

TOSHIBA

Toshiba BU505MCG Instruction Manual

Cmos camera

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BU Series CMOS Camera Instruction Manual

Model

B/W Camera

: BU302MG / BU505MG

Color Camera

: BU302MCG / BU302MCF / BU505MCG / BU505MCF

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.

Information contained in this document is subject to change without prior notice.

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D4253386C

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

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Related Manuals for Toshiba BU505MCG

[Digital Camera Toshiba BU302MG Instruction Manual](#)

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

Cmos camera (81 pages)

[Digital Camera Toshiba BU302MG Manual](#)

Cmos camera (35 pages)

[Digital Camera Toshiba BU1207MG Manual](#)

Cmos camera (35 pages)

[Digital Camera Toshiba BU205M Specifications](#)

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[Digital Camera Toshiba BU406M Specifications](#)

Cmos camera bu series (27 pages)

[Digital Camera Toshiba BU406M Instruction Manual](#)

Bu series cmos camera (67 pages)

[Digital Camera Toshiba BU238M Instruction Manual](#)

Bu series cmos camera (79 pages)

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

Cmos camera (75 pages)

[Digital Camera Toshiba PDR PDR-M70 Instruction Manual](#)

Digital still camera (142 pages)

[Digital Camera Toshiba PDR-4300 Instruction Manual](#)

Toshiba pdr-4300: owners manual (137 pages)

[Digital Camera Toshiba CAMILEO X-SPORTS User Manual](#)

(33 pages)

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

Toshiba pdr-m25: owner manual (102 pages)

[Digital Camera Toshiba PDR-3300 Owner's Manual](#)

Toshiba pdr-3300: owner manual (135 pages)

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

Toshiba pdr-2300: owner manual (98 pages)

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

Toshiba pdr-m500: owners manual (120 pages)

Summary of Contents for Toshiba BU505MCG

Page 1 B/W Camera : BU302MG / BU505MG Color Camera : BU302MCG / BU302MCF / BU505MCG / BU505MCF 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.

Page 2: Table Of Contents

AntiGlitch / AntiChattering.....81 DPCControl 83
SequentialShutterControl85 Appendix 88 MultiFrame and Bulk

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

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Page 12: Installation

● TOSHIBA TELI CORPORATION Top Page <http://www.toshiba-teli.co.jp/en/> ● 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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 13: Specifications](#)

This product is based on GenlCam Generic Interface for Cameras Ver 2.3. ● IIDC2* Digital Camera Control Specification Ver.1.0.0 This product is based on IIDC2 Digital Camera Control Specification Ver.1.0.0. 12 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 14](#) * IIDC2 is a unified standard established by JIIA (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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 15: Configuration](#)

*1: Optional part. Contact your sales representative for details of option units. *2: Commercial items. 14 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[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 / 92 D4253386C
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<http://www.toshiba-teli.co.jp/en/...>

[Page 18: Outline Drawing](#)

Outline Drawing 17 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[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 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 20](#) 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 19 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 21](#) - 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 20 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 22: 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) 21 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 23: 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. 22 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 24](#) - 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. 23 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 25](#) : High active / Low active (initial factory setting: Low active) Signal Source : TIMERO ACTIVE USER OUTPUT EXPOSURE ACTIVE FRAME ACTIVE FRAME TRANSFER FRAME TRIGGER WAIT Input / Output circuit diagram Inside IOLineModeAll DC5.0V 10kΩ 24 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 26](#) : High active / Low active (initial factory setting: Low active) Signal Source : TIMERO ACTIVE USER OUTPUT EXPOSURE ACTIVE FRAME ACTIVE FRAME TRANSFER FRAME TRIGGER WAIT 25 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 27: Timing Specification](#)

1/(Frame Rate setting) Bayer10, Bayer12 15.3 RGB, BGR 23.0 Bayer8, Mono8 12.9 12.9 YUV 4:1:1 18.4 YUV 4:2:2 24.6 BU505MCG 15.3 Bayer10, Bayer12 24.6 RGB, BGR 36.8 26 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 28](#) 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. 27 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 29: Typical Spectral Response](#)

Typical Spectral Response * The lens characteristics and light source characteristics is not reflected in table. ● BU302MG / BU505MG 28 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 30](#) ● BU302MCG / BU505MCG ● BU302MCF / BU505MCF 29 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 31: 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 30 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 32](#) (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. 31 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 33: 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 32 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 34](#) ○ AntiGlitch ○ ○ ○ ○ AntiChattering ○ ○ ○ ○ DPCControl ○ ○ ○ ○ SequentialShutterControl Details of each feature are described in following pages. 33 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 35: 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. 34 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.

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

[Page 36: 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). 35 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 37: Imageformatcontrol](#)

ImageFormatSelector Function Format0 (*) Scalable Format1 Binning Format2 Decimation * initial factory setting ● Note Changing "ImageFormatSelector" register value is invalid during image stream data output. 36 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 38: 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. 37 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 39](#) 2048 x 1536 2448 x 2048 * initial factory setting ● Note Changing "Width", "Height", "OffsetX", "OffsetY" register value is invalid during image stream data output. 38 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 40: 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. 39 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 41](#) 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. 40 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 42: 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). 41 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 43](#) 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. 42 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 44: 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 43 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 45: Pixelformat](#)

0x020C001E YUV422Packed YUV422 PixelFormat ID 0x0210001F RGB8 (*) PixelFormat ID 0x02180014 BGR8 PixelFormat ID 0x02180015 *1 initial factory setting *2 ReverseX and ReverseY setting are FALSE. 44 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 46](#) BalanceRatio ○ ColorCorrectionMatrix ○ ○ LUTControl ○ ○ DPCCControl * initial

factory setting ● Note Changing "PixelSize" register value is invalid during image stream data output. 45 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 47: Testpattern](#)

BU series supports test pattern data output. Camera provides following Test patterns; Black White GreyA GreyB GreyHorizontalRamp GreyVerticalRamp GreyScale ColorBar (B/W model only) (Color model only) Test pattern (e.g. BU505MG/BU505MCG @RGB) 46 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 48](#) All pixel = 85 @Mono8 GreyHorizontalRamp Horizontal Ramp GreyVerticalRamp Vertical Ramp GreyScale Grey scale (B/W model only) ColorBar Color bars (Color model only) * initial factory setting ● Note 47 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 49: 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. 48 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 50](#) 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. 49 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 51: 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). 50 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 52](#) [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. 51 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 53: Triggercontrol](#)

Random Trigger Shutter mode Trigger pulse width control -Edge mode:TriggerSequence0 SoftwareTrigger -Bulk mode:TriggerSequence6 "ExposureTime" register control * The camera operation not mentioned above is not guaranteed. 52 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 54](#) And you can add delay time from trigger edge to exposure start by register setting. Trigger signal TriggerDelay Exposure USB Streaming Image Trigger Delay Details of Random Trigger Shutter operation, refer to "Timing" of "Specification". 53 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 55](#) TriggerSource Function Line0 (*) Hardware trigger (I/O connector : 4 pin) Line2 Hardware trigger (I/O connector : 1 pin) TriggerSoftware Software trigger * initial factory setting 54 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 56](#) 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. 55 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 57: Exposuretime](#)

* initial factory setting Model BU302MG/MCG BU505MG/MCG ExposureTime (*) 8000 [μs] 13000 [μs] ExposureTimeMin 30 [μs] 30 [μs] ExposureTimeMax 16000000 [μs] 16000000 [μs] * initial factory setting ● Note 56 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 58: 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. 57 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 59](#) * 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). 58 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 60](#) 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". 59 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 61: 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. 60 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 62](#) 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. 61 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 63: 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. 62 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 64: 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 63 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 65: 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 64 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 66: Hue/Saturation](#)

- Set Hue Set the following value to "Hue" register. Setting value is Float type. Value Minimum -180[°] Maximum +180[°] * initial factory setting = 0[°] 65 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 67](#) Minimum Maximum x 2.0 * initial factory setting = x 1.3 ● Note Hue/Saturation control is available in following PixelForamt modes. Bayer8/10/12-Full, RGB8, BGR8, YUV411, YUV422 66 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 68: Balanceratio](#)

Setting value is Enumeration type. BalanceRatioSelector Function None (*) None of component is selected. BalanceRatio = Red Gain Blue BalanceRatio = Blue Gain * initial factory setting 67 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 69](#) Too high white balance gain increases noises. After adjusting the white balance of the image, I ask you to have final image quality checked with your environment. 68 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 70: Balancewhiteauto](#)

Execute auto white balance once. * initial factory setting ● Note BalanceRatio and BalanceWhiteAuto controls are available in following PixelFormat modes. Bayer8/10/12. RGB8, BGR8, YUV411, YUV422 69 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 71: Colorcorrectionmatrix](#)

Selects a row element of color correction matrix. ColorCorrectionMatrixSelectorJ Beginner Selects a column element of color correction matrix. ColorCorrectionMatrix Beginner Sets a coefficient of color correction matrix. 70 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 72](#) Initial factory setting SelectorJ -0.50 0.15 SelectorI -0.50 -0.35 0.10 -0.65 ● Note ColorCorrectionMatrix control is available in following PixelFormat modes. Bayer8/10/12-Full, RGB8, BGR8, YUV411, YUV422 71 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 73: 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 72 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 74: Usersetcontrol](#)

SequentialShutterEntry(*) DigitalIOControl UserOutputValueAll LineSelector LineSource TimerTriggerSource CounterAndTimerControl TimerDuration TimerDelay (*) DPC and SequentialShutter entries are stored to a single channel. Entries are shared with all channels. 73 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 75](#) When execute “UserSetLoad”, the camera loads user setting from the channel selected in “UserSetSelector” register and applies them. When execute “UserSetSave”, the camera saves user setting to the channel selected in “UserSetSelector” register. 74 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 76](#) * 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. 75 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 77: 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. 76 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 78](#) 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. 77 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.

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

Page 79 Set the following value to “EventNotification” register. The setting value is Enumeration type. setting value Event notification Off (*) Inactive Active * initial factory setting
● Note 78 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved.
<http://www.toshiba-teli.co.jp/en/...>

Page 80: 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 79 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 81: 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 80 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 82: 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 81 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 83 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 82 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 84: Dpccontrol

In the case that there is a number of defective pixels, they can be corrected by pointing new DPCIndex and setting coordinates DPCNumber DPCIndex Minimum Maximum DPCEntryX DPCEntryY Minimum Maximum WidthMax-1 HeightMax-1 83 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 85 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 84 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 86: 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. 85 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 87 - 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 86 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 88 List of registers to be applied to SequentialShutter Category Register Category Register OffsetX Gain ImageFormatControl OffsetY BlackLevel ExposureControl ExposureTime Gamma UserOutputValueAll AnalogControl DigitalIOControl LineSource Saturation TimerDuration BalanceRatio CounterAndTimerControl TimerDelay ColorCorrectionMatrix LUTControl LUTEnable 87 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

Page 89: Appendix

Frame 3 Frame 4 Frame 1 This exposure is *Exposure overlaps sensor readout. discarded.

Stream USB Streaming stops Frame 1 Frame 2 Frame 3 Frame 1 AcquisitionFrameCount 88 / 92
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[Page 90](#) Frame 1 TriggerAdditionalParameter *Exposure overlaps sensor readout. *Exposure time is determined by ExposureTime setting. Stream USB Streaming stops Frame 1 Frame 2 Frame 3 Frame 1 89 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 91](#) This exposure is discarded. TriggerAdditionalParameter *Exposure overlaps sensor readout. *Exposure time is determined by ExposureTime setting. Stream USB Streaming stops Frame 1 Frame 2 Frame 1 AcquisitionFrameCount 90 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 92: 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 91 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 93: 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. 92 / 92 D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

[Page 94](#) ☐ It certainly occurs. ☐ It sometimes occurs. ☐ It occurs, after time passes. ☐ Others ☐ <For dealer use> Reception date : Receipt No. : JOB No. : Check : D4253386C Copyright © 2016 TOSHIBA TELI CORPORATION, All rights reserved. <http://www.toshiba-teli.co.jp/en/...>

This manual is also suitable for:

Bu series Bu505mcf Bu302mg Bu505mg Bu302mcg Bu302mcf