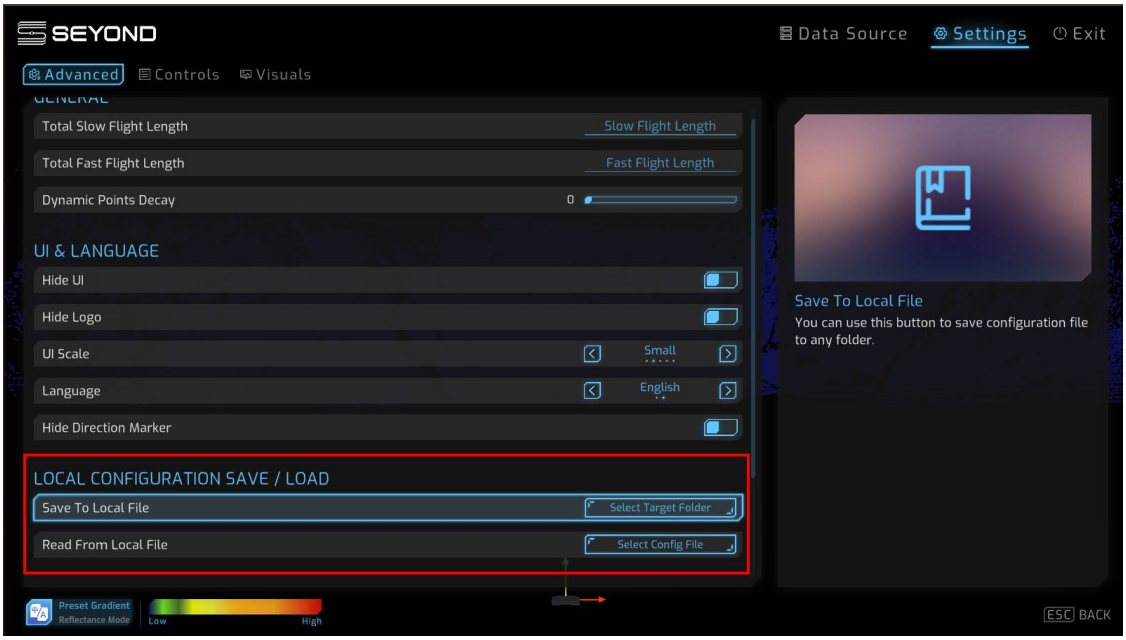
Go to **Settings** > **Visuals**. Configure resolution, FOV, and other parameters according to the actual needs.



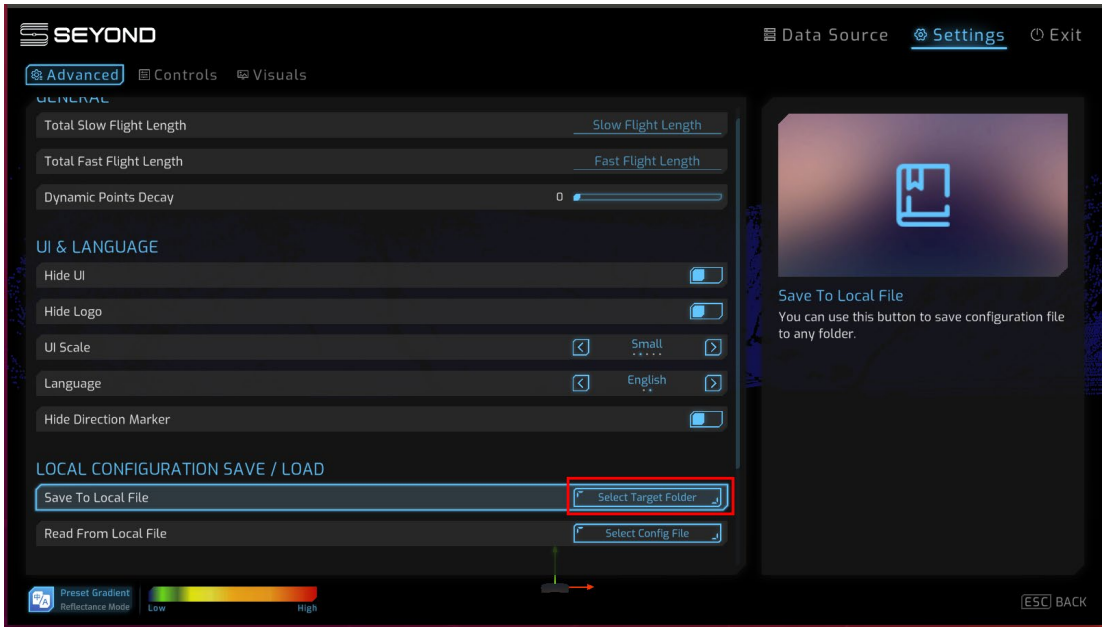
3.8.5 Export a configuration file

You can export the configuration and save the file locally.

1. Go to **Settings** > **Advanced** > **LOCAL CONFIGURATION SAVE/LOAD**.



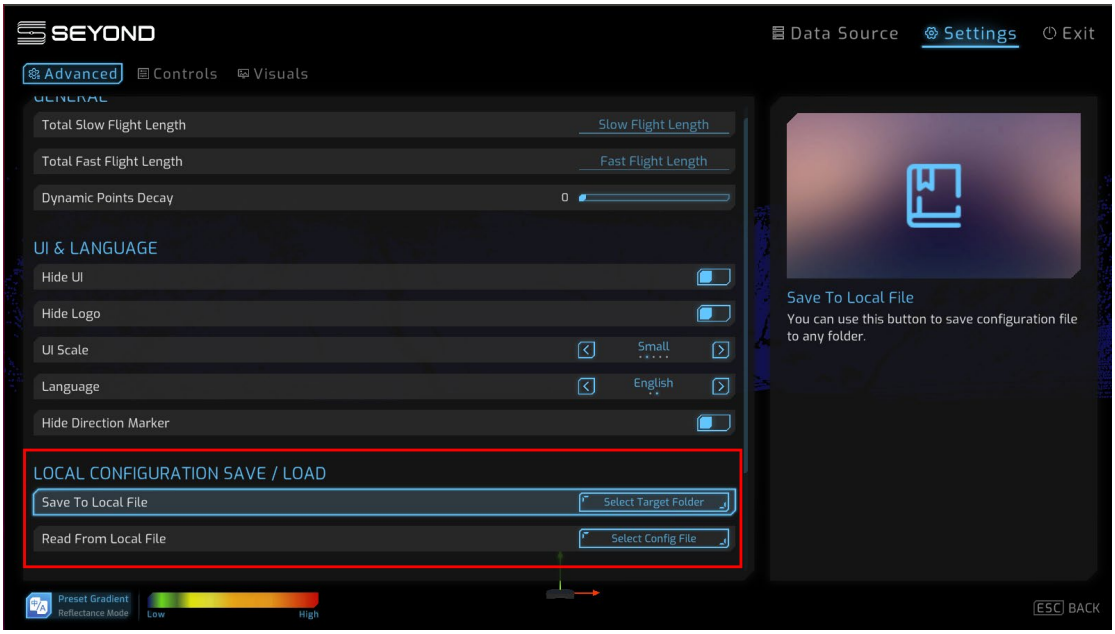
2. Click **Select Target Folder** to select the path of the configuration file.



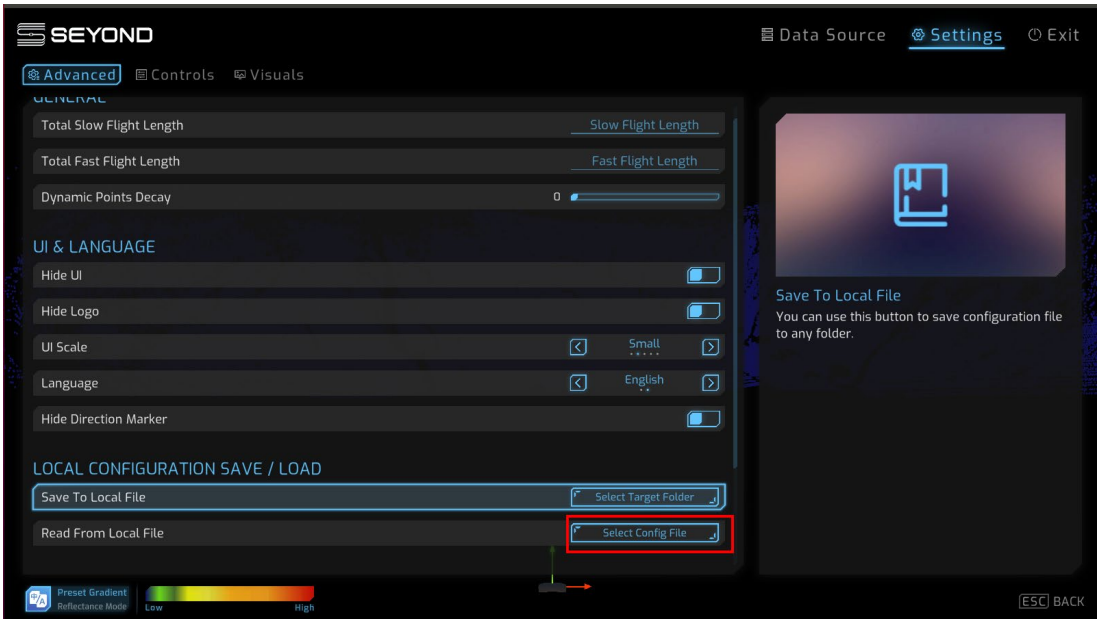
3.8.6 Import a configuration file

Import the configuration to MetaView.

1. Go to **Settings** > **Advanced** > **LOCAL CONFIGURATION SAVE/LOAD**.



2. Click **Select Config File** and select the configuration file to be imported.



Appendix A. Troubleshooting

A.1 Cannot connect to the LiDAR when communicating in UDP.

1. Connect the computer to the LiDAR.
2. Open the web browser. Enter the LiDAR IP address and port number in the address bar <IP Address>:<PORT> to access the ILA.

Note

The default LiDAR IP address is 172.168.1.10. By default, the ILA port number is 8675. The default ILA login address is 172.168.1.10:8675.

3. Follow the instructions below according to the ILA and MetaView performance.

- When there is a good connection between the LiDAR and the computer, but you have trouble accessing the ILA, please contact the Seyond staff to disable the LiDAR vlan and reboot the LiDAR.
- When you can access the ILA but not the MetaView, please contact the Seyond staff to check if the LiDAR port has been changed.
- When you can access the ILA and the MetaView but cannot obtain the point cloud status.
  i. Check the firewall settings of your computer.
  ii. Enable the LiDAR pcs.

A.2 Live point cloud status stutters.

The possible reason could be either the bad Ethernet connection or the inefficient computer settings.

1. Check if there is a good connection between your computer and the LiDAR. A wired connection is recommended due to the heavy volume of data exchange.
2. Check the computer settings and the current operating system in MetaView. The recommended computer settings are 11th Intel Core i7 + NVIDIA 30 serial or higher.

Note

When running MetaView for the Linux operating system on a virtual machine, abnormal Graphic card configuration may lead the incorrect rendering of the point cloud.

A.3 Computer stutters after startup MetaView and cannot connect to the LiDAR.

The possible reason could be the wireless network card and the wired network card are in the same network segment, so the computer stutters because of the routing exception.
You could set a new network address for the Wi-Fi or directly disable it.

A.4 Available format for point cloud playback.

The available formats are inno_pc, inno_pc_xyz, pcd(Binary/ASCII), pcap, bag, csv, record, etc.

A.5 Cannot start MetaView in Linux/ Mac operating system.

Please authorize the MetaView before startup.

- When using the Linux operating system.

  i. Open a new terminal.

  ii. Execute the following command to authorize the MetaView.

```
chmod 777 ./MetaView.x86_64
```

- When using the Mac operating system (the version should be 10.15 or higher), execute the following command to authorize the MetaView.

```
sudo xattr -r -d com.apple.quarantine <absolute path>
chmod -R 777 <absolute path>/Contents/MacOS/MetaView
```

A.6 Recording pcap files failure in Linux operating system.

1. Check the IP setting of the computer NIC.
2. Top the NIC connected to the LiDAR.

Note

You should remove the ARP cache or the DNS query cache in some situations.

3. Restart the network service.

A.7 Single color when displaying point cloud.

Please switch the rendering mode in **MetaView**.