Next generation CMOS sensor technology providing 5,400 fps, 1024x1024 pixels

The Photron FASTCAM SA1 will meet the imaging requirements of the most demanding applications in research and development due to its unrivaled sensitivity, speed and resolution.

The FASTCAM SA1 uses the latest CMOS sensor to achieve sensitivity and speeds previously unattainable. With a top speed in excess of 600,000 fps (frames per second) and with true 12-bit dynamic range, the FASTCAM SA1 once again establishes Photron as the true leader of high speed imaging innovation.

With a global shutter operating independently of the frame rate selected; from 1/60th of a second to 1μs, and with the dead time between sequential frames less than a microsecond, the FASTCAM SA1 provides everything, yes, everything, even an SDI output as standard, that true high speed users demand.

For those not wanting to use a PC to control and operate the camera through the Gigabit Ethernet port, the FASTCAM SA1 can be controlled by an RS-422 remote control keypad with built-in 5” LCD monitor for complete camera set-up and operation.

For applications where ingress of dust or moisture would be hazardous, a sealed version (FASTCAM SA1 RV) is available.

Target applications include:
- Balistics
- Aerospace
- Materials research
- Fluid dynamics
- Defence
- PIV

Benefits

- **Performance:**
  - 1,024 x 1,024 pixels @ 5,400 fps
  - 832 x 608 pixels @ 10,800 fps
  - 640 x 480 pixels @ 18,000 fps
  - 512 x 512 pixels @ 20,000 fps
  - 256 x 256 pixels @ 67,500 fps
  - 256 x 16 pixels @ 500,000 fps
  - 64 x 16 pixels @ 675,000 fps

- **Variable Region of Interest (ROI)**
- **Capture 12-bit uncompressed data**
- **One microsecond global shutter**
- **Composite and SDI video output for real time monitoring during set up, recording and playback**
- **Memory options include 8GB, 16GB and 32GB**
- **Phase lock to IRIG/GPS**

www.photron.com
### FASTCAM SA1.1

**HIGH SPEED VIDEO SYSTEM**

---

### Specifications: Frame Rate / Recording Duration Table

<table>
<thead>
<tr>
<th>Frame Rate (fps)</th>
<th>Maximum Resolution Horizontal</th>
<th>Maximum Resolution Vertical</th>
<th>Shutter Exposure Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>1,024</td>
<td>1,024</td>
<td></td>
</tr>
<tr>
<td>2,000</td>
<td>1,024</td>
<td>1,024</td>
<td></td>
</tr>
<tr>
<td>3,000</td>
<td>1,024</td>
<td>1,024</td>
<td></td>
</tr>
<tr>
<td>5,000</td>
<td>1,024</td>
<td>1,024</td>
<td></td>
</tr>
<tr>
<td>5,400</td>
<td>1,024</td>
<td>1,024</td>
<td></td>
</tr>
<tr>
<td>7,680</td>
<td>1,024</td>
<td>1,024</td>
<td></td>
</tr>
<tr>
<td>10,000</td>
<td>768</td>
<td>768</td>
<td></td>
</tr>
<tr>
<td>15,000</td>
<td>768</td>
<td>512</td>
<td></td>
</tr>
<tr>
<td>20,000</td>
<td>512</td>
<td>352</td>
<td></td>
</tr>
<tr>
<td>30,000</td>
<td>512</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>50,000</td>
<td>512</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>75,000</td>
<td>512</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>100,000</td>
<td>512</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>125,000</td>
<td>128</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>150,000</td>
<td>128</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>250,000</td>
<td>128</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>300,000</td>
<td>128</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>500,000</td>
<td>64</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>675,000</td>
<td>64</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

### Record Duration (12-Bit)

<table>
<thead>
<tr>
<th>8GB</th>
<th>16GB</th>
<th>32GB</th>
<th>8GB</th>
<th>16GB</th>
<th>32GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.46</td>
<td>10.92</td>
<td>21.84</td>
<td>5.457</td>
<td>10.918</td>
<td>21.841</td>
</tr>
<tr>
<td>2.73</td>
<td>5.46</td>
<td>10.92</td>
<td>5.457</td>
<td>10.918</td>
<td>21.841</td>
</tr>
<tr>
<td>1.82</td>
<td>3.64</td>
<td>7.28</td>
<td>5.457</td>
<td>10.918</td>
<td>21.841</td>
</tr>
<tr>
<td>1.09</td>
<td>2.18</td>
<td>4.37</td>
<td>5.457</td>
<td>10.918</td>
<td>21.841</td>
</tr>
<tr>
<td>1.01</td>
<td>2.02</td>
<td>4.04</td>
<td>5.457</td>
<td>10.918</td>
<td>21.841</td>
</tr>
<tr>
<td>0.93</td>
<td>1.94</td>
<td>3.68</td>
<td>9.701</td>
<td>19.410</td>
<td>38.029</td>
</tr>
<tr>
<td>0.97</td>
<td>1.94</td>
<td>3.68</td>
<td>14.552</td>
<td>28.116</td>
<td>56.243</td>
</tr>
<tr>
<td>1.09</td>
<td>2.18</td>
<td>4.37</td>
<td>21.829</td>
<td>43.674</td>
<td>87.365</td>
</tr>
<tr>
<td>1.06</td>
<td>2.12</td>
<td>4.24</td>
<td>31.751</td>
<td>63.526</td>
<td>127.076</td>
</tr>
<tr>
<td>1.16</td>
<td>2.33</td>
<td>4.66</td>
<td>87.317</td>
<td>174.698</td>
<td>349.461</td>
</tr>
<tr>
<td>1.40</td>
<td>2.80</td>
<td>5.59</td>
<td>139.707</td>
<td>279.517</td>
<td>559.138</td>
</tr>
<tr>
<td>1.50</td>
<td>2.89</td>
<td>5.59</td>
<td>174.024</td>
<td>349.339</td>
<td>699.092</td>
</tr>
<tr>
<td>1.94</td>
<td>3.88</td>
<td>7.77</td>
<td>349.269</td>
<td>698.784</td>
<td>1,397.845</td>
</tr>
<tr>
<td>2.24</td>
<td>4.47</td>
<td>8.95</td>
<td>558.830</td>
<td>1,118.071</td>
<td>2,236.552</td>
</tr>
<tr>
<td>2.33</td>
<td>4.66</td>
<td>9.32</td>
<td>698.538</td>
<td>1,397.589</td>
<td>2,795.690</td>
</tr>
<tr>
<td>5.59</td>
<td>5.59</td>
<td>22.37</td>
<td>2,794.154</td>
<td>2,795.178</td>
<td>11,182.762</td>
</tr>
<tr>
<td>8.28</td>
<td>16.36</td>
<td>33.13</td>
<td>5,588.309</td>
<td>11,180.714</td>
<td>22,365.525</td>
</tr>
</tbody>
</table>

---

### Sensor

12-bit ADC (Bayer system color, single sensor) with 20µm pixel

### Shutter

Global electronic shutter from 16.7ms to 1µs independent of frame rate is standard

### Lens Mount

Interchangeable F-mount and C-mount using supplied adapters

### Extended Dynamic Range

Selectable in twenty steps (0 to 95% in 5% increments) to prevent pixel over-exposure

### Memory

8GB (standard), 5457 frames, 1.01 sec @ 5400fps
16GB (option), 10918 frames, 2.02 sec @ 5400fps
32GB (option), 21841 frames, 4.04 sec @ 5400fps

### Video Output 1

NTSC/PAL composite VBS (BNC), Ability to zoom, pan and scroll within image via keypad. Live video during recording.

### Video Output 2

SDI:D1 digital component 1 channel (BNC) industry standard digital output NTSC and PAL

### Camera Control

Available Gigabit Ethernet and RS-422 keypad with built-in 5" LCD viewfinder

### User Preset Switches

Four user selectable camera function control mounted on the cameras rear panel

### Low Light Mode

Low light mode drops the frame rate and shutter time to their maximum values, while maintaining other set parameters, to enable users to position and focus the camera

### Triggering

Selectable positive or negative TTL 5Vp-p or switch closure

### Trigger Delay

Programmable delay on selected input and output triggers, 100ns resolution

### Timing

Internal clock or external source such as IRIG or GPS

---

### Phase Lock

Enables cameras to be precisely synchronized together, or to an external source, such as IRIG or GPS time codes

### Event Markers

Ten user–entered event markers mark specific events within the image sequence in real time. Immediately accessible through software

### Dual Speed Recording™

Enables the recording speed to be changed up or down by a factor of 2, 4 or 8 during a recording

### Recording Modes

Start, End, Center, Manual, Random, Random Reset, Random Center, Random Manual and Dual Speed Recording

### Saved Image Formats

JPEG, AVI, TIFF, BMP, RAW, RAWW, PNG and FTIF. Images can be saved with or without timing and comment data

### Data Display

Frame Rate, Shutter Speed, Trigger Mode, Date or Time (can be switched), Status (Playback/Record), Real Time, Frame Count and Resolution

### Partitioning

Up to 64 memory segments for multiple recordings in memory

### Data Acquisition

Supports Photron MCDL and DAQ

### Cooling

Actively cooled

### Operating Temp.

0-40 degrees C (Range version increases upper limit to 45C)

### Mounting

1x ¼-20 UNC, 1x 3/8-16 UNC, 6x M6

### Dimensions and Weight

160mm (6.30")H x 153mm (9.55")W x 242.5mm (9.55")D

### Power Requirements

100V - 240V AC ~ 1.5A, 50-60Hz optional DC operation 20 to 36V DC. AC adaptor provided

---

**PHOTRON USA, INC.**
9520 Faggott Street, Suite 110
San Diego, CA 92126-4446
USA
Tel: 858.684.3555 or 800.585.2129
Fax: 858.684.3558
Email: image@photron.com
www.photron.com

**PHOTRON (EUROPE) LIMITED**
The Barn, Bottom Road
West Wycombe, Bucks, HP14 4BS
United Kingdom
Tel: +44 (0) 1494 481011
Fax: +44 (0) 1494 487011
Email: image@photron.com
www.photron.com

**PHOTRON LIMITED**
Fujimi 1-1-8
Chiyoda-Ku, Tokyo 102-0071
Japan
Tel: +81 (0) 3 3238-2106
Fax: +81 (0) 3 3238-2109
Email: image@photron.co.jp
www.photron.co.jp