HYDRA3D+
FIRST HIGH RESOLUTION ToF SENSOR TO WORK IN ALL LIGHT CONDITIONS WITHOUT MOTION ARTEFACTS

Hydra3D+ is a 832 x 600 pixel resolution CMOS image sensor, designed with Teledyne e2V’s proprietary CMOS technology, and is tailored for versatile 3D detection and measurement. The sensor includes a brand-new 10 μm, three-tap pixel, which provides very fast transfer times and displays high sensitivity in the NIR wavelength, alongside excellent demodulation contrast. This combination enables the sensor to operate in real-time without motion artefacts (even if there are fast moving objects in the scene) for customers seeking reliable 3D detection and the highest levels of 3D performance, including high depth resolution, high speed and flexible operation conditions, all without system interference. Hydra3D+ can be operated in real-time at short, mid and long-range distances, in both indoor and outdoor conditions while providing an excellent temporal precision, making it suitable for a wide range of professional and challenging applications.

SENSOR FEATURES

Compact, with high spatial resolution
832 x 600 pixels
LGA ceramic package 24 x 22 mm

Excellent precision and speed performance
Three-tap cutting edge pixel with transfer time down to 10 ns, >400 fps (readout only)
On-chip multi-system management

Flexible configuration and high dynamic range management
Frame-to-frame timing configuration changes
Non-destructive readout HDR feature

CUSTOMER BENEFITS

Large Field-of-View with good angular resolution in a compact sensor
High spatial resolution in both 2D and 3D 2/3” optics compatible

Real-time decision making combined with reliable 3D detection, without motion artefacts and systems interferences
High precision, >30 fps depth map

Outstanding adaptability to various scenarios, in all light conditions
Capability to trade-off distance range, object reflectivity, frame rate, light power, etc.
Robust to ambient light
## Sensor Characteristics

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<table>
<thead>
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<tbody>
<tr>
<td><strong>Resolution – pixels</strong></td>
<td>832 x 600</td>
</tr>
<tr>
<td><strong>Aspect Ratio</strong></td>
<td>4 : 3</td>
</tr>
<tr>
<td><strong>Size Type</strong></td>
<td>2/3” (10.3 mm diagonal)</td>
</tr>
<tr>
<td><strong>Pixel Type / size – square</strong></td>
<td>Three-tap global shutter – gated global shutter / 10 μm</td>
</tr>
<tr>
<td><strong>Maximum frame rate @ 12 bits</strong></td>
<td>416.7 fps¹</td>
</tr>
<tr>
<td><strong>FFxQE – %, @ 850 / 940 nm</strong></td>
<td>41 / 31²</td>
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<tr>
<td><strong>Transfer time – ns</strong></td>
<td>Down to 10</td>
</tr>
<tr>
<td><strong>Readout noise – e- RMS</strong></td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Linearity: LEmin / LEmax – %</strong></td>
<td>-1 / +1</td>
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<thead>
<tr>
<th></th>
<th>Node A</th>
<th>Node B</th>
<th>Node C</th>
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<tbody>
<tr>
<td><strong>Full well capacity – e-</strong></td>
<td>18,000</td>
<td>18,000</td>
<td>18,000</td>
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<tr>
<td><strong>Temporal noise – e-</strong></td>
<td>12</td>
<td>12</td>
<td>12</td>
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<tr>
<td><strong>Dynamic Range³ – dB</strong></td>
<td>64</td>
<td>64</td>
<td>64</td>
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¹. Considering only readout. Exposure is not concurrent
². In 2D greyscale mode
³. Single readout, 2D greyscale mode

### EMBEDDED FEATURES
- Multiple acquisition modes: distance measurement and greyscale
- High Dynamic Range mode through non-destructive readout
- Programmable exposure time
- Row-wise RoI (up to 4 for distance measurement, 1 for 2D greyscale image)
- Column-wise ROI (with 64 columns granularity)
- Frame-to-frame “hot” changes of exposure parameters and ROI
- Multiple trigger modes
- HFPN correction
- On-chip multi-system management

### SYSTEM INTEGRATION
- Package: ceramic LGA
- Operating temperature [-40°C to 105°C]
- Power consumption: 2.6 W⁴
- Scalable LVDS outputs (13, 7 or 4 channels)
- SPI controls

### TYPICAL APPLICATIONS
- Warehouse/Logistics management
- Pick and place robots
- Robot navigation
- Factory automation
- Factory safety
- Construction/building mapping
- Surveillance
- ITS

⁴. Full array, 100 ns gating cycle duration (three phases), 10% duty cycle, 50% gating time

### HYDRA3D+ SAMPLES
**Coming in January 2023**