



5.7 in x 3.00 in x 3.00 in  
14.5 cm x 7.62 cm x 7.62 cm

# SU1024-LDH Digital Line Scan Camera

## High Speed SD-OCT Imaging

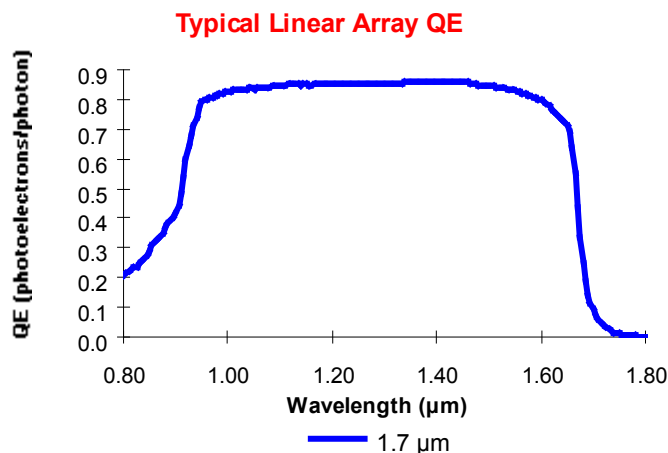
The new SU1024-LDH Linear Digital High speed InGaAs Camera increases line rates for 1024 pixels to over 46,000 lines per second for spectral-domain optical coherence tomography (SD-OCT), NIR spectroscopy and machine vision. This versatile high speed camera provides 14-bit digital capture into base format Camera Link® interface cards. It utilizes the new LC series of linear arrays, which feature double-sampling, integrate-while-read acquisition and low noise, delivering the high dynamic range demanded by these applications. The camera is available with 500  $\mu\text{m}$  tall pixels for easy alignment in SD-OCT systems, or square 25  $\mu\text{m}$  pixels for high-time resolution machine vision or for PS-OCT.

### APPLICATIONS

- Optical Coherence Tomography (OCT)
- Agricultural and food product inspection
- Machine vision for inspection, and monitor of continuous processes
- High-speed spectroscopy for moisture or other molecular vibration bands in the 800-1700 nm range
- Telecommunications fiber and waveguide alignment
- Materials classification and sorting
- Remote ground sensing

### FEATURES

- Wavelength response over 0.8  $\mu\text{m}$  to 1.7  $\mu\text{m}$
- 25  $\mu\text{m}$  pixel pitch with aperture heights of 25  $\mu\text{m}$  or 500  $\mu\text{m}$
- 1024 pixel arrays
- Over 46,000 lps for 1024 pixels
- Integrate-while-read snapshot acquisition
- 14-bit base Camera Link® compatible output and control
- Operating temperature range of -10 to +50°C
- High dynamic range and quantum efficiency
- Mounts easily to spectrometers
- Optional adapters for C-mount, F-mount or FD mount lenses



**UTC Aerospace Systems**

INTERFACES	
<b>Control:</b>	MDR 26-pin connector (Camera Link®)
<b>Image Data:</b>	MDR 26-pin connector (Camera Link®)
<b>Power</b>	Hirose HR25-7TR-8S connector
<b>Sync Output:</b>	BNC: 5 V, 50 Ω series terminated, active high: integration active
<b>Trigger: Input</b>	BNC, Low < 0.5, 3 V > high < 5 V
<b>Status LED:</b>	Green: TEC locked at setpoint Red: TEC unlocked Blinking: Timing or triggering error

ENVIRONMENTAL AND POWER	
<b>Operating temperature:</b>	-10°C to +50°C case temperature
<b>Storage temperature:</b>	-20°C to 70°C
<b>Humidity:</b>	Non-condensing
<b>Power requirements: AC adapter supplied DC (voltage/power) In-rush current</b>	100-240 VAC, 47-63 Hz, < 1.0 A 7-28 V, < 7 W at 25°C, <11 W at 50°C < 1.5 A peak

REGULATORY COMPLIANCE	
<b>CE:</b>	Meets class A level for emission, immunity and ESD standards
<b>FCC:</b>	Meets requirements for Part 15, Subpart B, Class A, 2006

MECHANICAL	
<b>Length x Width x Height:</b>	14.5 cm x 7.62 cm x 7.62 cm 5.7 in x 3.00 in x 3.00 in Length includes I/O connectors, excludes lens adapter
<b>Weight:</b>	< 1 kg or 2.2 lbs (no lens or adapter)
<b>Threaded Lens Mount and optional lens mount adapters <sup>1</sup></b>	M42x1-6H with 6 mm focal distance (std.) Fixed distance C-Mount adapter (opt.) Adjustable distance FD-Mount adapter (opt.) Adjustable distance F-Mount adapter (opt.)
<b>Spectrometer mount</b>	4 tapped 8-32 holes in 2 inch square pattern 4 tapped M4-6H holes spaced 4 cm x 5 cm O-Ring light seal, 1.9 inch diameter, 1/16th thickness
<b>Camera mount (bottom)</b>	3 tapped ¼-20 holes 2 tapped M6-6H holes

<sup>1</sup> LDV/LDH accessory kits are available that consist of the user-specified lens adapter, power supply, case, manual, o-ring and cables.

ELECTRO-OPTICAL PERFORMANCE						
<b>Sensor format <sup>1</sup></b>	1024 pixels on 25 µm pitch with 4 readout ADCs					
<b>Optical aperture (pixel height) <sup>1</sup></b>	500 µm or 25 µm					
<b>Peak quantum efficiency <sup>1</sup></b>	> 70%					
<b>Gain capacitor setting</b>	0.1 pF		1 pF		10 pF	
	Typical	Specification	Typical	Specification	Typical	Specification
<b>Net full well capacity (Me-) <sup>2</sup></b>	1.6	>1.1	15.9	>9.2	150	>110
<b>Gain (e-/cnt) <sup>1,3</sup></b>	107		1000		9600	
<b>Temporal noise (rms counts) <sup>1,2</sup></b>	8	< 10.5	3.5	<4.5	2.5	<3.5
<b>Dynamic range <sup>1,2,4</sup></b>	2000:1	>1500:1	4500:1	>3500:1	5300:1	>4500:1
<b>Differential non-linearity <sup>1,2</sup></b>	+/- 1%	< +/- 2%	+/- 1%	< +/- 2%	+/- 0.8%	< +/- 2%
<b>Bad pixel specification</b>	White, dark, noisy or pixels exceeding +/- 10 of the mean value when illuminated at 50% of full well. Number of bad pixels limited to a maximum of 1% of array total; no bad neighbors within 5 pixels					
<b>Digital Output Format</b>	14-bit base Camera Link® compatible					
<b>Exposure time <sup>1,3</sup></b>	0.007 ms to 907 ms in corrected preset modes or user programmed in camera clock cycles to >1 s					
<b>Trigger modes <sup>3</sup></b>	Free run, single line per trigger, programmable exposure, or gated burst					
<b>Sync output</b>	Digital signal, high during integration					
<b>External trigger <sup>3</sup></b>	Three modes via CC1 or BNC					
<b>External variable ET</b>	User set by the duration of trigger signal (minimum ET pulse: 10 µs)					
<b>External trigger jitter</b>	1 clock cycle: nominally 80 ns					
<b>Pixel rate</b>	50 Mpix/s					
<b>Readout mode</b>	Integrate while read, differential double sampling					
<b>Corrections (preset OPRs)</b>	Factory calibrated gain, offset, and bad pixel replace					

<sup>1</sup> Actual formats and performance governed by user-selected SUI linear array purchased with camera (dark current may limit longest usable ET)

<sup>2</sup> Camera readout noise limited until exposure time for 500 µm pixels exceeds 50 ms in low gain, 10 µm in medium, and 1/2 ms in high gain mode

<sup>3</sup> User selectable by command over Camera Link® serial lines

<sup>4</sup> Dynamic range limited to maximum values shown when camera operated at exposure times shorter than 28 µs

ORDERING INFORMATION					
Camera Model <sup>1,2</sup>	Max. Line rate <sup>1</sup>	Pitch	Pixels	FPA length	Aperture (height) <sup>2</sup>
SU1024LDH-1.7RT-XXXX/LC	>46,000 lps	25 µm	1024	25.6 mm	0025 or 0500

<sup>1</sup> Cameras include the photodiode array – see the array datasheet for array specific performance specifications such as dark current.

<sup>2</sup> Currently available pixel height codes to substitute for XXXX in the part number for each cutoff wavelength – contact Sensors Unlimited, Inc. for other combinations



**POLYTEC GmbH**  
Tel: +49 (72 43) 604-1540

**Polytec-Platz 1 - 7**  
Fax: +49 (72 43) 69944

**D -76337 Waldbronn**  
E-Mail: osm@polytec.de

**GERMANY**  
www.polytec.de