

Advanced Function

Advanced function

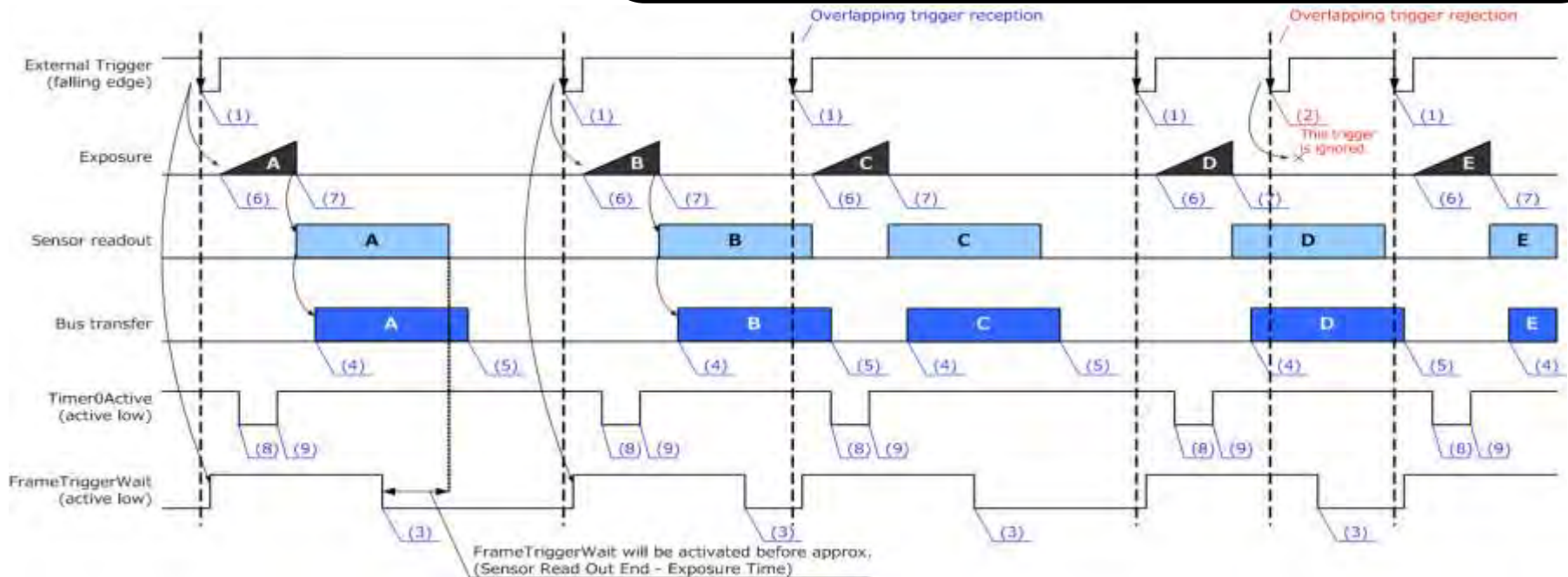
- **Event notice function** · BU/DU series function
- **Bulk trigger** ······ BU/DU series function
- **Sequential shutter** ··· CMOS model
- **Image buffer** ······ CMOS model
- **Pixel defect correction** CMOS model
- **Bus synchronization** ··· CCD/CMOS-GS model
- **BERT function** ······ CMOS model

Advanced function (1)

■ Event notification function :

- Camera status can be referred through USB3 by using event packet of USB3 Vision

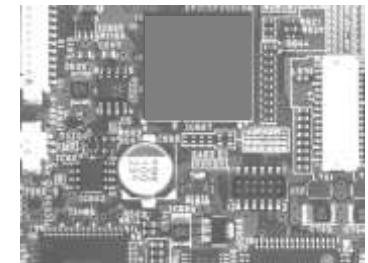
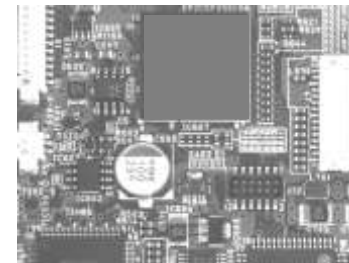
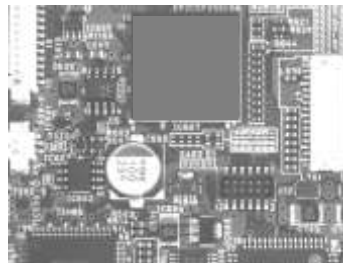
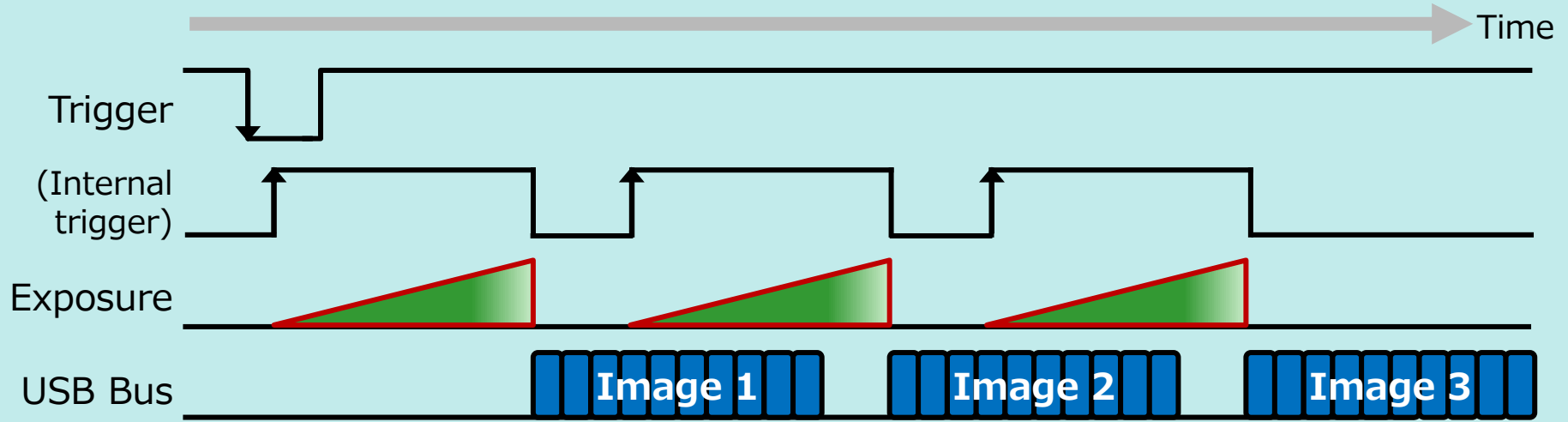
(1) Frame Trigger	: Reception of Frame Start Trigger
(2) Frame Trigger Error	: Rejection of Frame Start Trigger
(3) Frame Trigger Wait	: Start of waiting for Frame Start Trigger
(4) Frame Transfer Start	: Start of transferring Streaming data
(5) Frame Transfer End	: End of Transferring Streaming data
(6) Exposure Start	: Start of Exposure
(7) Exposure End	: End of Exposure
(8) Timer0Active	: Start of Timer0
(9) Timer0End	: End of Timer0



Advanced function (2)

■ Bulk trigger mode :

- Exposure and image output of multiple times can be achieved by one time input of trigger signal
- Example of use :
selecting the best image among several frames, measuring moving distance etc.



Advanced function (3-1)

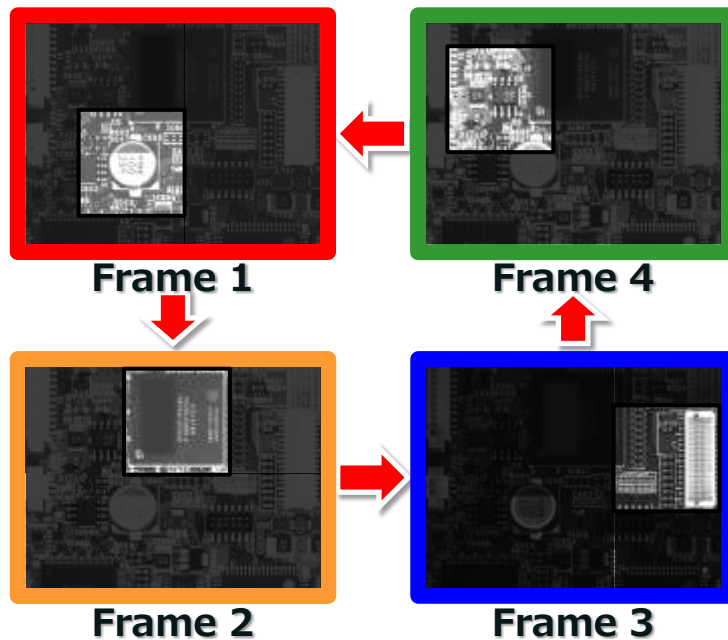
■ Sequential shutter mode

- Together with trigger mode, sequential shutter function of BU (CMOS) series can switch programmed settings such as gain, exposure, AOI trigger delay in each time of trigger input with each frame.

<Ex.1>

Changing ROI position, Gain and Exposure Time every time

Sequential Shutter Setting : 4 shots



Memory Bank1	SEQ : Frame 1 <ul style="list-style-type: none">• Gain : 0dB• Exposure : 2ms• ROI Position :
Memory Bank2	
Memory Bank3	
Memory Bank4	
Memory Bank5	SEQ : Frame 3 <ul style="list-style-type: none">• Gain : 0dB• Exposure : 1ms• ROI Position :
Memory Bank6	
Memory Bank7	
Memory Bank8	
Memory Bank9	SEQ : Frame 2 <ul style="list-style-type: none">• Gain : +6dB• Exposure : 2ms• ROI Position :
Memory Bank10	
Memory Bank11	
Memory Bank12	
Memory Bank13	
Memory Bank14	
Memory Bank15	SEQ : Frame 4 <ul style="list-style-type: none">• Gain : +3dB• Exposure : 2ms• ROI Position :

Advanced function (3-2)

■ Sequential shutter mode

<Ex.2>

Changing Gain and Exposure Time by shot

Sequential Shutter Setting : 3 shots



Image data output
(3 frames)



First Shot



Gain: 0.5dB
Exp: 0.7msec

Second Shot



Gain: 3dB
Exp: 0.7msec

Third Shot

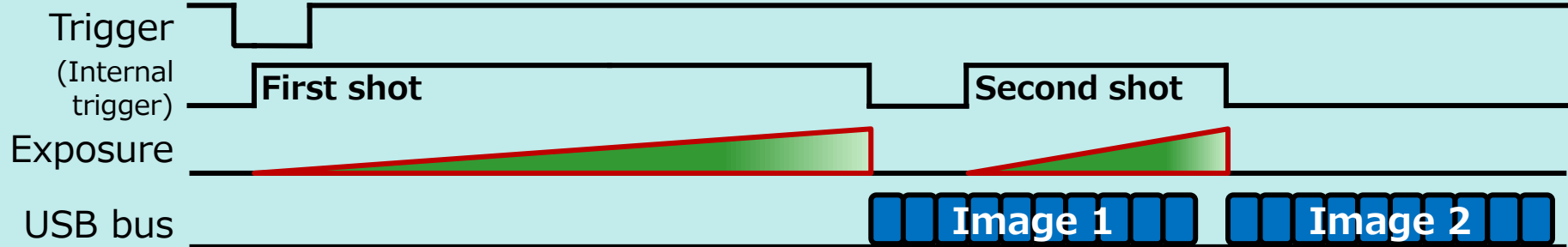


Gain: 8dB
Exp: 0.3msec

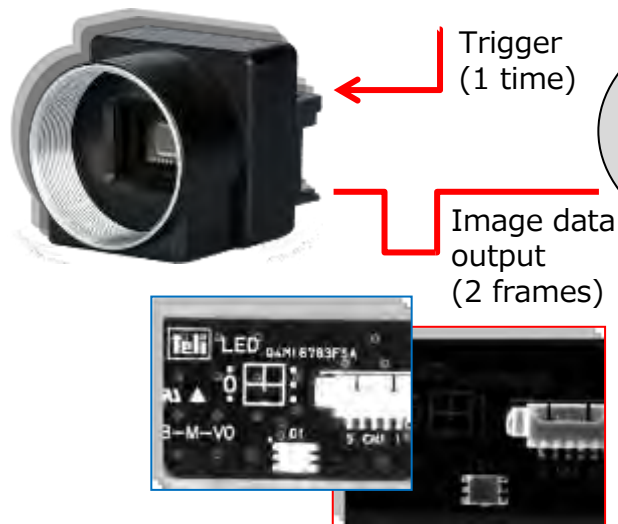
Advanced function (4)

■ Sequential shutter with Bulk trigger mode

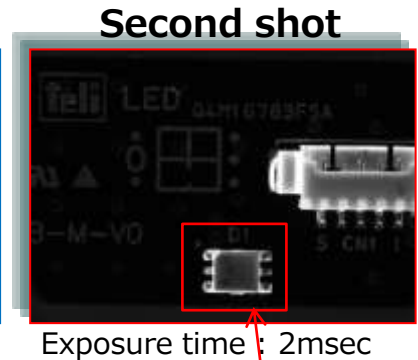
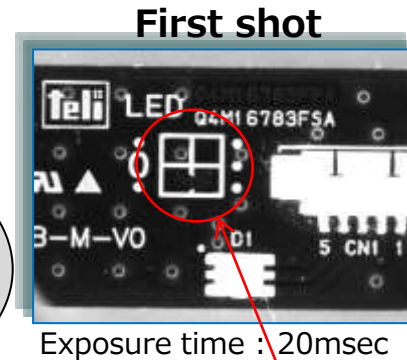
<Ex.3> Output multiple images of different shutter speed by one shot trigger



Bulk trigger setting : 2 shots
Sequential shutter setting : 2 sequences



Inspection on multi items by one time trigger input !



Silk inspection

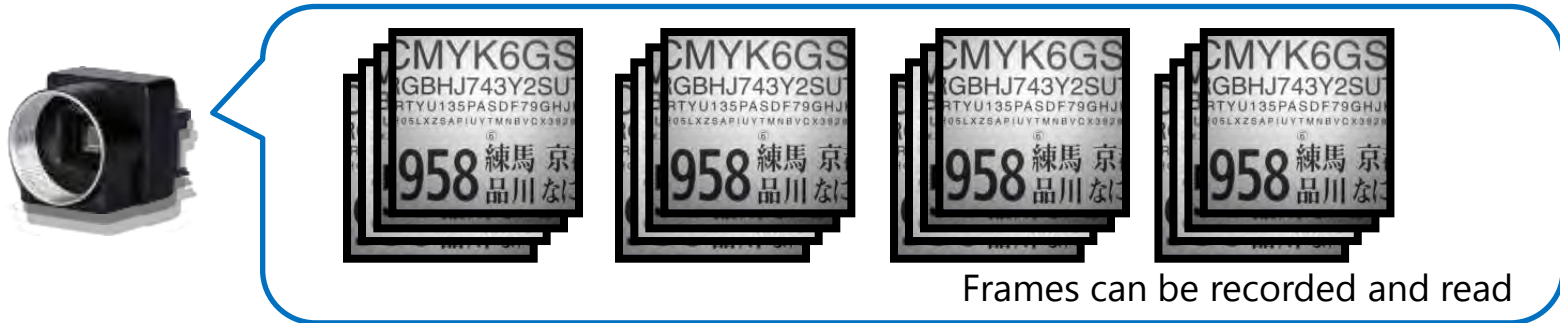
Appearance inspection of scratch or dent

For example, appearance and silk lucking of parts can be inspected at the same time

Advanced function (5)

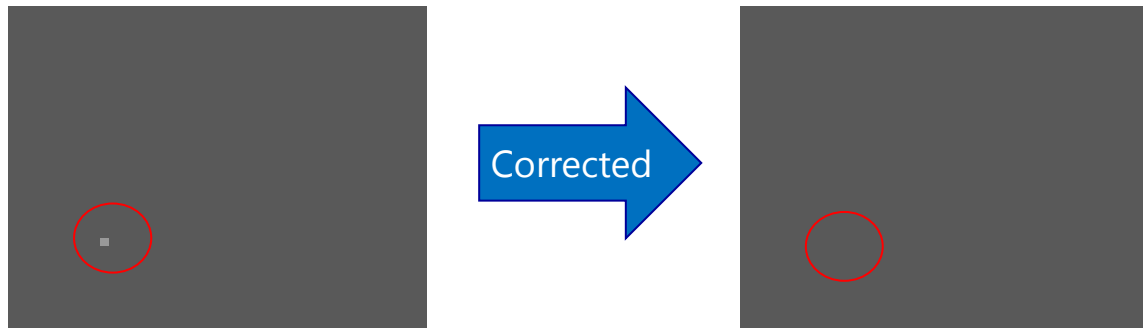
■ Image buffer

- As BU(CMOS) series have 64MB image buffer memory in it, recorded image data can be read from host PC at any time.



■ Pixel defect correction

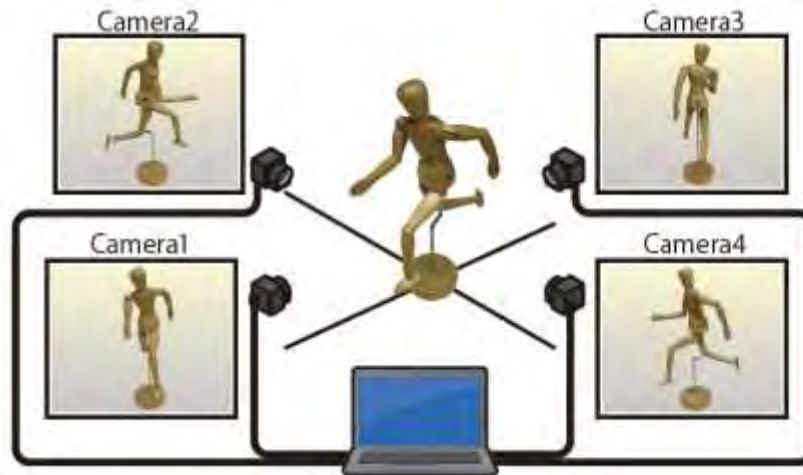
- BU(CMOS) series have correction function of pixel defect. This function can be switched on and off depend on occasion.



Advanced function (6)

■ Bus synchronization

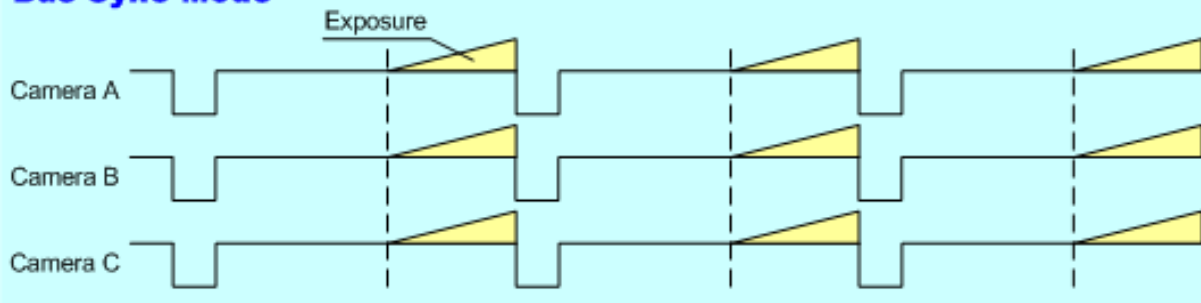
- Fully synchronized exposure timing among several cameras.



**No cable needed for
'Trigger in'!**

**Applications:
Stereo camera
Motion capture**

Bus Sync Mode

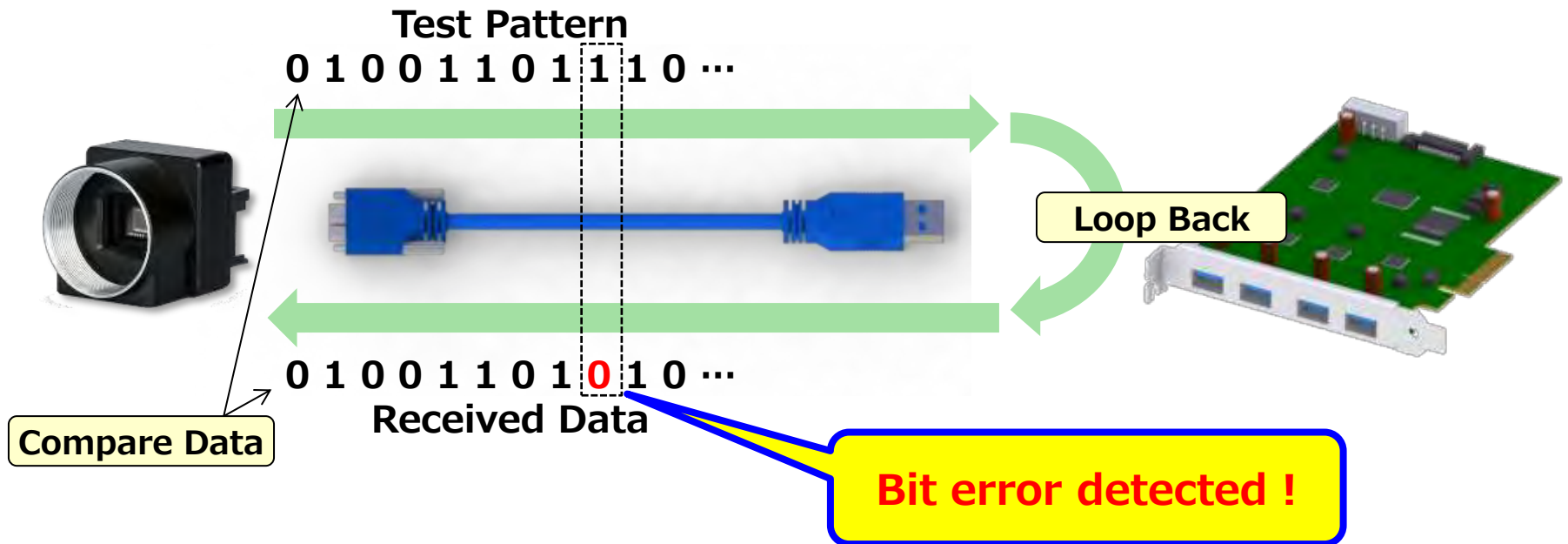


- Technical information of BERT function can download from following web site;
<http://www.toshiba-teli.co.jp/en/products/industrial/info/>

Advanced function (7)

■ BERT (Bit Error Rate Test) = CMOS model

- "BERT Function" can easily check a signal quality including cable. With "BERT Function", signal quality can be checked under user's circumstances at starting up or change system.



Camera function list (USB3.0 camera)

Series		BU-B/W CCD				BU-B/W CMOS							DUB/W CMOS			BU Color CCD			BU Color CMOS						DU Color CMOS					
Pixels		0.3M	0.3M	0.8M	1.3M	0.4M	1.3M	1.6M	2M	2.3M	3M	4M	5M	6.5M	8M	12M	0.3M	1.3M	0.4M	1.3M	2.3M	3M	4M	5M	12M	6.5M	8M	12M		
Category	Function	BU030	BU031	BU080	BU130	BU040M	BU132M	BU160M	BU205M	BU238M	BU302MG	BU406M BU406MN	BU505MG	DU657M	DU806MG	DU1207MG	BU030C BU030CF	BU130C BU130CF	BU040MCG BU040MCF	BU160MCG BU160MCF	BU238MC BU238MCF	BU302MCG BU302MCF	BU406MC BU406MCF	BU505MCG BU505MCF	BU1203MC BU1203MCF	DU657MC	DU806MCG DU806MCF	DU1207MCG DU1207MCF		
USB3Vision	Bootstrap Registers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
DeviceControl	DeviceControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
ImageFormatControl	ImageFormatSelector	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Scalable	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Binning	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Decimation	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Reverse	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	PixelFormat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	TestPattern	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	AcquisitionControl	AcquisitionControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ImageBuffer		-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TriggerControl		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
DigitalIOControl	ExposureControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	DigitalIOControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CounterAndTimerControl	TimerControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
AnalogControl	Gain	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	BlackLevel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Gamma	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	BalanceRatio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	BalanceWhiteAuto	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	ColorCorrectionMatrix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
LUTControl	LUTControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
UserSetControl	UserSetControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
EventControl	EventControl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	FrameSynchronization	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
VenderUniqueControl	LEDIndicatorLuminance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AntiGlitch	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	AntiChattering	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
DPCControl	DPCControl	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
SequentialShutterControl	SequentialShutterControl	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Other	ColorSpaceCorrection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		