Vzense

Multiple Cameras Coexist Application Note

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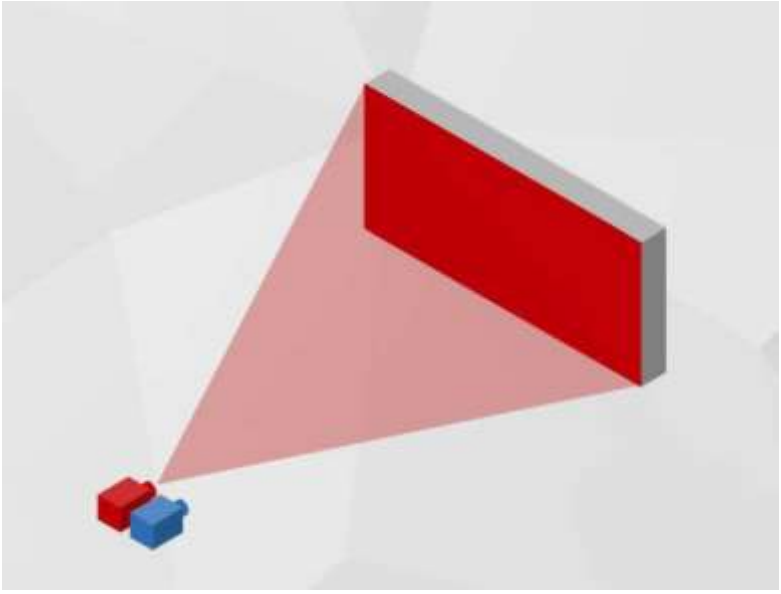
1. General Information

The purpose of this document is to familiarize the customer with the Multiple Cameras Synchronization function of the Vzense ToF product. This document explains the principle of Multiple Cameras Synchronization function, and the steps to implement it in two ways.

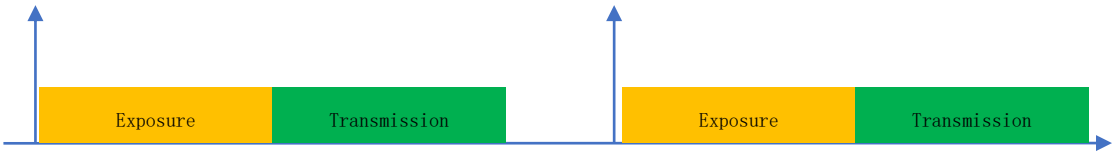
This document applies to Vzense ToF products, DCAM710 and DCAM550 series.



2. Laser Interference

As the ToF product emits laser light, so if multiple cameras operate simultaneously, they interfere with each other. The multi-camera interference causes a lot of errors in depth measurement. The depth quality is severely reduced, which limits the application of TOF cameras and needs to be resolved.

For each frame, the ToF camera emits laser and exposure at a specific timing, and no laser emitted in rest of the frame.



While multiple cameras work in the same area, interference can happen if the exposure timing overlaps each other.

3. Slave Trigger Mode

Vzense ToF products support slave trigger mode. At slave trigger mode, the ToF product outputs every image only at every trigger signal happens.

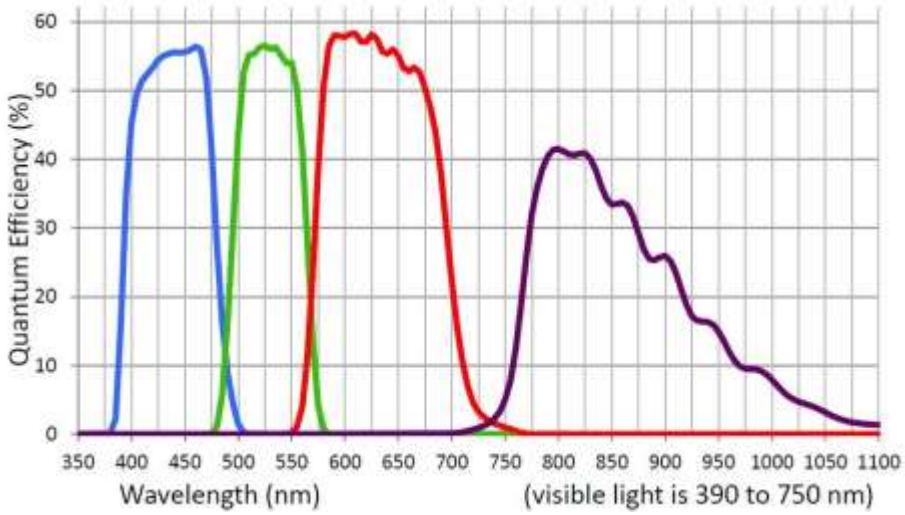
Please find the “slave trigger mode” contents in the user manual for the steps to set the products at slave mode.

4. Multiple Camera Coexist

Two ways can solve the issue of multiple camera interference.

4.1 Use different wavelength of the laser

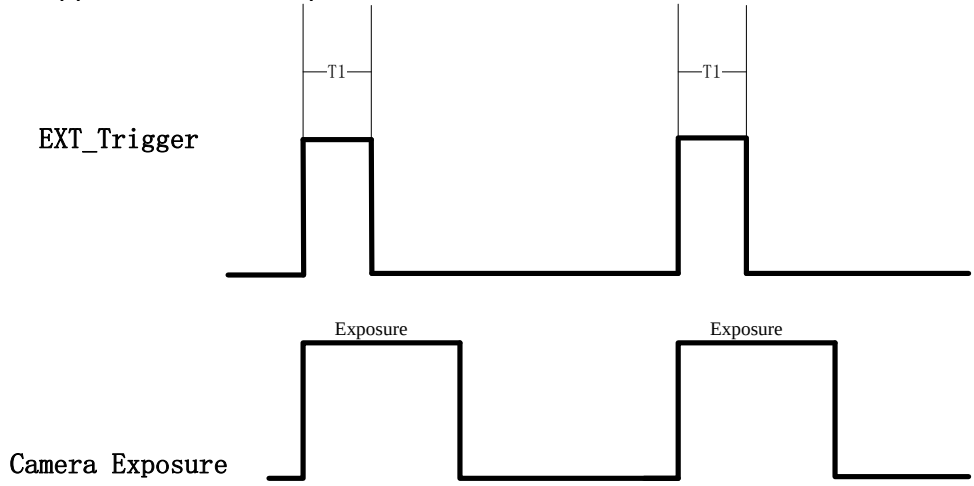
Vzense has the two type of the laser wavelength, 850nm and 940nm. A band pass filter in the lens is used to filter out unwanted light. So two products with different waveform can coexist in the same area.



This way is applicable if only two cameras coexist. No additional setting for the software, just install two different wavelength ToF products.

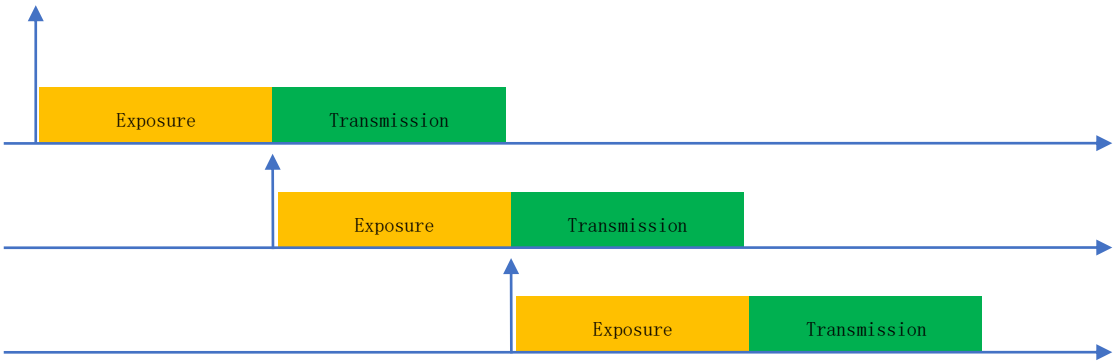
4.2 Slave Trigger

In this way, the camera works at slave trigger mode, it will wait until a trigger signal happens, and start exposure of one frame.

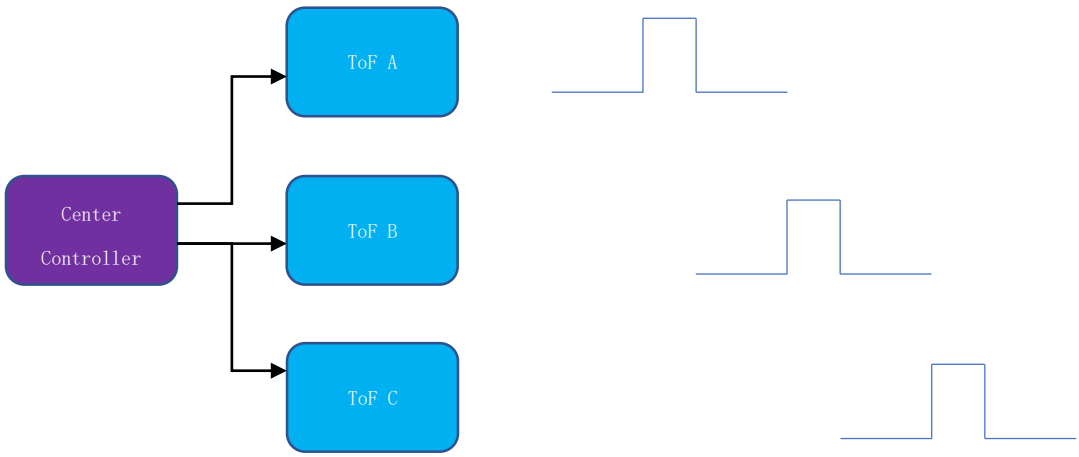


4.2.1 Center Controller Synchronization

1) Set multiple cameras as slave trigger mode, please find the operation steps in the user manual of the camera;
2) Use a center controller to generate the trigger signal for each camera. Make sure the timing of each trigger signal is timing divided.

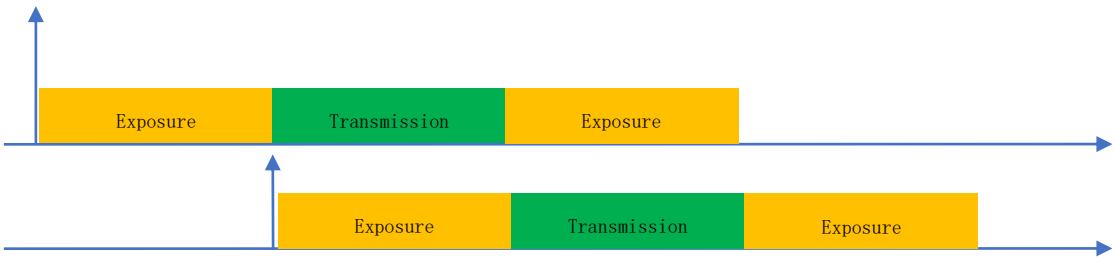


3) Please find the Ext_Trigger signal, and connect the trigger signal from the center controller to the cameras.



4.2.2 Master&Slave

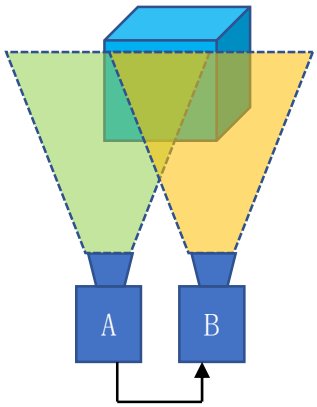
You can also set one camera as slave trigger mode, while another one as master mode. Using the Exposure_timing signal of the master camera as the trigger source of the slave one.



1) Hardware Connection:

Find the Exposure_timing and Ext_Trigger signal in the user manual of the cameras;
Connect the Exposure_timing signal of master camera A to the Ext_Trigger signal of slave camera B;
Connect the GND of camera A to GND of camera B;

Pin	Designation
1	RX232-RXD
2	RX232-TXD
3	Ext_Trigger
4	Exposure_timing
5	GND
6	VDD



2) Set the camera A as master mode, and set camera B as slave mode. Please find the steps in the user manual.