

TOSHIBA

Toshiba BU302MG Instruction Manual

1	
Table Of Contents	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67

68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83

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•

[Table of Contents](#)

•

Bookmarks

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Quick Links

[Download this manual](#) See also: [Manual](#)



BU Series CMOS Camera Instruction Manual

Model

B/W Camera : BU302MG / BU505MG

Thank you for purchasing our product.

Before using this CMOS camera, please read through this instruction manual carefully in order to use this product correctly and safely.

After reading, keep this instruction manual handy so that you can refer to, whenever you need it.

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D4253386A

[Table of Contents](#)

[Next Page](#)

1
2
3
4
5

Related Manuals for Toshiba BU302MG

[Digital Camera Toshiba BU505MCG Instruction Manual](#)

Cmos camera (94 pages)

[Digital Camera Toshiba BU302MG Manual](#)

Cmos camera (35 pages)

[Digital Camera Toshiba BU Series Instruction Manual](#)

Cmos camera (81 pages)

[Digital Camera Toshiba BU1207MG Manual](#)

Cmos camera (35 pages)

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Bu series cmos camera (67 pages)

[Digital Camera Toshiba BU406M Specifications](#)

Cmos camera bu series (27 pages)

[Digital Camera Toshiba BU238M Instruction Manual](#)

Bu series cmos camera (79 pages)

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Toshiba pdr-3300: owner manual (135 pages)

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Toshiba pdr-4300: software manual (30 pages)

[Digital Camera Toshiba PDR-M25 Owner's Manual](#)

Toshiba pdr-m25: owner manual (102 pages)

[Digital Camera Toshiba PDR-M500 Instruction Manual](#)

Toshiba pdr-m500: owners manual (120 pages)

[Digital Camera Toshiba IK-TU51CU Service Manual](#)

Ccd camera (80 pages)

[Digital Camera Toshiba PDR-2300 Owner's Manual](#)

Toshiba pdr-2300: owner manual (98 pages)

[Digital Camera Toshiba PDR-2 Quick Reference Manual](#)

Toshiba pdr-2: quick start (21 pages)

Summary of Contents for Toshiba BU302MG

[Page 1: Instruction Manual](#)

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[Page 2: Table Of Contents](#)

AntiGlitch / AntiChattering.....70 DPCControl 72
SequentialShutterControl74 Appendix 77 MultiFrame and Bulk
function difference77 Warranty rules 80 Repair81

[Page 3: Safety Precautions](#)

The content of prohibition is shown by a picture or words beside the symbol. This sign indicates MANDATORY ACTION (You are required to do). MANDATORY The content of action is shown by a picture or words beside the symbol. 2 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 4: General Handling](#)

❏ Do not be handled roughly, damaged, fabricated, bent forcefully, pulled, twisted, bundled, placed under heavy objects or heated the power cable and the connection cable. Avoid Otherwise, fire or electric shock may result. 3 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 5](#) (every approx five years). Accumulation of dust inside the equipment may result in fire or electric shock. For inspection and cleaning costs, contact your sales representative. Instruction 4 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 6: Cases For Indemnity \(Limited Warranty\)](#)

● The item that is not described in specifications of this product is out of the guarantee. ● The case of damages or losses which are caused by incorrect connection of the cable is out of the guarantee. 5 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 7: Restriction For Use](#)

(*2): Equipment relating to maintenance of public services/functions involving factors of safety refers to. - Traffic control systems for air transportation, railways, roads, or marine transportation - Equipment for nuclear power generation - Equipment related to the above 6 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 8: Notes On Using This Product](#)

C-mount lens 10mm or less ● Mounting to pedestal When mounting this product to a pedestal, make sure carefully that lens doesn't touch with the pedestal. 7 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 9](#) Never use alcohol, benzene, thinner, or other chemicals because such chemicals may damage or discolor the paint and indications. If the image pickup surface becomes dusty, contaminated, or scratched, consult your sales representative. 8 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 10](#) The brightness of the upper part of the screen may be different from that of the lower part. Note that this is a characteristic of a CMOS image sensor and is not a fault. 9 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 11](#) This information is applicable for People's Republic of China only. 中国国内での使用に際しては、必ずこの情報を参照してください。 Information on recycling of wrapping composition 中国国内での使用に際しては、必ずこの情報を参照してください。 Internal buffer materials Bag Paper board 10 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 12: Installation](#)

● TOSHIBA TELI CORPORATION Top Page <http://www.toshiba-teli.co.jp/index.htm> ● Service & Support <https://www.toshiba-teli.co.jp/cgi/ss/en/service.cgi> Please refer to the TeliCamSDK startup guide, about Operation environment, Installation, and Setup. 11 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 13: Specifications](#)

This BU CMOS series is an integrated-(one-body)-type camera that adopts a global shutter CMOS sensor. These are BU302MG (3M type1/1.8) BU505MG (5M type2/3). For video output and camera control, the USB 3.0 interface standard is adopted for high transfer rate, and it is easy to integrate into industrial equipment.

[Page 14](#) * IIC2 is a unified standard established by JIA (Japan Industrial Association). * e-CON (Easy & Economy connector) is a sensor connector that is normalized by the manufacturer of the sensor, FA equipment and connector. 13 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 15: Configuration](#)

*1: Optional part. Contact your sales representative for details of option units. *2: Commercial items. 14 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 16: Connection](#)

Please confirm wires' specifications before use them. Lost packets may occur by an electrical characteristic of the transmission line of USB3.0. (USB3.0 Interface Card, USB3.0 Cable, and USB3.0 HUB). 15 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 17: Connector Pin Assignment](#)

Pin assignment ↑TOP *Above figure is connector view from insert side. Pin No. Signal Function
Line2 GPIO Input / Output Line1 GPIO Output Ground Line0 GPIO Input 16 / 81 D4253386A
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<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 18: Outline Drawing](#)

Outline Drawing 17 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 19: General Specifications](#)

Camera body grounding: Non-Conductive between circuit GND and camera body insulation status *1 F1.4, Gain: Maximum (+24dB), video level: 50% *2 at the all pixel readout 18 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 20](#) - As for the C-mount lens used combining this camera, the projection distance from bottom of the screw should use 10mm or less. Bottom of the screw C-mount lens 10mm or less 19 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 21: Led Status](#)

Flash orange (ON: 200ms, OFF: 800ms) Data being transferred Fast flash green (ON:60ms, OFF:20ms) Error during data transfer Solid Red (Time period: 500ms) Stand-by Super slow flash orange (ON:200ms, OFF: 2800ms) 20 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 22: I/O Specification](#)

EXT_TRIG signal. Please confirm it before use. Notes of input level: Line0 and Line2 have different input level. Please use input level within the voltage described in this specification. 21 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 23](#) - Pin 3 is signal ground. It isn't conducted with camera frame. Using shield cable, terminal processing of the shield is referred as above. - Please confirm the EMC adaptability in whole of your system. 22 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 24](#) : High active / Low active (initial factory setting: Low active) Signal Source : TIMER0

ACTIVE USER OUTPUT EXPOSURE ACTIVE FRAME ACTIVE FRAME TRANSFER FRAME TRIGGER
WAIT Input / Output circuit diagram Inside IOLineModeAll DC5.0V 10kΩ 23 / 81 D4253386A
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<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 25](#) : High active / Low active (initial factory setting: Low active) Signal Source : TIMER0
ACTIVE USER OUTPUT EXPOSURE ACTIVE FRAME ACTIVE FRAME TRANSFER FRAME TRIGGER
WAIT 24 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.
<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 26: Timing Specification](#)

● In normal shutter mode Exposure USB bus Image Image Default Framerate Model Name
format [ms] [fps] Mono8 BU302MG Mono10, Mono12 1/(Frame Rate setting) Mono8 12.9
BU505MG Mono10, Mono12 15.3 25 / 81 D4253386A Copyright © 2016 TOSHIBA TELI
CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 27](#) When the interval of the input trigger signal is extremely short, or when the trigger
signal is noisy, there is a possibility of causing the malfunction. In this case, please input a
proper trigger signal. 26 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All
rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 28: Typical Spectral Response](#)

Typical Spectral Response * The lens characteristics and light source characteristics is not
reflected in table. ● BU302MG / BU505MG 27 / 81 D4253386A Copyright © 2016 TOSHIBA TELI
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[Page 29: Operating Ambient Conditions](#)

Please provide sufficient heat radiation depending on your installation. ● EMC Conditions - EMI
(Electro-Magnetic Interference): EN61000-6-4 FCC Part 15 Subpart B Class A - EMS (Electro-
Magnetic Susceptibility): EN61000-6-2 28 / 81 D4253386A Copyright © 2016 TOSHIBA TELI
CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 30](#) (Hitachi cable, Ltd.) Connection: e-CON GPIO(Line2) GPIO(Line2) GPIO(Line1)
GPIO(Line1) TRIG IN(Line0) TRIG IN(Line0) Please confirm the EMC adaptability when it
combines with parts other than them. 29 / 81 D4253386A Copyright © 2016 TOSHIBA TELI
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[Page 31: Functions](#)

VenderUniqueControl FrameSynchronization Frame synchronization control
LEDIndicatorLuminance LED luminance control AntiGlitch AntiGlitch control AntiChattering
AntiChattering control DPCControl DPCControl Defect pixel correction control
SequentialShutterControl SequentialShutterControl Sequential shutter control 30 / 81
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[Page 32](#) ○ FrameSynchronization ○ ○ LEDIndicatorLuminance ○ ○ AntiGlitch ○ ○
AntiChattering ○ ○ DPCControl ○ ○ SequentialShutterControl Details of each feature are
described in following pages. 31 / 81 D4253386A Copyright © 2016 TOSHIBA TELI
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[Page 33: Bootstrap Registers](#)

When opening and closing the stream channel, it is required to control StreamEnable plus SDK
setups on your application. Please refer to the TeliCamSDK for details. 32 / 81 D4253386A
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[Page 34: Devicecontrol](#)

DeviceModelName Beginner Returns the model name. DeviceManufacturerInfo Beginner
Returns the manufacturer information. DeviceVersion Beginner Returns the device version.
DeviceID Beginner Returns the device ID (serial number). 33 / 81 D4253386A Copyright © 2016
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[Page 35: Imageformatcontrol](#)

ImageFormatSelector Function Format0 (*) Scalable Format1 Binning Format2 Decimation * initial factory setting ● Note Changing "ImageFormatSelector" register value is invalid during image stream data output. 34 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 36: Scalable](#)

Sets horizontal offset (in pixels) from the origin to the region of interest. OffsetY Beginner Sets vertical offset (in pixels) from the origin to the region of interest. 35 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 37](#) 2048 x 1536 2448 x 2048 * initial factory setting ● Note Changing "Width", "Height", "OffsetX", "OffsetY" register value is invalid during image stream data output. 36 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 38: Binning](#)

All pixel readout 1224 1024 Binning Binning operation (e.g. BU505MG) ● Registers Register Visibility Access Description BinningHorizontal Beginner Set horizontal binning. BinningVertical Beginner Set vertical binning. 37 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 39](#) Binning is disabled when the camera is running in Scalable mode or Decimation mode. Scalable and Decimation are disabled when the camera is running in Binning mode. Changing "BinningHorizontal", "BinningVertical" register value is invalid during image stream data output. 38 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 40: Decimation](#)

Decimation operation (e.g. BU505MG) ● Registers Register Visibility Access Description DecimationHorizontal Beginner Set the number of horizontal Decimation line(s). DecimationVertical Beginner Set the number of vertical Decimation line(s). 39 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 41](#) Decimation is disabled when the camera is running in Scalable mode or Binning mode. Scalable and Binning are disabled when the camera is running in Decimation mode. Changing "DecimationHorizontal", "DecimationVertical" register value is invalid during image stream data output. 40 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 42: Reverse](#)

Set the following value to "ReverseX", "ReverseY" registers. Setting value is Boolean type. Value Image reverse FALSE (*) Non reverse TRUE Reverse * initial factory setting ● Note 41 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 43: Pixelformat](#)

Mono8 (*) Mono10 Mono12 PixelFormat ID 0x01080001 0x01100003 0x01100005 * initial factory setting ● Note Changing "PixelFormat" register value is invalid during image stream data output. 42 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 44: Testpattern](#)

TestPattern BU series supports test pattern data output. Camera provides following Test patterns; Black White GreyA GreyB GreyHorizontalRamp GreyVerticalRamp GreyScale Test pattern (e.g. BU505MG) 43 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 45](#) All pixel = 170 @Mono8 GreyB All pixel = 85 @Mono8 GreyHorizontalRamp Horizontal Ramp GreyVerticalRamp Vertical Ramp GreyScale Grey scale * initial factory setting

[Page 46: Acquisitioncontrol](#)

* initial factory setting - Set the number of frames to transfer (In MultiFrame mode) Set the number of frames to transfer to "AcquisitionFrameCount". Setting value is Integer type. 45 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.
<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 47](#) Depends on your PC or USB3.0 interface card configurations, images may not be captured normally (e.g. frame drops may occur). In this case, change to frame rate setting lower. 46 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.
<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 48: Imagebuffer](#)

- Read images from the buffer Read the number of AcquisitionFrameCount image(s) from the buffer by executing "ImageBufferRead" register command (it is equivalent to write value 10 to "AcquisitionCommand" register). 47 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 49](#) [Start] button in TeliCamViewer can't deal with "StreamEnable" register alone. Please substitute procedure "StreamEnable" = 1 to following instructions. - Push [Start] button on TeliCamViewer main window. - Execute [AcquisitionStop] in XML window. 48 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.
<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 50: Triggercontrol](#)

Random Trigger Shutter mode Trigger pulse width control SoftwareTrigger -Edge mode:TriggerSequence0 -Bulk mode:TriggerSequence6 "ExposureTime" register control * The camera operation not mentioned above is not guaranteed. 49 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.
<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 51](#) And you can add delay time from trigger edge to exposure start by register setting. Trigger signal TriggerDelay Exposure USB bus Image Trigger Delay Details of Random Trigger Shutter operation, refer to "Timing" of "Specification". 50 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 52](#) TriggerSource Function Line0 (*) Hardware trigger (I/O connector : 4 pin) Line2 Hardware trigger (I/O connector : 1 pin) TriggerSoftware Software trigger * initial factory setting 51 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.
<http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 53](#) When executes "TriggerSoftware" register command, software trigger command is generated. Camera starts exposure by receiving software trigger command. ● Note In SoftwareTrigger operation, the delay time from "TriggerSoftware" to exposure is not guaranteed. 52 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 54: Exposuretime](#)

* initial factory setting Model BU302MG BU505MG ExposureTime (*) 8000 [μs] 13000 [μs] ExposureTimeMin 30 [μs] 30 [μs] ExposureTimeMax 16000000 [μs] 16000000 [μs] * initial factory setting ● Note 53 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 55: Digitaliocontrol](#)

Returns the status of each Line signal. UserOutputValueAll Beginner Sets the user output value. LineSelector Beginner Selects the Line of I/O connector. LineSource Beginner Selects the source of the output signal. 54 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 56](#) * initial factory setting - Set the UserOutput signal Set the following value to "UserOutputValueAll" register. Setting value is Integer type. Each bit corresponds to each Line

(bit0=Line0, bit1=Line1). 55 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 57](#) Line1 UserOutput UserOutputValueAll[1] (GPIO_Output) Internal Trigger LineModeAll LineInverterAll LineSource GPIO internal circuit diagram ● Note About the details of Timer0Active signal, refer to “TimerControl” of “Functions”. 56 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 58: Timercontrol](#)

TimerDuration Beginner Sets the width of Timer0Active signal. TimerDelay Beginner Sets the delay of Timer0Active signal. TimerTriggerSource Beginner Selects the source of Timer0Active pulse to start. 57 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 59](#) HardwareTrigger and Software Trigger mode, and not to be responded at FrameTriggerError. ExposureStart is available in both HardwareTrigger and Software Trigger mode, and not to be responded at Timer0Active pulse delays TiggerDelay+TimerDelay[us]. FrameTriggerError. 58 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 60: Gain](#)

Setting the gain value too high increases noises. When you adjust the brightness of the image, I ask you to have final image quality checked with your environment. 59 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 61: Blacklevel](#)

Set the following value to “BlackLevel” register. Setting value is Float type. BlackLevel Value Minimum -25.00[%] Maximum +25.00[%] * initial factory setting = 0.00[%] ● Note 60 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 62: Gamma](#)

- Set Gamma correction Set the following value to “Gamma” register. Setting value is Float type. Gamma Value Minimum 0.45 Maximum (*) 1.00 * initial factory setting ● Note 61 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 63: Lutcontrol](#)

“LUTIndex” register value is input level of LUT, and “LUTValue” register value is output level of LUT. LUTIndex / LUTValue setting value Minimum (*) Maximum 4095 * initial factory setting ● Note 62 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 64: Usersetcontrol](#)

LineInverterAll DigitalIOControl UserOutputValueAll LineSelector LineSource TimerTriggerSource CounterAndTimerControl TimerDuration TimerDelay (*) DPC and SequentialShutter entries are stored to a single channel. Entries are shared with all channels. 63 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 65](#) * initial factory setting ● Note “UserSetDefault” register value is stored to non-volatile memory when “UserSetSave” is executed. Thus, “UserSetSelector” shall be set other than “Default” in advance. 64 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 66: Eventcontrol](#)

: End of transferring streaming data. (6) ExposureStart : Start of Exposure. (7) ExposureEnd : End of Exposure. (8) Timer0Start : Start of Timer0. (9) Timer0End : End of Timer0. 65 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.

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Page 67 Returns the timestamp at the time of Event. EventTimer0StartData EventTimer0StartTimestamp Expert Returns the timestamp at the time of Event. EventTimer0EndData EventTimer0EndTimestamp Expert Returns the timestamp at the time of Event. 66 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 68 Set the following value to "EventNotification" register. The setting value is Enumeration type. setting value Event notification Off (*) Inactive Active * initial factory setting ● Note 67 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 69: Framesynchronization

Set the following value to "FrameSynchronization" register. Setting value is Enumeration type. setting value function Off (*) Internal synchronization Bus synchronization * initial factory setting ● Note 68 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 70: Ledindicatorluminance

- Set LED indicator luminance Set the following value to "LEDIndicatorLuminance" register. Setting value is Float type. LEDIndicatorLuminance Value Minimum 0.00(%) Maximum (*) 100.00(%) * initial factory setting ● Note 69 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 71: Antigitch / Antichattering

AntiGlitch Circuit Edge Edge Edge Edge Output Invalid Edge AntiChattering Insensible Insensible Value Time Time High AntiChattering Circuit Valid Valid Signal Signal Output Fig. AntiGlitch and AntiChattering 70 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 72 The setting is applied to the GPIO Input of Line0 and Line2. Insensitive time AntiChattering [sec] Minimum (*) 0.000 001 992 Maximum 0.001 999 992 * initial factory setting ● Note 71 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 73: Dpccontrol

DPCIndex and setting coordinates DPCNumber DPCIndex Minimum (*) Maximum * initial factory setting DPCEntryX DPCEntryY Minimum (*) Maximum WidthMax-1 HeightMax-1 * initial factory setting 72 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 74 DPCEntryX and Y shall be sorted in order from the top left to the top right and to the bottom left to the bottom right. (X,Y)=(0,0) (WidthMax-1,0) DPCIndex[0] DPCIndex[1] DPCIndex[2] DPCIndex[3] DPCIndex[4] (0,HeightMax-1) (WidthMax-1,HeightMax-1) Sorting of DPCIndex and DPCEntryX, Y 73 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 75: Sequentialshuttercontrol

Sets the number of Index to repeat the sequence. SequentialShutterIndex Expert Sets the sequence number to register. SequentialShutterEntry Expert Sets the UserSet number to register to the sequence. 74 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 76 - Set the activation of Sequential Shutter Set the following value to "SequentialShutterEnable" register. The setting value is Boolean type. setting value function OFF (*) Inactive Active * initial factory setting 75 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

Page 77 List of registers to be applied to SequentialShutter Category Register Category Register OffsetX Gain ImageFormatControl OffsetY BlackLevel AnalogControl ExposureControl ExposureTime Gamma UserOutputValueAll DigitalIOControl LineSource LUTControl LUTEnable TimerDuration CounterAndTimerControl TimerDelay 76 / 81 D4253386A Copyright © 2016

[Page 78: Appendix](#)

Frame 3 Frame 4 Frame 1 This exposure is *Exposure overlaps sensor readout. discarded.
Stream USB Bus stops Frame 1 Frame 2 Frame 3 Frame 1 AcquisitionFrameCount 77 / 81
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[Page 79](#) Frame 1 TriggerAdditionalParameter *Exposure overlaps sensor readout. *Exposure
time is determined by ExposureTime setting. Stream USB Bus stops Frame 1 Frame 2 Frame 3
Frame 1 78 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights
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[Page 80](#) This exposure is discarded. TriggerAdditionalParameter *Exposure overlaps sensor
readout. *Exposure time is determined by ExposureTime setting. Stream USB Bus stops Frame 1
Frame 2 Frame 1 AcquisitionFrameCount 79 / 81 D4253386A Copyright © 2016 TOSHIBA TELI
CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 81: Warranty Rules](#)

9. Forgery product, products which does not have proper serial number, products of which serial
number is forged, damaged or deleted 10. All defects that happened after the expiration for a
warranty term 80 / 81 D4253386A Copyright © 2016 TOSHIBA TELI CORPORATION, All rights
reserved. <http://www.toshiba-teli.co.jp/en/index.htm...>

[Page 82: Repair](#)

10. The immunity from responsibility of the product is applied in the repair completion products.
* Please refer for the inquiry about the software to our homepage or sales personnel. 81 / 81
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[Page 83](#) ☐ It certainly occurs. ☐ It sometimes occurs. ☐ It occurs, after time passes. ☐ ☐
Others ☐ <For dealer use> Reception date : Receipt No. : JOB No. : Check : D4253386A
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