

# **Intel® RealSense™ L515 Camera**

**Specification Update**

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***Revision 008***

***February 2021***

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# Revision History

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Revision Number	Description	Revision Date
001	Major Firmware 1.3.15.100 Release	June 2020
002	Minor Firmware 1.4.1.0 Release	June 2020
003	Minor Firmware 1.4.1.2 (Recommended)	July 2020
004	Major Firmware 01.05.00.00	August 2020
005	Minor Firmware 01.05.01.03	October 2020
006	Minor Firmware 01.05.02.00	November 2020
007	Minor Firmware 01.05.03.00	January 2021
008	Minor Firmware 01.05.04.01	February 2021

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# 1 Preface

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This document is an update to the specification contained in the [Affected Documents](#) table below. This document is a compilation of device and documentation errata, specification clarifications and changes. It is intended for hardware systems manufactures and software developers of applications, systems or tools.

Information types defined in Nomenclature are consolidated into the specification updates and are no longer published in other documents.

This document may also contain information that was not previously published.

## 1.1 Affected Documents

Document Title	Location
Intel® RealSense™ L515 Camera Datasheet	<a href="https://dev.intelrealsense.com/docs/lidar-camera-l515-datasheet">https://dev.intelrealsense.com/docs/lidar-camera-l515-datasheet</a>

## 1.2 Nomenclature

**Errata** are design defects or errors. These may cause behavior to deviate from published specifications. Hardware and software designed to be used with any given stepping must assume that all errata documented for that stepping are present on all devices.

**Specification Changes** are modifications to the current published specifications. These changes will be incorporated in any new release of the specifications.

**Specification Clarifications** describe a specification in greater detail or further highlight a specification's impact to a complex design situation. These clarifications will be incorporated in any new release of the specification.

**Documentation Changes** include typos, errors, or omissions from the current published specifications. These will be incorporated in any new release of the specification.



## 2 Summary Table of Changes

The following tables indicate the errata, specification changes, specification clarifications, or documentation changes which apply to the Product Name product. Intel may fix some of the errata in a future stepping of the component and account for the other outstanding issues through documentation or specification changes as noted.

### 2.1 Codes Used in Summary Tables

#### Status

Doc:	Document change or update will be implemented
Open:	In engineering assessment
Plan Fix:	This erratum may be fixed in a future firm of the product
Fixed:	This erratum has been previously fixed
No Fix:	There are no plans to fix this erratum

**Table 2-1. Errata Summary Table**

Number	Status	Errata
N/A	<b>Fixed</b> in Minor Firmware 1.4.1.0	Horizontal shift of depth map
RS5-7338	<b>Fixed</b> in Minor Firmware 1.4.1.0	Camera lost connection to LIBRS after closing all sensors
RS5-7604	<b>Fixed</b> in Minor Firmware 1.4.1.0	Close object invalidation
RS5-7195	<b>Fixed</b> in Minor Firmware 1.4.1.2	Sequential frame drops when simultaneously streaming color, depth, IR, confidence, accelerometer, and gyroscope.
RS5-7898	<b>Fixed</b> in Minor Firmware 1.4.1.2	Preset and control changes
RS5-5250	Open	Occasionally, after resetting the device, the Viewer gets stuck and does not show the camera. The reproduction rate is very low (<100ppm) and has been observed only on Windows 10 RS4 machines. The recovery is by unplugging and replugging the device.
RS5-5104	Open	First two color video streams are incomplete.
RS5-6586	<b>Fixed</b> in Minor Firmware 1.4.1.2	Corrupted Depth and IR
RS5-7374	<b>Fixed</b> in LibRS	LIBRS stuck after camera hardware reset
N/A	N/A	All Windows validation is performed on RS5. Validation and support for RS4 is not planned.
RS5-7693	Open	Initial IMU frames incorrect after setting a new IMU frame rate.

## Summary Table of Changes

Number	Status	Errata
RS5-8025	<b>Fixed</b> in Major Firmware 01.05.00.00	Fall detect enabled even if it was previously disabled.
RS5-9994	<b>Fixed</b> in Minor Firmware 01.05.04.01	Noise artifacts in depth image when set to QVGA resolution.

**Table 2-2. Specification Changes**

Number	Specification Changes
N/A	Minor firmware 01.05.01.03 includes support for USB2 as well as support for QVGA depth resolution at 30fps. Note: This firmware needs to be updated on the L515 camera via USB3 first before USB2 support is available.
N/A	Minor firmware 1.4.1.0 is highly recommended as this firmware fixes a horizontal shift of the depth map. Using the combination of FW 1.4.1.0 and Librealsense version 2.35.2 will be the best configuration for L515 cameras since the Librealsense version 2.35.2 is the first official release of SDK that supports L515 cameras.

**Table 2-3. Specification Clarifications**

No.	Specification Clarifications
	<p>Firmware releases are classified as "Major" and "Minor" Firmware.</p> <p><b>Major Firmware</b> – This is a production firmware release. Production firmware is recommended and supported for production builds integrating Intel RealSense depth cameras. This is a firmware which is used on the Intel RealSense camera production line. Major Releases are recommended and supported for customers integrating Intel® RealSense™ depth cameras or modules into complete products. The current release cadence is bi-annually.</p> <p><b>Minor Firmware</b> – These are development firmware releases between the bi-annual Major Releases. The Intel RealSense team continues implementing new features and resolving issues. All the new changes are validated, but a complete end to end system validation is not completed until a Major release. Minor releases are completely acceptable for customer integration. Customers can take advantages of the new features and resolved issues.</p>

**Table 2-4. Documentation Changes**

No.	Documentation Changes
	None for this revision of this specification update.

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## 3 Errata

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### 3.1 Open

<b>RS-5250</b>	<b>Occasionally, after resetting the device, the Viewer gets stuck and does not show the camera. The reproduction rate is very low (&lt;100ppm) and has been observed only on Windows 10 RS4 machines. The recovery is by unplugging and replugging the device.</b>
<b>Problem:</b>	When restarting the device using the HW Monitor Command RST, the device may not be recognized by RS Viewer. This has only been observed on Windows 10 RS4 machines and happens rarely.
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	Unplug and plug the device.
<b>Status:</b>	Refer the Summary Tables of Changes

<b>RS5-5104</b>	<b>First two color video streams are incomplete.</b>
<b>Problem:</b>	In some instances, the first two color video frames are incomplete when Depth, IR, Confidence, and IR streams are simultaneously streaming. This issue only occurs on Intel host controllers.
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	None
<b>Status:</b>	Refer the <i>Summary Tables of Changes</i>

<b>RS5-7693</b>	<b>Initial IMU frames incorrect after setting a new IMU frame rate.</b>
<b>Problem:</b>	After setting a new IMU frame rate and restarting the stream, up to 7 of the first frames may be invalid (either old frame rate or dropped). Subsequent restarts show no issue.
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	After changing IMU frame rate and restarting stream, discard the first several IMU frames received.
<b>Status:</b>	Refer the <i>Summary Tables of Changes</i>

## 3.2 Fixed

<b>N/A</b>	<b>Horizontal shift of depth map</b>
<b>Problem:</b>	It is possible for the depth map to shift in the horizontal direction over time.
<b>Implication:</b>	Depth map looks good however it slightly shifted compared to a reference such as the RGB camera image.
<b>Status:</b>	Refer the Summary Tables of Changes

<b>RS5-7338</b>	<b>Camera lost connection to LIBRS after closing all sensors</b>
<b>Problem:</b>	Occasionally camera lost connection after sensor start stop operation
<b>Implication:</b>	N/A
<b>Workaround:</b>	N/A
<b>Status:</b>	Refer the Summary Tables of Changes

<b>RS5-7604</b>	<b>Close object invalidation</b>
<b>Problem:</b>	Camera behavior change, in previous release camera will shut down depth stream once close object is detected after 1 sec. in 1.4.1.0 release the camera will invalidate the frames with the invalid depth
<b>Implication:</b>	N/A
<b>Workaround:</b>	N/A
<b>Status:</b>	Refer the Summary Tables of Changes

<b>RS5-7195</b>	<b>Sequential frame drops when simultaneously streaming color, depth, IR, confidence, accelerometer, and gyroscope.</b>
<b>Problem:</b>	While concurrently streaming color, depth, IR, confidence, accelerometer, and gyroscope, several consecutive frames may drop. This issue happens on rare occasions.
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	None
<b>Status:</b>	Refer the Summary Tables of Changes

<b>RS5-7898</b>	<b>Preset and control changes</b>
<b>Problem:</b>	Camera presets and control changes are in effect only if performed after start streaming
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	None
<b>Status:</b>	Refer the <i>Summary Tables of Changes</i>

<b>RS5-6586</b>	<b>Corrupted Depth and IR</b>
<b>Problem:</b>	Occasionally, after few hrs of operation a corrupted IR or depth image may happen
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	Stop and Start the camera
<b>Status:</b>	Refer the <i>Summary Tables of Changes</i>

<b>RS5-8025</b>	<b>Fall detect enabled even if it was previously disabled.</b>
<b>Problem:</b>	If the Fall Detect feature is manually disabled, it will automatically be enabled on next restart.
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	None
<b>Status:</b>	Refer the <i>Summary Tables of Changes</i>

<b>RS5-7374</b>	<b>LIBRS stuck after camera hardware reset</b>
<b>Problem:</b>	LIBRS lost connection to camera after disconnecting and reconnect of the USB
<b>Implication:</b>	Low reproduction rate
<b>Workaround:</b>	Restart LIBRS
<b>Status:</b>	Refer the <i>Summary Tables of Changes</i>

<b>RS5-9994</b>	<b>Noise artifacts in depth image when set to QVGA resolution</b>
<b>Problem:</b>	When setting depth resolution to QVGA, artifacts seen in depth image
<b>Implication:</b>	The failure is observed on L515 cameras
<b>Workaround:</b>	None
<b>Status:</b>	Refer the <i>Summary Tables of Changes</i>