### Grasshopper3®

**HIGH PERFORMANCE CCD + CMOS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Version</th>
<th>MP</th>
<th>Imaging Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS3-U3-1455C-C</td>
<td>Color</td>
<td>1.4 MP</td>
<td>Sony IMX252, 2/3&quot;, 4.1 µm</td>
</tr>
<tr>
<td>GS3-U3-1455M-C</td>
<td>Mono</td>
<td>1.4 MP</td>
<td>Global shutter</td>
</tr>
<tr>
<td>GS3-U3-1555C-C</td>
<td>Color</td>
<td>6.0 MP</td>
<td>Sony IMX255, 1&quot;, 4.5 µm</td>
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<tr>
<td>GS3-U3-1555M-C</td>
<td>Mono</td>
<td>6.0 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-2356C-C</td>
<td>Color</td>
<td>2.3 MP</td>
<td>Sony IMX274, 1/2&quot;, 5.86 µm</td>
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<td>GS3-U3-2356M-C</td>
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<td>2.3 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-2854C-C</td>
<td>Color</td>
<td>2.8 MP</td>
<td>Sony IMX287, 1/1.8&quot;, 3.69 µm</td>
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<tr>
<td>GS3-U3-2854M-C</td>
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<td>2.8 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-3254C-C</td>
<td>Color</td>
<td>3.2 MP</td>
<td>Sony IMX292, 1/2&quot;, 3.45 µm</td>
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<td>GS3-U3-3254M-C</td>
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<td>3.2 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-414C-C</td>
<td>Color</td>
<td>4.1 MP</td>
<td>CMOS5 CMV4000-3.5, 1&quot;, 5.5 µm</td>
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<td>GS3-U3-414CM-C</td>
<td>Mono</td>
<td>4.1 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-415C-C</td>
<td>Color</td>
<td>4.1 MP</td>
<td>CMOS5 CMV4000-3.612, 1&quot;, 5.5 µm</td>
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<td>GS3-U3-415CM-C</td>
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<td>4.1 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-505C-C</td>
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<td>5.0 MP</td>
<td>Sony IMX292, 1/2&quot;, 3.45 µm</td>
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<tr>
<td>GS3-U3-515S-C</td>
<td>Color</td>
<td>5.0 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-60QS6M-C</td>
<td>Color</td>
<td>6.0 MP</td>
<td>Sony IMX287, 1/2&quot;, 4.54 µm</td>
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<tr>
<td>GS3-U3-60QS6C-C</td>
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<td>6.0 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-81S5C-C</td>
<td>Color</td>
<td>8.9 MP</td>
<td>Sony IMX255, 1&quot;, 3.45 µm</td>
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<tr>
<td>GS3-U3-81S5M-C</td>
<td>Mono</td>
<td>8.9 MP</td>
<td>Global shutter</td>
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<tr>
<td>GS3-U3-91S6M-C</td>
<td>Color</td>
<td>12.3 MP</td>
<td>Sony IMX250, 3&quot;, 4.5 µm</td>
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<tr>
<td>GS3-U3-91S6C-C</td>
<td>Mono</td>
<td>12.3 MP</td>
<td>Global shutter</td>
</tr>
</tbody>
</table>

**Imaging Performance**

See the **Imaging Performance Specification**, which includes quantum efficiency, saturation capacity (full well depth), read noise, dynamic range and signal to noise ratio.

**A/D Converter**

14-bit 10-Bit (GS3-U3-455C, GS3-U3-455M, GS3-U3-505C, GS3-U3-515S, GS3-U3-60QS6M, GS3-U3-81S5M, GS3-U3-91S6M, GS3-U3-120S6M)

**Video Data Output**

8, 12, 16 and 24-bit digital data

**Image Data Formats**

Monochrome, Monochrome (all models), RGB, YUV421, YUV422, YUV444, Raw8, Raw12, Raw16 (color models)

**Partial Image Modes**

Pixel binning and region of interest (ROI) modes.

**Image Processing**

Gammas, lookup table, hue, saturation, and sharpness

**Shutter**

Global shutter; Automatic/manual/one-push/extended shutter modes

**Gain**

Automatic/manual/one-push modes

Auto Gain: 3.66 dB to 24 dB (GS3-U3-1455); 1.583 dB to 24 dB (GS3-U3-1555); 0 dB to 24 dB (GS3-U3-2356/2365/2854/2855); up to 30 seconds (GS3-U3-2355); up to 10 seconds (GS3-U3-2356/2854/2855); up to 30 seconds (GS3-U3-2356); up to 30 seconds (GS3-U3-2356)

**Gamma**

0.50 to 4.00, programmable lookup table

**White Balance**

Automatic/manual/one-push modes

**High Dynamic Range**

Cycle 4 gain and exposure presets

**Color Processing**

Discontinuous in YUV or RGB format, or on-PC in Raw format.

**Digital Interface**

USB 3.0 interface with screw locks for camera control, data, and power

**Transfer Rates**

5 Gbit/s

**GPIO**

8-bit mime HwR25 GPIO connector for power, trigger, strobe, PWM, and serial I/O, 1 opto-isolated input, 1 opto-isolated output, 2 bi-directional I/O pins

**External Trigger Modes**

Standard, burst, low smear (CCD only), overlapped, and multi shot trigger modes

**Image Buffer**

128 MB frame buffer

**Memory Channels**

2 user configuration sets for custom camera settings

**Flash Memory**

2 MB non-volatile memory

**Dimensions**

44 mm x 29 mm x 58 mm excluding lens holder, without optics (metal case)

**Mass**

90 grams (without optics or tripod mounting bracket)

**Power Consumption**

5 V or USB 3.0 or 8-24 V via GPIO (external power is recommended)

**Camera Control**

Via FlyCapture SDK or third party software

**Camera Updates**

In-field firmware updates

**Lens Mount**

C-mount

**Temperature**

Operating: 0° to 50°C; Storage: -30° to 60°C

**Humidity**

Operating: 20 to 90% (no condensation); Storage: 20 to 95% (no condensation)

**Compliance**

CE, FCC, RoHS

**Operating System**

Windows, Linux (32- or 64-bit)

**Warranty**

3 years

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**US Vision**

Innovation in Imaging

USB 3.0 for bandwidth, ease of use, and cost effectiveness

Variety of high-resolution large format CCD and CMOS sensors

FPGA and frame buffer-based architecture for optimal reliability

The high performance Grasshopper3 camera line combines the benefits of CCD with the affordability and data throughput of USB 3.0. Its FPGA and frame buffer-based architecture provides optimal reliability, a rich set of features, and a full image processing pipeline including color interpolation, gamma, and lookup table functionality. The Grasshopper3 offers a powerful, easy-to-use, and cost-effective alternative to Camera Link and dual GigE LAG solutions.