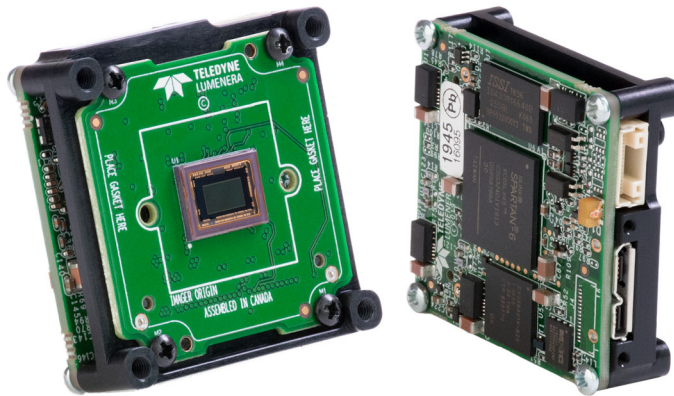| To:	**Worldwide Partners**
cc:	Teledyne Imaging - Digital Imaging offices
From:	Manny Romero
Date:	September 9, 2020
RE:	Lt Series Board Level Cameras – New Sony Starvis 8.3M models in Production

Lt Series Board Level Cameras– M3840B / C3840B

Versatile High Resolution USB3 Board Level Cameras targeted at Embedded Vision systems

Description

The Teledyne Lumenera Lt Series Board Level Cameras are a member of the Lt family, and a new series of affordable easy to use digital cameras specifically engineered for industrial imaging applications requiring tight system integration.

Lt Series Board Level Cameras use the industry's latest leading sensors, such as the Sony® Starvis™ rolling shutter and Pregius™ Gen2 series of global shutter active pixel-type CMOS image sensors. Additional leading sensors are targeted like Teledyne e2v Emerald series and Sony Pregius Gen3 series.

Lt Series Board Level Cameras combine standard USB 3.1 Gen 1 technology (supporting USB3 Vision 1.0) with the Teledyne Lumenera USB expertise to dependably capture and transfer images from the camera to the host PC. The Lt Series cameras are available in several models implementing different sensors, image resolutions, and feature sets, either in monochrome or color versions.

www.teledynelumenera.com

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lumenera.sales@teledyne.com	lumenera.sales@teledyne.com	lumenera.sales@teledyne.com	lumenera.sales@teledyne.com

TABLE of CONTENTS

Features and Details

Models Specific Details

Supported Features	Board-Level Camera Models
	M3840B / C3840B
Resolution	3840 x 2160
Sensor	Sony IMX334 (8.3M)
Optical Format	1/1.8"
Shutter	Rolling shutter function (with Global row reset in External trigger mode)
Pixel Size	2.0µm x 2.0µm
Maximum Frame Rate (in full resolution)	44 fps
Pixel Data Formats	Monochrome 8-bit / 12-bit (for Mono model) Bayer 8-bit / 12-bit (for Color model)
Exposure Control	Internal - Programmable via the camera API External – based on trigger width
Exposure Minimal	104 µs (single frame) / 18 µs (free running)
Synchronization	Via External Trigger Signal
Auto-Exposure	Yes, with programable target
Black Offset Control	Yes
Flip function	Reverse X and reverse Y
Full Well charge	10.4 Ke- (typical)
Output Dynamic Range	70.53 dB
Responsivity	see graphic below

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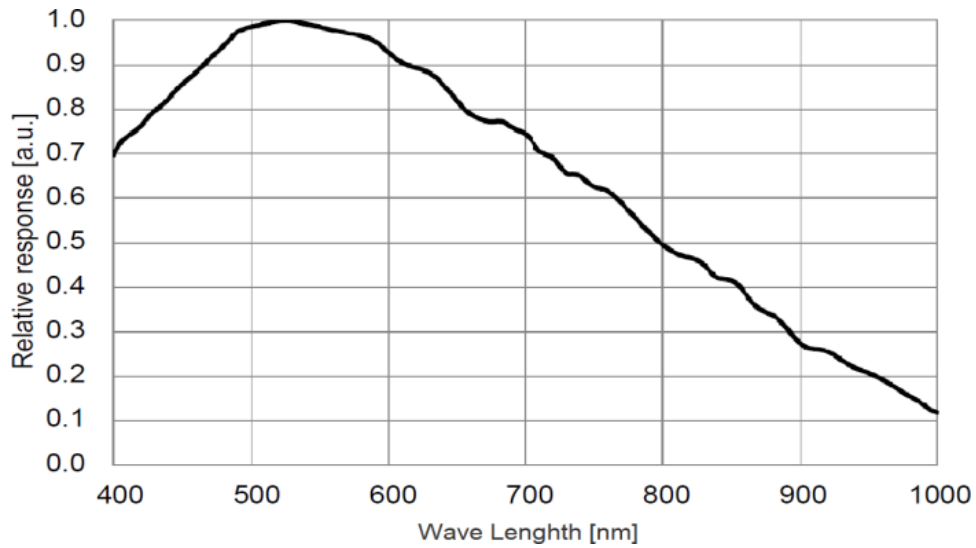+49 89-89-54-57-3-80
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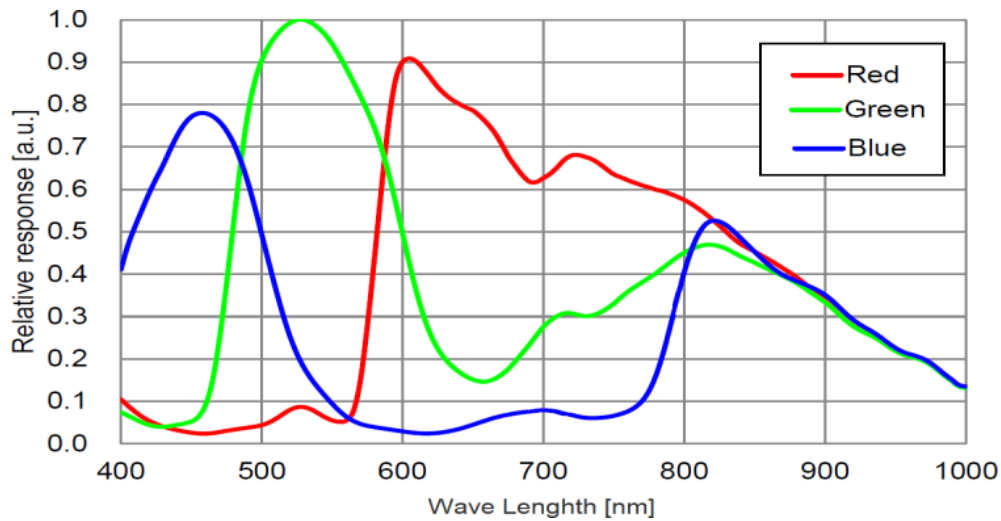lumenera.sales@teledyne.com

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Spectral Response

Monochrome Model M3840B (Starvis IMX334)

Color Model C3840B (Starvis IMX334)

Common Details

Camera Controls	

Exposure Modes	Programmable in increments of 1µs
	    minimum (in µs) is 18 µs
	    maximum is 76 Minutes
	Pulse controlled via Trigger pulse width.

Trigger Inputs	Opto-isolated, 33V to 24V typical, 20mA. Trigger delay supported
Strobe Outputs	Output opto-isolated
Features	
Image Buffer	128 MB of on-board memory
Color Enhancement support	Brightness, Contrast and Gamma features on Color models
Defective pixel replacement	Yes
I/O signals	1 Input Opto-isolated, 1 Output Opto-isolated and 2 TTL bidirectional I/O
Software Interface	
Software Compatibility	Lt-Uxxx-xxxxNBL P/N for the UBS3 Vision v1.0 compliant Lt-Lxxx-xxxxNBL P/N for the Lumenera SDK compliant
Mechanical Interface	
Camera (L x H x W)	21.2 mm x 40.4 mm x 40.4 mm
Mass	29 g
Input Power	via 9-pin connector, or Data connector through USB
Data connector	USB3 Micro-B
I/O connector	JST# SM09B-NSHSS-TB (mating part:JST # NSHR-09V-S)
Electrical Interface	
Input Voltage	+5 to +12 Volts DC (+/-10%) on Auxiliary connector Supports the Power Over USB standard.
Power Dissipation	~3.6W
USB Speed	USB 3.1 Gen 1 (5Gbps)
Data and Control	USB 3.1 Gen 1
Environmental Conditions	
Operating Temperature	0℃ to 50℃ (Housing Temperature)
Operating Relative Humidity	10% to 70% non-condensing
Storage Temperature	-40℃ to +80℃
Storage Relative Humidity	20% to 80% non-condensing

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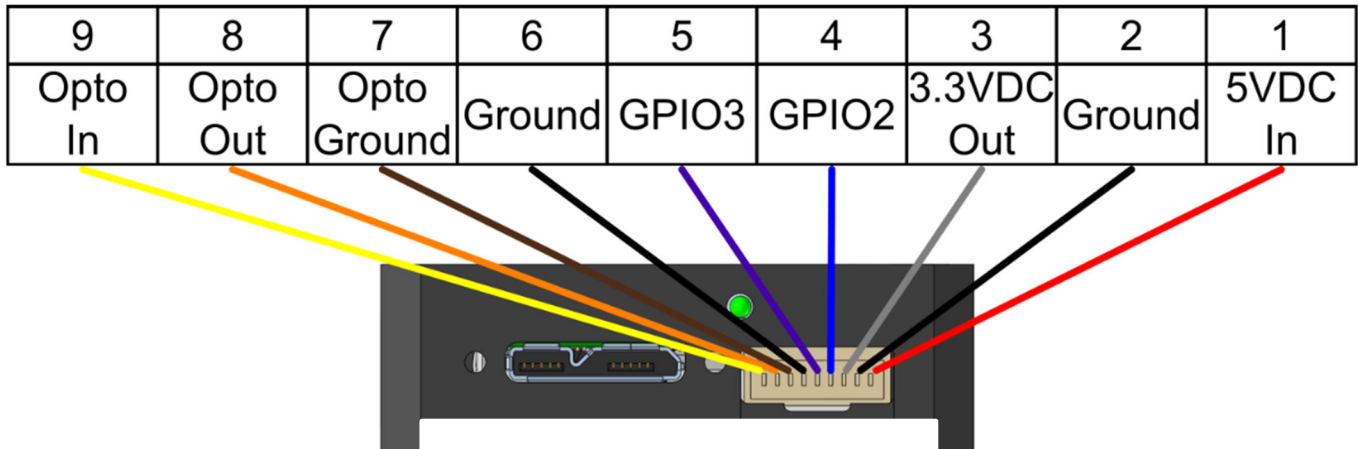+49 89-89-54-57-3-80
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9-pin I/O Connector Details

- A single 9-pin connector (JST# SM09B-NSHSS-TB) is available for all Lt Series Board Level Cameras for I/O and an auxiliary DC power source. The following figure shows the pin number assignment.

9	8	7	6	5	4	3	2	1
Opto In	Opto Out	Opto Ground	Ground	GPIO3	GPIO2	3.3VDC Out	Ground	5VDC In

I/O Mating Connector Sources

Teledyne Lumenera offer a cable assembly for the Lt Series Board Level Cameras. Refer to the cable pn: La4000PAFL in the accessory list.

For users wishing to build their own custom I/O cabling, the following product information is provided to expedite your cable solutions.

MFG	Part #	Description	Data Sheet
JST	NSHR-09V-S	Discrete connector	http://www.jst-mfg.com/product/pdf/eng/eNSH.pdf
JST	SSHL-003T-P0.2	contact	https://www.digikey.com/product-detail/en/jst-sales-america-inc/SSHL-003T-P0.2/455-2792-1-ND/3313668

JST # NSHR-09V-S Connector availability online

For North America (specific countries can be selected)

https://www.digikey.com/product-detail/en/jst-sales-america-inc/NSHR-09V-S/455-2785-ND/3313624
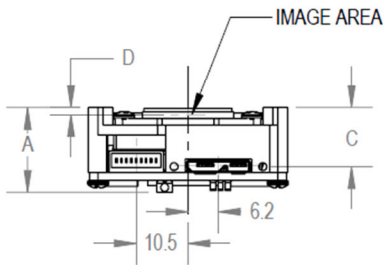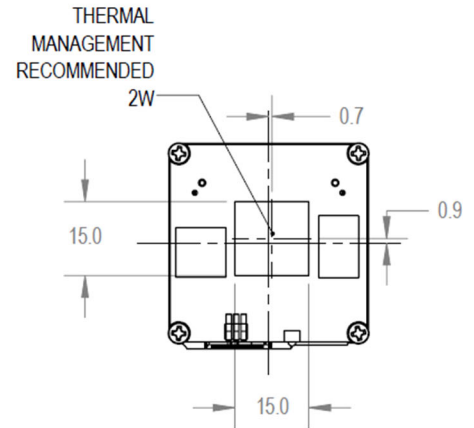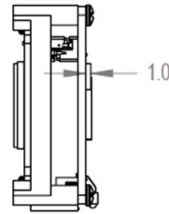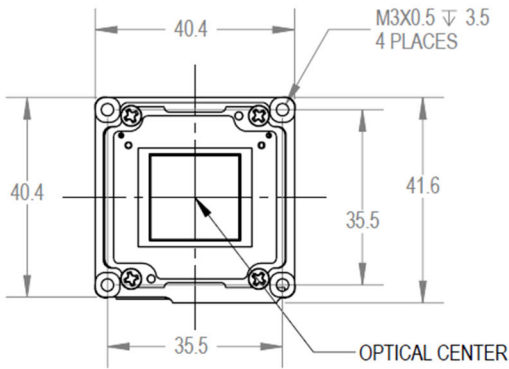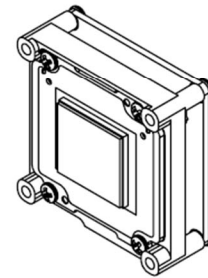
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Mechanical Information

M3X0.5 ▽ 3.5
4 PLACES

40.4

40.4

41.6

35.5

35.5

OPTICAL CENTER

THERMAL MANAGEMENT RECOMMENDED 2W

0.7

1.0

15.0

0.9

15.0

IMAGE AREA

D

A

C

6.2

10.5

MODELS	DIMENSION		
	A	C	D
LT-1950B LT-2020B LT-2420B LT-4020B LT-4030B	17.1	11.9	1.3
LT-1900B LT-3840B	14.1	8.9	1.4

DIMENSIONS IN MILLIMETERS

Software support

The Teledyne Lumenera Lt Series Board Level Cameras are compatible with the following software packages

All the part numbers starting with LT-**L**xxx-xxxxxx are compatible with the Teledyne Lumenera SDK below:

Operating System	Teledyne LUMENERA SDK
ubuntu Linux	Lumenera Camera Software Development Kit (LINUX) **v2.4.1**
Windows / LuCam	LuCam Software and Software Development Kit **v6.8.3**

A download link can be found below:

https://www.lumenera.com/support/industrial-usb-ethernet/drivers-downloads.html

The Teledyne Lumenera Lt Series Board Level Cameras with part numbers starting with LT-**U**xxx-xxxxxx are compatible with a USB3 Vision compliant SDK:

USB3 VISION

Teledyne Imaging have a beta driver USB3 Vision support within its popular Sapera Lt SDK (within v 8.60)

Contact your sell representative to have access to the Beta driver today.

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Availability

Production units are available NOW.

For the model based on the Sony 2M Starvis sensor, another SIU will soon be release with availability and pricing.

Pricing and Ordering Options

The list prices for the camera models based on the 8M Starvis sensor are provided in the table below.
Current lead time for cameras is 2 to 3 weeks.

Contact your sales representative for volumes greater than 5 units.

Lt Series – Board Level camera (40mm x 40mm)					
Model	**Resolution**	**Input Voltage**	**Part Number**	**Mount Option**	**List Price**
Lt-M3840B	3840 x 2160 @ 44fps Sony IMX334 Mono (8.3M) Rolling	5 Volt DC and Power over USB	LT-**x**M10-M384NBL	N/A	$365
Lt-C3840B	3840 x 2160 @ 44fps Sony IMX334 Color (8.3M) Rolling	5 Volt DC and Power over USB	LT-**x**C10-C384NBL	N/A	$365

To order a specific model with USB3 Vision support, use any of the part numbers above with the prefix, LT-**U**xxx-xxxxx.

To order a specific model with LuCam Software SDK support, use any of the part numbers above with the prefix, LT-**L**xxx-xxxxx.

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Accessories

Part Number	Description	List Price
La303ML	USB 3.1 Gen 1 Cable A-Male to Micro-B male Locking (3m / 9.75ft)	$20
La4000PAFL	GPIO Sync cable, 9-Pin with IO lead (power & lead cable) (applicable to PN: LT-xx1x-xxxxxx)	$30

Best Regards,

Manny Romero

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