Firmware Changelog for Gemini 330 series

<table>
<tr><th>The latest firmware version</th><th>The previous release version</th><th>Changelog</th><th>Supported Product</th><th>SDK Version</th><th>Release Date</th></tr>
<tr><td rowspan="20">V1.8.10</td><td rowspan="20">V1.6.00</td><td>New feature: expand hardware D2C (Depth-to-Color) alignment support, now covering all RGB camera resolution modes. Users can directly obtain hardware-level depth-to-color alignment results in high-resolution color image modes without relying on host-side software alignment processing, significantly reducing host CPU utilization.
Since the on-chip D2C alignment only supports resolutions up to 640x480, for all color image resolutions above 640x480, the in-camera aligned depth images will be further upsampled on the host side to match the desired color image resolution.</td><td>Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td><td rowspan="20">V2.8.7</td><td rowspan="20">2026/6/26</td></tr>
<tr><td>New feature: add a new frame rate of 20 FPS to depth & IR & color streams.
(Note: 20 FPS is not supported for the following configurations — Gemini 335/336/330_RGB at 320×180 or 320×240; Gemini 335Lg_IR/Depth at 848×100; Gemini 335L/336L/330L_IR/Depth at 848×100; and Gemini 335/336/330_IR/Depth at 848×100.)</td></tr>
<tr><td>New feature: add configurable color presets: Default and Warm Biased AWB. The Default preset gives standard color reproduction, while the Warm Biased AWB preset is optimized for mixed-lighting scenes, automatically suppressing blue tint in white-light regions and improving overall perceptual consistency. The default preset is Default.</td><td>Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td></tr>
<tr><td>New feature: add configurable exposure alignment support for short-baseline cameras across all synchronization modes, enabling flexible intra- and inter-camera synchronization.</td><td>Gemini 335/336/330</td></tr>
<tr><td>New feature:add extended depth data formats, besides the original format Y16, depth can stream in additional formats: Y12 & Y14. The new formats can be used to suppress the bandwidth required for streaming depth data and thus reduces unexpected frame drops on busy networks.</td><td>Gemini 335Le</td></tr>
<tr><td>New feature: add CCP (Control Channel Privilege) support, enabling control channel access management to enhance device control security and consistency in multi-host environments.</td><td>Gemini 335Le</td></tr>
<tr><td>New feature: add DHCP lease auto-renewal mechanism. The device proactively initiates lease renewal before IP expiration, preventing network disconnection caused by lease timeout and improving network stability.</td><td>Gemini 335Le</td></tr>
<tr><td>New feature: add 640 × 360 (16:9) color resolution for the USB 2.0 connection.</td><td>Gemini 335/336/330</td></tr>
<tr><td>New feature: add new color stream options of 640x480 @ 10/20FPS and 424x240 @ 10/20FPS for the USB 2 connection.</td><td>Gemini 335/336/330</td></tr>
<tr><td>New feature: add support for setting the camera gateway address to 0.0.0.0, which is suitable for scenarios that only require local network communication without external network access (such as closed networks or direct device connections). This can avoid network issues caused by improper gateway configuration and improve usage stability.</td><td>Gemini 335Le</td></tr>
<tr><td>New feature: For the color image anti-flicker function, when the power line frequency is set to Auto, an anti-flicker mode on/off switch is added. When the anti-flicker mode is enabled, the exposure time is not allowed to fall below the anti-flicker threshold, to avoid brightness fluctuations in the image. When the anti-flicker mode is disabled, the exposure time may fall below the anti-flicker threshold to prevent overexposure caused by excessively long exposure under bright light.</td><td>Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td></tr>
<tr><td>New feature: add new depth presets High Accuracy & High Density which are pre-integrated into the camera firmware. The depth preset High Accuracy is designed for robotics and the depth preset High Density is designed for 3D reconstructions.</td><td>Gemini 335Le</td></tr>
<tr><td>New Feature: add configurable DHCP timeout with flexible range of 5-180s (default: 45s), enabling customized deployment across diverse network environments.</td><td>Gemini 335Le</td></tr>
<tr><td>New Feature: add support for configuring the disparity search range, disparity offset and AE ROI (depth/IR/color) before starting streams. There is an additional min/max check for the configured values to ensure that the actually used configurations are within the valid min/max ranges. This feature must be used with Orbbec SDK v2_V2.9.0 or a later version.</td><td>Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td></tr>
<tr><td>New Feature: add a new feature to boost the supported maximum trigger frequency for frame rates of 30fps and lower. This feature is supported only for the USB 3.0 and GMSL2 connections. With the fps boost feature enabled, the supported maximum trigger frequency is increased from half of the configured frame rate to the full frame rate, which enables image acquisitions at higher frequencies in both hardware and software triggering modes. When the fps boost feature is enabled and the supported maximum trigger frequency is boosted, the supported maximum exposure time is reduced by ~50% in comparison to the unboosted configuration, as a side effect.
The fps boost feature is optional and is disabled by default. Thus, users can boost the maximum trigger frequency in triggering modes on demand, and there is no need to modify their established implementations and applications.
Below is a table for a direct comparison between the fps boost feature disabled and enabled:
<table>
<tr><th rowspan="2">Set The Camera's Fixed Frame Rate(fps)</th><th colspan="2">fps Boost Disabled</th><th colspan="2">fps Boost Enabled</th></tr>
<tr><th>Supportable Passive Trigger Interval (ms)</th><th>Supportable Passive Trigger Frequency (Hz)</th><th>Supportable Passive Trigger Interval (ms)</th><th>Supportable Passive Trigger Frequency (Hz)</th></tr>
<tr><td>90</td><td>> 22.3</td><td>0 - 45</td><td>> 22.3</td><td>0 - 45</td></tr>
<tr><td>60</td><td>> 33.4</td><td>0 - 30</td><td>> 33.4</td><td>0 - 30</td></tr>
<tr><td>30</td><td>> 66.7</td><td>0 - 15</td><td>> 33.4</td><td>0 - 30</td></tr>
<tr><td>15</td><td>> 133.4</td><td>0 - 7.5</td><td>> 66.7</td><td>0 - 15</td></tr>
<tr><td>10</td><td>> 200</td><td>0 - 5</td><td>> 100</td><td>0 - 10</td></tr>
<tr><td>6</td><td>>333.4</td><td>0 - 3</td><td>> 166.7</td><td>0 - 6</td></tr>
<tr><td>5</td><td>> 400</td><td>0 - 2.5</td><td>> 200</td><td>0 - 5</td></tr>
</table></td><td>Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg</td></tr>
<tr><td>New Feature: add support for hosts with multiple NICs and multi-IP configurations for NICs.</td><td>Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix a data stream transmission issue that could occur when multiple cameras were connected to the same switch and the host Ethernet cable was hot-plugged, improving the robustness of the cameras under network topology changes.</td><td>Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix a low-probability issue where unstable power supply during the camera power-on self-check process could cause an abnormal firmware health status, which in turn brings the device into boot/recovery mode.</td><td>Gemini 335/336/330
Gemini 335L/336L/330L</td></tr>
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<tr><th>The latest firmware version</th><th>The previous release version</th><th>Changelog</th><th>Supported Product</th><th>SDK Version</th><th>Release Date</th></tr>
<tr><td rowspan="15"></td><td rowspan="15"></td><td>Fixed issue:fix the issue where the color image would flicker when the ROI of the color image was set to 50×50 pixels or smaller.</td><td>Gemini 335Lg
Gemini 335Le</td><td rowspan="15"></td><td rowspan="15"></td></tr>
<tr><td>Fixed issue: fix an issue where color images could flicker in inter-camera synchronization modes at 5 FPS, improving the stability of synchronized multi-camera imaging.</td><td>Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix the issue where the device could not be discovered due to network connection timeout (>100s) after power-on.</td><td>Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix an issue where timestamp alignment at the end of exposure could have significant deviations in triggered mode for cameras, improving temporal accuracy for multi-camera synchronization and coordination with external devices.</td><td>Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix the issue where manually set color exposure parameters occasionally fail to take effect.</td><td>Gemini 335/336/330
Gemini 335L/336L/330L</td></tr>
<tr><td>Improvement: improve the reliability of the start stream operations.</td><td>Gemini 335Le</td></tr>
<tr><td>Improvement: color frames from rolling shutter sensors are not synced to trigger signals in triggering modes and stream continuously in the configured frame rate.</td><td>Gemini 335/336/330</td></tr>
<tr><td>Improvement: improve the reliability of the start stream operations in triggering modes for USB 2 connections.</td><td>Gemini 335/336/330
Gemini 335L/336L/330L</td></tr>
<tr><td>Improvement: the LRM measurement sampling rate is upated from 2.5Hz to 10Hz with improved reading out speed.</td><td rowspan="2">Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td></tr>
<tr><td>Improvement： optimize color gain settings:
1.Extended max color Gain from 128 to 248, enhancing low-light image brightness and detail capture;
2. Aligned color Gain mapping with Depth Gain to simplify multi-sensor calibration and reduce customer integration effort.
Adjusted differences as per table below:
<table>
<tr><th>Gain setting value</th><th>Old gain multiplier</th><th>New gain multiplier</th></tr>
<tr><td>0</td><td>1.00x</td><td>1.00x</td></tr>
<tr><td>8</td><td>1.50x</td><td>1.00x</td></tr>
<tr><td>16</td><td>2.00x</td><td>1.00x</td></tr>
<tr><td>24</td><td>2.50x</td><td>1.50x</td></tr>
<tr><td>32</td><td>3.00x</td><td>2.00x</td></tr>
<tr><td>48</td><td>4.00x</td><td>3.00x</td></tr>
<tr><td>64</td><td>5.00x</td><td>4.00x</td></tr>
<tr><td>80</td><td>6.00x</td><td>5.00x</td></tr>
<tr><td>96</td><td>7.00x</td><td>6.00x</td></tr>
<tr><td>112</td><td>8.00x</td><td>7.00x</td></tr>
<tr><td>128</td><td>9.00x</td><td>8.00x</td></tr>
<tr><td>160</td><td>N/A</td><td>10.00x</td></tr>
<tr><td>192</td><td>N/A</td><td>12.00x</td></tr>
<tr><td>224</td><td>N/A</td><td>15.00x</td></tr>
<tr><td>248</td><td>N/A</td><td>15.50x</td></tr>
</table></td></tr>
<tr><td rowspan="15">V1.6.00</td><td rowspan="15">V1.5.55</td><td>New feature: add configurable exposure alignment in both software and hardware triggering modes to enable precise synchronization between the camera and external devices.</td><td rowspan="4">Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td><td rowspan="15">V2.5.5</td><td rowspan="15">2025/10/13</td></tr>
<tr><td>New feature: add color backlight compensation feature with adjustable intensity levels from 0 to 6. The default level is 3; higher levels result in brighter images.</td></tr>
<tr><td>New feature: add support for adjustable color denoising levels. The default setting is Auto mode, with manual configuration available from level 1 to 8. When set to a fixed level, the camera applies denoising according to the selected level; higher levels provide stronger noise reduction but may slightly reduce image sharpness.</td></tr>
<tr><td>New feature: add support for PTP (Precision Time Protocol) V2 time synchronization to enable high-precision clock synchronization between the camera and external devices.</td><td>Gemini 335Le</td></tr>
<tr><td>New feature: add support for the FORCEIP_CMD feature. This allows users to temporarily assign an IP address for short-term access and configuration of the camera. After power-off or reboot, the device automatically reverts to its original IP configuration, ensuring that temporary changes do not affect the camera's long-term network settings.</td><td>Gemini 335Le</td></tr>
<tr><td>New feature: add support for device discovery from different hosts or subnets.thereby improving flexibility in device management and access.</td><td>Gemini 335Le</td></tr>
<tr><td>New Feature: when the camera is operating in DHCP mode and fails to obtain an IP address within 45 seconds, it will automatically switch to the previously configured static IP mode to ensure stable device connection and accessibility.</td><td>Gemini 335Le</td></tr>
<tr><td>New feature: add support for embedding metadata in the first frame of the image, with the feature disabled by default. Enabling this feature allows the host platform to access metadata that would otherwise be unavailable.</td><td>Gemini 335Lg</td></tr>
<tr><td>Fixed issue: fix the issue of frame drops occurring when the device is connected to an external network through a switch and affected by network interference.</td><td>Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix the issue where the device occasionally encountered static IP abnormalities after disabling DHCP.</td><td>Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix the issue of abnormal depth images in secondary-synced mode at 60 fps.</td><td>Gemini 335Lg</td></tr>
<tr><td>Fixed issue: fix the purple color issue for single color image captures under triggering modes.</td><td>Gemini 335L/336L/330L
Gemini 335Lg/335Le</td></tr>
<tr><td>Fixed issue:fix the issue of IR camera AE flickering caused by the object being too close.</td><td rowspan="3">Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td></tr>
<tr><td>Fixed issue: fix the intermittent issue where the depth stream fails to start due to specific timing configurations.</td></tr>
<tr><td>Fixed issue: fix the issue where IR streaming occasionally failed when switching the synchronization mode during active streaming.</td></tr>
<tr><td>Improvement: enhance the firmware security mechanism of the Gemini 330 series to prevent the camera from being affected by incorrectly flashed firmware versions.</td><td>Gemini 335/336/330
Gemini 335L/336L/330L
Gemini 335Lg
Gemini 335Le</td></tr>
</table>

Firmware Changelog for Gemini 330 series

The latest firmware version	The previous release version	Changelog	Supported Product	SDK Version	Release Date
V1.5.55	V1.5.31	New Feature: add support for depth HDR in both software and hardware triggering modes.	Gemini 335/336/330 Gemini 335L/336L/330L Gemini 335Lg Gemini 335Le	V2.4.3	2025/6/30
		New Feature: add support for an expanded disparity search range of 256 pixels. This feature is enabled only for specific depth presets. Please find detailed information on the depth preset release website.	Gemini 335/336/330		
		Fixed issue: fix the issue of occasional frame drops while operating with the Factory preset.	Gemini 335/336/330 Gemini 335L/336L/330L		
		Fixed issue: enable the full performance of DHCP.	Gemini 335Le		
		Fixed issue: fix the issue of very occasional failures while starting depth / IR streams in the secondary-synced mode.	Gemini 335/336/330 Gemini 335L/336L/330L Gemini 335Lg Gemini 335Le		
		Improvement: improve the synchronization accuracy of the device timestamps across multiple cameras.			
		Fixed issue: fix the issue of abnormal RGB images while starting the RGB stream.			
		Improvement: improve the overall operational stability.	Gemini 335Le		
		Improvement: improve depth performance for high ambient temperatures. The overall laser energy is reduced by 50% at 70 °C before completely shutting down the laser, to prevent from potential overheating of the laser device while still maintaining adequate laser performance for most use cases.	Gemini 335/336/330 Gemini 335L/336L/330L Gemini 335Lg Gemini 335Le		
		Improvement: enhance the exception handling while starting / stopping data streams.			
		Improvement: optimize imaging quality for short exposures (typically < 100us).			
V1.5.31	V1.4.60	New feature: add support for Gemini 335Le	Gemini 335Le	V2.3.5	2025/4/15
V1.4.60	V1.4.00	New feature: add support for the backup firmware. If the camera firmware becomes corrupted due to unexpected interruptions while being updated, the backup firmware will maitain the camera still operational. However, a retry of the firmwire update is indispensable for the optimal camera performance.	Gemini 335/335L Gemini 336/336L Gemini 330/330L Gemini 335Lg	V2.2.8	2025/2/17
		New feature: add support for optional depth presets which are complementary to the built-in depth presets in the camera firmware and can be configured by users. Users can obtain new depth presets as single files from the Gemini 330 series documentation page and download them as optional depth presets from the host to the camera. Maximal three depth presets can be downloaded to the camera. No reboot of the camera is required to enable the downloaded new depth presets.	Gemini 335/335L Gemini 336/336L Gemini 330/330L Gemini 335Lg		
		New feature: add support for the on-chip hardware noise removal filter, which is alternative to the software noise removal filter in SDK and thus reduces the host CPU load. This hardware noise removal filter is disabled by default.	Gemini 335/335L Gemini 336/336L Gemini 330/330L Gemini 335Lg		
		New feature: add support for the disparity search range offset, which can be used to shift the depth operating range. Larger offset value leads to decreased min-Z depth value and also decreased max-Z depth value. This features is supported only for the depth resolutinos of 1280x800 & 1280x720 & 640x400 & 424x266. The depth stream must be started before configuring this value.	Gemini 335/335L Gemini 336/336L Gemini 330/330L Gemini 335Lg		
		New features: add new function for Gemini 335Lg. 1. Add depth/IR AE support for alternating depth/IR imaging configurations. 2. Add laser on/off status sync option. 3. Add exposure priority option to depth AE and this option is disabled by default. 4. add a new resolution of 424 x 266 to depth and IR.	Gemini 335Lg		
		Improvement: reduce peak power consumptions without any performance degradation. Comparisons between typical values before and after optimization: - Gemini 335Lg: 8.4W -> 7.5W	Gemini 335Lg		
		Fixed issue: fix the isuue of abnormal depth during the switch of depth configuration parameter.	Gemini 335/335L Gemini 336/336L Gemini 330/330L Gemini 335Lg		
		Fixed issue: fix the issue of data stream loss during stream-off process.			
		Fixed issue: .fix the issue of wrong timestamp while the frame rate changed and the data is streamed via V4L2.	Gemini 335/336		
		Fixed issue: fix the issue of RGB exposure value in metadata and the invalidation of exposure priority.	Gemini 335Lg		

Firmware Changelog for Gemini 330 series

The latest firmware version	The previous release version	Changelog	Supported Product	SDK Version	Release Date
V1.4.00	V1.3.70	New feature: add depth/IR AE support for alternating depth/IR imaging configurations. Typically used for simultaneously acquiring depth images with laser on and speckle-free IR images with laser off, as well as for acquiring HDR depth images.	Gemini 335/335L Gemini 336/336L Gemini 330/330L	V2.1.1	2024/12/24
		New feature: add laser on/off status sync option. Typically used for synchronization of the laser status among multiple Gemini 330 series cameras, while these cameras operating in the laser on-off or off-on mode with alternating laser status.			
		New feature: add exposure priority option to depth AE and this option is disabled by default. With this option enabled depth AE can increase the exposure to an extreme large value for the optimal imaging quality on dark objects, which however may lead to decreased depth frame rate.			
		New feature: add a new resolution of 424 x 266 to depth and IR. This resolution is with the same depth performance as 1280 x 800 and 640 x 400, but with less data volume for reduced bandwidth and CPU load.			
		New feature: add depth preset "High Accuracy" to Gemini 336/336L. This preset is with less dense depth information in comparison to "Default", but with higher accuracy and being more reliable against false positives/ghost depth.	Genini 336/336L		
		Improvement: optimize the software timestamp reset function. The delay between receiving the reset command from the host and the reset operation has been decreased from approximately 22ms to nearly 0ms.	Gemini 335/335L Gemini 336/336L Gemini 330/330L		
		Improvement: reduce peak power consumptions without any performance degradation.			
		Fixed issue: fix the issue of RGB Gain leading to inconsistent brightness.			
		Fixed issue: fix the issue of RGB metadata while repeatly switching RGB AE on and off.			
		Fixed issue: fix the issue of flickering depth/IR images after timestamp reset or timestamp synchronization.			
V1.3.70	V1.3.25	New feature: add support for Gemini 335Lg	Gemini 335Lg	2.0.18	2024/10/29
		New feature: add support for streaming low resolution RGB images at 90fps - 640x480/640x400/640x360/480x270/424x240	Gemini 335L/336L		
		New feature: add support for streaming low resolution Depth images at 90fps - 640x480/640x360/480x270/424x240	Gemini 335/336 Gemini 335L/336L		
		Fixed issue: fixed the abnormal format issue of RGB images streaming at 60fps and in MJPEG format.			
		Fixed issue: fixed the non-functioning issue of the 8-pin syncport Pin_2 GPIO_OUT.			
		Fixed issue: fixed the issue where switching Preset mode from any other to factory would not produce an IR stream after enabling depth.			
		Fixed issue: fixed depth ROI setting a point that causes AE to fail			
V1.3.25	V1.3.00	New feature: add RGB resolution by 10fps.	Gemini 335/336 Gemini 330	1.10.12	2024/8/7
		New feature: add frame rates of 6, 10, 15 for Depth 640x360 resolution under USB2.0.			
		New feature: add frame rates of 5, 10, 15 for Depth 640x360 resolution under USB2.0.	Gemini 335L/336L Gemini 330L		
		New feature: add 90fps for RGB resolutions of 640x480 and below.			
		New feature: add 10fps for all Depth/IR resolutions.	Gemini 335/335L Gemini 336/336L Gemini 330/330L		
		New feature: add hardware D2C functionality			
V1.3.25	V1.3.00	New feature: add disparity search ranges of 256 and 64. For resolutions 1280x800, 1280x720, and 640x400, the default disparity search range is 256 and also supports configurations of 256, 128, and 64. For other resolutions, only 128 is supported. For resolutions 1280x800, 1280x720, and 640x400, when the disparity search range is 256, Min-Z (minimum depth distance) is 0.25m. When the disparity search range is 128, Min-Z is 0.5m. Using a disparity search range of 256 increases power consumption	Gemini 335L/336L Gemini 330L	1.10.12	2024/8/7
		Fixed issue: fixed synchronization issues on Gemini 335/336 devices after power-on or resolution switch.	Gemini 335/335L Gemini 336/336L Gemini 330/330L		
		Fixed issue: fixed inaccurate timing issues during stream shutdown.			
V1.3.00	V1.2.81	Add low power mode at the standby	Gemini 335/335L Gemini 336/336L Gemini 330/330L	1.10.8	2024/6/20
		Add interface to set maximum exposure for RGB/IR AE.			
		Add RGB YUYV 1280x800/1280x720 at 30fps.			
		Update ISP firmware to fix the synchronous issue at the 5fps of the Gemini 335L			
		Fixed depth unit errors when switching Preset mode(non-factory calib preset => factory calib preset => non-factory calib preset)			
		Fixed abnormal temperature readings from the IMU at negative Celsius temperatures.			
V1.2.81	-	First release for Gemini 335/335L,Gemini 336/336L and Gemini 330/330L	Gemini 335/335L Gemini 336/336L Gemini 330/330L	1.10.5	2024/5/30