



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

1024-LDH Digital Line Scan Camera

High Speed SD-OCT Imaging

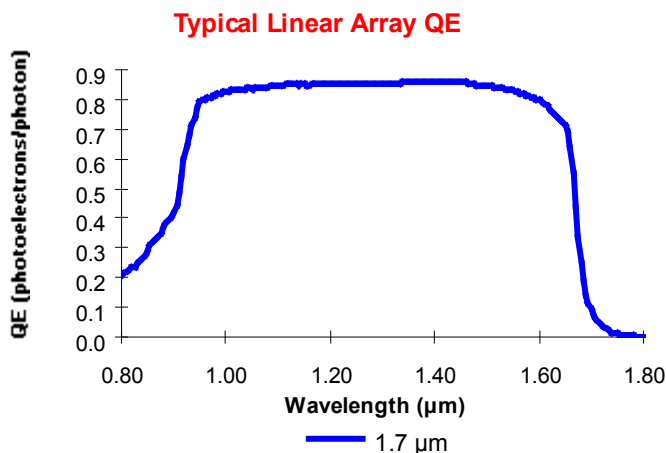
The new 1024-LDH Linear Digital High speed InGaAs Camera increases line rates for 1024 pixels to over 46,000 lines per second for spectral-domain optical coherence tomography (SD-OCT), NIR spectroscopy and machine vision. This versatile high speed camera provides 14-bit digital capture into base format 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 μm tall pixels for easy alignment in SD-OCT systems, or square 25 μm 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 μm to 1.7 μm
- 25 μm pixel pitch with aperture heights of 25 μm or 500 μm
- 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



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

ENVIRONMENTAL AND POWER	
Operating temperature:	-10°C to +50°C case temperature
Storage temperature:	-20°C to 70°C
Humidity:	Non-condensing
Power requirements: AC adapter supplied DC (voltage/power) In-rush current	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	
CE:	Meets class A level for emission, immunity and ESD standards
FCC:	Meets requirements for Part 15, Subpart B, Class A, 2006

MECHANICAL	
Length x Width x Height:	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
Weight:	< 1 kg or 2.2 lbs (no lens or adapter)
Threaded Lens Mount and optional lens mount adapters ¹	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.)
Spectrometer mount	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
Camera mount (bottom)	3 tapped ¼-20 holes 2 tapped M6-6H holes

¹ 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						
Sensor format ¹	1024 pixels on 25 µm pitch with 4 readout ADCs					
Optical aperture (pixel height) ¹	500 µm or 25 µm					
Peak quantum efficiency ¹	> 70%					
Gain capacitor setting	0.1 pF		1 pF		10 pF	
	Typical	Specification	Typical	Specification	Typical	Specification
Net full well capacity (Me-) ²	1.6	>1.1	15.9	>9.2	150	>110
Gain (e-/cnt) ^{1,3}	107		1000		9600	
Temporal noise (rms counts) ^{1,2}	8	< 10.5	3.5	<4.5	2.5	<3.5
Dynamic range ^{1,2,4}	2000:1	>1500:1	4500:1	>3500:1	5300:1	>4500:1
Differential non-linearity ^{1,2}	+/- 1%	< +/- 2%	+/- 1%	< +/- 2%	+/- 0.8%	< +/- 2%
Bad pixel specification	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					
Digital Output Format	14-bit base Camera Link® compatible					
Exposure time ^{1,3}	0.007 ms to 907 ms in corrected preset modes or user programmed in camera clock cycles to >1 s					
Trigger modes ³	Free run, single line per trigger, programmable exposure, or gated burst					
Sync output	Digital signal, high during integration					
External trigger ³	Three modes via CC1 or BNC					
External variable ET	User set by the duration of trigger signal (minimum ET pulse: 10 µs)					
External trigger jitter	1 clock cycle: nominally 80 ns					
Pixel rate	50 Mpix/s					
Readout mode	Integrate while read, differential double sampling					
Corrections (preset OPRs)	Factory calibrated gain, offset, and bad pixel replace					

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

² 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

³ User selectable by command over Camera Link® serial lines

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

ORDERING INFORMATION						
Camera Model ^{1, 2}	Max. Line rate ¹	Pitch	Pixels	FPA length	Aperture (height) ²	Classification
SU1024LDH-1.7RT-XXXX/LC	>46,000 lps	25 µm	1024	25.6 mm	0025 or 0500	EAR99

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

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



Model No: 1024-LDH Doc. No: 4110-0179 Rev: D March 2017

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