

# ACUROS® CQD® 640 USB3 SWIR Camera

## ACUROS-0640-USB3-001

The ACUROS CQD SWIR cameras are sensitive to wavelengths from 400 nm to 1700 nm and feature up to 1920 x 1080 resolution with 15 µm pixels to enable high performance at the lowest cost. The camera features low noise, highly stable performance, and up to 10 dB higher SNR compared to the competition’s 5 µm pixel InGaAs cameras. It supports a range of applications, including industrial inspection, military intelligence, and advanced research, offering versatility and outstanding image quality for both low-cost and high-performance applications.

Please see the ACUROS eSWIR product line for expanded sensitivity capabilities from 400 nm to 2000 nm.

### SPECIFICATIONS

**Table 1. ELECTRO-OPTICAL SPECIFICATIONS**

| Parameter                         | Value/Description                               |
|-----------------------------------|---|
| Sensor                            | ACUROS CQD sensor                               |
| Temperature Stabilization         | Single-stage thermo-electric cooler             |
| Sensor Array Format               | 640 x 512                                       |
| Resolution                        | 0.33 MP (megapixel)                             |
| Spectral Band                     | 400–1700 nm                                     |
| Array Size                        | 9.6 mm x 7.7 mm, 12.3 mm diagonal               |
| Pixel Pitch                       | 15 µm x 15 µm                                   |
| Max Frame Rate at Full Resolution | 270 fps (8, 10, 12, 14 bit)                     |
| Pixel Operability                 | 99.9% typical, 99.75% min                       |
| Bit Depth                         | 8, 10, 12, 14 bit selectable                    |
| Integration Type                  | Snapshot global shutter                         |
| Trigger                           | External TTL                                    |
| Integration Time                  | 100 µs to 4 s                                   |
| Dynamic Range                     | 70 dB typical                                   |
| Windowing & Windowing Frame Rate  | Array centered. Scales inversely to window size |
| Laser Beam Fringeless Operation   | No (See ACUROS laser series cameras)            |
| Binning Arrays                    | 2 x 2, 4 x 4                                    |
| Non-uniformity Correction         | 2-point non-uniformity correction               |
| Temporal Dark Noise               | 80/70/65 e <sup>-</sup> typical                 |
| Quantum Efficiency                | See typical QE curve (Figure 4)                 |



### ORDERING INFORMATION

| Part Number          |
|----------------------|
| ACUROS-0640-USB3-001 |

### Features

- VGA Resolution
- TEC Cooling
- Low Noise
- Fast Frame Rate
- Visible-SWIR
- USB3 Vision

### Applications

- Machine Vision
- Silicon Inspection
- Automotive
- Fill-level
- Surveillance
- Hyperspectral
- Chemical Sensors
- Agricultural
- Medical Imaging
- Thermography

**Table 2. ENVIRONMENTAL & POWER SPECIFICATIONS, TYPICAL PERFORMANCE**

| Parameter                  | Value/Description                  |
|----------------------------|------------------------------------|
| Operating Case Temperature | -20 °C to +55 °C                   |
| Power Consumption          | 6.5–12 W depending on TEC settings |
| Power Supply Voltage       | 6–16 V dc                          |
| Regulatory Compliance      | CE mark                            |

**Table 3. MECHANICAL SPECIFICATIONS**

| Parameter                 | Value/Description                     |
|---------------------------|---------------------------------------|
| Dimensions Excluding Lens | 6.1 x 6.1 x 9.7 cm (C-mount)          |
| Weight Excluding Lens     | 590 grams with C-mount adapter        |
| Lens Mounts               | C, M42 (C-mount flange-back distance) |
| Power Connector           | Hirose 12-pin, HR10A-10R-12PB (71)    |
| Trigger Connector         | BNC                                   |

**Table 4. SOFTWARE AND USER INTERFACE**

| Parameter                | Value/Description                                     |
|--------------------------|---|
| Software Development Kit | Windows GUI & Pleora eBUS SDK (Linux, Windows, macOS) |
| GenICam Compliance       | Yes   |
| Interface                | USB3 Vision   |

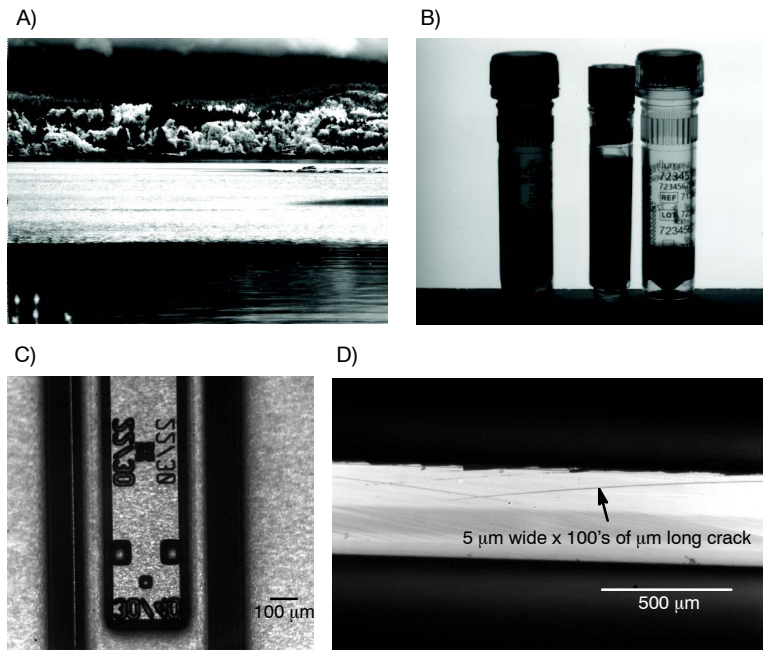


**Figure 1. C-mount, and M-42 Lens Mounts**



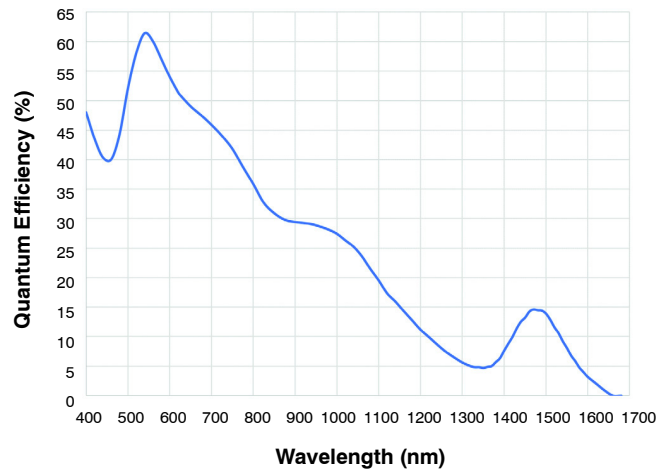
**Figure 2. USB3 Vision Interface**

# ACUROS-0640-USB3-001



- A) ACUROS 640: imaging through maritime rain event
- B) ACUROS 640: imaging through pharmaceutical vial labels
- C) ACUROS 1280: alignment mark in bonded wafers
- D) ACUROS 1920: mag image of semiconductor chip edge

**Figure 3. ACUROS CQD SWIR Camera Images**

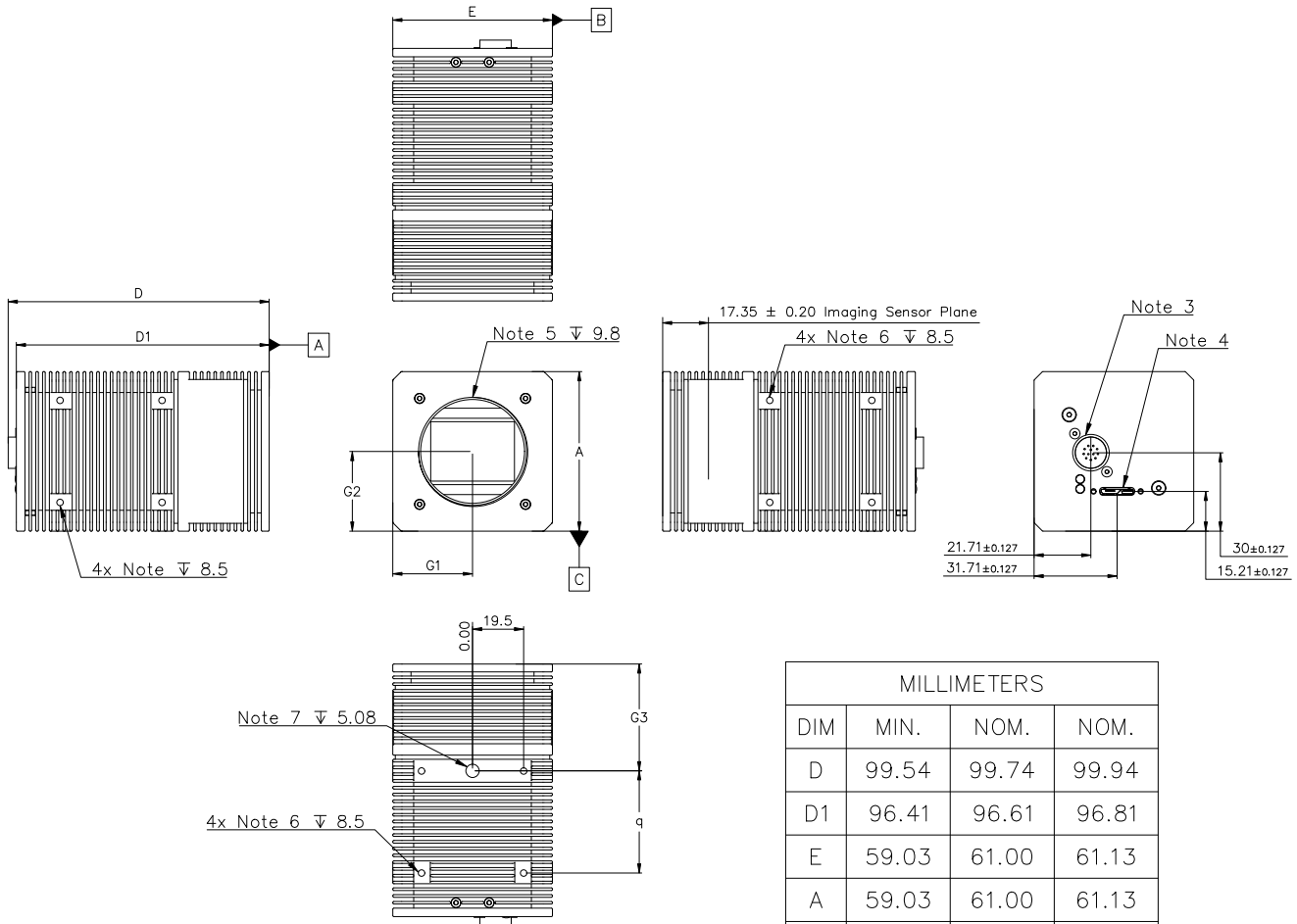


**Figure 4. Typical QE Performance**

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**ISSUE O**

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NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M. 2018.
2. CONTROLLING DIMENSION: MILLIMETER
3. HIROSE 12 PIN CONNECTOR
4. USB 3.0 Micro-B
5. M42-MOUNT  $\nabla$  9.8
6. M3X0.5 DEPTH  $\nabla$  8.5
7. 1/4-20 UNC DEPTH  $\nabla$  5.08

| MILLIMETERS |       |       |       |
|-------------|-------|-------|-------|
| DIM         | MIN.  | NOM.  | NOM.  |
| D           | 99.54 | 99.74 | 99.94 |
| D1          | 96.41 | 96.61 | 96.81 |
| E           | 59.03 | 61.00 | 61.13 |
| A           | 59.03 | 61.00 | 61.13 |
| G1          | 30.37 | 30.50 | 30.63 |
| G2          | 30.37 | 30.50 | 30.63 |
| G3          | 40.63 | 40.83 | 41.03 |
| q           | 38.98 | 39.11 | 39.24 |
| q1          | 19.37 | 19.50 | 19.63 |

|                         |                               |   |
|-------------------------|-------------------------------|---|
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