

# ACUROS® CQD® 640L USB3 SWIR Camera

## ACUROS-0640-USB3-003

The ACUROS CQD L-Series SWIR cameras feature large sensor area, low angular dependence and a longer working distance for highly divergent emitters and collimated beams. Acuros cameras deliver high resolution, high dynamic range and very high detectivity imaging from 400 to 1700 nm. The L-Series cameras are designed for use in laser beam diagnostics, laser beam imaging and laser alignment applications by mitigating interference fringing sources.

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,<br>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.<br>Scales inversely to window size |
| Laser Beam Fringeless Operation   | Yes                                                |
| 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 5)                    |



### ORDERING INFORMATION

| Part Number          |
|----------------------|
| ACUROS-0640-USB3-003 |

### Features

- Large Sensor Size
- Short Working Distance for Highly Divergent Beams
- Low Angular Dependence
- Dynamic Range up to 70 dB
- Linear Photoresponse
- VGA Resolution
- TEC Cooling
- Low Noise
- USB3 Vision
- Visible-SWIR

### Applications

- Laser Beam Diagnostics
- Laser Beam Imaging
- Laser Alignment

**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 9.1 cm (C-mount)                         |
| Weight Excluding Lens     | 508 grams with (C-mount) adapter                     |
| Lens Mounts               | Standard mount (C-mount). Inquire for other options. |
| Power Connector           | Hirose 12-pin, HR10A-10R-12PB (71)                   |
| Trigger Connector         | BNC                                                  |

**Table 4. SOFTWARE AND USER INTERFACE**

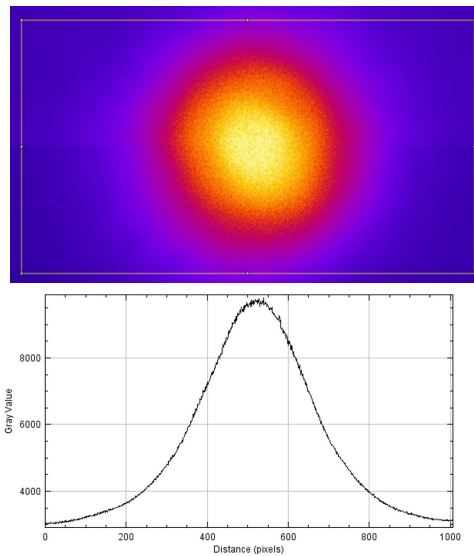
| Parameter                | Value/Description |
|--------------------------|-------------------|
| Software Development Kit | Windows GUI       |
| GenICam Compliance       | Yes               |
| Interface                | USB3 Vision       |



**Figure 1. Lens Mount**

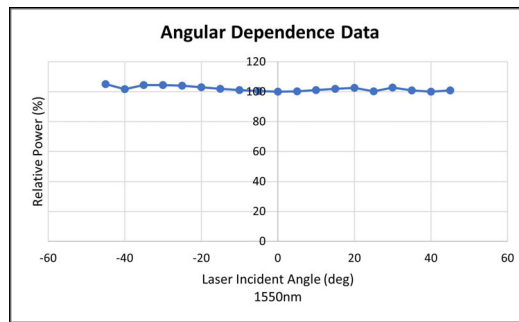


**Figure 2. USB Vision Interface**

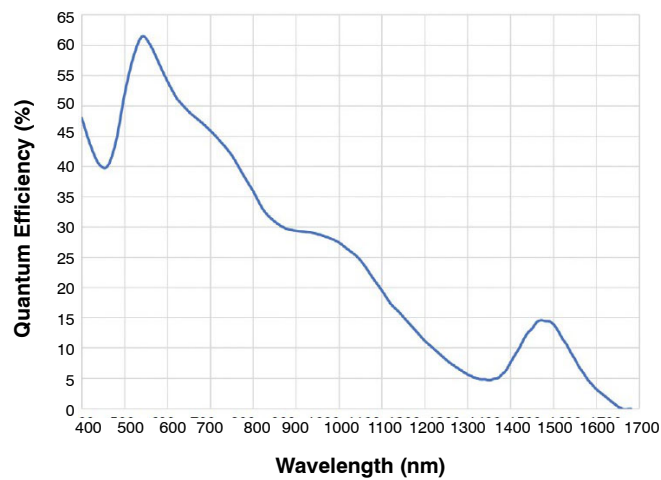


1550 nm Laser image and corresponding line file (false color added post image)

**Figure 3. ACUROS CQD SWIR Camera Image of Laser**



**Figure 4. Angular Dependence Data**



**Figure 5. Typical QE Performance**

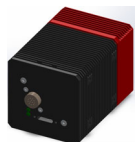
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REVISION HISTORY

| Revision | Description of Changes                                                       | Date      |
|----------|------------------------------------------------------------------------------|-----------|
| 3        | Removed "eBUS SDK" from Software Development Kit due to change in licensing. | 3/13/2026 |

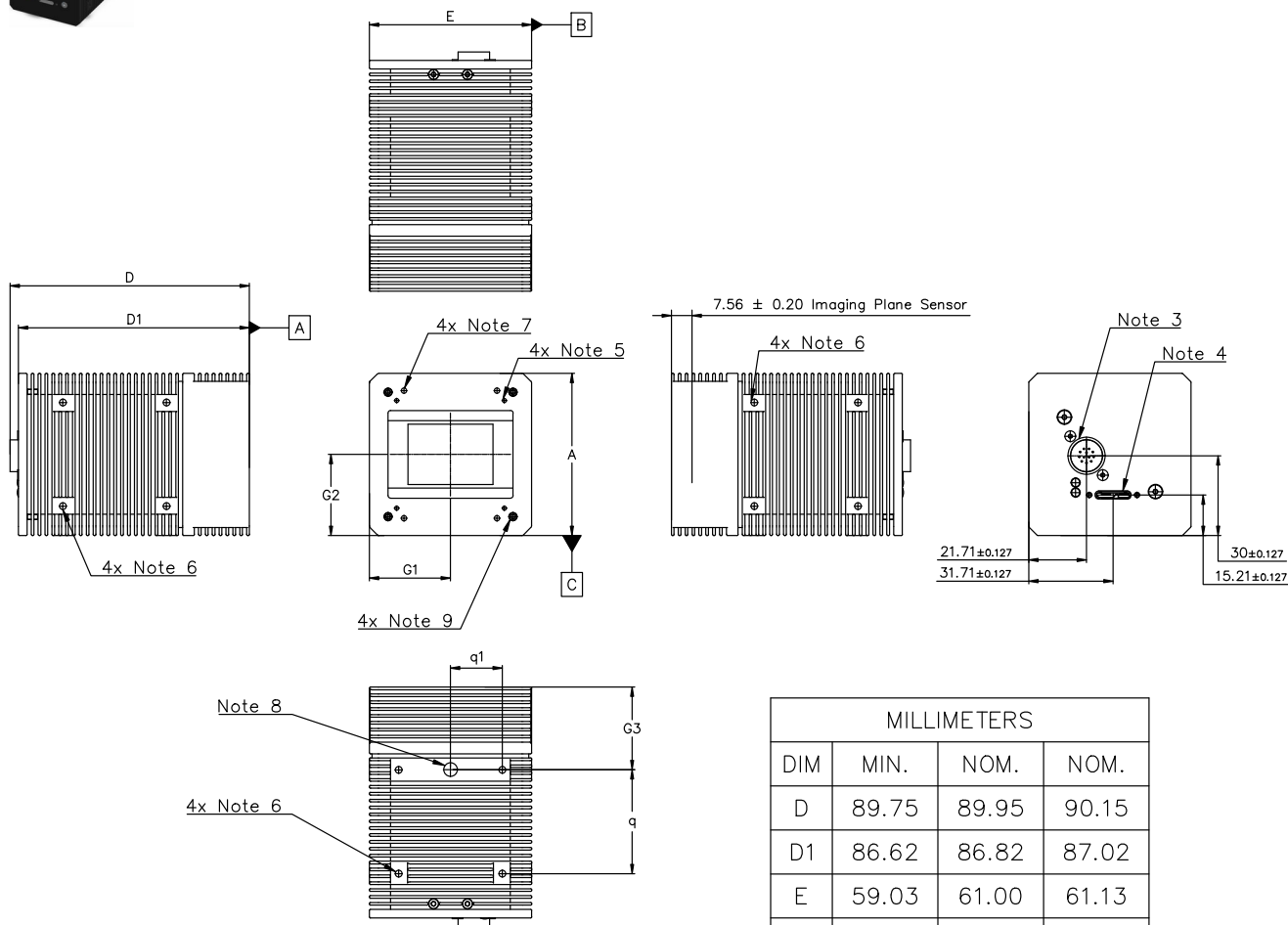
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.





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ISSUE A

DATE 04 JUN 2025



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. M2x0.4  $\nabla$  2
6. M3x0.5 DEPTH  $\nabla$  3.0
7. REGISTRATION HOLES  $\phi$ 2.05  $\nabla$  2
8. 1/4-20 UNC DEPTH  $\nabla$  5.08
9. M2x6

| MILLIMETERS |       |       |       |
|-------------|-------|-------|-------|
| DIM         | MIN.  | NOM.  | NOM.  |
| D           | 89.75 | 89.95 | 90.15 |
| D1          | 86.62 | 86.82 | 87.02 |
| 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          | 30.84 | 31.04 | 31.24 |
| q           | 38.98 | 39.11 | 39.24 |
| q1          | 19.37 | 19.50 | 19.63 |

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