



# Z CAM WonderStitch User Guide

Version 0.54

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# 1.0 General Information

Z CAM WonderStitch is an advance 360 VR stitching software solution, designed for Z CAM professional VR cameras. With a few simple selections in the setting menu, Z CAM WonderStitch automatically generates equirectangular video or still image output. Advanced features are also made available to meet professional requirements.

Please note that in order to use Z CAM WonderStitch, a valid license shall be obtained, either paid or free (for different tiers of features), on a per camera basis. Z CAM WonderStitch can only stitch footage captured by a properly licensed Z CAM professional VR camera. It can be run on multiple computers though.

# 2.0 Computer Requirements

Please refer to the below requirements in order to run Z CAM WonderStitch properly:

- Windows 10
- For 4K or 6K output resolution, 8GB RAM or higher;  
For 8K output resolution, 16G RAM or higher
- CPU must be multicores,3.0GHz or higher
- GPU acceleration is currently supported on Nvidia CUDA GPUs:
  - Compute Capability must be 5.0 or higher
  - GPU memory must be more than 4GBTo verify your GPU compute capability, please check this link:  
<https://developer.nvidia.com/cuda-gpus>  
For example, the supported GPUs are GTX1080, GTX980 and so on.  
\* The OPENGL acceleration(For AMD GPUs) will be available in the next version.

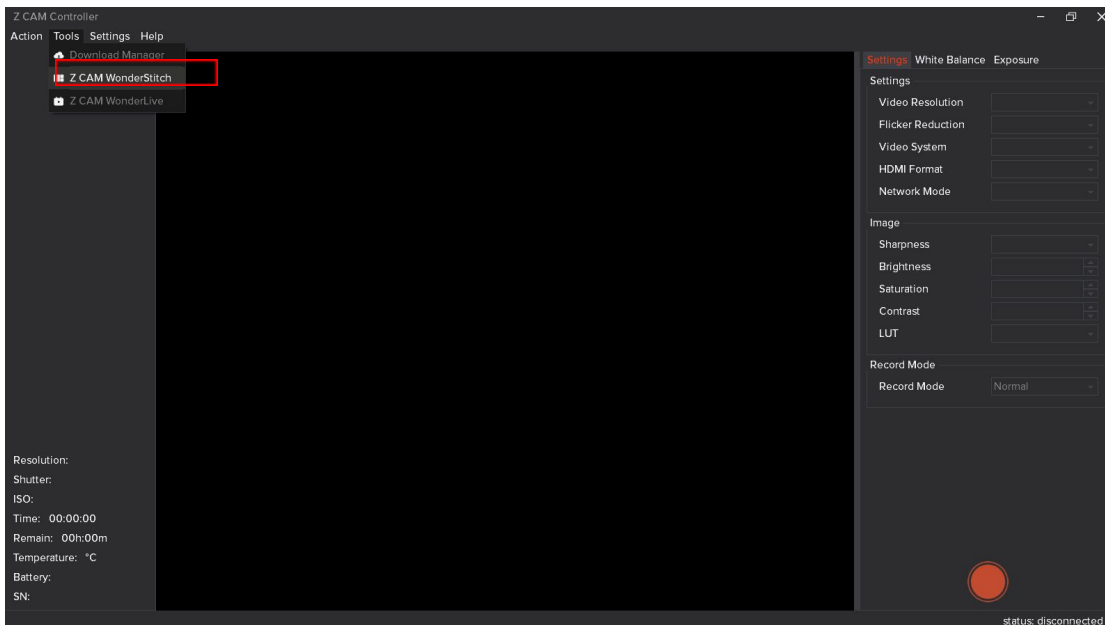
## 3.0 Setup Procedures

1. Double click the setup exe file.
2. Click the **Next** button.
3. Review the license terms, click “**I accept the terms of the License Agreement**” and then the **Next** button to continue should you agree.
4. Select the components you need and then click **Install** to setup. You may also keep the default configurations.
5. Wait for the installation process to complete.
6. Click the **Finish** button.

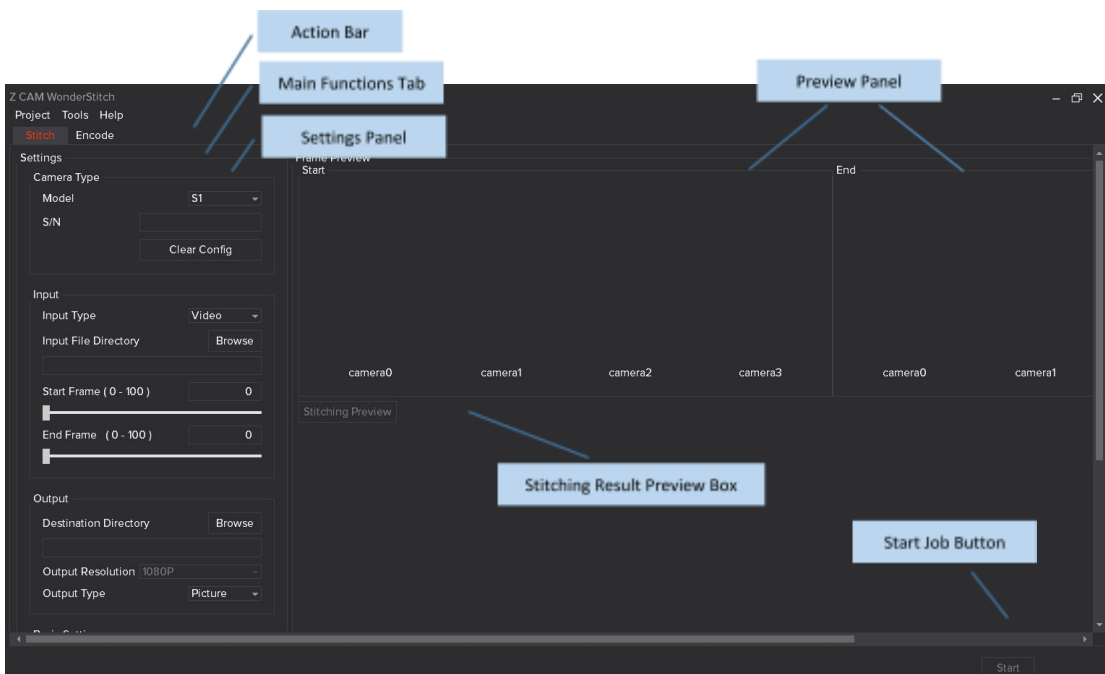
## 4.0 WonderStitch Introduction

### 4.1 Enter WonderStitch Panel

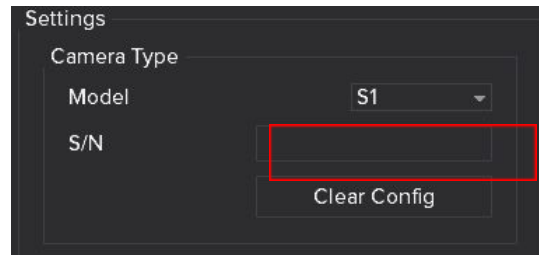
From the Z CAM Controller main menu, click **Tools** button, select **Z CAM WonderStitch** from the drop-down menu.



WonderStitch Panel has two tabs, **Stitch tab** for video or still image stitching, and **Encode tab** for encoding PNG files to video.



First of all, input the camera ID and select the corresponding **Camera Type**.



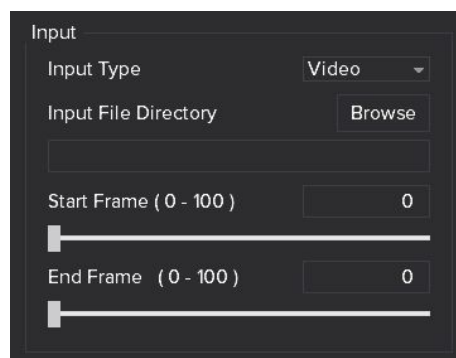
There are three license types for different tiers of features:

- **Full License** : Optical Flow - Full, Optical Flow - Hybrid , Express Mode. all at full resolution.
- **Lite License** : Optical Flow - Full, at 1080p resolution. Optical Flow - Hybrid & Express Mode at full resolution.
- **Free Trial License** : Optical Flow - Full & Optical Flow - Hybrid at 1080p resolution. Express Mode at full resolution.

## 4.2 Stitching Videos

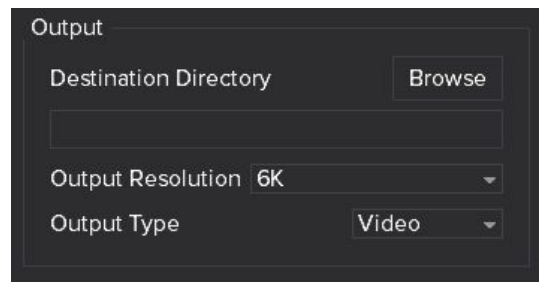
1. Set the **Input** preferences .

- Select the **Input Type** to **Video**.
- Click **Browse** button to select the Input File Directory folder path.
- Set your desired **Start Frame** and **End Frame** number, which determines the start and end position of the stitching.

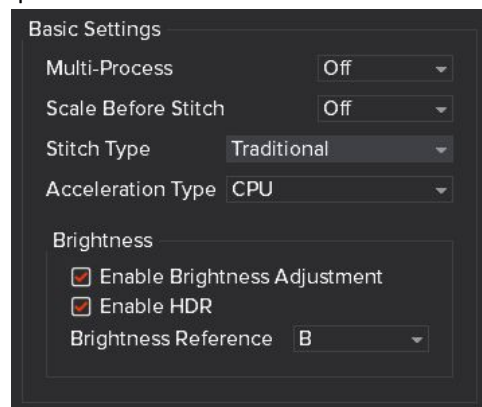


2. Set the **Output** preferences.

- Click **Browse** button to select the Destination Directory folder path.
- Select the desired **Output Resolution**.
- Select the desired **Output Type**, either **Video** or **Still Image**.
  - Video, video output file to be saved in the Destination Directory.
  - Photo, all stitched equirectangular images in PNG format to be saved in the Destination Directory.



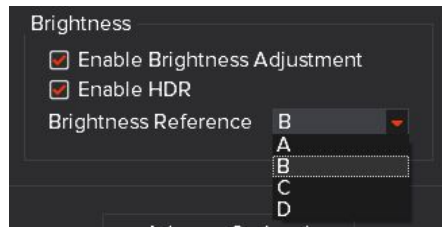
3. Set the **Basic Settings** preferences.



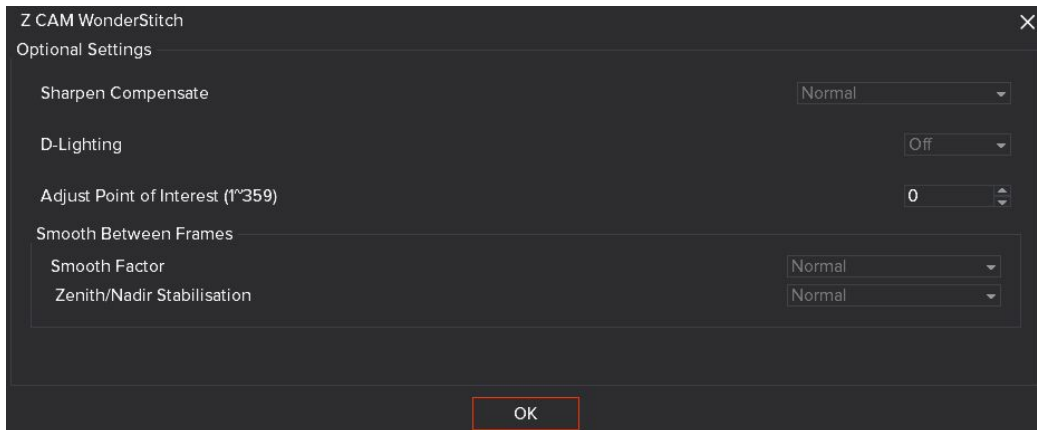
- **Stitch Engine**, there are two selections currently, **CPU** or **CUDA (Nvidia)**. If your GPU meets the software requirements, **CUDA(Nvidia)** item would be shown.
  - **CPU** is primary stitch engine
  - **CUDA (Nvidia)** stitch engine type is much faster than CPU, acceleration is according to the GPU class.
- **Stitch Type**, currently support three types: **Optical Flow - Full**, **Optical Flow - Hybrid** and **Express Mode**
  - **Optical Flow - Full** has the best stitching quality, but it is relatively slower.
  - **Optical Flow- Hybrid**, mix of optical flow and Express Mode, good quality stitching and relatively fast.
  - **Express Mode** is the fastest and delivers decent stitching quality.

Select the **Stitch Type** according to user cases.

- **Scale Before Stitch**, frames will be scaled down according to output resolution prior to stitching, resulting in shorter processing time.
- **Multi-Process**, this is only applicable when **Stitch Engine** is **CPU**.
  - When it's **on**, it will utilize the maximum performance of your computer.
  - When it's **off**, you can continue to perform some minimal tasks on the computer during the stitching.
- **Brightness Setting**
  - Click to enable brightness adjustment.
  - Click to enable HDR once the above is enabled.
  - Select any one of A, B, C or D as the brightness reference.

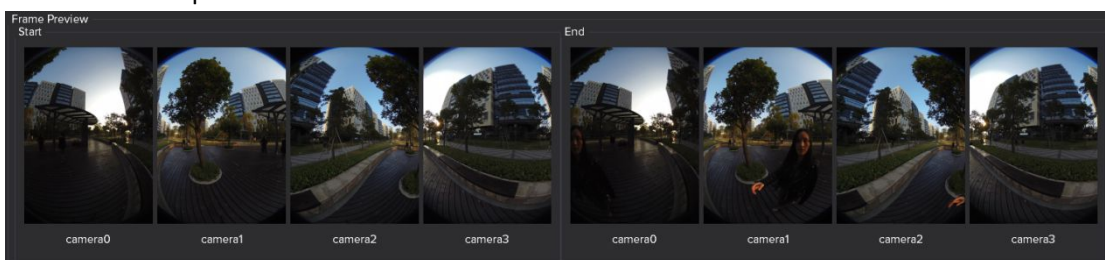


4. Advance Optional Settings are for professional use, which is self explanatory.

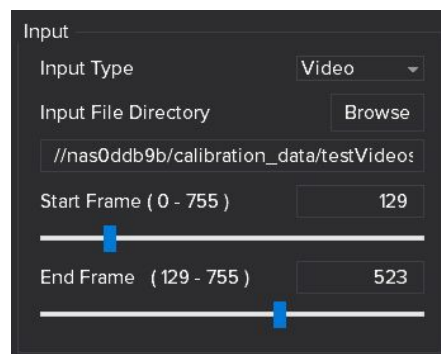


5. After the above steps,now you can preview the original frame by frame source video images from the right **Frame Preview** window.

This is a sample:



Drag the **Start Frame Slider** and the **End Frame Slider** to preview the corresponding frames. Duration of the stitching is set by the numbers of frames guarded within.





6. Click **Stitching Preview** button to preview the stitched image of the starting frame.



7. Click the **Start** button at the bottom right to start stitching. Upon completion of stitching, you can find the output video file in the destination directory.

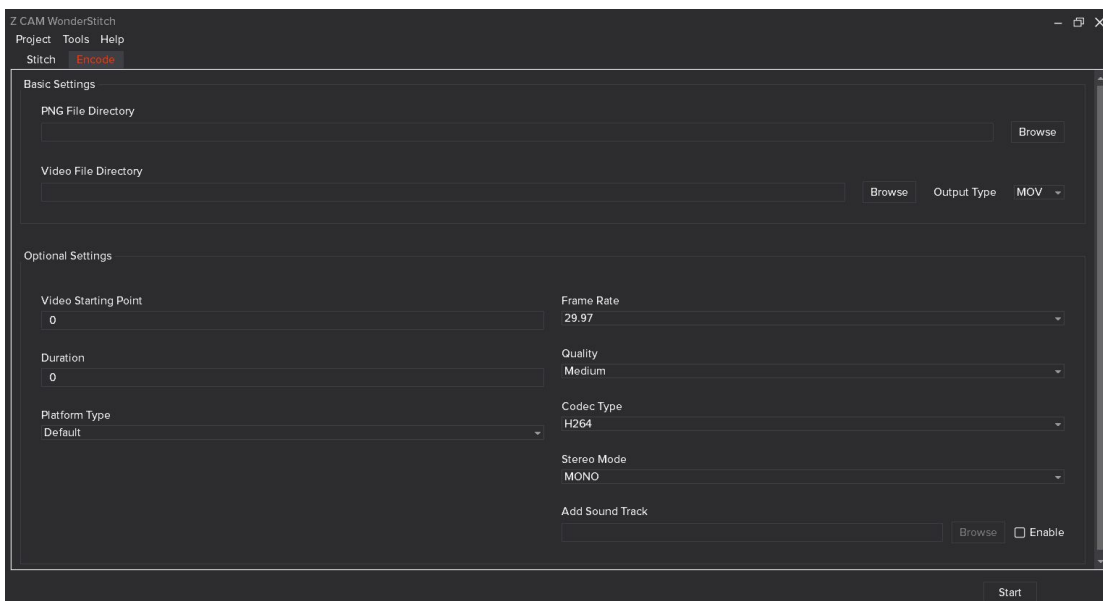
## 4.3 Encode PNG pictures to Video

Should you wish to process the stitched output as frame by frame individual still images for post processing purpose, please select “still image” in the Output Type.



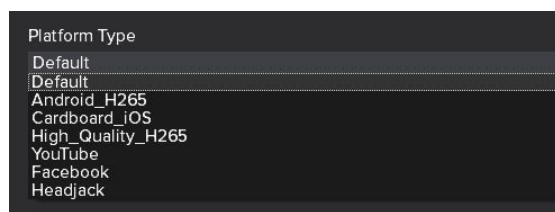
Stitched output will be in the form of frame by frame individual PNG files, each labelled with the corresponding frame number, saved in the Destination Directory.

Upon completion of stitching, or after the PNG files are further processed, you may click the **Encode Tab** to start encoding PNG files to video file.



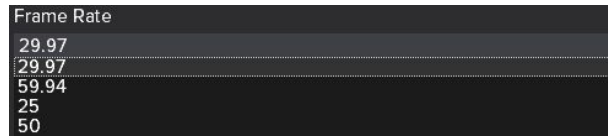
There are **Basic Settings** and **Optional Settings** to customize the encoding workflow.

- **Basic Settings**
  - **PNG File Directory**, browse to select the PNG files output folder path.
  - **Video File Directory**, browse to select the output video folder path.
  - **Output Type**, select either MOV or MP4 file type.
- **Optional Settings**
  - **Video Starting Point**, a start frame number will be shown by default. User may set a different start frame number.
  - **Duration**, input the total number of frames (PNG files) for encoding.
  - **Platform Type**, select your desired playback platform of the encoded video. In order to display all the hidden options, click **Help** -> **About**, then click **About** dialog continuously for ten times in a quick manner.

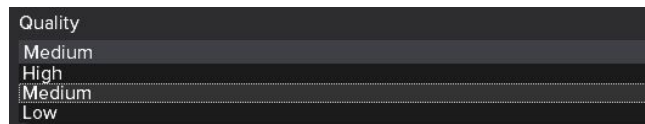


Choose **Default** if there is no desired playback platform of the encoded video.

- **Frame Rate**, select a frame rate to encode the video, which normally should be the same as the captured frame rate.



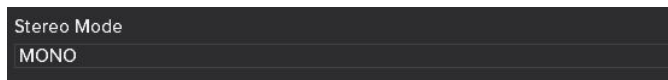
- **Quality**
  - **High**, high quality and generates a larger file size.
  - **Medium**, medium quality and generates a medium file size.
  - **Low**, low quality and generates a smaller file size.



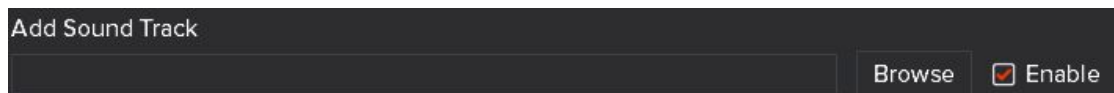
- **Codec Type**, both provide the same image quality:
  - **H264**, faster than H265, but with a larger file size.
  - **H265**, an upgrade version of H264 which takes up less space.



- **Stereo/Mono Mode**, current version only supports mono.



- **Add Sound Track**, click enable to add sound track to the encoded video, then browse to select from one of the original video files for the desired sound track. Note that no sound track will be added to the video file should **Add Sound Track** is not enabled.



After the above is set, click **Start** button at the bottom right corner to start encoding the PNG files to video. There is dialog box to show the progress. Once the encoding process is completed, you may find the output video file in the **Video File Directory**.

## 4.4 CLI (command-line interface)

Use CLI if you want to stitch multiple video footage simultaneously.