Intel® RealSense™ Product Family D400 Series

Specification Clarification

Revision 029

May 2021

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Revision History

Document Number	Revision Number	Description	Revision Date
337125	029	D455 RGB Specification Clarification Only	May 2021

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1 Preface

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™ D400 Series Product Family Datasheet	https://dev.intelrealsense.com/docs/intel-realsense-d400-series-product-family-datasheet

1.2 Nomenclature

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.

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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 Summary Tables

Table 2-1. Specification Clarifications

No.	Specification Clarifications
DSO-15718	D455 – Camera when placed in very bright sunlight with low exposure yields incorrect color on RGB

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3   *Specification Clarification*

3.1   D455 Clarification Details

The Intel® RealSense™ Depth Camera D455 is a significant improvement in performance when compared to previous generations of Intel stereo cameras. Along with improving the depth KPI from two (2) meters to four (4) meters, D455 also includes a global shutter RGB sensor with increased sensitivity for better performance. The integrated RGB sensor over-saturates in bright sunlight and presents itself as a purple hue. We do not see this phenomenon indoors or outdoors without direct bright sunlight. This has no effect on depth quality. We are able to mitigate some of the effect with options shown in this document.

Design Details Differences

In the spirit of continuous improvement, Intel is constantly working to improve products. Below is a comparison between our previous stereo cameras RGB and the D455 RGB. These changes impact this specification clarification.

Feature	D455	D435/D415	Comment
Shutter	Global	Rolling	Rolling shutter allows for line by line exposure while global exposes the entire frame simultaneously. The global shutter works better for higher speed scenes and low light scenarios. Excessively bright scenes may be impacted.
Pixel Sensitivity	450% increase	Baseline	The increased pixel sensitivity increases the effect of bright sunlight on the RGB.

D455 RGB Camera in Bright Sunlight

- Due to the high sensitivity of the D455 RGB global shutter sensor, it over-saturates in bright sunlight and presents itself as a purple hue.
- In the majority of use cases, indoors or out of direct sunlight, the D455 yields excellent images.
- For customers who wish to utilize the D455 in extremely bright sunlight then Intel suggests the option of attaching a Neutral Density Filter just over the RGB camera.
- Example results we have seen are below. The image on the left has the purple hue and the image on the right has a Neutral Density filter with no discoloration. The filter is from Thorlabs and the specific part number is NE20B (OD=2). There are other options at varying prices. This is just an example. Company link: https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=5011.
- Additionally, from a parameter perspective, settings such as FPS, saturation and exposure time may impact this specification clarification. In some cases, increasing the FPS may improve saturation, but each use case may vary.
- More details on filters and their usage with RealSense™ products can be found at: https://dev.intelrealsense.com/docs/optical-filters-for-intel-realsense-depth-cameras-d400