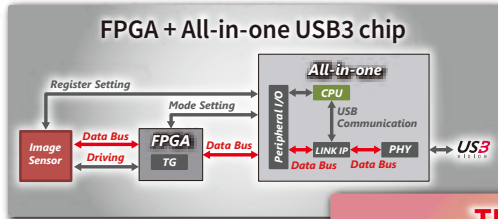


# Toshiba Teli USB3 Camera BU Series

## Featuring TELI original IP "TELI Core Technology"

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

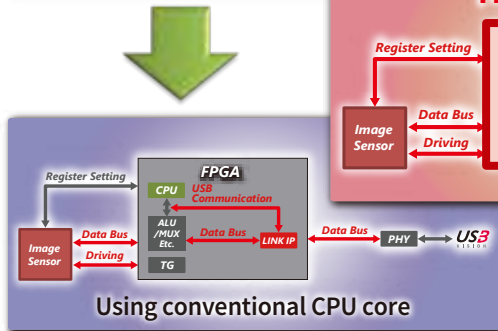
### Teli Core Technology



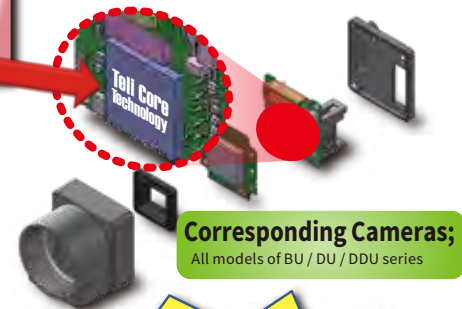
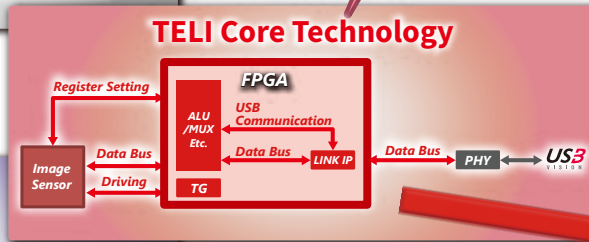
Downsizing,  
High  
integration

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

Downsizing and super  
high speed response  
by high integration!



Downsizing,  
High  
integration



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

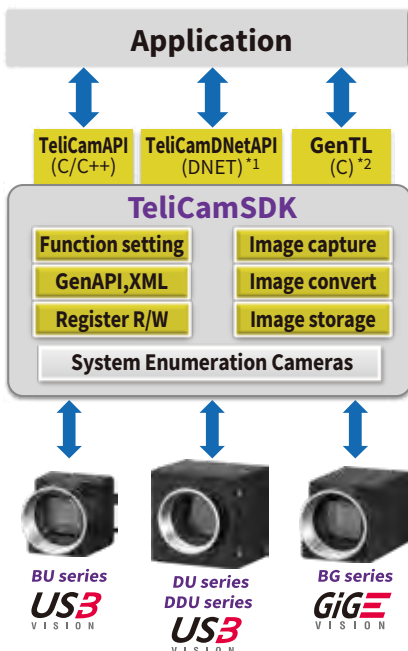
**Overwhelming  
high speed processing!**

\* 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		40.8 / 44.6 μs	223 / 546 μs
Software trigger (write register)		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



\* 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	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

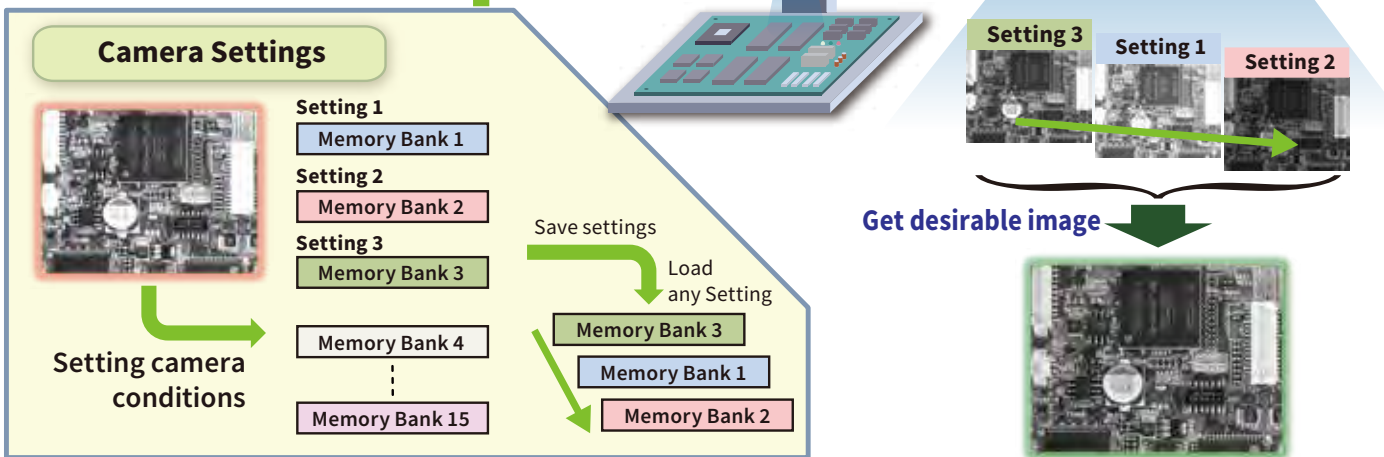


## Sequential Shutter mode + Bulk Trigger mode

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

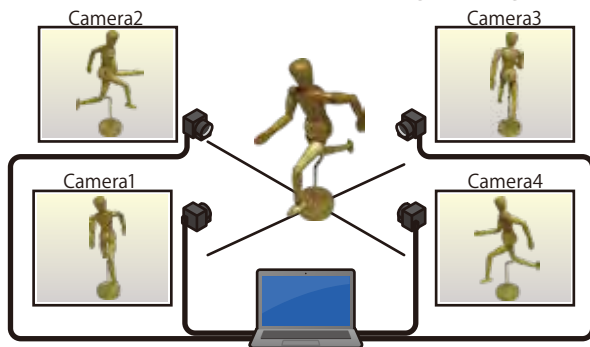
### Corresponding Cameras;

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



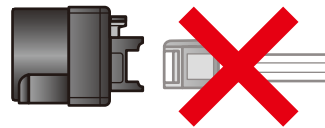
## Bus Synchronization

- 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;

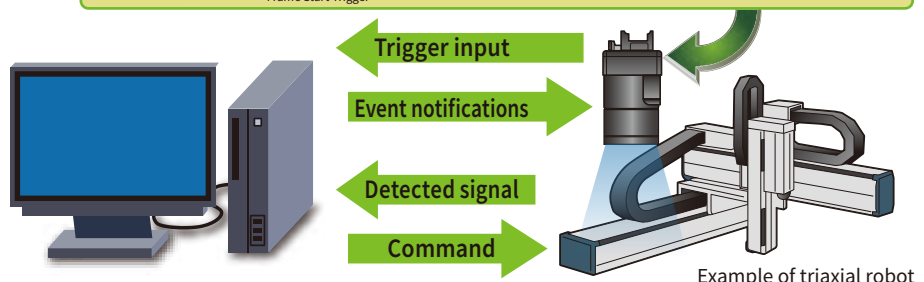
- Stereo camera
- Motion capture

\* 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.