

Processor SDK - Vision

Version 03.04.00

Release Notes
June 2018

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IMPORTANT NOTES: <MUST READ>

- *VSDK folder structure has been modified since 3.0 releases. Kindly refer VisionSDK_Getting_Started_Guide.pdf for details.*
- *VSDK build flow has been modified to improve the build time, see the VisionSDK_UserGuide_BuildSystem.pdf for details.*
- *For OpenCV, OpenCL & OpenVX, this is a preliminary release with limited testing (Alpha Quality).*
- *CCS version 6.0.1.00040 or higher should be used along with vision SDK 2.10 release onwards.*
- *BSP/Starterware is merged into single package – PDK Any reference to BSP/Starterware in the documentation refers to PDK.*

Build ID: 03.04.00.00

IMPORTANT NOTE: Vision SDK by default supports the TDA2xx, TDA2Px, TDA3xx & TDA2Ex super set device configuration. Please refer to the Device Data Manual to know the details of the CPUs supported in that part. Vision SDK supports selecting only the CPUs available for the specific part.

Major New Features in the Release

New features in the release vs previous Vision SDK release are:

- vDRM Display distributor links for HLOS compositor (Weston) with M4 display
- 1GB memory map for TDA3x-RVP for ~200+ 3D SRV view points
- SMP support for IPU1 sub-system of TDA3xx
- Adaptive 3D SRV – enhancements
- Coexistence of Camera and Radar usecases
- 2 New platforms from D3 Engineering TDA2x RVP & TDA3x Starter Kit supported with VSDK

Radar new features:

- Support for Cascade Radar Board.
- Cascade Radar Data processing demonstration.
- DSP algorithms for second dimension, peak detection and angle of arrival detection.
- Migration to MMWAVEDFP 01. 01.00 With AWR1243 ES3.0 Support.

Installation and Usage (BIOS ONLY)

- Kindly refer user guides \vision_sdk\docs\UserGuides\VisionSDK_UserGuide_TDAxxx.pdf

Example use-cases (BIOS ONLY)

- Vision SDK demonstrates use-cases as examples. Below table lists these usecases and also indicates the SOC/Platform it is validated on.

No.	Use-cases	TDA2xx EVM	TDA2Ex EVM	TDA3xx EVM	TDA2Px EVM
Single Camera Use-cases					
1.	1CH VIP capture + Display	YES	YES	YES	YES
2.	1CH VIP capture + Alg Frame Copy (DSP1) + Display	YES	YES	YES	YES
3.	1CH VIP capture + Alg Frame Copy (EVE1) + Display	YES	NO	YES	YES
4.	1CH VIP capture + Alg Frame Copy (A15) + Display	YES	YES	NO	YES
5.	1CH VIP capture + Edge Detect (EVE1) + Display	YES	NO	YES	YES
6.	1CH VIP capture + Dense Optical Flow (EVE1) + Display (HDMI)	YES	NO	YES ¹	NO
7.	1Ch VIP capture + Sparse Optical Flow (EVE1) + Display	YES	NO	YES	YES
8.	1CH VIP capture + Alg Subframe Copy (EVE1) + Display	YES	NO	YES	YES
9.	1CH VIP capture + DSSWB + CRC + Display	NO	NO	YES	NO
10.	1CH VIP capture + ENC + DEC + VPE + Display	YES	YES	NO	YES
11.	1CH VIP capture (HDMI) + Lane Detect (DSP1 + EVE1) + Display	YES	YES	YES	YES



12.	1CH VIP capture (HDMI) + SOF (EVE1) + SFM (DSP1) + Display	YES	NO	YES	YES
13.	1CH VIP capture (HDMI) + Traffic Light Recognition (TLR) (DSP1) + Display	YES	YES	YES	YES
14.	1CH VIP capture (HDMI) + Pedestrian, Traffic Sign, Vehicle Detect 2 (EVE1 + DSP1) + Display	YES	NO	YES	YES
15.	1CH VIP capture (HDMI) + FrontCam Analytics 2 (PD+TSR+VD+LD+TLR+SFM) (DSPx, EVEx) + Display (HDMI)	YES	NO	YES	YES
16.	1CH VIP capture + QM Alg Frame Copy with FFI (DSP1) + Display	YES	YES	YES	NO
17.	1CH VIP capture + QM Alg Frame Copy with FFI (EVE1) + Display	NO	NO	YES	NO
18.	1CH VIP capture + Safe Frame Copy (A15) + Display	YES	NO	NO	YES
19.	1CH VIP capture + DisplayMultiPipe + DSSWb + Metadata	NO	NO	YES	NO
OpenCV Use-cases					
19.	1CH VIP capture + OpenCV Canny (A15) + Display	YES	NO	NO	NO
20.	1CH VIP capture + OpenCV OpenCL Dilation (A15 + DSP) + Display	YES	NO	NO	NO
OpenCL Use-cases					
21.	1CH VIP capture + Frame Copy (A15) + Display	YES	NO	NO	NO
22.	1CH VIP capture + Canny Edge (DSP1) + Display	YES	NO	NO	NO
Multi-Camera LVDS Use-cases					
23.	4CH VIP Capture + Mosaic Display	YES	YES	NO	YES
24.	4CH VIP Capture + Surround View (DSP) + Display (HDMI) (TDA2x & TDA2Ex ONLY)	YES	YES	NO	YES
25.	5CH VIP Capture + Surround View (DSPx) + Analytics (DSP/EVE) + Ultrasound (DSPx) + HDMI Display (HDMI) (TDA2x ONLY)	YES	NO	NO	NO
26.	4CH VIP Capture + Surround View (DSPx) + Display (HDMI) (TDA3x ONLY)	NO	NO	YES	YES
27.	2CH VIP Capture (2560x720) + Surround View (DSPx) + Display (TDA2x + TIDA0455 only)	YES	NO	NO	NO
28.	Surround View Calibration	YES	YES	NO	YES
29.	OV10635 & UB964 4CH CSI2 Capture + Display (TDA2Ex only)	NO	YES	NO	NO
AVB RX Use-cases, (TDA2x ONLY)					
30.	4CH AVB Capture + Decode + VPE + Sync + Alg DMA SW Mosaic (IPU1-0) + Display (TDA2x & TDA2Ex ONLY)	YES	YES	NO	YES
31.	4CH AVB Capture + Surround View (DSPx) + Display (HDMI) (TDA2x & TDA2Ex ONLY)	YES	YES	NO	NO
Dual Display Use-cases, (TDA2x EVM ONLY)					
32.	1CH VIP capture + Dual Display	YES	NO	NO	NO
33.	2CH LVDS VIP capture + Dual Display	YES	NO	NO	NO
ISS Use-cases, (TDA3x & TDA2Px ONLY)					
34.	1CH ISS capture + ISS ISP + ISS LDC+VTNF + Display	NO	NO	YES	YES
35.	4CH ISS capture + ISS ISP + Simcop + Surround View (DSP1) + Display	NO	NO	YES	NO
36.	1CH ISS capture (AR0132) + ISS ISP Monochrome + Display	NO	NO	YES	NO
37.	3D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display	NO	NO	YES	YES
38.	Surround View Calibration	NO	NO	YES	YES
39.	3D + 2D SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + Display	NO	NO	YES	YES
40.	SRV 4CH ISS capture + ISS ISP + DeWarp + Synthesis (DSP1) + RearView + Display	NO	NO	YES	NO



Other Use-cases					
41.	File IO using MMCSD	YES	NO	YES	NO

SDK Features (BIOS ONLY)

- Support the following SoC/Platforms
 - TDA2x SoC ES1.0/ES1.1/ES2.0 EVM
 - TDA3x SoC ES1.0/ES2.0/ES2.1 EVM, RVP, Starter Kit
 - TDA2Ex Soc ES1.0/ES2.0 EVM
 - TDA2Ex 17x17 (J6 Entry) Soc ES1.0/ ES2.0/ES2.1 EVM
 - TDA2Px Soc ES1.0 EVM
- Support for all CPU's in the TDA2xx Device (IPU1-0, IPU1-1, IPU2, DSP1, DSP2, EVE1, EVE2, EVE3, EVE4, A15-0)
- Single-channel Capture via VIP for OV10635 sensor, HDMI receiver
- Multi-channel Capture (via VIP with LVDS, via Ethernet with AVB)
- Dual Display and Display Controller for VENCs (LCDx and On-Chip HDMI)
- Single-channel DSS Write Back Capture
- VPE (Scalar), Encode (MJPEG/H264), Decode (MJPEG/H264)
- Stripe based capture – support for OTF processing
- Dual A15 support (SMP BIOS mode)
- 4CH OV10635 capture via UB960/OV490/TIDA00455 to support for Low cost surround view on TDA2xx
- Support for creating Image pyramid using VPE.
- Support for TDA2xx secure boot on HS samples.
- TI Deep Learning File Input/Output use case.
- IPU2 (SMP mode) support
- All SoC supports Links Such as Dup, Merge, Select, Sync, NullSrc, Null and IPC (In/Out).
- Gate Link – Gives selective control to application on part of usecase data flow.
- Split Link (TDA2xx only) – Allows single video buffer of higher resolution to be split into multiple channels of lower resolutions on same output queue.
- Display module supporting multiple display sync'd pipes
- Algorithm link with algorithm plug-in's support on all CPU's
- DSS M2M link in VSDK to support overlay write back
- Utility to measure time taken for a function in multi-task environment
- Support for all CPU's in the TDA3xx Device (IPU1-0, IPU1-1, DSP1, DSP2, EVE)
- Capture via ISS CAL OV10640 Rev E (CSI2), AR132 (Parallel), AR140 (parallel), IMX224 (CSI2)
- ISS M2M-ISP & ISS M2M-SIMCOP Links

- Single Display and Display Controller for VENCs (LCD, SD VENC (NTSC/PAL) and Off-Chip HDMI).
- ISS Image tuning tool (DCC – Dynamic Camera Configuration), AWB, AE library
- Tuned AR140, OV10640 Rev E, IMX224 with WDR
- Multiple channel processing support for ISS CAPTURE and ISS M2M-SIMCOP Links.
- Fast boot mode which allows capture-display to bring up first without DSP/EVE and Seamless switch to Object Detect usecase after DSP and EVE are up
- Frame freeze detect using display write back & HW CRC
- 4CH AR140 CAL CSI2 capture via UB960 CSI2 Hub for Low cost surround view with HW LDC support for distortion correction.
- RTI configuration, expiry detection and recovery.
- Enhanced ISP based 3D Surround View on TDA3x with HW LDC
- Support for single pass & multi-pass WDR.
- Improved imaging for SRV with Improved AE stability & Photometric alignment
- New Algo Link “DeWarp” primarily used for multiple channel LDC correction.
- Support to add various tap-points for dumping the frames in different points in the ISS ISP frame processing.
- Support for creating Image pyramid using ISS.
- Support added for TDA3x RVP.
- Added split screen 2D + 3D Surround View with HW LDC for 3D & DSP LDC for 2D
- AR0132 Image Tuning, enabled with 2A and WDR
- Support for TDA3xx secure boot on HS samples
- Support 128MB DDR 3D SRV on TDA3xx
- 3D SRV + Rear view with lane marking and marking movement based on vehicle movement
- Front Cam (EU-NCAP) use-case – OD, SFM, FCW, TLR, OC (Object Classification)
- Validated TIDL use case on TDA3xx EVM
- Support for all CPU’s in the TDA2Ex 23x23 and 17x17 (J6 Entry) Device (IPU1-0, IPU1-1, DSP1, A15-0)
- CSI2 capture support, 4ch capture (CSI2) + Display with channel switching (YUV) on TDA2Ex
- 2D SRV Support (UB964 & 4 modules of SAT0088) on TDA2Ex and TDA2Ex 17x17
- Capture & Display usecase with UB9640 & 4 modules of SAT0088 on TDA2Ex and TDA2Ex 17x17
- 4ch Ethernet SRV with 1MP H.264 AVB camera on TDA2Ex based Ethernet SRV platform
- TDA2Px (J6+) platform Support with VSDK
- AR0143 Sensor Support
- IVA H264 Encoder - IDR frame only configuration support
- AVB Ethernet based Surround View on TDA2x and TDA2Ex (23x23, 17x17)
- 2D SRV Support (UB964 & 4 modules of SAT0088) on TDA2Ex and TDA2Ex 17x17

- Support for Safety features and Freedom From Interference (FFI).
- Support for Firewalls in L3, XMC, ECC, CRC (HW CRC TDA3xx only), TeSOC (TDA3xx only), RTI (TDA3xx only), DCC(TDA3xx only), ESM (TDA3xx only), MPU (Memory Protection Unit).
- Support for SafeIPC in Vision SDK.
- Enhanced sensor framework to support easy integration of new sensors
- System and Local EDMA support on all cores
- TCP/IP support via NDK/NSP on IPU1-1 (TDA2xx, TDA3xx, TDA2Ex), A15-0 (TDA2xx,TDA2Ex)
- Support for TFDTP stack on IPU1-1 (TDA2xx, TDA3xx, TDA2Ex), A15-0 (TDA2xx,TDA2Ex)
- Support for FAT File system with MMC/SD card. (Note: for TDA3x EVM, both Networking and FAT FS should not be enabled simultaneously)
- Low latency IPC support in VSDK to reduce the CPU load and latency
- Power Management
- CPU idle (A15 – Retention, M4 – Auto Clock Gate, DSP – Auto Clock Gate, EVE – Auto Clock Gate) & Temperature measurement support.
- Thermal management Limp Home Mode demonstration in Front Cam (EU-NCAP) use-case.
- Demonstration of DSP and EVE to power domain off and reboot for analytics standby low power state in TDA3xx Fast Boot use case.
- Ability to measure the Actual time for which the CPU was in low power.
- Ability to measure the power drawn by different voltage rails from on board INA226 on TDA2xx.
- Links framework, BSP/Starterware drivers modified to support optional static memory allocation (Refer VisionSDK_DevelopmentGuide.pdf for more details).
- Debug and Instrumentation Framework
- Performance log (FPS, CPU Load, Heap memory usage)
- Debug log (exception log, assert log)
- DDR BW statistics via HW statistic collectors
- PRCM status and reading clock frequencies of different modules.
- Reading Voltage values of different device voltage rails from PMIC.
- Link statistics logic updated to get link statistics and CPU status without sending command to remote core.
- Enhanced TDA3X 3D SRV - Flash size optimization and configurable blend seems
- Multi camera harmonization for TDA3x 3D SRV
- IMX390 Sensor Driver and IQ Tuning
- TIDA1130 (OV2775) Sensor Driver and IQ Tuning
- Custom SWMS link to use VPE (scalar) internally to avoid DMA copy
- TIDL deep learning demo for object detection
- 4/6 camera capture and display with Fusion board and TDA2x+ using both CSI2 PHYs (Phy1 and Phy2)

- IMX390 Sensor IQ Tuning
- Enable AEWB for all 4 Channels for ISS based 3D SRV on TDA2Px and TDA3x
- [TDA3x 3D SRV]: Added support for Output Resolution change
- Retransmit support in TFDTP receive
- Support in the makefile to allow for file specific compile options
- DSS Link to support override the input data format of the link.
- Added support for TDA2x RVP and TDA3x Starter Kit
- Radar capture and processing support included in VSDK 3.2 release
- Multiple boot mode support
 - TDA2x EVM: QSPI boot, SD boot, NOR boot, CCS boot
 - TDA3x EVM: QSPI boot, QSPI+SD boot (SBL in QSPI, ApplImage in SD card), CCS boot
 - TDA2Ex EVM: QSPI boot, SD boot, NOR boot, CCS boot
 - TDA2x xCAM: QSPI boot, SD boot, CCS boot
 - TDA3x RVP: QSPI+SD boot (SBL in QSPI, ApplImage in SD card), CCS boot
- GEL installation package has changed, New package and installation methods are available at :http://processors.wiki.ti.com/index.php/Device_support_files
- Open CV Support for A15 host (Bios) with DSP acceleration.
- Open CL Support for A15 host (Bios) with offloading algorithms to DSP.
- Open VX Framework support on BIOS and Linux.
- Car black box demo usecase on Linux on TDA2ex (23x23, 17x17)
- AVB Ethernet based Surround View on TDA2x and TDA2Ex (23x23, 17x17)
- 2D SRV Support (UB964 & 4 modules of SAT0088) on TDA2Ex and TDA2Ex 17x17
- Support Auto use-case generation tool. Refer VisionSDK_UsecaseGen_Overview.pdf & VisionSDK_UsecaseGen_UserGuide.pdf under docs folder for details.
- Vision SDK restructuring.
 - PDK Integration with Vision SDK.
 - SDK Framework and application separation.
- Integrated below TI algorithms (sample reference algorithms only)
 - Pedestrian Detection
 - Traffic Sign Recognition
 - Lane Detection
 - Sparse Optical Flow
 - Dense Optical Flow
 - Edge Detection
 - Structure from Motion
 - Traffic Light Detection
 - Forward Collision Warning
 - Object Classification.

- Stereo (xCAM ONLY)
- 2D Surround View

Radar features:

- Support the following SoC/Platforms
 - TDA3x SoC + AWR12 (ES1.0 & ES2.0) ALPS Board.
 - TDA3x SoC + AWR12 D3 RVP Board.
 - TDA3x SoC + FPDLink AWR12 D3 RVP Board.
 - TDA3x SoC ES1.0/ES1.0A (15x15) EVM + AWR12 (ES1.0 & ES2.0) Booster Pack.
 - TDA2x SoC ES1.1/ES2.0 (23x23) EVM
 - TDA2px SoC ES1.0 EVM
- Support for CPU's in the TDA3xx/TDA2xx Device (IPU1-0, IPU1-1, DSP, EVE)
 - Support for TDA2px EVM using Network and File read and write of Radar Data.
 - Support for Radar System Planner to the documents section for offline analysis of TDA compute and bandwidth requirement.
 - Support for multi-channel processing as part of the Radar Algorithm Process.
 - Support for AR12xx Radar Sensor Data Capture
 - Support for the Dynamic Chirp Configuration API for ES2.0 AWR1243.
 - Driver support for Monitoring and run time calibration.
 - Support for Radar Processing Algorithm Plugin with FFT Algorithm Function and FFT Heat Map Draw Algorithm Functions.
 - EVE FFT, Peak detection and Beam forming algorithm integrated using WorkQ.
 - Support for AWR12 advanced frame configuration, Dynamic Configuration of parameters to change the radar waveform properties.

Example use-cases (Linux + Bios)

- Vision SDK demonstrates use-cases as examples. Below table lists these usecases and also indicates the SOC/Platform it is validated on.

No.	Usecases	TDA2xx EVM	TDA2Ex EVM	TDA3xx EVM	TDA2Px EVM
Single Camera Use-cases					
1	1CH VIP capture + SGX Copy + DISPLAY	YES	YES	NO	YES
2	1CH VIP capture + Encode + Decode + SGX Copy + DISPLAY	YES	YES	NO	YES
5	NullSrc + Decode + Display (Only 1920x1080 H264/MJPEG Video Input Bit-Stream Supported)	YES	YES	NO	YES
6	1CH VIP capture + Alg Frame Copy (A15) + SGX Copy + DISPLAY	YES	YES	NO	YES
7	1CH VIP + Alg Frame Copy (A15) + Connector Links (Dup, Merge, Select, Gate on A15) + SGX Copy + DISPLAY	YES	YES	NO	YES
OpenCV Use-cases					
8	1CH VIP capture + OpenCV Canny (A15) + SGX Copy + DISPLAY	YES	NO	NO	NO
9	1CH VIP capture + OpenCV OpenCL Dilation (A15 + DSP) + SGX Copy + DISPLAY	YES	NO	NO	NO
OpenCL Use-cases					



10	1CH VIP capture + OpenCL Copy (A15->DSP) + SGX Copy + DISPLAY	YES	NO	NO	NO
Multi-Camera LVDS Use-cases					
11	4CH VIP LVDS capture + SGX MOSAIC + DISPLAY	YES	YES	NO	YES
12	4CH VIP LVDS capture + 3D SRV (SGX/A15) + DISPLAY - Only HDMI 1080p display supported	YES	YES	NO	YES
13	4CH VIP LVDS capture + 3D SRV + 4CH SfM (3D perception demo - EVE1-4/DSP1&2) + DISPLAY - Only on TDA2xx with HDMI 1080p display	YES	YES	NO	NO
14	2CH OV490 2560x720 capture + Split + 3D SRV (SGX/A15) + DISPLAY - Only HDMI 1080p display supported	YES	YES	NO	NO
15	Surround View Calibration	YES	YES	NO	YES
16	4CH CSI2 CAL capture + 3D SRV (SGX/A15) + DISPLAY - Only HDMI 1080p display supported	NO	YES	NO	YES
17	CSI2 CAL Surround View Calibration	NO	YES	NO	YES
18	4CH CSI2 CAL capture + SgxFrmCpy + DISPLAY	NO	NO	NO	YES
AVB RX Use-cases, (TDA2x ONLY)					
19	4CH AVB Capture + Decode + SGX MOSAIC + DISPLAY	YES	YES	NO	YES
ISS Use-cases, (TDA2Px ONLY)					
20	1CH ISS Capture + ISP + DISPLAY	NO	NO	NO	YES
21	4CH ISS Capture + ISP + 3DSRV + SGX + Display	NO	NO	NO	YES

SDK Features (Linux + Bios)

- Support the following SoC/Platforms
 - TDA2x SoC ES1.0/ES1.1/ES2.0 EVM, RVP
 - TDA2Ex Soc ES1.0/ES2.0 EVM
 - TDA2Ex 17x17 (J6 Entry) Soc ES1.0/ ES2.0/ES2.1 EVM
 - TDA2Px Soc ES1.0 EVM
- Compatible with Processor SDK Linux version 4.4, Linux on A15 (4.4 kernel) & BIOS on all other cores
- Support for IPU2 as the main IPU core in SMP mode
- Support the following CPU's in the TDA2xx system (IPU2, IPU1-0, DSP1, DSP2, EVE1, EVE2, EVE3, EVE4, A15-0)
- This release supports Rev-E and higher versions of TDA2xx EVM
- Support the following CPU's in the TDA2Ex system (IPU2, IPU1-0, DSP1, A15-0)
- Support display only on M4 (Bios) for TDA2xx, TDA2Ex and TDA2Ex 17x17.
- Single-channel Capture via VIP for OV10365 sensor
- Multi-channel Capture (via VIP with LVDS, via Ethernet with AVB)
- VPE (Scalar), Encode (MJPEG/H264), Decode (MJPEG/H264)
- IPU1 based EVE loader
- LG 10 inch LCD display support for VSDK-Linux
- VSDK Linux - Display device & sensors configure from M4/Bios with dedicated I2C
- GPU optimization to allow Both fragment and Vertex shader to work in parallel



- GPU based 3D Surround View (360 Degree Flyaround , on Linux + BIOS Vision SDK ONLY) with Dynamic bowl creation in 3D surround view on TDA2x.
- Improved 3D SRV with auto-calibration using SGX (Open-GL Algo) for creating the “360 degree view of the car with virtual camera motion” is integrated
- AVB and NDK support on IPU2 when A15 is running Linux
- New usecase demonstrating 3-D perception.
- sgxFrmcpy, sgx3Dsrv, sgx3Dsfm, Algorithm link and other connector links (Dup, Merge, Select, Sync, Gate, NullSrc, Null and IPC (In/Out) ported to A15 Linux
- Inter processor communication framework infrastructure between A15 running Linux and other cores running BIOS,
- Basic SGX/OpenGL support - SGX link on A15 can be used to render/texture the video frames
- Support GPU off-screen rendering using EGL PixMap and IPU allocated buffers
- Debug and Instrumentation Framework (same as BIOS only Vision SDK)
- EVE loader updated to use SBL Lib and PM Lib.
- Support for common links on the Linux side for VSDK Linux and InfoAdas.
- Support for IPUMM along with Vision SDK on single IPU core
- Open CV Support for A15 host (Linux) with offloading algorithms to DSP with more DSP kernels.
- Open CL Support for A15 host (Linux) with offloading algorithms to DSP.
- AVB based 3D SRV demo on both TDA2x, TDA2Ex & TDA2Ex 17x17
- TDA2Ex CSI2 based 3D SRV with UB964 & 4 modules of SAT0088 on TDA2Ex & TDA2Ex 17x17
- Car Black Box support on TDA2Ex & TDA2Ex 17x17
- InfoADAS CMEM, Android/QNX supported on TDA2x
- Dynamic bowl creation in 3D surround view on TDA2x.
- 3D SRV with UB96x on TDA2Ex (17x17).
- 2MP SRV (ISP+GPU) with IMX390/OV2775 with Fusion board on TDA2Px EVM
- Auto use case generation tool (same as BIOS only Vision SDK)

Installation and Usage (Linux + Bios)

- Kindly refer [\vision_sdk\docs\Linux\VisionSDK_LinuxUserGuide.pdf](#)

Component Versions

The versions of the different components included in Vision SDK Release Package can be referred to “[\vision_sdk\docs\VisionSDK_3_00_00_00_manifest.html](#)”.

Validation Hardware

This software package is tested with the below hardware



- **TDA2xx EVM/RVP**
 - Single Camera use-cases: Vision Application Board + OV10635 sensor or HDMI capture + LCD or HDMI display
 - LVDS Multi Camera use-cases: Vision Application Board + De-serializer board + 4~5xSerializer board + 4~5x OV10635 sensor + LCD or HDMI display
 - AVB Multi Camera use-cases: Vision Application Board + HDMI display + AVB talker (on Linux on PC)

- **TDA3xx EVM/RVP/Starter Kit**
 - Single Camera VIP use-cases: OV10635 sensor or HDMI capture + LCD or SDTV or HDMI display
 - LVDS Multi Camera use-cases: De-serializer board + 4xSerializer board + 4x OV10635 sensor + SDTV display
 - Single Camera ISS use-cases: OV10640 Rev E(CSI2) or AR0132 (Parallel) sensor + LCD or SDTV or HDMI display
 - Surround view use-case: Requires UB960 EVM with 4 TIDA00262 camera modules and HDMI Display

- **TDA2Ex & TDA2Ex 17x17 EVM**
 - Single Camera use-cases: Vision Application Board + OV10635 sensor + HDMI display
 - LVDS Multi Camera use-cases: Vision Application Board + De-serializer board + 4xSerializer board + 4x OV10635 sensor + HDMI display

- **TDA2Px EVM**
 - 1MP Surround view use-case: UB964 EVM with 4 OV10640 IMI camera modules and HDMI Display
 - 2MP Surround view use-case: Fusion Board with 4 OV2775 or IMX390 camera modules and HDMI Display

- **Radar**
 - TDA3xx, TDA2xx and TDA2px EVM
 - TDA3xx + AWR1243 ALPS Board:
 - TDA3xx EVM + AWR1243 Booster + AR1xxx Debug Dev Pack
 - TDA3xx RVP + AWR1243 (Direct Connection & FPDLink)

- **Boot mode Supported**
 - TDA2x EVM: QSPI boot, SD boot, NOR boot, CCS boot
 - TDA3x EVM: QSPI boot, QSPI+SD boot (SBL in QSPI, ApplImage in SD card), CCS boot
 - TDA2Ex (23x23, 17x17) EVM: QSPI boot, SD boot, NOR boot, CCS boot

Refer user guide for exact board number and revision that this release is validated with.



SW Quality – Status

Software Component	System Testing	MISRA - C *	Static analysis	Quality / Safety
SBL	Yes	Yes	Yes	TI SW Development process
CSL/FL / StarterWare	Yes	Yes	Yes	TI SW Development process
BSP / Drivers	Yes	Yes	Yes	TI SW Development process
EVE SW	Yes	Yes	Yes	TI SW Development process
VXLib (C66x)	Yes	Yes	Yes	TI SW Development process
NDK / NSP / AVB	Yes	Yes	Yes	TI SW Development process
IVAHD codecs	Yes	No	Yes	TI SW Development process
EDMA LLD	Yes	Yes	Yes	TI SW Development process
Framework Components	Yes	Yes	Yes	TI SW Development process
BIOS	Yes	Yes	Yes	TI SW Development process
BIOS-IPC	Yes	Yes	Yes	TI SW Development process
IPCLib	Yes	Yes	Yes	TI SW Development process
Links Framework [‡]	Yes	Yes	Yes	TI SW Development process
AutoSAR MCAL	Yes	Yes	Yes	ASIL – B

[‡] Vision Software Development Kit (Vision SDK) is broadly divided into

- **Core SDK Framework (links_fw)**
 - Core SDK – Contains Links and Chain Framework for both Bios and HLOS
 - SW quality processes like MISRA-C/KW static checker etc. are done only for links framework
- **Demo Application (apps)**
 - Demo applications to validate VSDK FW
 - SW quality processes like MISRA-C/KW static checker etc. are NOT done for apps and sample_app

Compilers	Production ready	Compiler Qualification Kit
EVE TI compiler	Yes	Available from TI
ARM M4 compiler	Yes	Available from TI
C66x TI compiler	Yes	Available from TI
ARM A15 compiler	Yes	3P

Bugs Fixed In This Release

JIRA ID	Description	Severity	Affects Version/s
ADASVISION-1869	[TDA2xx Bios] VPESWMS Link performance issues observed with lvds_vip_multi_cam_view usecase (4-camera mosaic)	S2-Major	VISION_SDK_03_03_00_00
ADASVISION-1877	[TDA2xx Linux] Flickering is observed on running back to back sgx related UC	S1-Critical	VISION_SDK_03_03_00_00
ADASVISION-1878	[TDA2xx Linux] Assert observed on running OpenCl framecopy UC	S2-Major	VISION_SDK_03_02_00_00, VISION_SDK_03_03_00_00
ADASVISION-1851	IPU crash during kernel boot when kernel log-level set to 0	S3-Minor	VISION_SDK_03_02_00_00, VISION_SDK_03_03_00_00
ADASVISION-1861	ISS use cases fail on TDA3 RVP/Starter Kit	S3-Minor	VISION_SDK_03_03_00_00
ADASVISION-1182	TFDTP receive with windows PC packet drop issue	S3-Minor	VISION_SDK_02_12_00_00, VISION_SDK_03_01_00_00, VISION_SDK_03_02_00_00, VISION_SDK_03_03_00_00
ADASVISION-1888	[TDA3x IPU SMP] Issues observed with IPU1 SMP mode, does not work with EVE and stats not correct	S2-Major	VISION_SDK_03_04_00_00
ADASVISION-1890	[TDA2xx Linux] Early boot late attach not working, XDC assert observed	S2-Major	VISION_SDK_03_04_00_00

Known Issues

JIRA ID	Description	Severity	Workaround	Affects Version/s
ADASVISION-1836	[TDA2Px] Running Back to Back 2MP 3D SRV UC failed	S3-Minor	Unload VSDK process and reload every time when restart the SRV application	VISION_SDK_03_03_00_00, VISION_SDK_03_04_00_00
ADASVISION-1882	Radar FFT and TIDL OD algorithm Links can't share the same EVE	S3-Minor	No	VISION_SDK_03_04_00_00
ADASVISION-1894	[TDA2xx Linux] OpenCL UC, Cmem initialization fails	S3-Minor	No	VISION_SDK_03_02_00_00, VISION_SDK_03_03_00_00, VISION_SDK_03_04_00_00
ADASVISION-1885	[Radar][Network] Network transmission fails when running only IPU1_0 and IPU1_1 on Cascade Radar EVM	S3-Minor	No	VISION_SDK_03_04_00_00
ADASVISION-1896	[TDA3x IPU SMP] - Log stats are not displaying correctly, sometimes core loading numbers noticed as negative values	S3-Minor	No	VISION_SDK_03_04_00_00

Refer the Release Notes of PDK and InfoADAS for additional known issues

Known Limitations

JIRA ID	Summary	Affects Version/s	Severity
ADASVISION-835	Deadlock in recursive System_linkControl calls on Linux	VISION_SDK_02_09_00_00 & Later	S3-Minor
ADASVISION-867	CBUF on OCMC RAM 2 does not work	VISION_SDK_02_10_00_00 & Later	S3-Minor
ADASVISION-1848	[TDA3x/TDA2Px] Known Image Quality issue with 2A & AEWB	VISION_SDK_03_03_00_00 & Later	S3-Minor
ADASVISION-420	[Vision_SDK] LCD probing is not return success first time on LVDS set-up. Return LCD not connected error	VISION_SDK_02_01_00_00 & Later	S3-Minor
ADASVISION-455	[Vision_SDK] Frame drop observed in 4th channel AVB SRV usecase, while AVB on A15	VISION_SDK_02_02_00_00 & Later	S3-Minor
ADASVISION-533	[Vision SDK] After running SOF usecase , EVE based use-case fail	VISION_SDK_02_03_00_00 & Later	S3-Minor
ADASVISION-587	[TDA2Ex] [TDA2Ex] for some board NDK: Link Status messages displayed continuously	VISION_SDK_02_06_00_01 & Later	S3-Minor
ADASVISION-552	TDA3x Errata: i873 - DSS: First Two Columns Of Active Video Are Always Black At The Output Of Video Encoder	VISION_SDK_02_06_01_01 & Later	S3-Minor
ADASVISION-876	Ethernet does not work on TDA2ex linux with Rev C	VISION_SDK_02_10_00_00 & Later	S3-Minor
ADASVISION-1042	1GBPS stability issue with TDA2xx Rev E board	VISION_SDK_02_11_00_00 & Later	S3-Minor
ADASVISION-1176	Network Rx with YUV422 1280x960 fails after some time	VISION_SDK_02_12_00_00 & Later	S3-Minor
ADASVISION-1175	Network Tx throughput issue with TCP/IP	VISION_SDK_02_12_00_00 & Later	S3-Minor
ADASVISION-1622	Ethernet packet drop issue on TDA2PX EVM	VISION_SDK_03_01_00_00 & Later	S3-Minor

Refer the Release Notes of PDK and InfoADAS for additional Limitations

Compatibility Info

This section contains information about compatibility of APIs between this release and 03.01.00.00.

NOTE: It is recommended to recompile the user created use-cases, alg plugins, links against the new release interface files even if no code level change is required in the user application.

Link API

Module	Interface file	Change in user application required	Change details
Display Distributer Link	dispDistSrcLink.h	No	[New File] Disp Dist Src Link is a source link which provides input to the next links. It can be used to integrate other links while taking input from HLOS applications using a display distribution user/distributor framework.
System Buffer	system_buffer.h	No	Added a parameter to system buffer to allow or disallow translation when the buffers are exchanged between RTOS and HLOS.
System Link ID	system_linkId.h	No	Addition of the Display Distributer Link Ids.
Ultra Sonic Capture Link	ultrasonicCaptureLink.h	No	Addition of support of multiple ultra-sonic sensors and PGA460.

Utils API – This API is used by users when writing an algorithm plugin or use-case or link

Module	Interface file	Change in user application required	Change details
UTILS	utils_link_stats_if.h	No	Support for the measurement of the CPU load for SMP CPUs