

GeoSLAM Hub 6

Quickstart Guide



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GeoSLAM
Phone: + 44 (0)1949 831 814
Email: support@geoslam.com
Web: www.geoslam.com

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1. Software Installation and Licensing

This section provides instructions on how to install the Hub software bundle from GeoSLAM. It is valid for GeoSLAM Hub versions 6.0 and later. The software bundle can be obtained either from the USB flash drive supplied with the product or as a download directly from the GeoSLAM website. The software bundle comprises:

The software kit comprises of:

- 1 USB flash drive, containing;
 - GeoSLAM Hub Installation file - GeoSLAM-Hub-bundle-6.0.0.exe
 - Test data.
 - User guide.
 - Quick start guide.
 - Operation video demonstration.
 - Warranty, including activation certificate.

1.1 System Requirements

GeoSLAM Hub software will install and operate on PCs capable of running the operating systems listed below.

Windows 10 (32 & 64-bit)

The latest service packs should also be installed for the operating system.

Minimum

- Windows 10
- i7 6th Generation
- AMD Ryzen 7 (1700X)
- Integrated Graphics
- 16GB RAM
- 30GB free space
- SSD

Recommended

- Windows 10
- i7, i9 8th Generation or greater (higher clock speed)
- AMD Ryzen 7 (2700X)
- NVIDIA GTX 1060
- 32GB RAM
- 30GB free space
- SSD

1.2 Installing GeoSLAM Hub and Draw

1. From either the USB flash drive or from the directory to where the installer was downloaded, run the GeoSLAM-Hub-bundle-6.0.0.exe and follow the installation instruction prompts.
2. Select -> Yes at the User Account Controls popup if applicable.
3. Select -> Next to start the installation (Figure 1).

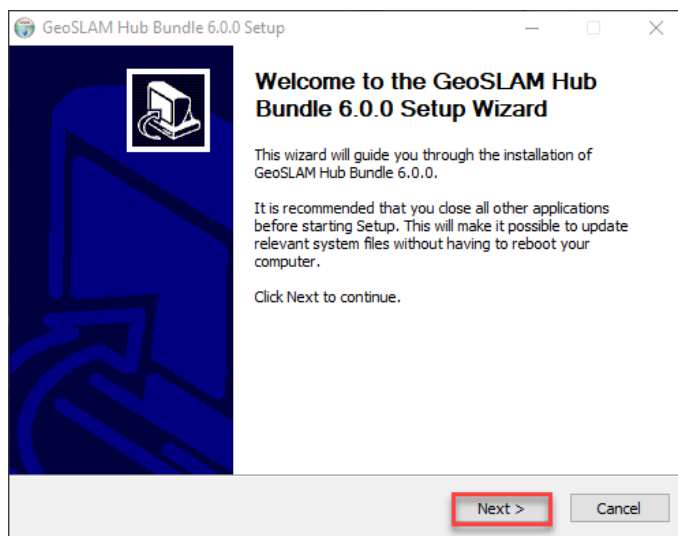


Figure 1. GeoSLAM Hub bundle installation dialog.

4. Check -> Select components to install from the Choose Components dialog (Figure 2).
 - a. GeoSLAM Hub.
 - b. GeoSLAM Draw.
5. Check -> **Select components to install** from the Choose Components dialog (Figure 2).
 - a. GeoSLAM Hub.
 - b. GeoSLAM Draw.

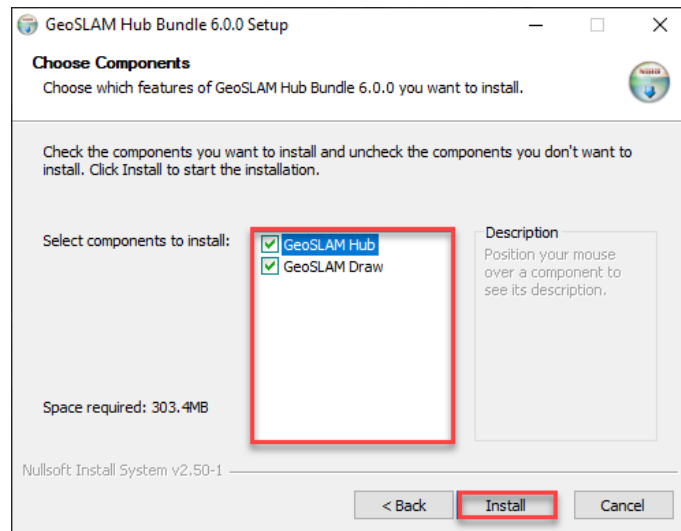


Figure 1. Choose Components dialog.

6. Select -> **Install** to begin the installation or **Cancel** to stop the installation.
7. The software will begin the installation of selected components of GeoSLAM Hub.

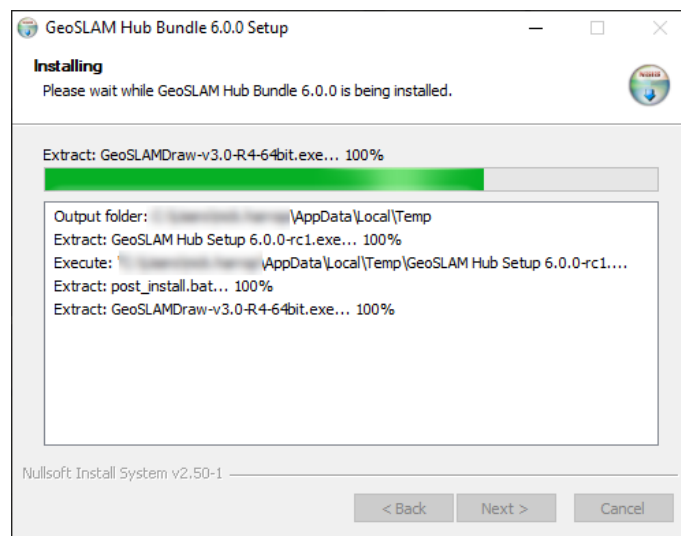


Figure 2. Hub installation.

8. When the Hub installation is complete, if selected the installation of GeoSLAM Draw will start.
9. Select -> installation language from the Select Setup Language dialog (Figure 4). Users have the option to choose:
 - c. English
 - d. German
 - e. Spanish
 - f. French
 - g. Russian
10. Select -> OK to continue.

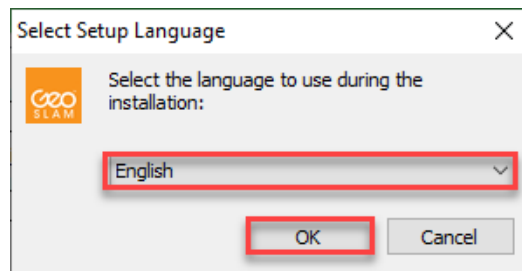


Figure 3. Setup Language dialog.

11. Check-> I accept the agreement from the License Agreement dialog (Figure 5).
12. Select -> **Next** to continue.



Note: Selecting I do not accept the agreement will prompt the user to cancel the installation.

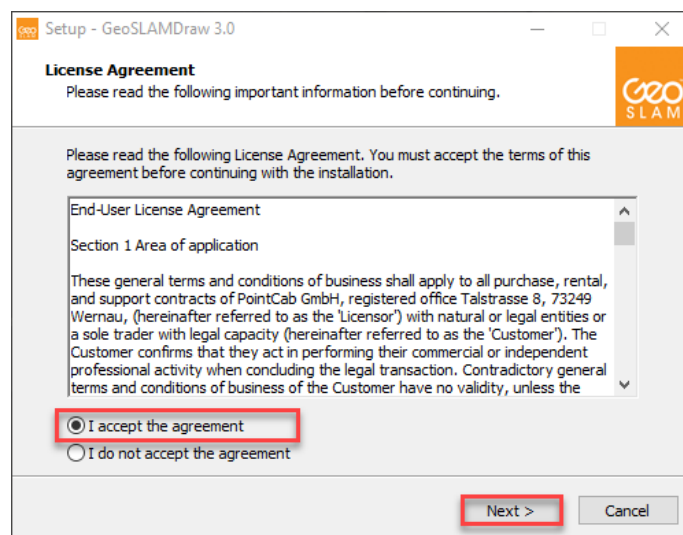


Figure 4. License Agreement dialog.

13. Select -> **Next** at the Select Destination Location dialog (Figure 6) to use the default installation directory, or
14. Select- > **Browse** to manually select another directory.

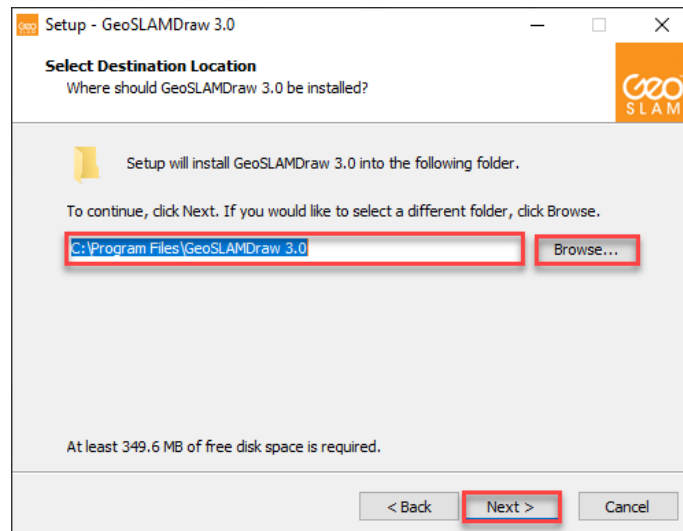


Figure 5. Select Destination Location folder selection dialog.

15. Check -> Select components from the Select Components dialog (Figure 7).
 - a. GeoSLAM Draw.
 - b. Faro SDK.
16. Select -> **Next** to continue.

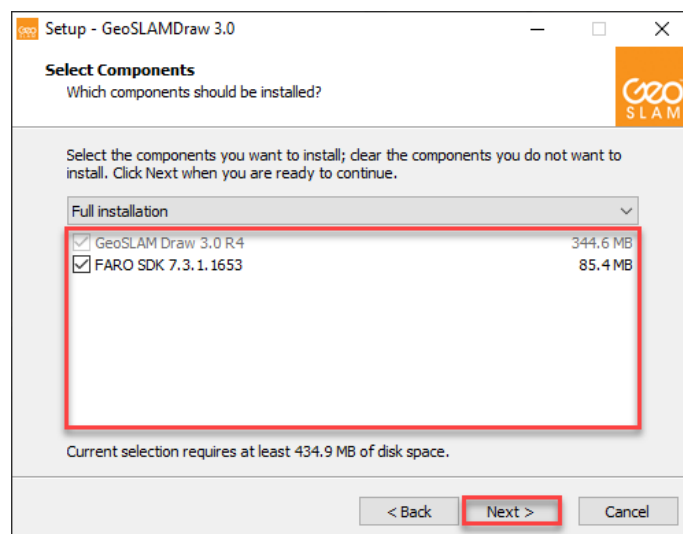


Figure 6. Select Component dialog for GeoSLAM Draw.

17. Select -> **Install** from the Setup – GeoSLAM Draw dialog (Figure 8) to begin the installation or Select -> **Back** to return to the previous screen and change the installation components.

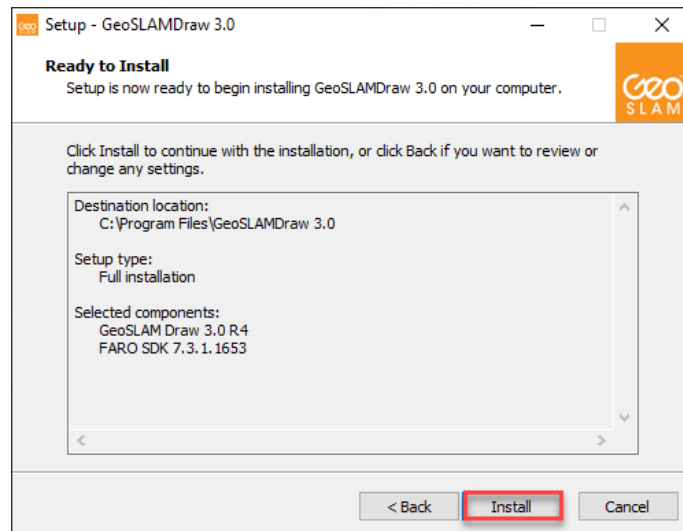


Figure 7. Setup - GeoSLAM Draw confirmation dialog.

18. Select -> **Finish** from the Setup dialog (Figure 9) when the installation is complete.

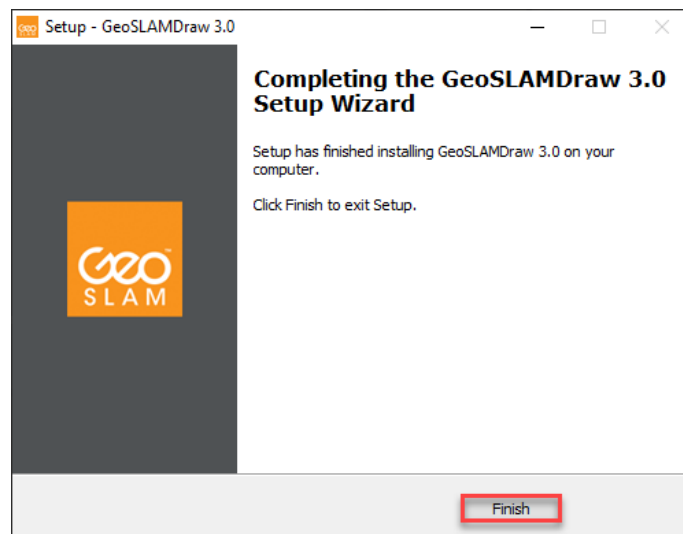


Figure 8. Setup completion confirmation dialog.

19. Once, GeoSLAM Draw is installed the user will be returned to the GeoSLAM Hub Bundle installation dialog (Figure 10).

20. Select -> **Next** to continue.

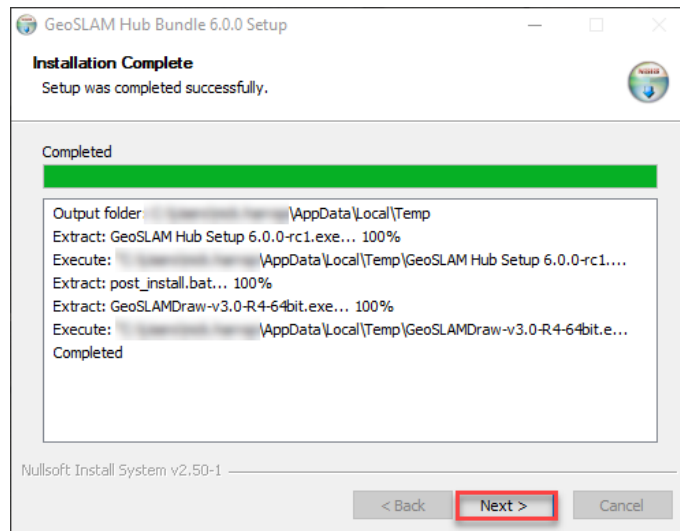


Figure 9. Installation Completion dialog.

21. Check -> **Start GeoSLAM Hub** (Figure 11) to automatically start Hub and then Select -> **Finish** to continue.

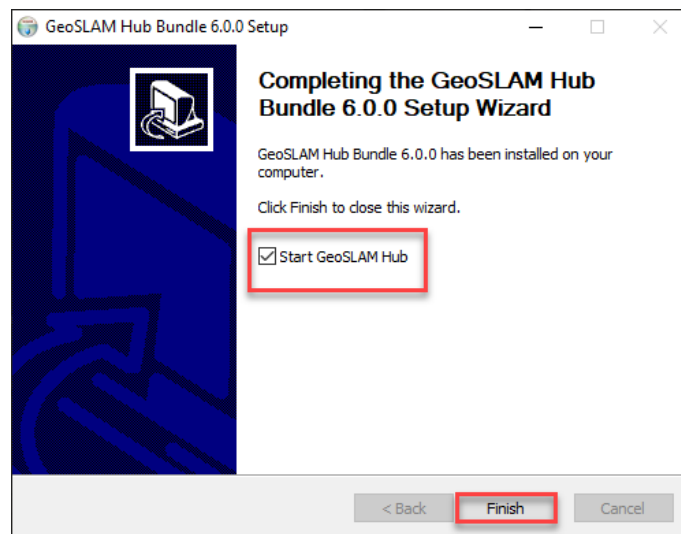


Figure 10. GeoSLAM Hub setup completion dialog.

Uninstalling GeoSLAM Hub

It is not required to uninstall previous versions of GeoSLAM Hub in order to upgrade to the latest version.

If you wish to remove GeoSLAM Hub, this can be done through Control Panel > Programs > Programs and Features. After selecting to uninstall GeoSLAM Hub you will be prompted to confirm. It will then remove all files and applications for GeoSLAM Hub.

1.3. License Activation

A simple user interface is provided within GeoSLAM Hub software to facilitate user activation with their Flexera licence.



GeoSLAM Hub is protected using Flexera software-based copy protection and licensing. A single licence key is provided with each system unless further seats or licenses are purchased. The licence key can either be activated directly via the internet or using a manual activation for offline computers.

1.4. Online Activation

This process is only applicable for PCs with an internet connection. This connection can be a temporary connection in order to communicate with the licensing database. Once, the software is activated the software does not need to maintain this connection and the internet connection can be disabled.

To complete Online Activation:

1. Open -> GeoSLAM Hub
2. Select -> **STATUS** menu to display the software Status window (Figure 12).
3. Select -> **Install License**. This will open the license Activation form (Figure 13).

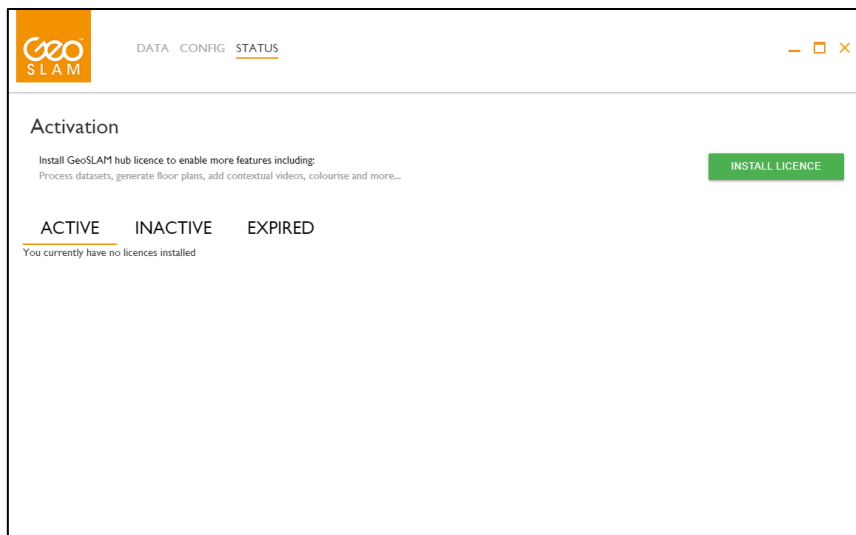
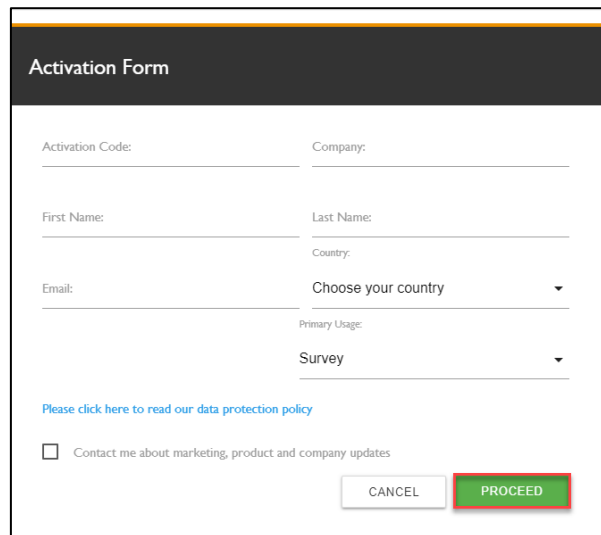


Figure 11. Status window.

4. From the Activation Form:
 - a. Enter -> **Activation Code** -> software activation code. This code can be found on the software certificate that is stored on the USB flash drive supplied with the product.
 - b. Enter -> **Company** -> user company name.
 - c. Enter -> **First Name** -> First name of contact at company.
 - d. Enter -> **Last Name** -> Last name of contact at company.

- e. Enter -> **Email** -> email address for the primary contact at the company.
 - f. Select -> **Country** -> from the dropdown list select the country where the company is located.
 - g. Select -> Primary Usage -> from the dropdown list select the primary usage of the product:
 - i. Survey
 - ii. Construction
 - iii. Engineering
 - iv. Facilities Management
 - v. Other
 - h. Select -> **Please click here to read out data protection policy** to review GeoSLAM's data protection policy.
 - i. Check -> **Contact me about marketing, product and company updates** to confirm that the user wishes to receive further communications from GeoSLAM.
5. Select -> **PROCEED** to continue.



The screenshot shows a web form titled "Activation Form". It has a dark header with the title in white. Below the header, there are several input fields arranged in two columns. The left column contains "Activation Code:", "First Name:", and "Email:". The right column contains "Company:", "Last Name:", "Country:" (with a dropdown arrow), and "Primary Usage:" (with a dropdown arrow). Below the "Primary Usage" dropdown, the word "Survey" is visible. Underneath the input fields, there is a blue link: "Please click here to read our data protection policy". Below the link is a checkbox with the text "Contact me about marketing, product and company updates". At the bottom right of the form, there are two buttons: a white "CANCEL" button and a green "PROCEED" button with a red border.

Figure 12. GeoSLAM Hub license Activation Form.

6. If a valid activation code has been entered, then the license type, activation code will be displayed (Figure 14).

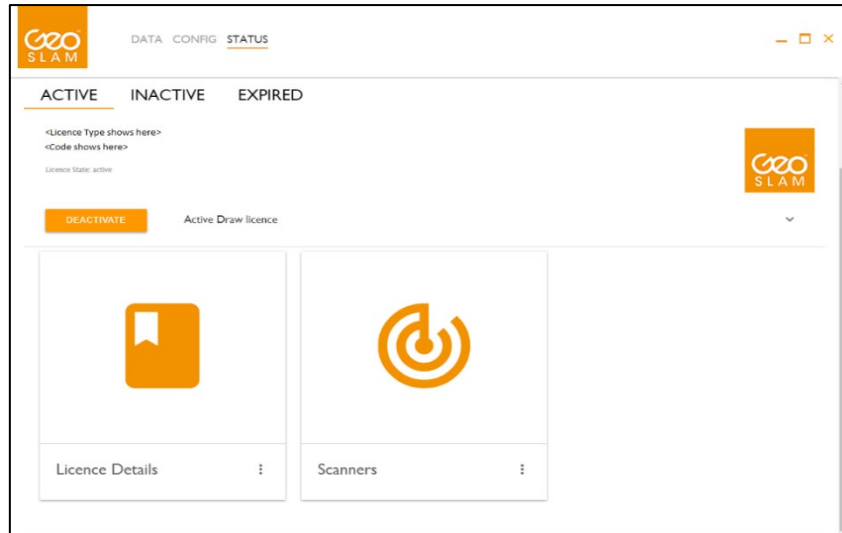


Figure 13. Status window following a successful activation.

1.5. Offline Activation



For more information and detailed instruction for offline activation please contact support@geoslam.com.

2. Getting Started

GeoSLAM Hub is a bespoke software designed for processing the raw data collected with the GeoSLAM Revo family of laser scanners.

- *ZEB Revo.*
- *ZEB Revo RT.*
- *ZEB Horizon.*
- *ZEB Pano*

2.1. File Formats

GeoSLAM Hub only support the import of *GeoSLAM* proprietary data format (*.geoslam). Video data recorded on the *ZEB Cam* are recorded in the MP4 video format.

Data type	Format	Format type
Input data format	.geoslam	Binary
Input camera data format	.mp4	Binary

Output data format	Laser	E57, LAS, LAZ, PLY, TXT	Binary, Ascii
	Trajectory	TXT, PLY	Ascii, Binary
	Video	MP4	Binary
	Video Stills	PNG, JPG, BMP	Binary
	Annotations	TXT	Ascii
	Reference Points	TXT	Ascii
	Processed GeoSLAM file	geoslam	Binary

Table 1. File formats used by GeoSLAM Hub.

2.2. Program Window

Opening the program will display the main screen. The main window is divided into 3 areas:

1. Menu bar.
2. Main interface window.
3. Program status bar.

Detailed descriptions for each of the 3 panels are described below.

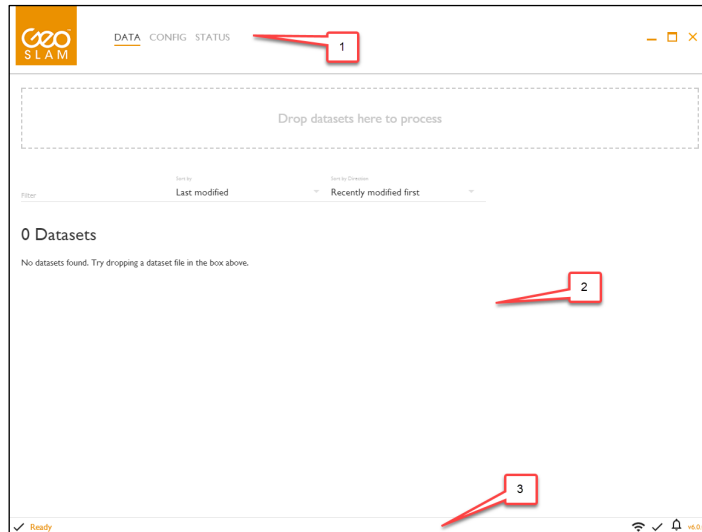


Figure 14. Main GeoSLAM Hub screen with no data loaded.

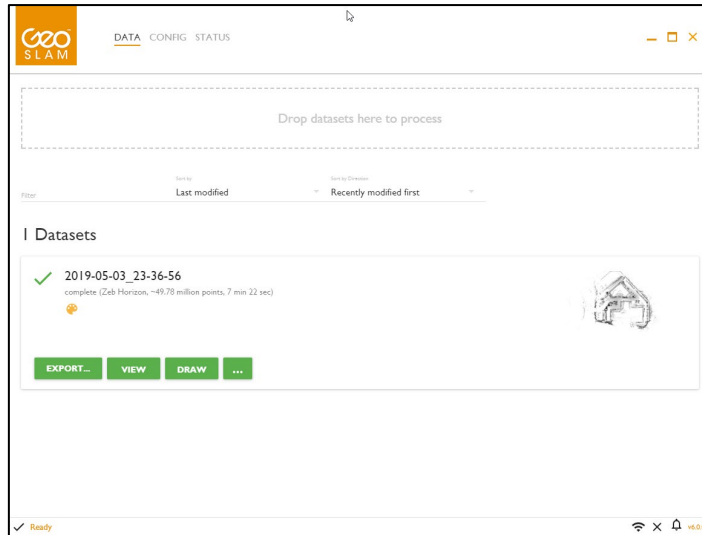


Figure 15. Main GeoSLAM Hub screen with a dataset loaded.

Number	Item	Description
1	Menu bar	Allows the user to select between the DATA, CONFIG and STATUS tabs.
2	Main Interface Window	Displays the interface for the tab selected in the menu bar.
3	Status Bar	Provides program status information including, internet connectivity, interface notification logs and software version identification.

Table 2. Program Interface components.

3. User Workflows

This section describes common workflows in the software. These are divided into basic and advanced workflows.

- Basic Workflow.
- Advanced Workflows:
 - Colourising.
 - Merging.

3.1. Basic Workflow

Processing Zeb Revo and Horizon data and exporting the pointcloud.

This workflow describes the steps necessary when processing a new dataset from the ZEB Revo and ZEB Horizon and then exporting the data.

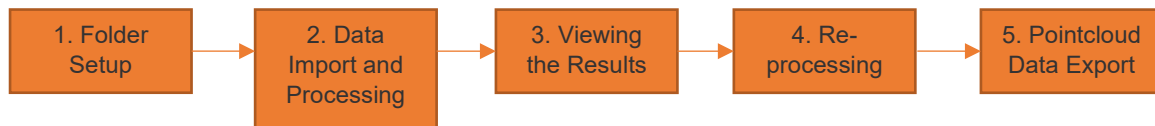
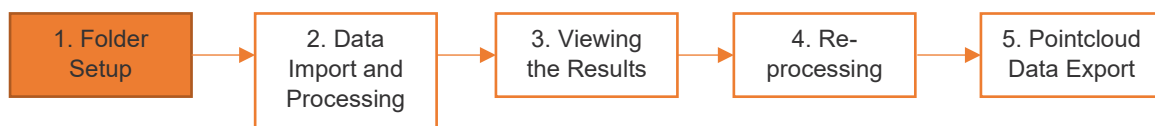


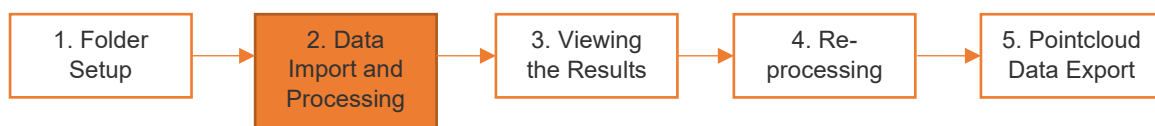
Figure 16. Basic Workflow: Creating a new Project and using manual data processing to create a report.

Step 1 – Folder Setup



1. Select -> **Advanced options** -> **Data Folder** -> **SET FOLDER**. This will open the Set the GeoSLAM HUB dataset folder dialog.
2. Select -> ... (browse). This will open a Windows Explorer dialog.
3. Select -> **Select Folder**, to continue.
4. Select -> **OK**, to continue. This will open the Confirm New Dataset Folder dialog (Figure 47).
5. Select -> **Confirm and Restart**, to continue.

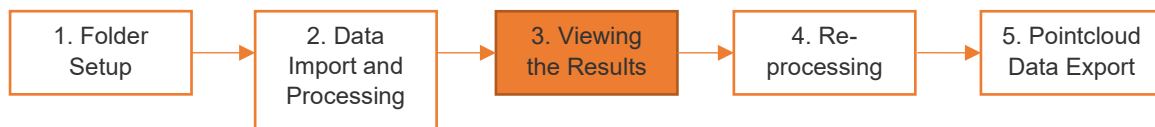
Step 2 – Data Import and Processing



1. Copy the raw data file(s) from the data logger and place them onto a USB flash drive following the instructions in the product hardware guide.
2. Select -> *.geoslam file(s) to process in the Windows Explorer window.
3. To import the file(s) either:
 - a. Drag -> *.geoslam file(s) -> GeoSLAM Hub -> **Drag datasets here to process**, or
 - b. Double-Click -> **Drag datasets here to process**. This will open a Windows file browser.
 - i. Browse to the required file(s).

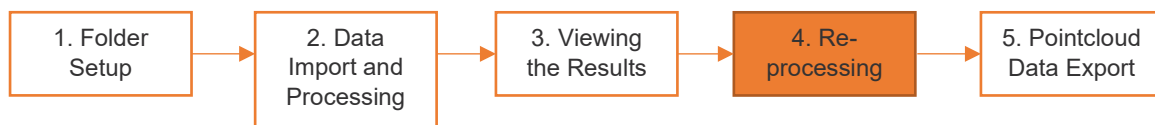
- ii. Select -> File(s) to import.
 - iii. Select -> **Open** to continue.
4. Data processing will begin automatically. Processing steps are:
- a. Data file(s) imported into the processing directory.
 - b. A processing subdirectory based on the file name is created where all processed data is stored.
 - c. Data is identified (ZEB Revo, Revo RT, Horizon).
 - d. Data processing begins (Local and Global processing) using the current processing parameters.
 - e. Processed data is saved.
 - f. Viewer data is generated.
 - g. Floors are automatically identified.

Step 3 – Viewing the Results



1. Select -> **View**. This will open GS View.
2. Pointclouds can be coloured by:
 - a. RGB (if video information has been added)
 - b. Intensity (for ZEB Horizon data only)
 - c. Intensity gradient (for ZEB Horizon data only)
 - d. Elevation (relative to data origin)
 - e. Single colour.
3. Analyse the data to identify artefacts in the point cloud.
 - a. **Rotate** -> Holding down the left mouse button and dragging will rotate the comparison scan.
 - b. **Pan View** -> Holding down the right mouse button will pan the view.
 - c. **Zoom View** -> Mouse Wheel Fwd and Rev.
 - d. **Change Rotation Pivot Point** -> Double-Click.
 - e. **Bounding Box** -> Double-Click black bounding box.
4. If errors are seen in the data proceed to Step 4, otherwise proceed to Step 5.

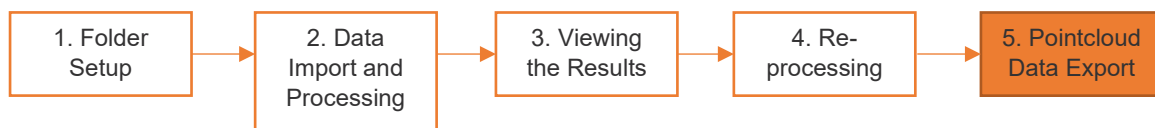
Step 4 – Reprocessing



1. Select -> **Other** -> **Reprocess**. This will open the Processing Options.
2. Scroll -> **Local**.
3. Users have the option to alter:

- a. Convergence threshold.
 - b. Window size.
 - c. Voxel density.
 - d. Rigidity
 - e. Maximum Range (Metres).
 - f. Modify Bounding Box.
 - g. Large Range Filter Slope
 - h. Prioritise laser constraints.
 - i. End processing early.
4. Select -> **Process**, to begin reprocessing of the data.
 5. A pop-up window will be displayed in the status bar when data processing is complete.
 6. Select -> **View** to open GS View. Analyse the data to determine the effect of altering the processing parameters.
 7. Repeat these steps until either the issue is resolved or until no further improvements can be made.

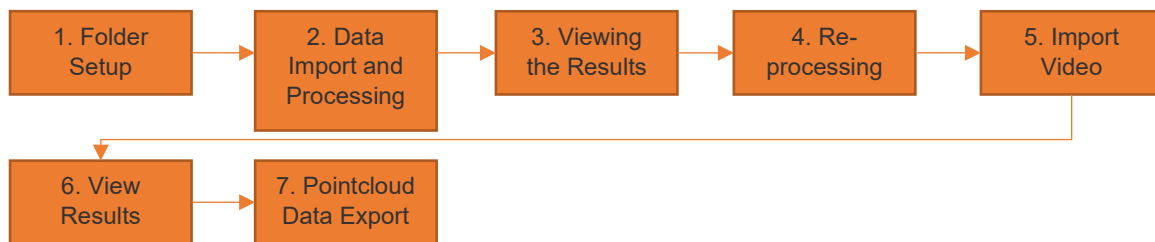
Step 5 – Pointcloud Data Export



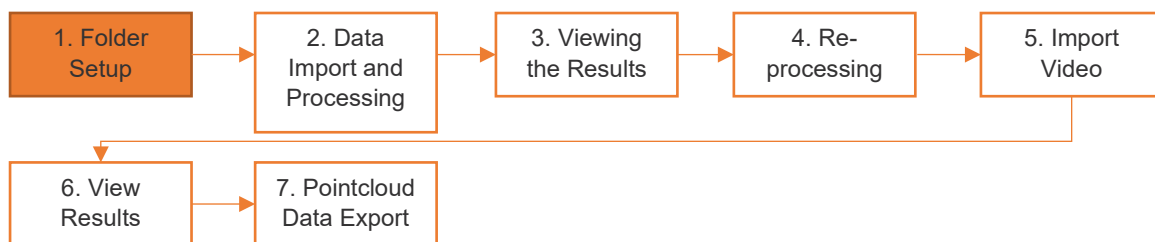
1. Select -> **Dataset** -> **Export** -> **Pointclouds**. This will open the Export Pointcloud dialog.
 - a. Select -> **Format** -> select file format from the dropdown menu.
 - b. Input ->
 - i. **% of Points**, and / or
 - ii. **SP Dec (mm)**.
 - c. Input -> **Point Colour**.
 - d. Input -> **Timestamp**.
 - e. Check -> **Smooth**, if required.
2. Select -> **ADD**, to set the output parameters. The chosen parameters will be displayed in the dialog.
3. Select -> **CHOOSE FOLDER LOCATION** and browse to the output data folder.
4. Select -> **Select Folder**, to continue.
5. Select -> **EXPORT**, to begin the data export.
6. A pop-up window will be displayed in the status bar when export is complete.

3.2. Advanced Workflow 1

Colouring Zeb Revo and Horizon data and exporting the pointcloud.

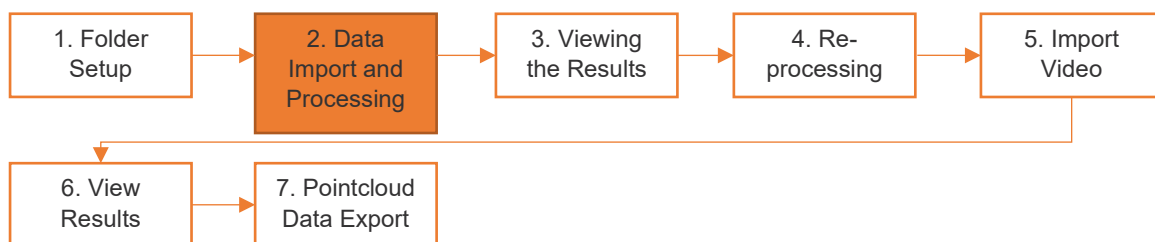


Step 1 – Folder Setup



1. Select -> **Advanced options** -> **Data Folder** -> **SET FOLDER**. This will open the Set the GeoSLAM HUB dataset folder dialog.
2. Select -> ... (browse). This will open a Windows Explorer dialog.
3. Select -> **Select Folder**, to continue.
4. Select -> **OK**, to continue. This will open the Confirm New Dataset Folder dialog (Figure 47).
5. Select -> **Confirm and Restart**, to continue.

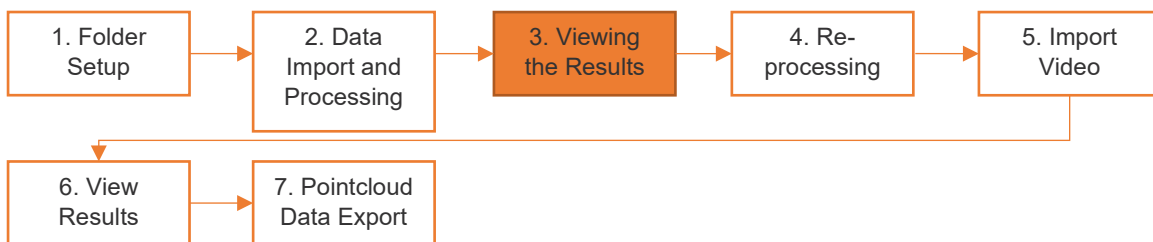
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3. To import the file(s) either:
 - a. Drag -> *.geoslam file(s) -> GeoSLAM Hub -> **Drag datasets here to process**, or
 - b. Double-Click -> **Drag datasets here to process**. This will open a Windows® file browser.
 - i. Browse to the required file(s).
 - ii. Select -> File(s) to import.

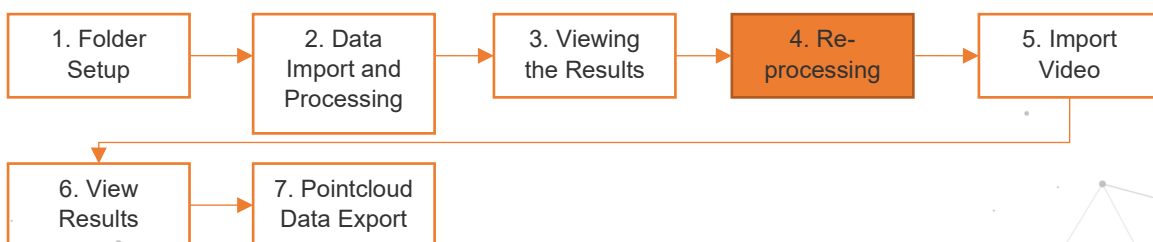
- iii. Select -> **Open** to continue.
- 4. Data processing will begin automatically. Processing steps are:
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 - b. A processing subdirectory based on the file name is created where all processed data is stored.
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 - e. Processed data is saved.
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Step 3 – Viewing the Results



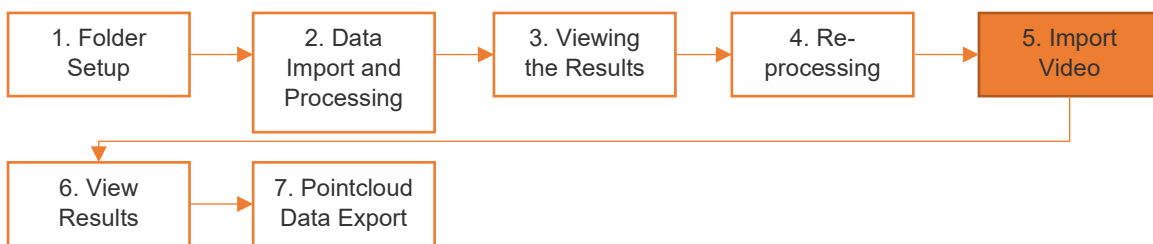
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 - a. RGB (if video information has been added)
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 - c. Intensity gradient (for ZEB Horizon data only)
 - d. Elevation (relative to data origin)
 - e. Single colour.
3. Analyse the data to identify artefacts in the point cloud.
 - a. **Rotate** -> Holding down the left mouse button and dragging will rotate the comparison scan.
 - b. **Pan View** -> Holding down the right mouse button will pan the view.
 - c. **Zoom View** -> Mouse Wheel Fwd and Rev.
 - d. **Change Rotation Pivot Point** -> Double-Click.
 - e. **Bounding Box** -> Double-Click black bounding box.
4. If errors are seen in the data proceed to Step 4, otherwise proceed to Step 5.

Step 4 – Reprocessing



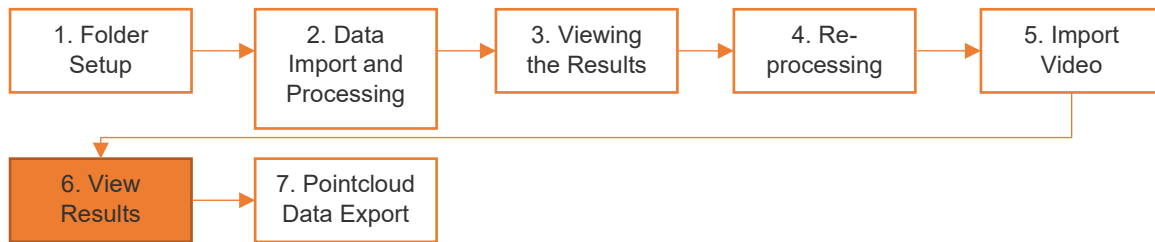
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2. Scroll -> **Local**.
3. Users have the option to alter:
 - a. Convergence threshold.
 - b. Window size.
 - c. Voxel density.
 - d. Rigidity
 - e. Maximum Range (Metres).
 - f. Modify Bounding Box.
 - g. Large Range Filter Slope
 - h. Prioritise laser constraints.
 - i. End processing early.
4. Select -> **Process**, to begin reprocessing of the data.
5. A pop-up window will be displayed in the status bar when data processing is complete.
6. Select -> **View** to open GS View. Analyse the data to determine the effect of altering the processing parameters.
7. Repeat these steps until either the issue is resolved or until no further improvements can be made.

Step 5 – Import Video



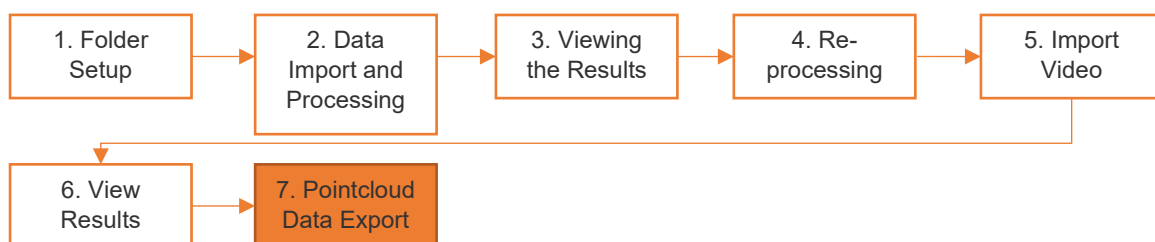
1. Select -> **Other** -> **Add Video**. This will open the Add Video dialog.
2. Select -> **CHOOSE VIDEO** and browse to the folder containing the raw video file.
3. Select -> **Select Folder**, to continue.
4. Processing will automatically start.
 - a. Data file is copied to the processing directory.
 - b. Data file imported into the dataset.
 - c. Colourisation processing.
 - d. Save colourised pointcloud file
 - e. Save individual frames as image files in a newly created \thumbnails folder in the processing directory.
5. A pop-up window will be displayed in the status bar when export is complete.

Step 6 – View Results



1. Select -> **View**. This will open GS View.
2. Select -> **Point Colour** -> **RGB**.

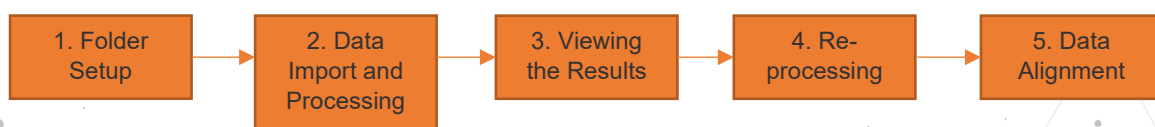
Step 7 – Pointcloud Data Export



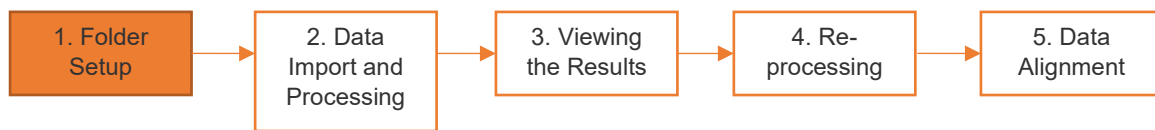
1. Select -> **Dataset** -> **Export** -> **Pointclouds**. This will open the Export Pointcloud dialog.
 - a. Select -> **Format** -> select file format from the dropdown menu.
 - b. Input ->
 - i. **% of Points**, and / or
 - ii. **SP Dec (mm)**.
 - c. Input -> **Point Colour**.
 - d. Input -> **Timestamp**.
 - e. Check -> **Smooth**, if required.
2. Select -> **ADD**, to set the output parameters. The chosen parameters will be displayed in the dialog.
3. Select -> **CHOOSE FOLDER LOCATION** and browse to the output data folder.
4. Select -> **Select Folder**, to continue.
5. Select -> **EXPORT**, to begin the data export.
6. A pop-up window will be displayed in the status bar when export is complete.

3.3. Advanced Workflow 2

Aligning Zeb Revo and Zeb Horizon datasets.

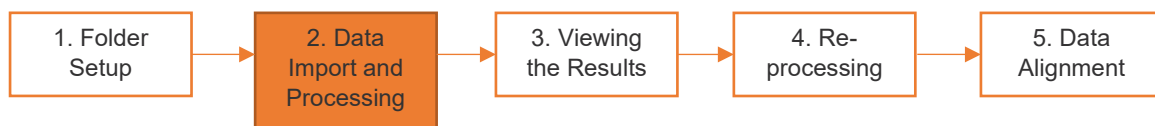


Step 1 – Folder Setup



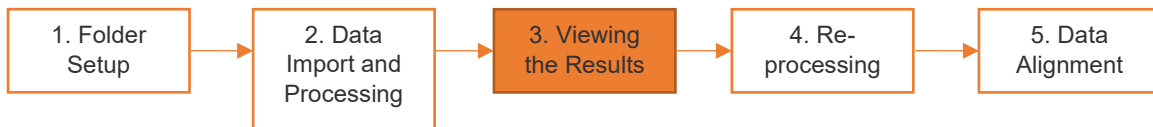
1. Select -> **Advanced options** -> **Data Folder** -> **SET FOLDER**. This will open the Set the GeoSLAM HUB dataset folder dialog.
2. Select -> ... (browse). This will open a Windows Explorer dialog.
3. Select -> **Select Folder**, to continue.
4. Select -> **OK**, to continue. This will open the Confirm New Dataset Folder dialog (Figure 47).
5. Select -> **Confirm and Restart**, to continue.

Step 2 – Data Import and Processing



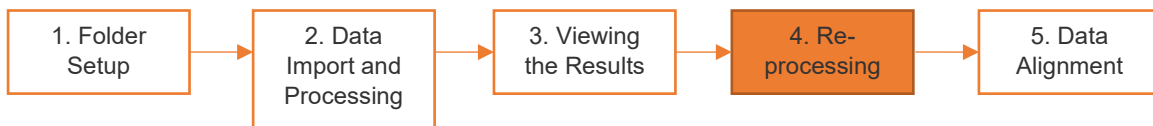
1. Copy the raw data file(s) from the data logger and place them onto a USB flash drive following the instructions in the product hardware guide.
2. Select -> *.geoslam file(s) to process in the Windows Explorer window.
3. To import the file(s) either:
 - a. Drag -> *.geoslam file(s) -> GeoSLAM Hub -> **Drag datasets here to process**, or
 - b. Double-Click -> **Drag datasets here to process**. This will open a Windows file browser.
 - i. Browse to the required file(s).
 - ii. Select -> File(s) to import.
 - iii. Select -> **Open** to continue.
4. Data processing will begin automatically. Processing steps are:
 - a. Data file(s) imported into the processing directory.
 - b. A processing subdirectory based on the file name is created where all processed data is stored.
 - c. Data is identified (ZEB Revo, Revo RT, Horizon).
 - d. Data processing begins (Local and Global processing) using the current processing parameters.
 - e. Processed data is saved.
 - f. Viewer data is generated.
 - g. Floors are automatically identified.

Step 3 – Viewing the Results



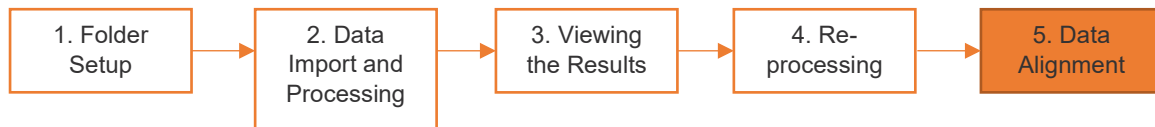
1. Select -> **View**. This will open GS View.
2. Pointclouds can be coloured by:
 - a. RGB (if video information has been added)
 - b. Intensity (for ZEB Horizon data)
 - c. Intensity gradient (for ZEB Horizon data only)
 - d. Elevation (relative to data origin)
 - e. Single colour.
3. Analyse the data to identify artefacts in the point cloud.
 - a. **Rotate** -> Holding down the left mouse button and dragging will rotate the comparison scan.
 - b. **Pan View** -> Holding down the right mouse button will pan the view.
 - c. **Zoom View** -> Mouse Wheel Fwd and Rev.
 - d. **Change Rotation Pivot Point** -> Double-Click.
 - e. **Bounding Box** -> Double-Click black bounding box.
4. If errors are seen in the data proceed to Step 4, otherwise proceed to Step 5.

Step 4 – Reprocessing



1. Select -> **Other** -> **Reprocess**. This will open the Processing Options.
2. Scroll -> **Local**.
3. Users have the option to alter:
 - a. Convergence threshold.
 - b. Window size.
 - c. Voxel density.
 - d. Rigidity
 - e. Maximum Range (Metres).
 - f. Modify Bounding Box.
 - g. Large Range Filter Slope
 - h. Prioritise laser constraints.
 - i. End processing early.
4. Select -> **Process**, to begin reprocessing of the data.
5. A pop-up window will be displayed in the status bar when data processing is complete.
6. Select -> **View** to open GS View. Analyse the data to determine the effect of altering the processing parameters.
7. Repeat these steps until either the issue is resolved or until no further improvements can be made.

Step 5 – Data Alignment



1. Select -> **Merge**.
2. Check -> **Dataset** of the dataset 1
3. Check -> **Dataset** of the dataset 2.
4. Select -> **Start Merge** to start the aligning process and open the aligning interface.
5. Manual Coarse Scan Alignment.
 - a. Select -> **Scan**, to select the comparison scan.
 - b. Select -> **Top** view.
 - c. Select -> **Complexity** -> scan dependent (typically 50%).
 - d. Select -> **Choose file**, to open a Windows Explorer dialog and browse to the directory to save the aligned data files.
 - i. Select -> **Select Folder**, to set the output folder.
 - e. Left-Click and Hold -> to rotate the comparison scan and align it with the reference scan.
 - f. Right-Click and Hold -> to move and fine align the scans.
 - g. Select -> **Front** view.
 - h. Right-Click and Hold -> to move and fine align the scans.
 - i. Select -> **Side** view.
 - j. Right-Click and Hold -> to move and fine align the scans.
 - k. Repeat these steps until the scans are as closely aligned as possible.
6. Automatic Fine Scan Alignment.
 - l. Select -> **Start Merge**, to start the fine alignment process. The alignment interface window will close, and the alignment process will automatically start (Figure 25).
7. When the merge process is complete, the newly created output files are automatically stored in the selected output directory.