

## Release Notes

### Intel® RealSense™ SDK Gold R2 Release

#### SDK version 4.0.0.112526

These release notes covers Intel® RealSense™ SDK for use with Intel® RealSense™ 3D Cameras, models F200 and R200. Please review the “**Intel RealSense SDK License.rtf**” for licensing terms. Please refer to attributions.rtf for third party attributions and third\_party\_programs.txt for third party licenses.

#### IMPORTANT! PLEASE READ!

- This release supports 2 cameras:
  - The **Intel® RealSense™ Developer Kit Camera (F200)**, which can be ordered on the Intel RealSense Website (<http://click.intel.com/intel-realsense-developer-kit.html> )
  - The **Intel R200 Camera**, which is not yet released but is being sampled to select ISVs.
- This package is the Software Development Kit. It does not include the driver/service (DCM) for the camera. Please download the Camera Driver / DCM Package from the Intel RealSense downloads website.
  - F200 Camera: DCM version 1.2.14.24922
  - R200 Camera: DCM version 2.0.0.47980
- If installer requests that you reboot, **please reboot**, or your system will not install correctly.
- Microsoft\* **Windows\* 8.1 x64 August Update required**. Windows 7 is not supported, but limited testing has been successfully performed with Microsoft \* **Windows\* 10 Technical Preview**.

#### SDK Features:

Please note that SDK features are at various levels of maturity in this release as follows:

Maturity	F200 Feature	R200 Feature
<b>Gold</b>	SDK essential interfaces and color/depth/IR data streaming Face Tracking Hand Tracking Speech Recognition and Synthesis Unity* Toolkit	Speech Recognition and Synthesis
<b>Beta</b>	Object Tracking Background Segmentation Touchless Controller	
<b>Alpha</b>	Browser Support	SDK essential interfaces and color/depth/IR data streaming. Scene Perception Face Tracking
<b>Preview</b>	3D Capture Emotion Recognition Java* language and Processing* framework support	3D Capture Enhanced Photography

	Face: Pulse Estimator Blob Tracking	
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### **Hardware Requirements:**

- 4th Generation Intel® Core™ Processor (code name Haswell), or later. Core i5/i7 recommended.
- 8 GB free hard disk space
- The Intel RealSense 3D Camera
  - F200 Camera: PRQ hardware version with firmware 2.38.05 or above.
  - R200 Camera: PRQ hardware version with firmware 1.0.64 or above.
- The Intel RealSense 3D Camera may have known defects and errata which will be provided with the product.
- A USB 3 port for the Intel RealSense 3D Camera.

**IMPORTANT NOTE:** To support the bandwidth needed by the camera, a **USB3** interface is required.

### **Software Requirements:**

- Microsoft **Windows 8.1 x64 August Update** operating system
- Microsoft Visual Studio\* 2010-2013 with the latest service pack or update
- Microsoft .NET\* 4.0 Framework for C# development
- Unity Pro 4.1.0 or later for Unity game development
- One of the following browsers for JavaScript\* development
  - Microsoft Internet Explorer\* 10.0.13 or later for JavaScript development
  - Google\* Chrome\* 33.0.1750.146 or later for JavaScript development
  - Mozilla\* Firefox\* 27.0.1 for JavaScript development
- Processing\* 2.1.2 or higher for Processing development
- Java\* JDK 1.7.0\_11 or higher for Java development
- R200 Only:
  - The graphics driver must support OpenCL™ version 1.2.

\* OpenCL and the OpenCL logo are trademarks of Apple Inc. used by permission by Khronos.

### **Installation steps for SDK Gold – This is for developer systems ONLY:**

- Remove any previous SDK packages. Cleanup the destination directory if needed. **Reboot your computer to allow a complete uninstallation.**
- If not already installed, run the DCM installer(s): intel\_rs\_dcm\_f200\_1.2.14.24922 for the F200 camera, and/or intel\_rs\_dcm\_r200\_2.0.0.47980.exe for the R200 camera.
- **Run the SDK off-line installer** (intel\_rs\_sdk\_offline\_package\_r\_4.0.0.112526.exe). **Reboot your computer again.**

### **F200 Release Notes:**

The following items apply to the F200 camera.

### **F200 SDK Features:**

- **Gold Features:**
  - SDK essential interfaces:

- Session management
- SenseManager pipeline programming
- File recording and playback
- Color and Depth Streaming:
  - Read color, depth and IR samples from the camera.
  - Map coordinates among color, depth coordinates, and world coordinates.
  - Recording/playing back device property changes.
- Depth Camera Manager
  - Intel RealSense Depth Camera Manager Service - The camera service is a Microsoft\* Windows\* based service that runs on the client machine. The camera service allows multiple Intel RealSense SDK applications and a single non SDK application to access data from the camera simultaneously, without blocking each other.
  - Intel RealSense 3D Camera Virtual Driver - The camera virtual driver is a Microsoft Windows based AVStream driver that runs on the client machine. The camera virtual driver allows non-SDK application to access camera streams as if they are connecting directly to the camera and without blocking other SDK applications.
- Face Tracking:
  - **Fixed bugs from Gold**
    - Improved landmarks accuracy for wider angles.
    - Improved landmarks sensitivity around the mouth area.
    - Improved facial expression such as Kiss based on 3D data.
    - Fix in X world coordinate direction according to SDK documentation.
    - Improved head center.
- Hand Tracking:
  - **Fixed bugs from Gold**
    - Major improvement in thumbsUp and thumbsDown gestures. No need to calibrate hand before this gesture.
    - Power and performance improvements in two hand scenarios
    - Power and performance improvements in contour mode
    - Power and performance in gestures
    - Multi-byte (Chinese/Japanese) login crash fixed
    - Finger foldedness works when EnableNormalizedJoints is set to true
    - Joint speed returns the correct values for two hand scenarios
    - Improvement in left/right hand switches
    - Hand module works with any version of GLEW (Cocos2s2d game engine)
    - False positive reduction in all gestures
    - Hand radius image coordinates fixed
    - Global rotation coordinate system aligned
    - Static gestures are now filtered if the hand is moving too fast or the hand is out of the FOV
  - **New:** vertical swipe gesture ("swipe\_up", "swipe\_down")
  - **New:** click gesture ("click")
  - **New:** Low confidence values and alerts in case of (see QueryTrackingStatus and PXCHandData::TrackingStatusType) Hands out of FOV, fast motion, too close/far from camera, pointing to camera.

- **New:** Automatic power gears in Hand and Blob Modules - lower FPS after a set period of time with no hand in the scene (with DCM1.3 only)
  - **New:** Kids Calibration files: added option to set the player's age and load a calibration file accordingly. This significantly improves tracking in sequences of kids hands. (see SetDefaultAge and QueryDefaultAge)
  - **New:** Palm radius (see QueryPalmRadiusImage and QueryPalmRadiusWorld)
  - **New:** Command line sample (see Hands Console)
  - **New:** 3D OpenGL sample (see Hands 3D Viewer)
- Speech Recognition and Synthesis:
  - Command And Control
  - Dictation
  - Text To Speech
  - Support for US English, British English, Latin American Spanish, and Portuguese.
  - Note: Due to large size, speech redistributables will be provided as a separate installer (web or bundled), which will be available on the Intel® RealSense™ Technology developer website in the next few weeks.
- Support for Unity\* ToolKit:
  - Scripts and prefabs for easy game development for all RealSense capabilities such as face tracking, hand tracking, object tracking and speech recognition.
  - Samples included to illustrate the use of the scripts and prefabs.
- Utilities
  - New: Rotation utility (see PXCRotation)
  - New: Point converter utility (see PXCPointConverter)
- **Beta Features:**
  - Object Tracking:
    - RGB+Depth marker-less tracking for 2D objects.
    - Edge-based 3D object tracking.
    - ToolBox: Camera Calibration, creation of object model and configuration files for 3d feature based and edge based tracking
    - Instant 3D tracking (SLAM) feature to create a map of the scene and start tracking automatically.
    - Extensible learning mode for 2D/3D tracking.
    - **New:** Map Creation Interfaces
  - 3D Background Segmentation:
    - Segment the user from the background (e.g. background removal/replacement)
    - Usage cues (fading) at near/far extents
    - **New:** Optional callback support for user enter, too close and too far events.
    - **New:** Improved hair segmentation
    - **New:** Improved performance and power consumption
    - **New:** Improved finger/hand segmentation
  - Touchless Controller
    - Control windows UI with hand gestures.
    - Map user behaviors to UI events, supporting navigation and selection, scrolling, zooming, going to start menu, backing, edge scrolling.
- **Alpha Features:**
  - Support for web browsers via JavaScript\*:

- Supports Hand, Blob, Face Tracking, and Speech Recognition.
- Support for Unity C# (web player platform):
  - Run SDK game applications in web browsers.
- **Preview Features:**
  - 3D Capture
    - Static object capture
    - Standard OBJ, PLY, STL output formats
    - Optional object on planar surface detection/trimming
    - Optional hole-filling and solidification
    - C++ Sample (DF\_3DScan.exe) with obj to html converter (WebGL mesh viewing/sharing)
  - Emotient\* Emotion Detection:
    - Support primary emotions: Anger, contempt, disgust, fear, joy, sadness, and surprise
    - Support sentiments: Positive, negative, and neutral
  - Java\*/Processing\*:
    - Support Java language programming. Used under the JDK environment or under the Processing framework.

## **F200 API Changes:**

- SDK Gold R2:
  - The PXC[M]Session interface extends the following features:
    - **New:** Get/Set the SDK wide coordinate system setting.
    - **New:** Helper function to access to the PXC[M]PowerState interface.
  - Deprecate PXC[M]DataSmoothing, replaced by PXC[M]Smoother for ease of use.
  - Deprecate PXC[M]BlobExtractor, PXC[M]ContourExtractor, replaced by the new Blob module (PXC[M]BlobModule) for ease of use.
  - The PXC[M]Capture interface extends with R200 specific definitions and functions.
  - The PXC[M]3DSeg interface extends to add alert notification when the user is too far/close relative to the camera.
  - The PXC[M]FaceData interface adds HeadPosition confidence value.
  - The PXC[M]HandConfiguration interface adds the user-age configuration.
  - The PXC[M]HandData interface extends to retrieve the tracking status and palm radius.
  - The PXC[M]PowerState interface adds methods to configure inactivity interval.
  - The PXC[M]TouchlessController interface adds methods to configure point sensitivity and scroll sensitivity.
- SDK Gold 84596:
  - The PXC[M]SenseManager made the following changes:
    - **New:** OnStatus is invoked upon module issued warnings.
  - The PXC[M]Capture interface made the following changes:
    - **New:** Added StreamOption. Corresponding changes in PXC[M]VideoModule.
    - **New:** QueryIVCAMAccuracyDefaultValue
    - **New:** QueryColorPowerLineFrequencyDefaultValue
  - The PXC[M]HandConfiguration interface made the following changes:
    - **New:** SetSmoothingValue
    - **New:** QuerySmoothingValue
    - Removed QueryDistanceUnit, marked as Deprecate since alpha.

- Removed SetDistanceUnit, marked as Deprecated since alpha.
- The PXC[M]BlobExtractor/PXC[M]ContourExtractor interfaces made the following changes:
  - ProcessImage takes the PXC[M]Image instance at input, instead of ImageData.
  - QueryBlobData takes the application allocated PXC[M]Image instance at input, instead of ImageData.
- The PXC[M]FaceData interface made the following changes:
  - **New:** Added new facial expression EXPRESSION\_TONGUE\_OUT
  - **New:** Added UnregisterUserByld under the RecognitionModuleData interface.
- The PXC[M]SpeechRecognition/PXC[M]SpeechSynthesis interface made the following changes:
  - **New:** Added the language enumeration LANGUAGE\_LA\_SPANISH.
- The PXC[M]Tracker interface made the following changes:
  - Added the extensible argument to the tracking setup functions.
  - Set3DInstantTrack added an optional argument to skip unstable incoming frames.
- SDK Beta 73633:
  - The PXC[M]Capture interface made the following changes:
    - Deprecated SetDepthLowConfidenceValue.
    - Deprecated Query/SetDepthSaturationValue and QueryColorSensorRange.
    - Changed QueryDepthUnit return type from int to float for better accuracy.
    - Changed Query/SetColorBackLightCompensation to int (from bool) for additional modes.
    - **New:** QueryDepthFocalLengthMM to return the focal length in mm.
    - **New:** QueryXXXXInfo for all read/write device properties.
  - **New:** New pixel format PIXEL\_FORMAT\_Y8\_IR\_RELATIVE for relative I1-I0 IR.
  - **New:** The PXC[M]HandData interface added the QueryOpenness function.
  - **New:** blob, contour and data smoothing utility interfaces under include/utilities.
- SDK Alpha Hot-Fix 65110:
  - No Interface change.
  - The default camera mirror mode is now MIRROR\_MODE\_DISABLED.
- SDK Alpha 60111:
  - This is the first major SDK release with new interfaces.

## **F200 Known Issues and Limitations:**

### **SDK Core/SDK Framework:**

Issue	Recovery/Workaround
High CPU use / low FPS seen in various scenarios, particularly when running multiple applications simultaneously	Will be addressed in future releases.
<p>The following exact installation sequence results in unusable SDK applications after the SDK developer package is uninstalled:</p> <ol style="list-style-type: none"> <li>1. Install the SDK developer package on a clean machine.</li> <li>2. Install any shipped SDK applications.</li> <li>3. Uninstall the SDK developer package.</li> </ol> <p>At this point, the SDK runtimes got uninstalled. The SDK applications do not work.</p>	<p>Avoid installing the SDK developer package before any SDK applications. If there is any SDK application installed before the SDK developer package, the uninstallation of the SDK developer package does not impact any SDK application installed before or after.</p>

This issue does not occur if the SDK developer package and the shipped SDK applications are different in SDK versions.	
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#### Face Detection, Pose Detection and Landmark Tracking:

Issue	Recovery/Workaround
The camera mirror mode is unsupported.	Mirror images in the application, if needed.
In some scenarios when using face recognition high CPU utilization may occur.	Disable face recognition when not required for your solution. Fix to be introduced in a future release.
Some expressions are still in the alpha quality (especially brows).	Use the landmarks directly.
In face_tracking sample, with RealSense camera connected, 2D mode cannot be used	This will be addressed in an upcoming update
When working with 3D camera and requesting face to work in 2D mode Face still works in 3D mode only.	Support for Face in 2D mode will become available in a future update release.
In a scenario when one application is setting the camera profile (resolution, FPS etc.) to an unsupported configuration by Face, Face behavior is unexpected	Ensure camera profile is set to one of the supported Face configurations

#### Hand Tracking and Gesture Recognition:

Issue	Recovery/Workaround
Hand module cannot be instantiated twice in a single application	Ensure each instance is properly destroyed before creating a new one
In a scenario when one application is setting the camera profile (resolution, FPS etc.) to an unsupported configuration by Hands, accuracy might be impacted	Ensure camera profile is set to one of the supported Hands configurations
Calling UnsubscribeAlert during OnFiredAlert will cause a crash	UnsubscribeAlert should not be called inside the callback function
Hands Viewer sample code has a small memory leak. This does not affect the Hands Module or the other Hands samples	N/A

#### 3D Background Segmentation:

Issue	Recovery/Workaround
When multiple people are in range, the segmentation mask quality degrades	None. The module is implemented to work with one person at a time. We are planning to add support for multiple people in a future release.
Glossy or IR absorbing materials (e.g. glasses, watches, headphones, hats and scarves) can degrade segmentation mask quality	Remove these items. Will improve in future releases.
The module fails to segment dark long hair	With plain background in another color – hair is segmented better.
The module confuses black objects from background that are at the same camera eye level of the user's head.	Will improve in future releases
Background Segmentation fails to segment when the user touches the background	Drop hands to sides and face the camera.

Background between fingers can be seen in some cases	Increase or decrease the distance between fingers or move hand away from head/object.
Wrong segmentation when user touches objects and then leaves FOV	Cover the camera and then uncover or move objects which remain
Small slice of user is not segmented in FOV right edge on certain resolutions	Move toward the center of the camera image
The module doesn't work together with other RSSDK modules	Work with 3D Background Segmentation solely
When holding objects or hands close to the head, mask quality is degraded	Move object, head or hands to avoid this case

#### Object Tracking:

Issue	Recovery/Workaround
When the edge based 3D tracking from CAD models is enabled, the initial pose coordinate system is always on and considered as a detected object until the target object in the scene is detected. After that point the initial rendered coordinate system is replaced by the new detected coordinate system.	Will be fixed in the next releases.

#### Unity Toolkit:

Issue	Recovery/Workaround
The Unity Toolkit sample 7 (object tracking) does not include the right execution path in the editor setting.	Modify the Cube game object setting in the Unity Editor: under the tracking Action script, modify the setting of Tracking Source -> Object Tracking -> Tracker 2DPath to be "C:\Program Files (x86)\Intel\RSSDK\sample\FF_ObjectTracking\Assets\2DTargets\targetEarth.jpg".
Editing Rules on multiple objects is currently not working.	User must Edit each rule separately.
Continuous tracking option causes left/right hand confusion sometimes	Need to be used with care.
PointCloud mesh is 9 <sup>th</sup> of the maximum depth resolution due to Unity's mesh limitation	N/A.
Tracking's orientation causes flip sometimes. (visually unpleasant)	
Working on AR mode (with "Sense AR" prefab) requires the game to be in a specific aspect ratio. Currently there is no automatic check and the objects are not falling at the right spot with respect to the RGB image	Set the game aspect ratio manually to 4:3.

#### Nuance Speech Recognition and Synthesis:

Issue	Recovery/Workaround
The release does not include redistributable components for speech recognition and synthesis.	Due to large size, speech redistributables will be provided as a separate installer (web or bundled), which will be available on the RealSense developer



	website in the next few weeks. Contact your Intel rep if redistributables package is needed sooner.
Speech synthesis does not properly select the languages installed on the system.	Develop by installing a single language on the system. This issue will be fixed in the next release.
Known issue when running two recognition sessions simultaneously.	1) If you know about workaround before update, just close all samples and SDKVoiceServer*.exe in task manager or just reboot the system before update. 2) If you faced this problem already, kill SDKVoiceServer*.exe in task manager and reinstall corrupted language pack using modify mode
BuildSentence crashes application if sentence parameter has 0 size ( sentence = '\0' )	Check sentence parameter before call
Voice recognition can hang in rare cases after hibernation.	Release recognition session before hibernation and start after wake up.

#### Frameworks Support (C#, Unity, Web support, Java and Processing):

Issue	Recovery/Workaround
<b>Unity sample:</b> The Unity web-player sample CubeSense shows "CreateInstance: False" when running the pre-compiled HTML. The precompiled HTML is not built up to date.	Recompile the Unity sample in the Unity Editor. The sample works after recompilation.
<b>Sample Browser/Processing:</b> The Processing sample does not run out of box. You need to set the sketch folder location in the Processing sample before running the sample.	Set the sketch folder location in the Processing Preferences to \$(RSDK_DIR)/framework/Processing.
<b>Java:</b> Advanced streaming through the PXCManager interface does not work as designed. The function LocateStreams may return failed on valid stream requests.	Avoid using the LocateStreams function. Use PXCManager for color/depth streaming.
The Java wrapper works with only the 64-bit Java runtime.	Use the 64-bit Java runtime.

#### Touchless Controller:

Issue	Recovery/Workaround
The Back gesture may not be recognized.	Will improve in future releases.
The Pinch gesture is intentionally ignored in the lower part of FOV.	Perform the gesture in the upper half of the FOV.

#### 3D Capture:

Issue	Recovery/Workaround
The 3D Capture scanning volume size is limited in this release	We expect to support larger scanning volumes in future releases
Color on Image is blurry	Texture mapping of color will be added in a future release, greatly increasing the quality of color images
Scan takes a long time to process	Current mesh size is large, will be better trimmed in future. Sample application

	uses web generator for mesh viewing (not required for most apps).
Face detection/trimming does not work	We expect to add face detection/trimming in a future release
Fast object/camera motion while in SCANNING mode may cause the preview image and scanning process to stall	Match the object/camera relative position and orientation shown in the preview, reconstruct the data collected up to that point, or restart the scan
Object structure/shape changes or adding/removing objects within scanning volume (e.g. hands) while in SCANNING mode may cause the preview image and scanning process to stall	Reconstruct the data collected up to that point, or restart the scan
Reconstruct returns PXC_STATUS_FEATURE_UNSUPPORTED if solidification is enabled and the current working directory isn't writable	Ensure that the working directory is writeable before calling Reconstruct or disable solidification. We expect to remove this restriction in a future release.
The first preview image after calling SetMode(PXC3DScan::SCANNING) is unexpectedly black	None. We expect to fix this in a future release.
Calling Reconstruct causes the system to return to PXC3DScan::TARGETING mode	The record and playback system can be used to process the same scan using various options.
When playing back recorded clips using DF_3DScan.exe, the (automatic) transition to PXC3DScan::SCANNING may not occur as expected if -realtime off is not used	When playing back recorded clips, use -realtime off to ensure that all of the frames are processed by DF_3DScan.exe
SetMode(PXC3DScan::SCANNING) returns PXC_STATUS_ITEM_UNAVAILABLE if PXC3DScan::OBJECT_ON_PLANAR_SURFACE_DETECTION is enabled, and no object is detected	The automatic (frame count based) transition to SCANNING mode in DF_3DScan uses a retry pattern to wait for the detected object. In manual mode (spacebar), a message appears in stdout.
Reconstruction returns PXC_STATUS_FEATURE_UNSUPPORTED if PXC3DScan::SOLIDIFICATION option is used and the current working direction is not writable	Temporarily change the current working directory to one which is writable during the Reconstruct call. We are planning to remove this restriction in a future release.

#### Depth Camera Manager:

Issue	Recovery
Windows update <a href="#">KB2919355</a> causes virtual driver to stop working. This is a known issue reported by Microsoft	Install <a href="#">KB2966804</a>
Physical cameras are exposed to users: Intel(R) RealSense(TM) 3D Camera (Front F200) Depth Intel(R) RealSense(TM) 3D Camera (Front F200) RGB In addition to the virtual driver Intel(R) RealSense(TM) 3D Camera Virtual Driver  Using either of the physical cameras can block SDK applications	Use virtual driver and not physical cameras. You may wish to implement Microsoft KB Article 2978137 to hide cameras for Windows Store applications.
Sporadic streaming failures on return from hibernate both over virtual driver and for SDK apps.	For SDK apps restart application. For virtual driver restart service.

UVMMap is cut off in HVGA and QVGA Resolutions	Do not use UVMMap in HVGA and QVGA
Uninstalling DCM while SDK applications are streaming may cause application to crash.	Close all SDK applications before uninstalling DCM.
From projection module point, MirrorMode works incorrectly for functions ProjectDepthToCamera and QueryVertices in DCM 1.2	To be fixed in upcoming release

- Further details may be found in DCM release notes

#### Utilities:

Issue	Recovery
Known limitation with PXCRotation utility	When using Euler Angles in the PXCRotation utility only the default EulerOrder ( Pitch->Yaw->Roll ) should be used.

### **R200 Release Notes:**

The following items apply to the R200 camera.

#### **R200 SDK Features:**

- **Alpha Features:**
  - SDK essential interfaces:
    - Session management
    - SenseManager pipeline programming
    - File recording and playback
    - C#, Java\*/Processing\* and Unity\* C#.
  - Color and Depth Streaming:
    - Read color (YUY2), depth and IR (left/right) samples from the camera.
    - UV mapping functions to map depth to color coordinates.
  - Depth Camera Manager
    - Intel RealSense Depth Camera Manager Service - The camera service is a Microsoft\* Windows\* based service that runs on the client machine. The camera service allows multiple Intel RealSense SDK applications to access data from the camera simultaneously, without blocking each other.
    - Integration with DSAPI 1.11.1
    - Coexistence with IVCAM on the same machine.
    - Concurrent streaming is supported only on one camera
    - ISV/Development/Validation only
  - Face Tracking
    - Face detection and tracking – current supported feature for Alpha is face detection (up to 10 faces) as well as tracking. API returns both the location in the image as well as the world coordinates.
    - Face events – supported events for this release are
      - Face out of field of view / face back to field of view
      - Face lost / new face detected

- Face occluded / face no longer occluded
  - Support camera movement – current version of the face tracking supports user moving the camera naturally. With this Alpha, fast movement of the camera may cause loss of face
  - Head moving freely, yaw, pitch, roll – this version supports user rotation of the face to all 3 directions up to 90 degrees.
  - Object perform natural motion, walking with head pointing 90 degrees from camera, rotating (body) - As a world facing technology, we support the user walking around within the field of view naturally, the face tracking should not be lost. Fast user movement may cause face lost.
- Face Sample code/application
  - Face Tracking C++ - currently for Alpha only the C++ sample code is supported. The only feature enabled in this sample is the face detection and tracking.
- Scene Perception
  - Simplified/Refactored sample application
  - Introduced the possibility to change coordinate system convention
- **Preview Features:**
  - 3D Capture
    - Static object/scene capture
    - Standard OBJ, PLY, STL output formats
    - Optional object on planar surface detection/trimming
    - Optional hole-filling and solidification
    - C++ Sample (DF\_3DScan.exe) with obj to html converter (WebGL mesh viewing/sharing)
  - Enhanced Photography
    - Image refocus based on depth
    - Euclidean distance measurement

## **R200 Known Issues and Limitations:**

### **SDK Core/SDK Framework:**

Issue	Recovery/Workaround
CaptureManagerFile always return 0 in QueryFrameIndex() while playing Left or Right stream	No workaround exists in this release. Will be fixed in the following release.
raw_streams shows the first color frame with wrong mirror mode	The first frame needs to be skipped for now. This will be addressed in future release.
Error in Java samples caused by JDK version - JDK 1.7.0_51	Please Use JDK 1.7.0_11
DF_Raw_streams.cs. sample: Picture In Picture is not correctly scaled in the Middle window	Will be addressed in future release

### **Face Tracking**

Issue	Recovery/Workaround
Distance up to 3 meters – user can be anywhere from 50cm to 3m from the camera and face tracking is expected to be working	Moving forward toward Beta we expect this limitation to be up to 4m

Camera rotating up to 10 degree per second - for this Alpha release the use of IMU is very limited thus the support for camera rotation is rather limited	Toward Beta release camera rotation will be enabled with no limitation
Motion of up to 1 meter per second	To achieve face tracking quality, user cannot move faster than 1 meter per second
60 fps resolutions and VGA YUY2 are not supported on R200.	N/A

#### Scene Perception:

Issue	Recovery/Workaround
The module may randomly return error during saving the mesh in Win32 configuration due to memory limitation.	Avoid saving a huge volume/mesh file in Win32. In the next release the module will return dedicated error code to indicate this limitation.
The sample crashes when using color 640x480x30 and depth 480x360x30.	Sample is designed to work only with color 320x240x30 and depth 320x240x30. Avoid using any other resolutions. Will be fixed on later release
GetCameraPose() returns different matrix than the one set using setInitialPose() is made before passing the first frame	Use GetCameraPose() after passing the first frame. Will fix in next release.
First successfully tracked frame returns Camera Pose matrix with translation x,y = (2, 2) for Low Voxel resolution	Later release will start with position 0, 0.
Volume dimension is incorrect for Med and High Voxel Resolution	Please change the value of volumeDimension to 2.0 and 1.0f for Med and high Voxel resolution in main.cpp. Will fix in next release.
Tracking Fails when scanning monotonous areas, reflective surfaces, walls, huge black areas or scene with very few details/geometry	This issue will be minimized with the help of using data from IMU in the next release.
The reconstruction might sink when the camera stays in a static position and orientation for a long period of time	Will be fixed in next release
Pose might drift when the camera camera stays in a static position and orientation for a long period of time	Will be fixed in next release
SP requires openCL 1.2	Upgrade to the correct version

#### Enhanced Photography:

Issue	Recovery/Workaround
In accurate measurement when one of the selected points is on the edge.	Choose points for measurement that are 2-3 pixel away from the object edge
In correct measurement in areas where the camera doesn't return depth data or returns inaccurate depth data.	Change camera position so the object of interest has good depth data.

#### Frameworks Support (C#, Unity, Web support, Java and Processing):

Issue	Recovery/Workaround
RealSenseWeb endless thread loop on machine without camera connected	Will be fixed in later release. Please ensure the camera is connected.

### 3D Capture (same as F200 above)

#### Depth Camera Manager:

Issue	Recovery
SDK application might hang and don't recover from hibernate state	Install two MS updates: KB2919355 & KB2966804
Physical cameras are exposed to users: Intel(R) RealSense(TM) 3D Camera (Front F200) Depth Intel(R) RealSense(TM) 3D Camera (Front F200) RGB Using either of the physical cameras can block SDK applications	The application that is using the camera must be closed before opening the SDK application
Sporadic streaming failures on return from hibernate both over virtual driver and for SDK apps.	For SDK apps restart application
Uninstalling DCM while SDK applications are streaming may cause application to crash.	Close all SDK applications before uninstalling DCM.
SDK application can configure the camera for a lower	
Camera properties aren't persistence after SX cycling	Application need to reconfigure all properties after Sx
Configuration of color FPS that is higher from the depth FPS is possible in the SDK but will fail	The camera requirements is that color FPS will greater or equal to depth FPS. The application must configure the FPS of the color to be equal or greater than the depth.
100 FPS is not supported	
DSAPI DLL isn't signed	
Service crashes and Application sometimes gets stuck or crashes at Init for color and depth together	
Unsupported combinations of stream profiles are exposed	Application must use only the supported configuration below.
Service may crash when configuring color & depth	
Error message when using depth/left/right camera directly	Only the color camera may be used directly. Using depth/left/right with standard camera applications is not supported.

#### R200 Supported Configuration:

Color / Depth(Left/Right)	No Stream	628x468 60 fps	628x468 30 fps	480x360 60 fps	480x360 30 fps	320x240 60 fps	320x240 30 fps
No Stream	---	OK	OK	OK	OK	OK	OK
1920x1080 15 fps YUY2	OK	X	X	X	X	OK	X
1920x1080 30 fps YUY2	OK	X	OK	X	OK	OK	OK
640x480 15 fps YUY2	OK	X	X	X	X	OK	OK
640x480 30 fps YUY2	OK	X	OK	X	OK	OK	OK
640x480 60 fps YUY2	OK	X	X	X	X	X	X

1920x1080 15 fps RGB32	OK	X	X	X	X	OK	X
1920x1080 30 fps RGB32	OK	X	OK	X	OK	OK	OK
1280x720 15 fps RGB32	OK	X	X	X	X	OK	X
1280x720 30 fps RGB32	OK	X	OK	X	OK	OK	OK
640x480 15 fps RGB32	OK	X	X	X	X	OK	X
640x480 30 fps RGB32	OK	X	OK	X	OK	OK	OK
640x480 60 fps RGB32	OK	X	X	X	X	X	X
320x240 15 fps RGB32	OK	X	X	X	X	OK	X
320x240 30 fps RGB32	OK	X	OK	X	OK	OK	OK
320x240 60 fps RGB32	OK	X	X	X	X	X	X

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