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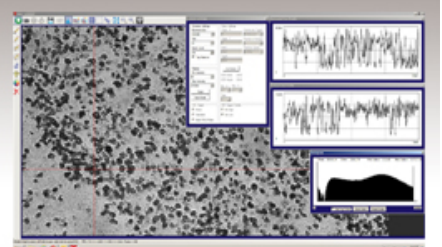


DCC1240M - MAR 17, 2021

Item # DCC1240M was discontinued on MAR 17, 2021. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

CMOS CAMERAS: USB 2.0 AND USB 3.0

- ▶ Monochrome Sensors
- ▶ Versions with Global Shutter and Trigger Available
- ▶ 1.3 Megapixel Sensors
- ▶ USB 2.0 or USB 3.0 for Fast Data Acquisition



GUI and Software Package Included



DCC1240M
 USB 2.0 with Trigger Input



DCC3240M
 High-Sensitivity USB
 3.0 with Trigger Input

OVERVIEW

Features

- Easy to Use in a Wide Range of Applications from Microscopy to Monitoring
- 1.3 Megapixel (1280 x 1024 Pixels) Monochrome CMOS Sensors
- Available with Global Shutter and External Trigger
- ThorCam™ Software for Windows® 7 and 10 Operating Systems
- SDK and Programming Interfaces Provide Support for:
 - C, C++, C#, and Visual Basic .NET APIs
 - LabVIEW, MATLAB, and µManager Third-Party Software

These compact, lightweight CMOS cameras are available with a monochrome sensor. They can be used in a wide range of applications from microscopy to monitoring. Our CMOS cameras offer a full-frame resolution of 1280 x 1024 pixels. All camera series are controlled and powered via a standard 5 V USB 2.0 or 3.0 port.

The DCC1240M and DCC3240M high-sensitivity CMOS cameras include CMOS sensors that allow for switching between rolling and global shutter mode, offer a considerably higher dynamic range, and include an input for an external trigger. A brief comparison of the features available in each model is presented in the table below. For a detailed list of specifications, see the *Specs* tab.

For quantitative applications requiring low noise, high quantum efficiency cameras, consider our Quantalux® sCMOS and Kiralux® CMOS Cameras.

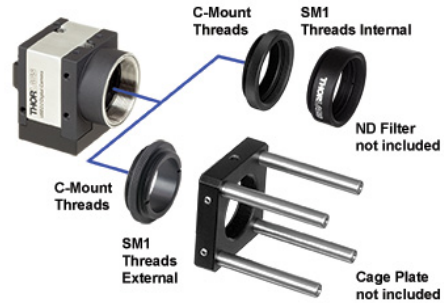
USB and Trigger Cables

For the DCC1240M camera, optional CAB-DCU-T1 and CAB-DCU-T2 USB and trigger cables allow one to use the additional trigger input and output ports (T1 and T2) of this camera together with the USB 2.0 connection. The exposure and readout/transfer events of the camera can be initiated via the input trigger, and external events like strobe lights can be triggered by the camera using the output trigger. The CAB-DCU-T3 GPIO cable can be used with the USB 3.0 cameras as an additional means of connecting and triggering peripheral devices. The trigger configuration (i.e., the source of the input trigger and the timing for the output trigger) can be set via the provided software or the LabVIEW drivers.

Software

Each camera also comes with ThorCam, our Windows-compatible GUI software package. Standard drivers like Direct Show (WDM) and .NET are provided and offer support for LabVIEW. An extensive SDK is available. The C/C++ drivers can additionally be imported to Matlab using MEX files.

SM1 Thread Compatibility



Compatibility of the C-Mount CMOS Cameras with Thorlabs' SM1 internal or external threadings. Our CS-Mount Cameras feature the same compatibility.

Item #	DCC1240M	DCC3240M
Resolution	1.3 Megapixels (1280 x 1024)	
Sensor	Monochrome	
Exposure Mode	Global and Rolling Shutter	
Interface and Included Cable	USB 2.0	USB 3.0
Input/Output Trigger	Yes	

S P E C S

Item # ^a	DCC1240M	DCC3240M
Sensor Type	Monochrome	Monochrome
Effective Number of Pixels (Horizontal x Vertical)	1280 x 1024	
Imaging Area (Horizontal x Vertical)	6.78 mm x 5.43 mm	6.78 mm x 5.43 mm
Pixel Size	5.3 μm , Square	5.3 μm , Square
Optical Format	1/1.8"	1/1.8"
Max Frame Rate	25.8 fps (Freerun Mode) 24.7 fps (Trigger Mode)	60.0 fps (Freerun Mode) 56.9 fps (Trigger Mode)
ADC ^a Resolution	8 Bits	10 Bits (8 Bits if Connected to USB 2.0)
Sensor Shutter Type	Global and Rolling Shutter	Global and Rolling Shutter
Peak Quantum Efficiency ^b	62%	62%
Read Noise	<30 e ⁻ RMS	<30 e ⁻ RMS
Exposure Time	0.009 ms ^c - 2 s ^d	0.009 ms ^c - 2 s ^d
Pixel Clock Speed	7 - 35 MHz	5 - 85 MHz
Vertical and Horizontal Hardware Binning	Horizontal, Vertical	Horizontal, Vertical
Region of Interest (ROI)	4 x 16 Pixels to 1024 x 1280 Pixels, Rectangular	4 x 16 Pixels to 1024 x 1280 Pixels, Rectangular
Lens Mount	C-Mount	C-Mount
Mounting Features	8-32 Tap, 5 mm Deep ^e M4 Tap, 5 mm Deep ^e	1/4"-20 Tap, 6 mm Deep ^e 8-32 (M4) Tap, 6.5 mm Deep w/ Included Adapters
Removable Optic	Uncoated Glass (D263)	Uncoated Glass (D263)
Interface	USB 2.0	USB 3.0 ^f
Power Consumption	0.3 - 0.7 W	1.3 W ^g
Ambient Operating Temperature	23 to 122 °F (-5 to 50 °C)	
Storage Temperature	-4 to 140 °F (-20 to 60 °C)	

a. ADC = Analog-to-Digital Converter

b. Please see the *Graphs* tab for more information.

c. Requires maximum pixel clock frequency.

d. Requires minimum pixel clock frequency.

e. Be careful not to thread a screw longer than the depth of the tap into the camera housing, as this could lead to damage.

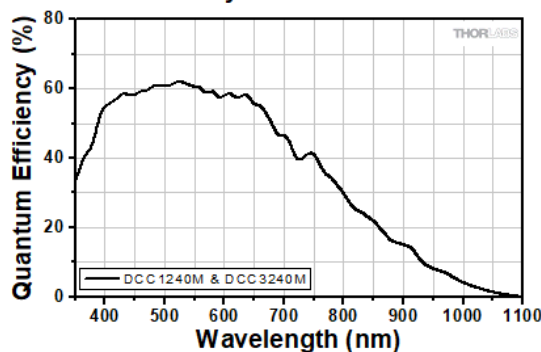
f. A USB 2.0 connection can be used, but will significantly decrease the frame rate and will be limited to 8-bit depth operation.

g. The power consumption depends on the sensor model and the pixel clock setting.

G R A P H S

A graph of the camera response as a function of wavelength is presented here. Individual sensitivity curves are provided below.

Quantum Efficiency of Monochrome Cameras



Click to Enlarge

SHIPPING LIST

Components Included with CMOS Cameras

Item #	Cable	Lens Mounting Adapters	Post Mounting Adapters	Other Accessories
DCC1240M	USB 2.0	C-Mount to External SM1 C-Mount to Internal SM1	-	Software CD with ManualQuick Start Guide
DCC3240M	USB 3.0	-	8-32 and M4 Thread Adapters	

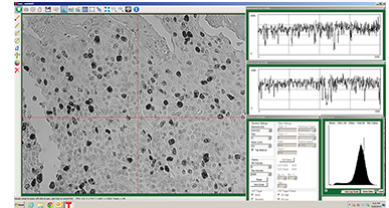
SOFTWARE

ThorCam™

Software

Version 3.5.1

Click the button below to visit the ThorCam software page.



Click to Enlarge
ThorCam Graphical User Interface (GUI)

ThorCam is a powerful image acquisition software package that is designed for use with our cameras on 32- and 64-bit Windows® 7 or 10 systems. This intuitive, easy-to-use graphical interface provides camera control as well as the ability to acquire and play back images. Single image capture and image sequences are supported. Application programming interfaces (APIs) and a software development kit (SDK) are included for the development of custom applications by OEMs and developers. The SDK provides easy integration with a wide variety of programming languages, such as C, C++, C#, and Visual Basic .NET. Support for third-party software packages, such as LabVIEW, MATLAB, and μ Manager* is available.

* μ Manager control of Zelux and 1.3 MP Kiralux cameras is not currently supported. When controlling the Kiralux Polarization-Sensitive Camera using μ Manager, only intensity images can be taken; the ThorCam software is required to produce images with polarization information.

High-Sensitivity CMOS USB 2.0 Camera with Global Shutter



Click to Enlarge
Back of Camera with
Input for External
Trigger


- ▶ Monochrome Sensor
- ▶ Global and Rolling Shutter Mode
- ▶ USB 2.0 Port Provides Power and Computer Interface
- ▶ 25.8 fps in Freerun Mode and up to 98 fps with Limited Area of Interest
- ▶ Trigger Input
- ▶ Ships with USB 2.0 Cable

Limited
STOCK

The DCC1240M monochrome high-sensitivity USB 2.0 CMOS camera includes CMOS sensors that allow for switching between rolling and global shutter mode, offer a high dynamic range and include an input for an external trigger. The camera is controlled and powered via a USB 2.0 connection. These cameras can achieve frame rates up to 98 fps (reduced ROI).

Each camera is shipped with C-mount to internal SM1 and C-mount to external SM1 adapters (also sold separately below). Taps in the bottom of the camera allow for post mounting with 8-32 or M4 screws.

These cameras are fully compatible with our C-Mount Camera Lenses and High-Magnification Zoom Lenses that are sold separately. Our standard lenses include fixed focal lengths from 3.5 mm to 75 mm with maximum apertures of up to $f/0.95$, as well as an 18 - 108 mm focal length, $f/2.5$ zoom lens. Our high-magnification zoom lenses are a modular system that features magnifications from 0.07 to 28.

Item #	DCC1240M
CMOS Sensor Type	Monochrome
Sensitivity Graph	
Exposure Mode	Global and Rolling Shutter
Read Out Mode	Progressive Scan
Resolution	1280 x 1024 Pixels
Optical Sensor Format	1/1.8"
Pixel Clock Range ^a	7 - 35 MHz
Frame Rate, Freerun Mode ^b	25.8 fps
Trigger Input	9-Pin, D-Sub Connector
Lens Mounting Thread	C-Mount (1.00"-32) ^c
Post Mounting Threads	8-32 and M4 Taps, 5 mm Deep ^d
Dimensions (H x W x D)	40.4 mm x 32.0 mm x 41.5 mm (1.59" x 1.26" x 1.63")
Weight	0.16 lbs (74 g)
Included Adapters	C-Mount to External SM1 and C-Mount to Internal SM1

a. Depends on the PC hardware used.

b. Requires maximum pixel clock frequency.

c. Please note that CS-Mount and C-Mount lens mounts both use 1.00"-32 threads but feature different flange-to-sensor distances.

d. Be careful not to thread a screw longer than the depth of the tap into the camera housing, as this could lead to damage.



The DCC1240M CMOS Camera will be retired and replaced by our new Zelux™ Compact Scientific Cameras when stock is depleted.

If you require a DCC camera for line production, please contact our OEM

Team.

Part Number	Description	Price	Availability
DCC1240M	Customer Inspired! High-Sensitivity USB 2.0 CMOS Camera, 1280 x 1024, Global Shutter, Monochrome Sensor	\$1,267.56	Lead Time

High-Sensitivity USB 3.0 CMOS Cameras with Global Shutter



Click to Enlarge

- ▶ Monochrome Sensor
- ▶ Global and Rolling Shutter Modes
- ▶ USB 3.0 and GPIO Ports
- ▶ 60 fps in Freerun Mode and Capable of 229 fps with Limited Area of Interest
- ▶ Trigger Input
- ▶ Ships with USB 3.0 Cable

Limited
STOCK

The DCC3240M monochrome camera has a USB 3.0 connection for improved performance. Compared to the DCC1240, the DCC3240M camera is capable of a faster frame rate (60.0 fps vs. 25.8 fps in Free Run Mode) and lower trigger delay (as low as 3 μ s vs. 20 μ s). The camera is powered via the USB port and also has two GPIOs (General Purpose I/O) that allow it to serve as a trigger for peripheral devices. Faster than the DCC1240 cameras, it can achieve a maximum frame rate of 229 fps (limited ROI).


The front aperture features an internal C-mount thread. The bottom of the housing has a 6 mm deep 1/4"-20 tap, so adapters are included for easy post mounting using either the 8-32 or M4 standard. These camera can also be connected to SM1-Threaded Lens Tubes using the adapters sold at the bottom of this page.

The DCC3240M camera is fully compatible with our C-Mount Camera Lenses and High-Magnification Zoom Lenses that are sold separately. Our standard lenses include fixed focal lengths from 3.5 mm to 75 mm with maximum apertures of up to $f/0.95$, as well as an 18 - 108 mm focal length, $f/2.5$ zoom lens. Our high-magnification zoom lenses are a modular system that features magnifications from 0.07 to 28.



The DCC3240M CMOS Camera will be retired and replaced by our new 1.3 MP Kiralux[®] Compact Scientific Cameras (including an NIR-enhanced option) when stock is depleted.

If you require a DCC camera for line production, please contact our OEM Team.

Item #	DCC3240M
CMOS Sensor Type	Monochrome
Sensitivity Graph	
Exposure Mode	Global and Rolling Shutter
Read Out Mode	Progressive Scan
Resolution	1280 x 1024 Pixels
Optical Sensor Format	1/1.8"
Pixel Clock Range ^a	5 - 85 MHz
Frame Rate, Freerun Mode ^b	60.0 fps
Trigger Input	8-Pin, Hirose Connector
Lens Mounting Thread	C-Mount (1.00"-32) ^c
Post Mounting Thread	1/4"-20 Tap, 6 mm Deep ^d
Dimensions w/ Adapter Plate (H x W x D)	35.0 mm x 29.0 mm x 46.4 mm (1.38" x 1.14" x 1.83")
Weight	60 g (0.13 lbs) w/ Adapter Plate 43 g (0.09 lbs) w/o Adapter Plate
Included Adapters	1/4"-20 to 8-32 and 1/4"-20 to M4

a. Depends on the PC hardware used.

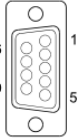

b. Requires maximum pixel clock frequency.

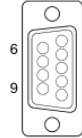

c. Please note that CS-Mount and C-Mount lens mounts both use 1.00"-32 threads but feature different flange-to-sensor distances.



d. Be careful not to thread a screw longer than the depth of the tap into the camera housing, as this could lead to damage.

Part Number	Description	Price	Availability
DCC3240M	High-Sensitivity USB 3.0 CMOS Camera, 1280 x 1024, Global Shutter, Monochrome Sensor	\$1,376.83	Lead Time

USB and Trigger Cables for DCC Series Cameras

Item #	CAB-DCU-T1			Pin	Assignment
 <p>Click to Enlarge</p>	Connector Device Side	Micro Sub-D, 90° Angled		2	Trigger Input +
	Connector PC Side	USB 2.0 A Male		3	Shield
	USB Standard	Hi-Speed USB2.0		4	USB +5 V
	Trigger In (Bare Wire)	x		5	USB GND
	Flash & Digital Out (Bare Wire)	x		6	Flash Strobe Output +
	Wire Gauge USB	24AWG/2C and 28AWG/1PR		7	Trigger Input -
	Shielding	Double Shielded 80 °C 30 V		8	USB D+
	Length	3 m		9	USB D-







Item #	CAB-DCU-T2			Pin	Assignment
 <p>Click to Enlarge</p>	Connector Device Side	Micro Sub-D, Straight		2	Trigger Input +
	Connector PC Side	USB 2.0 A Male		3	Shield
	USB Standard	Hi-Speed USB2.0		4	USB +5 V
	Trigger In (Bare Wire)	x		5	USB GND
	Flash & Digital Out (Bare Wire)	-		6	Not Connected
	Wire Gauge USB	24AWG/2C and 28AWG/1PR		7	Trigger Input -
	Shielding	Double Shielded 80 °C 30 V		8	USB D+
	Length	3 m		9	USB D-

Item #	CAB-DCU-T3			Pin	Assignment
 <p>Click to Enlarge</p>	Connector Device Side	Hirose HR25-7TP-8S		2	Flash Output ^a
	End Opposite Connectors	Tinned End of Wires		3	GPIO 1, 3.3 V LVCMOS
	Function	GPIO		4	Trigger Input ^a -
	Trigger In (Bare Wire)	yes		5	Flash Output ^a +
	Flash & Digital Out (Bare Wire)	yes		6	GPIO 2, 3.3 V LVCMOS
	Cable Type	Shielded High-Flexible Control Cable 8 x 0.1 mm, Ø4.9 mm		7	Trigger Input ^a +
	Shielding	Single Shielded		8	Output Supply Voltage, 5 V (100 mA)
	Length	2 m		9	N/A

a. These pins are opto-decoupled inside the camera to protect against high or incorrect voltages.

Part Number	Description	Price	Availability
CAB-DCU-T1	Customer Inspired! USB and Trigger Cable (In/Out) for DCU Series and DCC1240 Cameras, 3 m	\$145.33	Today
CAB-DCU-T2	Customer Inspired! USB and Trigger Cable (In Only) for DCU Series and DCC1240 Cameras, 3 m	\$85.23	Today
CAB-DCU-T3	Trigger and I/O Cable, Hirose 25, for DCC3240, DCC3260, WFS30 and WFS40, 2 m	\$103.81	Today

Camera Thread Adapters

Item #	SM1A9	SM1A9TS ^a	SM1A39
Image (Click To Enlarge)			
Thread 1	External C-Mount (1.00"-32)		
Thread 2	Internal SM1 (1.035"-40)		External SM1 (1.035"-40)
Material	Anodized Aluminum	Black Delrin ^{®b}	Anodized Aluminum
Typical Application	 Mount a C-Mount Camera to an Externally Threaded SM1 Lens Tube	 Mount a C-Mount Camera to an Externally Threaded SM1 Lens Tube	 Mount a C-Mount Camera to an Internally Threaded SM1 Lens Tube

^aThermally Insulating Adapter

^bDelrin[®] is a registered trademark of DuPont Polymers, Inc.

Part Number	Description	Price	Availability
SM1A9	Adapter with External C-Mount Threads and Internal SM1 Threads, 4.4 mm Spacer	\$19.96	5-8 Days
SM1A9TS	Customer Inspired! Thermally Insulating Adapter with External C-Mount Threads and Internal SM1 Threads, 6.5 mm Spacer	\$23.61	Today
SM1A39	Customer Inspired! Adapter with External C-Mount Threads and External SM1 Threads, 3.2 mm Spacer	\$21.21	Today

Visit the *CMOS Cameras: USB 2.0 and USB 3.0* page for pricing and availability information:

https://www.thorlabs.com/newgrouppage9.cfm?objectgroup_id=4024

