

Vision SDK

2MP 3D Surround View

User Guide

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Mailing Address:

Texas Instruments
Post Office Box 655303
Dallas, Texas 75265

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1 Introduction

Vision Software Development Kit (Vision SDK) is a multi-processor software development package for TI's family of ADAS SoCs. The software framework allows users to create different ADAS application data flows involving video capture, video pre-processing, video analytics algorithms, and video display. The framework has sample ADAS data flows which exercises different CPUs and HW accelerators in the ADAS SoC and demonstrates how to effectively use different sub-systems within the SoC. Frame work is generic enough to plug in application specific algorithms in the system.

This document details 2 megapixel (2 MP) 3D Surround View (SRV) use case which can be run on TDA2xx/TDA2Px platform.

Calibration use case needs to be run before running the SRV demo in order to run the demo perfectly.

There is no change in the procedure to build and run the 3D SRV use case; the 2MP SRV is additional use case in the Vision SDK Linux part.

This document is applicable for Vision SDK versioned 2.12.01 and greater.

1.1 References

Refer the below additional documents for more information about Vision SDK

Document	Description
Vision_sdk/docs/linux/ VisionSDK_Linux_DataSheet.pdf	Data Sheet document.
Vision_sdk/docs/linux/ VisionSDK_Linux_UserGuide.pdf	This document. Contains install, build, execution information
Vision_sdk/docs/UserGuides/VisionSDK_UserGuide_TDA2xx.pdf	Not relevant unless explicitly mentioned in this document
Vision_sdk/docs/VisionSDK_ReleaseNotes.pdf	Not relevant to this code drop
Vision_sdk/docs/VisionSDK_DataSheet.pdf	Not relevant to this code drop
Vision_sdk/docs/VisionSDK_ApiGuide.CHM	User API interface details
Vision_sdk/docs/Arhitecture/VisionSDK_SW_Architecture_Overview.pdf	Overview of software architecture
Vision_sdk/docs/VisionSDK_DevelopmentGuide.pdf	Developer Guide on bios side only, partly relevant for this code

	drop
Vision_sdk/docs/SurroundView/VisionSDK_Overview_SurroundView_Demo.pdf	Refer for all surround view use-cases

2 Setup and Run 2MP SRV Use case on TDA2xx with IMX290

VisionSDK_UserGuide_TDA2xx.pdf documents details pre-requisites to use Vision SDK, the following sections list 2 MP SRV use case specific requirements. It is assumed that the user is familiar with the setup required to run the 3D SRV use case. The serializer deserializer setup used for 2MP SRV is the same as the one for 1 MP SRV i.e. UB913/914.

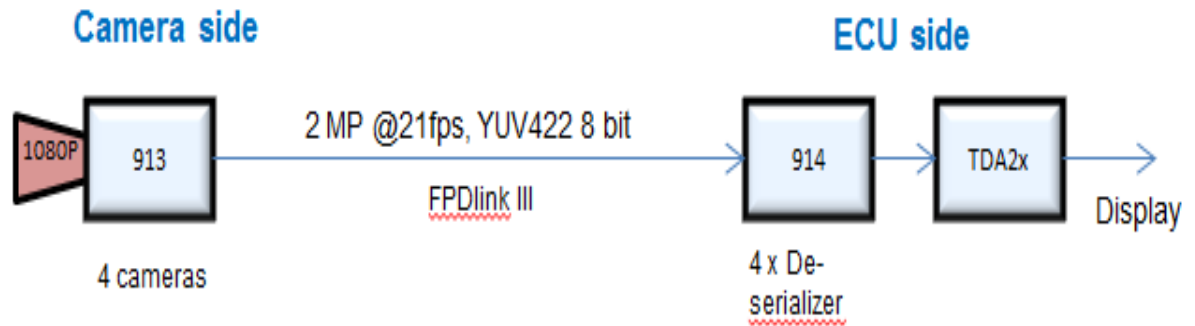


Figure 1 Block Diagram for 2MP SRV

2.1 Hardware Setup

2.1.1 Camera Modules

2.1.1.1 Firmware upgrade for 1920X1080

The camera module should be configured to stream 1920x1080 @ 21 fps, please contact Geo Semi FAE for the firmware and steps to flash.

2.1.1.2 Casing

Camera casings will have to be ordered from GeoSemi separately.

2.1.1.3 Connecting FPD Link III cables

It should be made sure that camera is mounted in such a way that FPD Link III cable is connected on the left side of the camera i.e. ensure that images are not flipped in horizontal axis.

2.1.1.4 Fish Eye lens used

The lens used is assumed to be Sunex DSL219.

2.1.1.5 Mounting camera modules on Jeep

The camera should be mounted centrally for the demo setup. The camera should be placed at an acute angle to the ground plane so as to have a proper fisheye view.

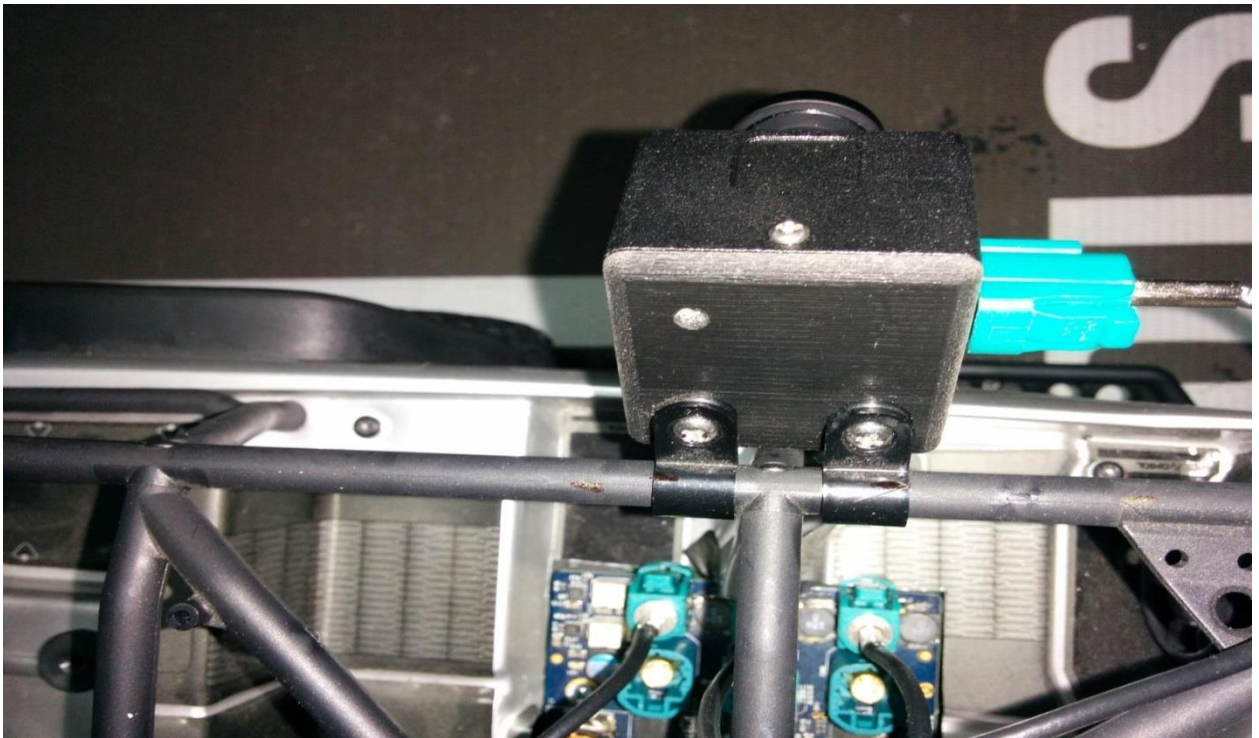


Figure 2 Camera mounted on side of the Jeep

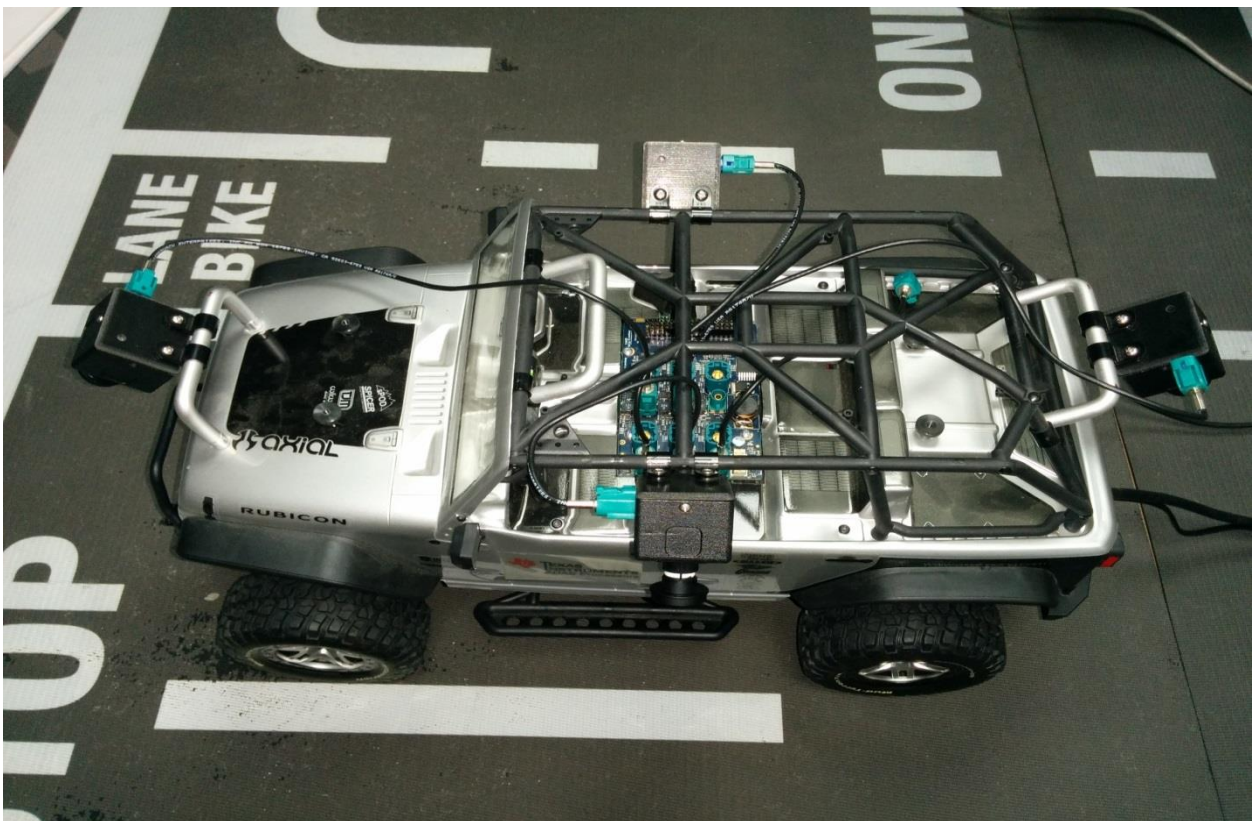


Figure 3 Cameras mounted on the Jeep

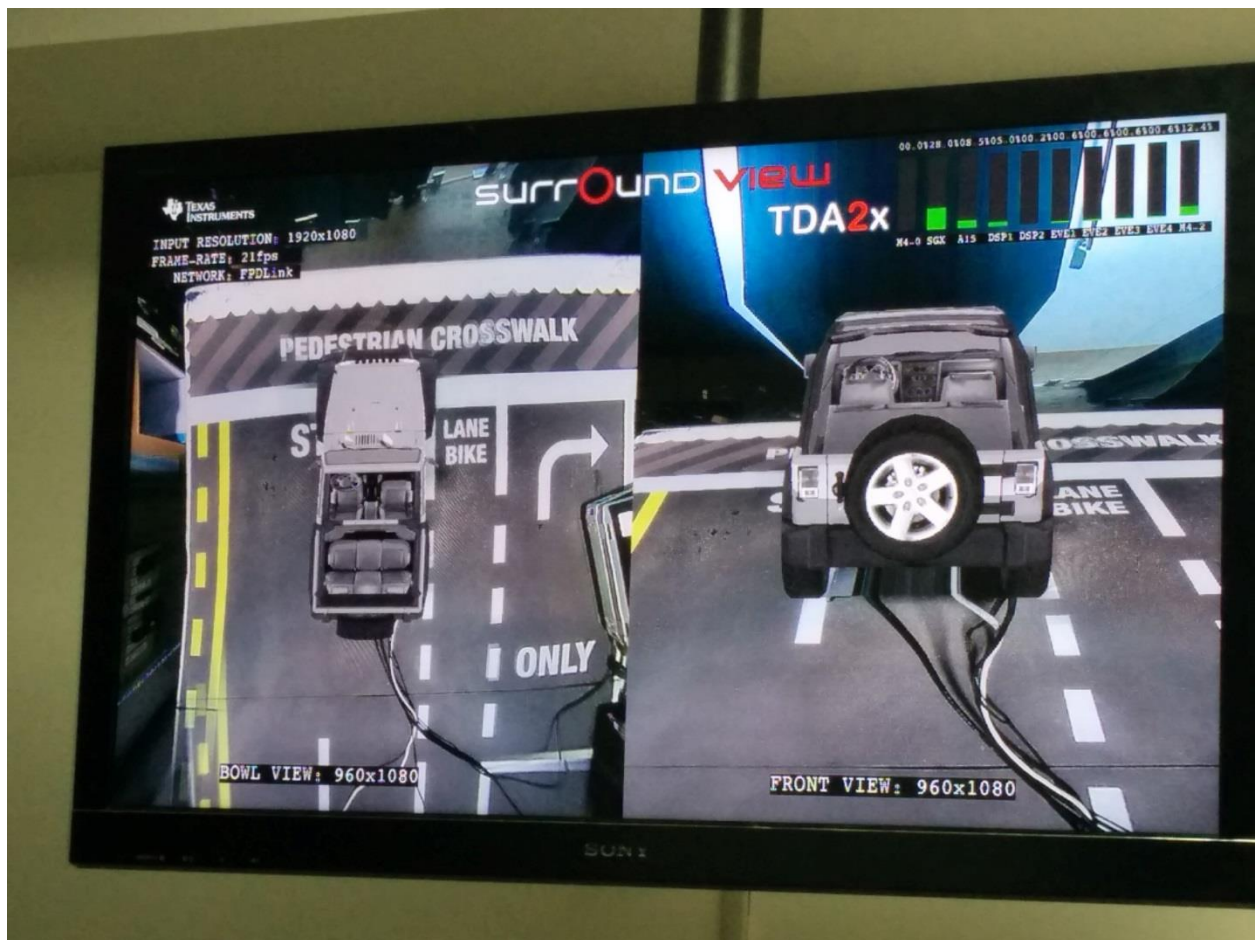
2.2 3D SRV Usecase

It is expected that surround view calibration is performed before this usecase. The calibration will create CALMAT.BIN which will be stored in targetfs/opt/vision_sdk folder. This usecase reads lens parameters from LENS.BIN and SGX Geometric Alignment LUT from CALMAT.BIN (both should be present in /opt/vision_sdk folder).

The detailed steps to run the use case are given below:

1. root
2. cd /opt/vision_sdk
3. ./vision_sdk_load.sh
4. ./apps.out
5. Run 2MP demo option

The demo will show a split view on the screen like the one given below (one is a stitched output view and the other is Front View):



SGX load needs to be enabled by the below commands:

1. Option another terminal using telnet
2. cd /opt/vision_sdk
3. ./pvrscope -f 0

3 Setup and Run 2MP SRV Use case on TDA2Px with OV2775

VisionSDK_UserGuide_TDA2px.pdf documents details pre-requisites to use Vision SDK, the following sections list 2 MP SRV use case specific requirements. It is assumed that the user is familiar with the setup required to run the 3D SRV use case.

3.1 Hardware Setup

Refer section 2.3.3 ISS Multiple Channel (2MP SRV) Use-case Hardware Setup of VisionSDK_UserGuide_TDA2px.pdf

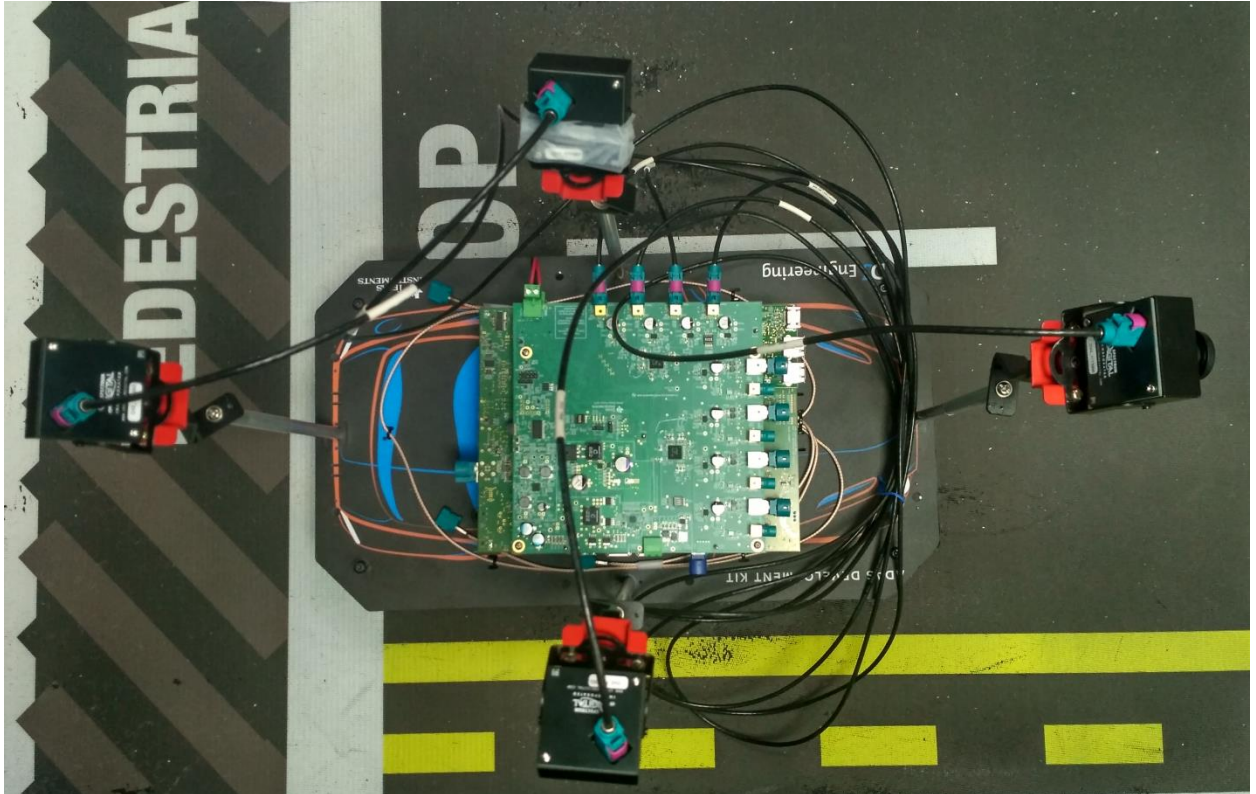


Figure 1 Cameras mounted on the skate board

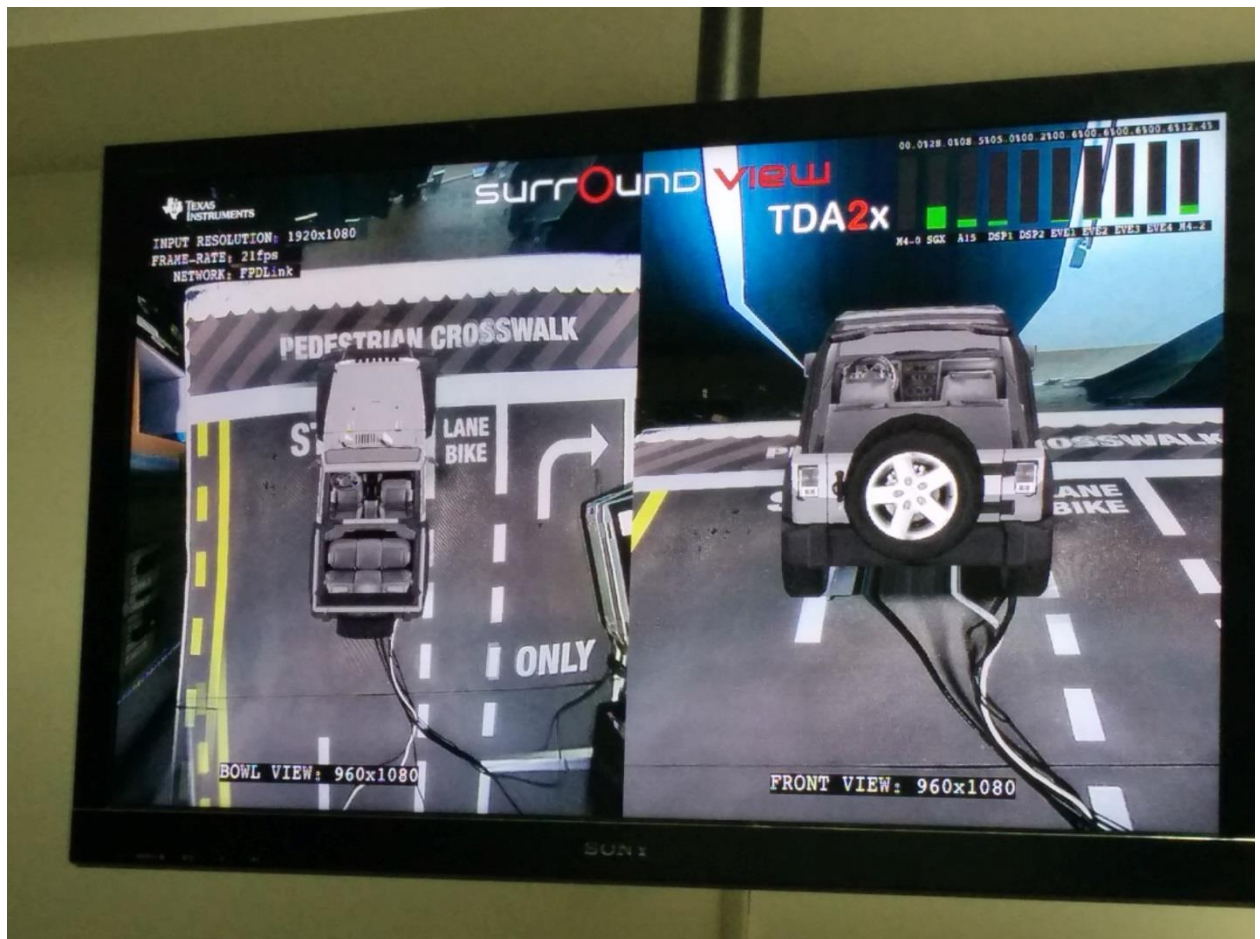
3.2 3D SRV Usecase

It is expected that surround view calibration is performed before this usecase. The calibration will create CALMAT.BIN which will be stored in targetfs/opt/vision_sdk folder. This usecase reads lens parameters from LENS.BIN and SGX Geometric Alignment LUT from CALMAT.BIN (both should be present in /opt/vision_sdk folder).

The detailed steps to run the use case are given below:

1. root
2. cd /opt/vision_sdk
3. ./vision_sdk_load.sh
4. ./apps.out
5. Select ISS uc
6. Run 2MP demo option

The demo will show a split view on the screen like the one given below (one is a stitched output view and the other is Front View):



SGX load needs to be enabled by the below commands:

4. Option another terminal using telnet
5. `cd /opt/vision_sdk`
6. `./pvrscope -f 0`

4 2MP 3D SRV calibration

By default VSDK has 1MP 3D SRV calibration option enabled. For 2MP UC please modify below code and rebuild SDK

```
/vision_sdk/apps/src/rtos/alg_plugins/autocalibration/include/svACDCommonDefs.h
#define INPUT_720P      0
```

5 Revision History

Version	Date	Revision History
0.1	7 th February 2017	First Draft
0.2	9 th Jan 2018	Added TDA2Px 2MP SRV

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