

Toshiba Teli's proud



USB3 Industrial Camera BU / DU / DDU Series

High reliability & resolution Dual USB3 models



6.5 MP DU657M Series
Teli Original

12.3 MP DU1207M Series
Sony IMX253
Pregius



NEW **12.3 MP** DDU1207M Series
Sony IMX253
Pregius

COMING SOON **16 MP** DDU1607M Series
OnSemi XGS 16000

Small & Low resolution



NEW **0.4 MP** BU040M Series
Sony IMX287
Pregius

1.3 MP BU132M
e2v EV76C560

NEW **1.6 MP** BU160M Series
Sony IMX273
Pregius

2 MP BU205M
CMOSIS CMV2000

2.3 MP BU238M Series
Sony IMX174
Pregius

Small & Middle resolution



3.1 MP BU302M Series
Sony IMX252
Pregius

4 MP BU406M Series
CMOSIS CMV4000

5 MP BU505M Series
Sony IMX250
Pregius

Small & High resolution



12.3 MP BU1207M Series
Sony IMX253
Pregius

COMING SOON **24 MP** BU2409M Series
Sony IMX540
Pregius S

CCD models



0.3 MP BU030/BU031 Series
Sony CCD

1.3 MP BU130 Series
Sony CCD

Rolling shutter models



6.2 MP BU602M Series
Sony IMX178
STARVIS

12 MP BU1203M Series
Sony IMX226
STARVIS

BU Series USB3.1 Gen1 (USB3.0)

“Teli Core Technology” Inside
 CCD/CMOS Image sensor
 USB3 Micro B connector
 LED Status indicator
 e-CON 4 pin connector
 Trigger input / GPIO
 Screw lock

Japanese Design Registration: No. 1462541

DU Series USB3.1 Gen1 (USB3.0)

“Teli Core Technology” Inside
 CCD/CMOS Image sensor
 USB3 Micro B connector
 LED Status indicator
 Trigger input / GPIO
 e-CON 4 pin connector
 Screw lock

DDU Series USB3.1 Gen1 (USB3.0)
Dual USB3

“Teli Core Technology” Inside
 CCD/CMOS Image sensor
 USB3 Micro B connector
 LED Status indicator
 Round type 6 pin connector
 Trigger input / GPIO
 e-CON 4 pin connector
 Trigger input / GPIO
 Screw lock

Toshiba Teli Corporation

<https://www.toshiba-teli.co.jp/en/>

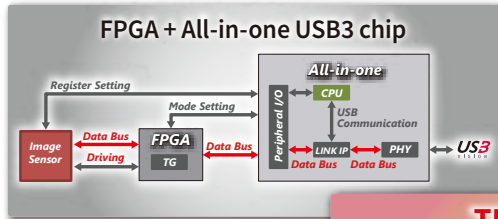


Toshiba Teli USB3 Camera BU Series

Featuring TELI original IP "TELI Core Technology"

- Achieved high integration with TELI's original technology.
- Shorten the response time!

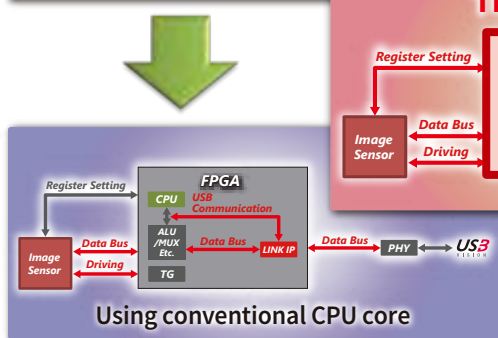
Teli Core Technology



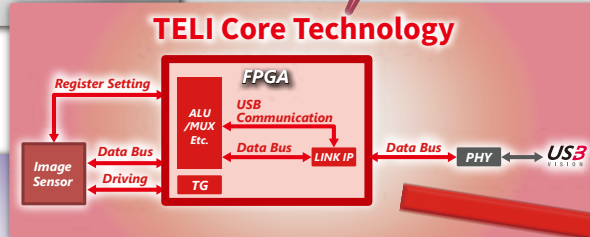
Downsizing,
High
integration

All hardware processing with
**no CPU and
no Firmware!**

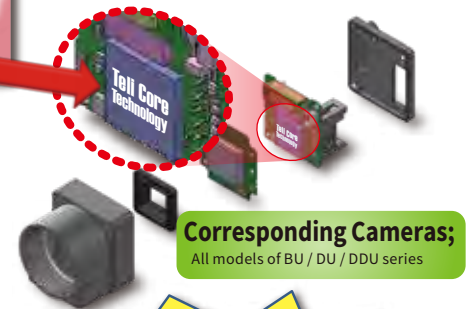
Downsizing and super
high speed response
by high integration!



Downsizing,
High
integration



— Firmware process
— Hardware process



Corresponding Cameras;
All models of BU / DU / DDU series

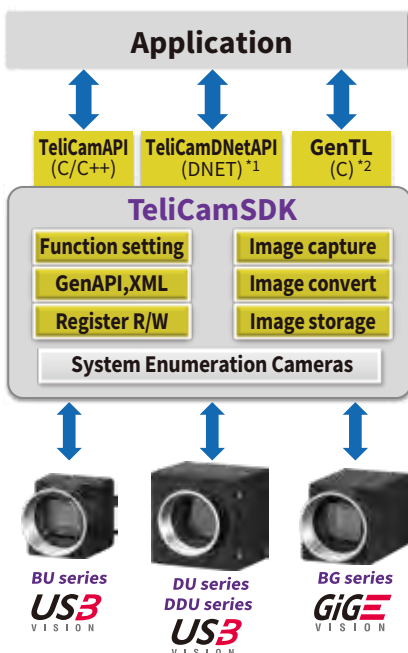
**Overwhelming
high speed processing!**

* Comparison value of read register access response with 'All-in-one USB chip' built-in model.

Access response (Average) PC (Board) side host controller : Intel / Renesas

Command	Teli Core Technology	Generic USB IP	All-in-one USB chip
		100 times faster	
		10 times faster	
Read register	2.2 / 5 μs	40.8 / 44.6 μs	223 / 546 μs
Software trigger (write register)	2.2 / 5.4 μs	46.9 / 71.0 μs	314 / 324 μs

TeliCamSDK



- Easy to capture image
- GEN<i></i>CAM available
- Varieties of functions for easy programming
- Abundant sample code
- Easy to understand manuals
- Unified SDK for USB3 & GigE



Package composition of TeliCamSDK

Driver	Library
Sample code	Viewer
Setting tools	Instruction manual

* TeliCamSDK contains the components necessary for application development.

OS ^{*4} Distribution	Windows			Linux						
	7	8.1	10	Ubuntu		Debian	CentOS	Fedora	ARM	
Support	✓	✓	✓	14.04 LTS amd64	16.04 LTS amd64	18.04 LTS amd64	8.1.0 amd64	7.3 amd64	27 amd64	✓
				✓	✓	✓	✓	✓	✓	✓

TeliCamSDK for Linux supported ARM architectures.

- Jetson TK1 / Jetson TX2 / Jetson nano / Odroid XU4 (*5) / Raspberry pi 3 (*5, *6)

*1: for Windows / *2: USB only / *3: Corresponds to old version / *4: Please contact us for other OS and distributions. / *5: With a GigE Vision camera, image might be missed depending on PC specifications. / *6: USB3 Vision camera cannot be used.

/ DU Series / DDU Series

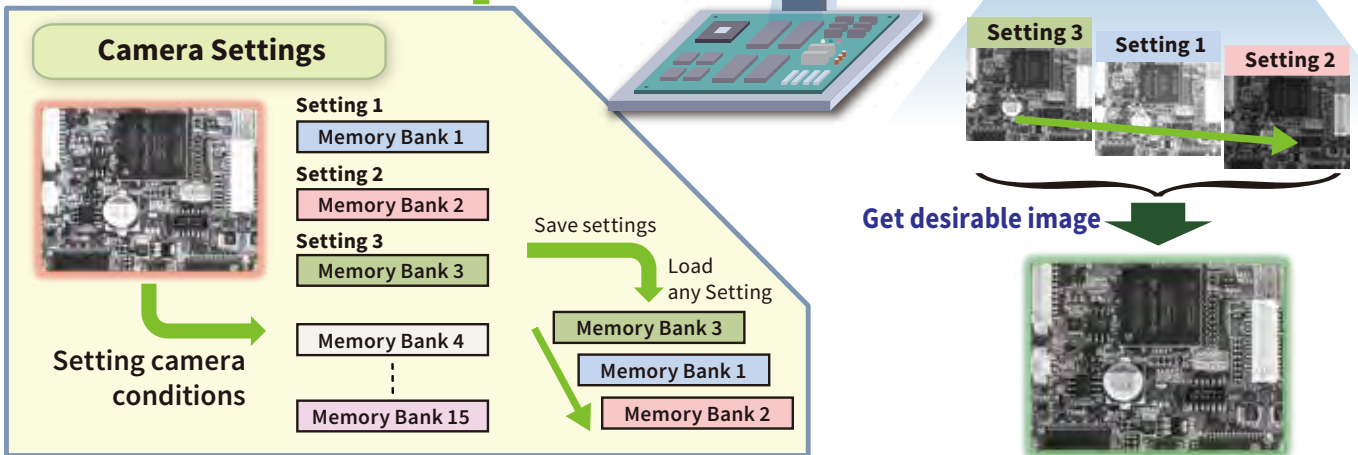


Sequential Shutter mode + Bulk Trigger mode

- Output several images of different setting with one trigger pulse.
- Easy to capture the images for desirable inspection.

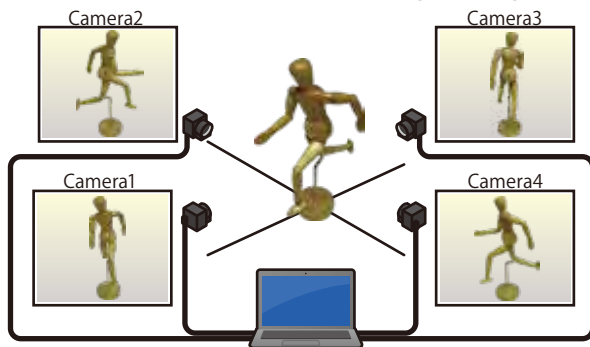
Corresponding Cameras;

BU040M series, BU132M, BU160M series, BU205M, BU238M series, BU302M series, BU406M series, BU505M series, BU1207M series, DU657M series, DU1207M series, DDU1207M series



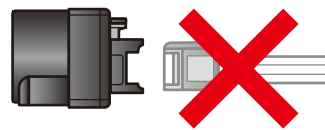
Bus Synchronization

- Fully synchronized exposure timing among several cameras.*



Corresponding Cameras;

BU030 series, BU031, BU130 series, BU040M series, BU160M series, BU205M, BU238M series, BU302M series, BU406M series, BU505M series, BU1207M series, DU657M series, DU1207M series, DDU1207M series



No cable needed for 'Trigger in'!

Example;

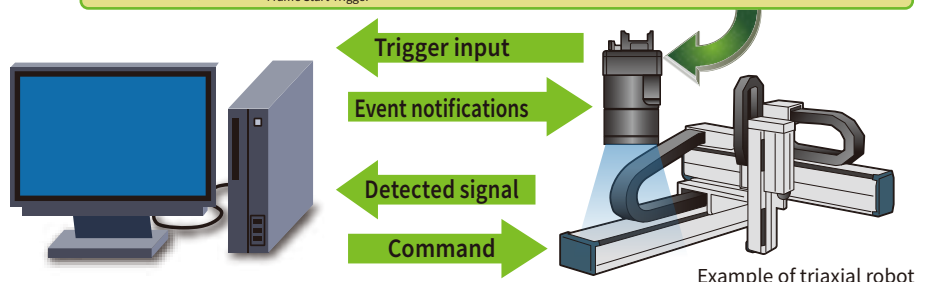
- Stereo camera
- Motion capture

* The time stamp in the USB bus is used. The camera with same time stamp can synchronize.

Event Notifications

- Camera notifies status information via event packet!
- Event notice without delay by the **Teli Core Technology**.
- Rendering great service to vision systems with high speed as its important feature.

1	FrameTrigger	- Reception of Frame Start Trigger	4	FrameTransferStart	- Start of transferring Streaming Data	7	ExposureEnd	- End of Exposure
2	FrameTriggerError	- Rejection of Frame Start Trigger	5	FrameTransferEnd	- End of transferring Streaming Data	8	Timer0Start	- Start of Timer "0"
3	FrameTriggerWait	- Start of waiting for Frame Start Trigger	6	ExposureStart	- Start of Exposure	9	Timer0End	- End of Timer "0"



Corresponding Cameras;

BU series all models, DU series all models, DDU series all models

Example of triaxial robot

Specifications

MODEL*1	DU657M	DU657MC	DU1207MG	DU1207MCG DU1207MCF	DDU1207MG	DDU1207MCG DDU1207MCF	DDU1607MG	DDU1607MCG DDU1607MCF
B/W or COLOR	B/W	COLOR	B/W	COLOR	B/W	COLOR	B/W	COLOR
Pixels	6.5M		12.3M		12.3M		16M	
Imager model	TELI Original 6.5M		Sony IMX253		Sony IMX253		OnSemi XGS 16000	
Imager size/type*2	1.1 type GS-CMOS		1.1 type GS-CMOS		1.1 type GS-CMOS		1.1 type GS-CMOS	
Resolution	2,560 x 2,560		4,096 x 3,000		4,096 x 3,000		4,000 x 4,000	
Frame rate	55 fps		32 fps	31 fps	62 fps	62 fps	45 fps	45 fps
Pixel size	5.0 x 5.0 μm		3.45 x 3.45 μm		3.45 x 3.45 μm		3.20 x 3.20 μm	
Bus synchronization	✓		✓		✓		✓	
Bulk trigger	✓		✓		✓		✓	
Image buffer	64MB		256MB		256MB		256MB	
Sequential shutter	✓		✓		✓		✓	
Short exposure mode*3	-		✓		(Planning)		-	
Product availability (CY)	Available		Available		Available		(Developing)	

MODEL*1	BU040M BU040MG	BU040MCG BU040MCF	BU132M	BU160M BU160MG	BU160MCG BU160MCF	BU205M	BU238M	BU238MCG BU238MCF	BU302MG	BU302MCG BU302MCF
B/W or COLOR	B/W	COLOR	B/W	B/W	COLOR	B/W	B/W	COLOR	B/W	COLOR
Pixels	0.4M		1.3M	1.6M		2.2M	2.3M		3.1M	
Imager model	Sony IMX287		e2v EV76C560	Sony IMX273		CMOSIS CMV2000	Sony IMX174		Sony IMX252	
Imager size/type*2	1/2.9 type GS-CMOS		1/1.8 type GS-CMOS	1/2.9 type GS-CMOS		2/3 type GS-CMOS	1/1.2 type GS-CMOS		1/1.8 type GS-CMOS	
Resolution	720 x 540		1,280 x 1,024	1,440 x 1,080		2,048 x 1,088	1,920 x 1,200		2,048 x 1,536	
Frame rate	523 fps		61 fps	240 fps		170 fps	165 fps		120 fps	
Pixel size	6.90 x 6.90 μm		5.3 x 5.3 μm	3.45 x 3.45 μm		5.5 x 5.5 μm	5.86 x 5.86 μm		3.45 x 3.45 μm	
Bus synchronization	✓		-	✓		✓	✓		✓	
Bulk trigger	✓		✓	✓		✓	✓		✓	
Image buffer	256MB		256MB	256MB		256MB	256MB		256MB	
Sequential shutter	✓		✓	✓		✓	✓		✓	
Short exposure mode*3	✓		-	✓		-	-		✓	
Product availability (CY)	Available		Available	Available		Available	Available		Available	

MODEL*1	BU406M BU406MN	BU406MCG BU406MCF	BU505MG	BU505MCG BU505MCF	BU1207MG	BU1207MCG BU1207MCF	BU2409MG	BU2409MCG BU2409MCF
B/W or COLOR	B/W	COLOR	B/W	COLOR	B/W	COLOR	B/W	COLOR
Pixels	4.2M		5M		12.3M		24.5M	
Imager model	CMOSIS CMV4000		Sony IMX250		Sony IMX253		Sony IMX540	
Imager size/type*2	1.0 type GS-CMOS		2/3 type GS-CMOS		1.1 type GS-CMOS		1.2 type GS-CMOS	
Resolution	2,048 x 2,048		2,448 x 2,048		4,096 x 3,000		5,320 x 4,600	
Frame rate	90 fps		75 fps		31 fps		TBD fps	
Pixel size	5.5 x 5.5 μm		3.45 x 3.45 μm		3.45 x 3.45 μm		2.74 x 2.74 μm	
Bus synchronization	✓		✓		✓		✓	
Bulk trigger	✓		✓		✓		✓	
Image buffer	256MB		256MB		256MB		256MB	
Sequential shutter	✓		✓		✓		✓	
Short exposure mode*3	-		✓		(Planning)		(Planning)	
Product availability (CY)	Available		Available		Available		(Developing)	

MODEL*1	BU030	BU030C BU030CF	BU031	BU130	BU602M	BU602MCG BU602MCF	BU1203MCG BU1203MCF
B/W or COLOR	B/W	COLOR	B/W	B/W	B/W	COLOR	COLOR
Pixels	0.3M		0.3M	1.3M	6.2M		12M
Imager model	Sony ICX424A		Sony ICX414A	Sony ICX445A	Sony IMX178		Sony IMX226
Imager size/type*2	1/3 type CCD		1/2 type CCD	1/3 type CCD	1/1.8 type RS-CMOS		1/1.7 type RS-CMOS
Resolution	640 x 480		640 x 480	1,280 x 960	3,072 x 2,048		4,000 x 3,000
Frame rate	125 fps		125 fps	30 fps	60 fps		30 fps
Pixel size	7.4 x 7.4 μm		9.9 x 9.9 μm	3.75 x 3.75 μm	2.40 x 2.40 μm		1.85 x 1.85 μm
Bus synchronization	✓		✓	✓	-		-
Bulk trigger	✓		✓	✓	-		-
Image buffer	-		-	-	256MB		256MB
Sequential shutter	-		-	-	-		-
Short exposure mode*3	-		-	-	-		-
Product availability (CY)	Available		Available	Available	Available		Available

*1: MODEL suffix

C/MC: without IR-cut filter, CF/MCF: with IR-cut filter, G/CG: with Dust-proof Glass

*2: Imager type

GS-CMOS: Global shutter type CMOS sensor, RS-CMOS: Rolling shutter type CMOS sensor

*3: Short exposure mode

The mode to switch it for short time exposure (1.1μs or more) by enhancing electronic shutter. (Contact for details)



Notes on Safety

- Before using this product, please read "Operation Manual" carefully in order to use this product safely and correctly.
- If this product should be used in the extraordinary conditions or environments, or if you have any questions or problems, please contact our sales division.

Toshiba Teli Corporation

<https://www.toshiba-teli.co.jp/en/>

teli camera