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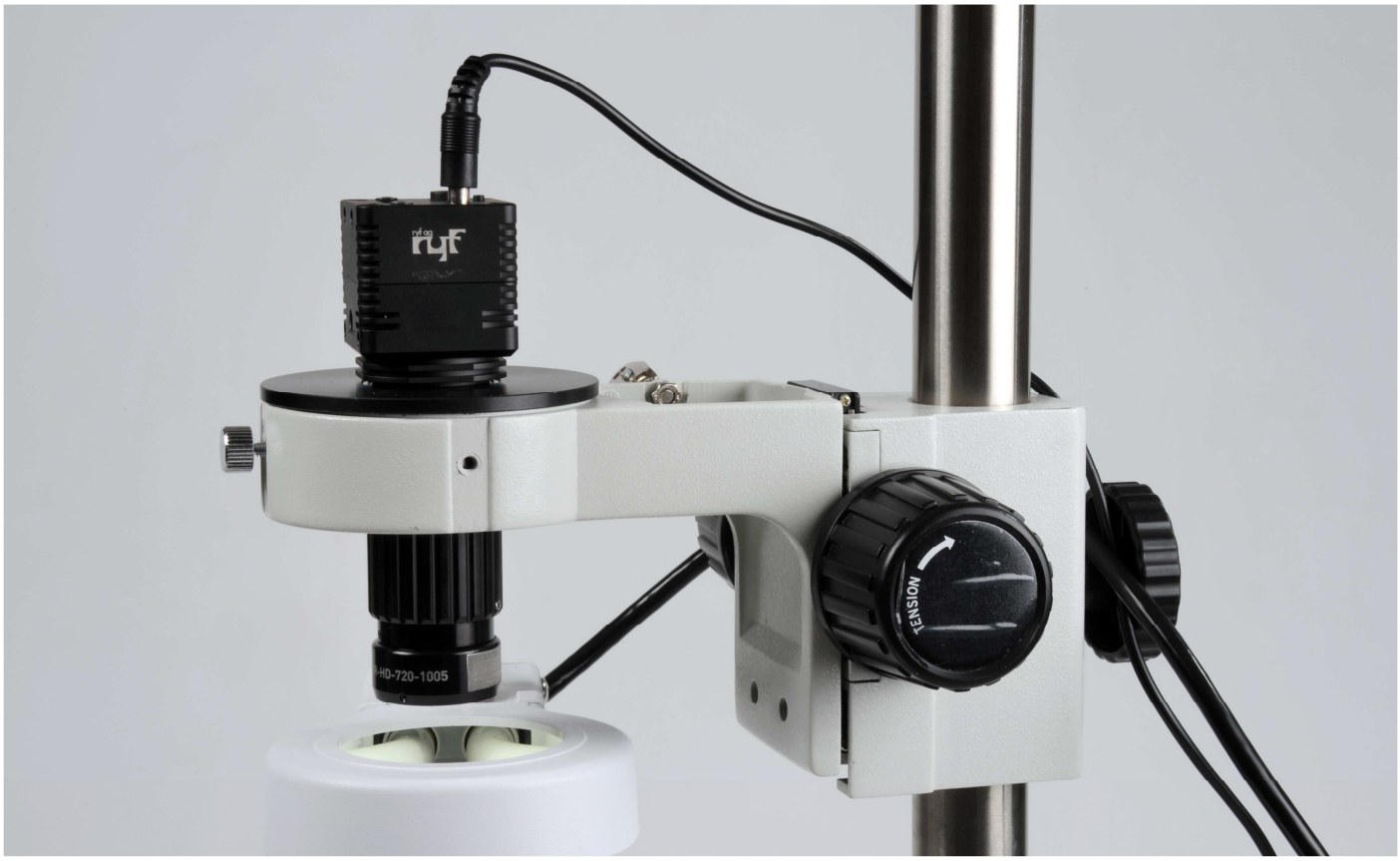

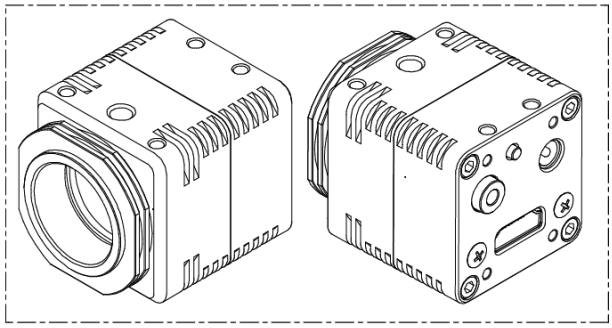

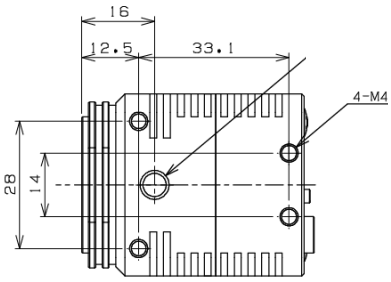

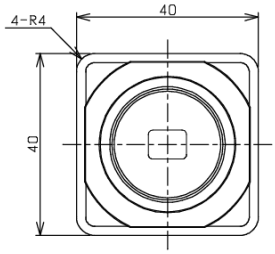

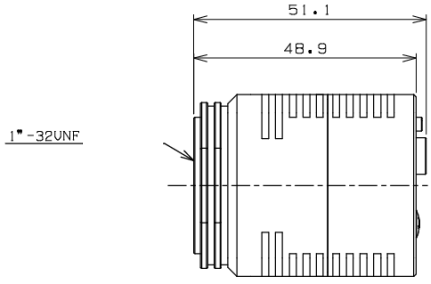

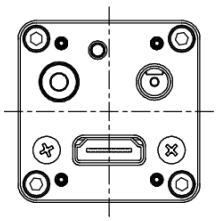

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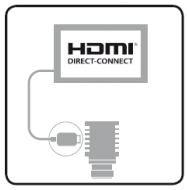

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Product				STC-HD203**(Cased type)
Electronic specifications	Imager			1/2.8" 230Mega pixel CMOS (SONY: IMX136), Rolling Shutter
	Active picture elements			1936 (H) x 1096(V)
	HD active picture elements			1920 (H) x 1080 (V)
	Optical size			5.44 (H) x 3.09 (V) mm
	Cell size			2.8 (H) x 2.8 (V) μm
	Sync system			Progressive
	Minimum scene illumination			TBD Lux (AGC ON)
	Sync. System			Internal
	Video output	DVI Model		DVI 1.0 conformity RGB, 1080P60,1080P59.94, 1080P50, 1080P30,1080P29.97, 1080P25, 720P60, 720P59.94, 720P50 **(Defalut:1080P60)**
		SDI Model		3G-SDI(SMPTE424M Compliant), 4:2:2 YCbCr 10bit 1080P60/59.94/50 HD-SDI (SMPTE292M Compliant) 4:2:2 YCbCr 10bit 1080P30/29.97/25 720P60/59.94/50
	Camera functions			
		ALC		Can be configured via the UART communication with auto electronic shutter and AGC
		Shutter speed		Adjustable shutter speed via the UART communication (AEE) **(Default: Auto)**
			Extended	Extend shutter frame unit (Up to2.55 sec)
			High speed	Up to 1/10,000 seconds
		Gain		AGC or Fixed gain selectable via the UART communication 0 to 45 dB
		Gamma		Selectable gamma through 5 preset (one preset is manual, / 0.45 / 0.6 / 0.8 / 1) Selectable gamma via the UART communication **(Default: manual)**
		White balance		Auto white balance / manual white balance / push to set white balance Selectable white balance via the UART **(Default: Auto white balance)**
		WDR		Wide Dynamic Range OFF/ON **(Defalut:OFF)** WDR enable via the UART communication
		Mirror image		Normal image / horizontal flip / vertical flip / horizontal vertical flip(180 degree rotation) **Default: Normal image**
		Picture modes		8 user preset mode, Normal picture mode or pseudo color mode can be selectable Selectable picture mode via the UART communication **(Default: Preset 0)**
		Line generator		Both horizontal and vertical with all available colors (Line number: 2) Adjustable thickness via the UART communication (**Default: Disable**)
		Shadow mask generator		Both horizontal and vertical with shading level adjustment via the UART communication(**Default: Disable**)
		Freeze image		Selectable Live image or freeze image via the UART communication
		Communication		+3.3V UART communication via 3.5Φ stereo jack (Baud rate: 38,400bps, 19,200bps, 9,600bps)
		Character generator		Built-in character generation function via the UART communication
		Pixel blemish collection		Support
	Power	Input voltage		+9 to +15 Vdc (Typical: +12 Vdc)
		Consumption		4.4W(preliminary)
Mechanical specifications	Dimensions			40 (W) x 40 (H) x 51.1(D) mm (Excluding the connector)
	Optical filter			IR cut filter with OPLF
	Material			Aluminum (AC)
	Lens mount			C mount (Recommendation F: more than 2.0))
	Interface connector		Video output	DVI Output : HDMI connector,SDI Output : BNC connector
			Power input	+9 to +15 Vdc (Typical: +12 Vdc)
			External control	3.5Φ stereo jack with SW board
			Communication	3.5Φ stereo jack
	Weight			Approximately 116g
Environmental specifications	Operational temperature			-0 to 40 deg. C
	Storage temperature			-30 to 65 deg. C
	Vibration			20Hz to 200Hz to 20Hz (5min./cycle), acceleration 10G, XYZ 3 directions 30 min. each)
	Shock			Acceleration 38G, half amplitude 6ms, XYZ 3 directions 3times each
	Standard compliancy			EMS: EN61000-6-2, EMI: EN55022 (Class B)
	RoHS			RoHS compliance

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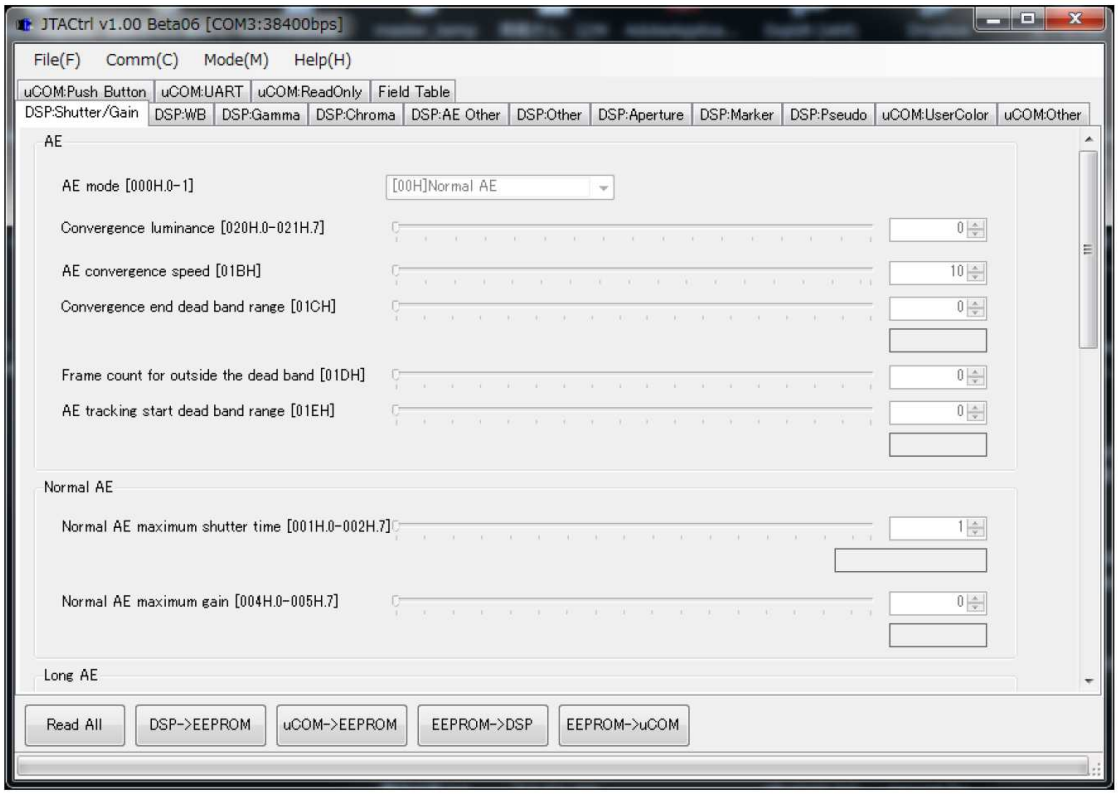
4 Control Software User's Guide

4.1 Requirements

- +12V DC Power Supply
- Remote Control
- Communication Tool
- Control Software

4.2 Basic Operating Procedure

- Connect the power supply with the camera, as well as connecting the Communication tool with the PC via USB cable.
- After JTA Ctrl has been installed, the control software can be launched from JTACtrl.exe



- Select the COM port number through COMM(C) → Port Setting
- Click Read All to read all of the register values from the camera.
- All of the camera settings can be configured through the control software.

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4.3 Button Description

Read All

Read out All of the DSP register and the uCOM register values on the camera. Please execute this command every time the camera is started up.

DSP → EEPROM

Save the DSP register values into the EEPROM

uCOM → EEPROM

Save the uCOM register values into the EEPROM

EEPROM → DSP

Read the DSP register values on the EEPROM

EEPROM → uCOM

Read the uCOM register values on the EEPROM

4.4 Differences between the uCOM and DSP Register

The main difference is that the DSP register is mainly where video control functions are stored along with the eight User Presets that the user can load for different applications. The uCOM is primarily used for communication and other functions.

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4.5 Functional Description

DSP: Shutter/GainTab

AE

AE mode

Normal AE, Long AE, USER Mode can be selectable. If User likes to use Fixed Gain, Fixed Shutter, USER mode should be selected. If User likes to use Auto Gain or Auto Shutter, Normal AE, Long AE should be selected on Priority Mode.

Convergence luminance

This setting is target luminance at which AE has converged to the appropriate luminance.

AE convergence speed

This setting is used to set the time to be taken for the exposure amount appropriate for the image to be established.

Convergence end dead band range

This setting is used to set the range in which convergence is to be identified.

Frame count for outside the dead band

When the absolute value of the error amount is below the setting and the same status has continued for frame number.

AE tracking start dead band range

This function is used to ensure that the AE operation will not overly respond to changes in the subject when an object has passed cut across the shooting screen while AE is in the appropriate status. Tracking is started when the AE error amount is above the setting and this has continued for at least the number of outside thee dead band frame number.

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Normal AE

Long AE

Priority Mode

When Normal AE or Long AE is selected on AE Mode, this setting might be reflected. If User likes to use Fixed Gain or Fixed Shutter, this Priority Mode should be selected.

USER Mode

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When User likes to use Fixed Gain or Fixed Shutter, this mode can be used when USER mode is selected on AE mode.

DSP: WB

White Balance

AWB, Full-Open, AWB Hold, USER Mode can be selectable. When User likes to use Fixed White Balance, please select USER Mode.

AWB Pull-in Speed

Pull-in speed of AWB mode is set in the number of frames specified by this setting. This setting might be available when Auto or Full Open is selected on White Balance Mode. Unit: Frame number

AWB Pull-in Delay

When a status outside the dead band has been detected in the AWB mode, pull-in is started after achieving consistency in the number of frames specified by this setting. Unit: Frame number

Convergence Step inside target area

The AWB pull-in steps inside target area can be indicated. When set step shortly, the convergence speed of white balance is faster.

Convergence Step outside target area

The AWB pull-in steps outside target area can be indicated. When set step shortly, the convergence speed of white balance is faster.

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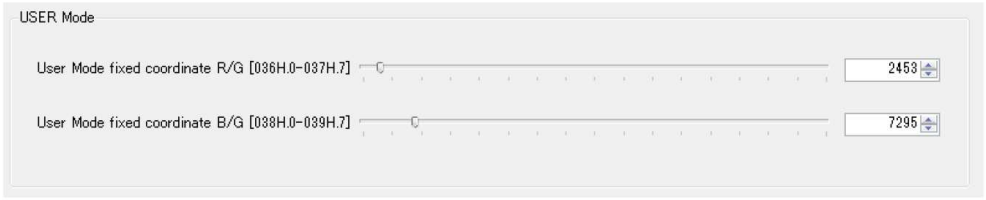
Pull-in Step for Full Open

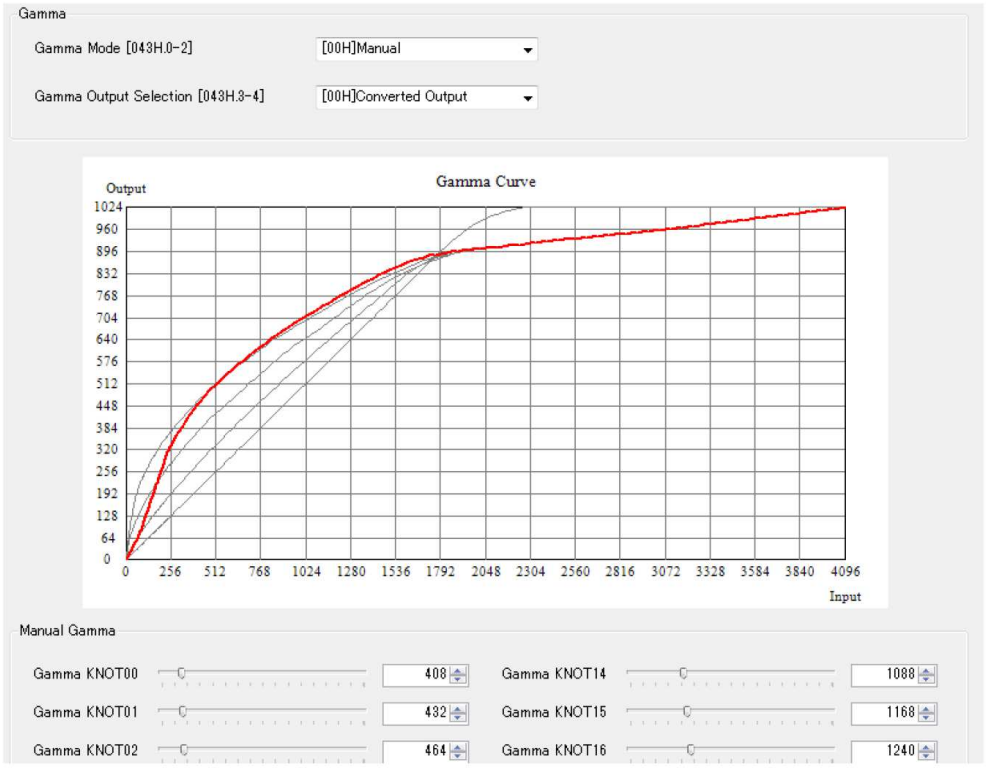
When set the number of steps for full open mode pull-in, the convergence speed is faster.

USER Mode



When White Balance mode is on USER mode. Fixed White Balance can be set.

DSP: Gamma



Gamma Mode

Manual or Preset value (0.45,0.6,0.8,1.0) can be selected. When Manual is selected, Gamma curb that was defined on Manual Gamma part are reflected.

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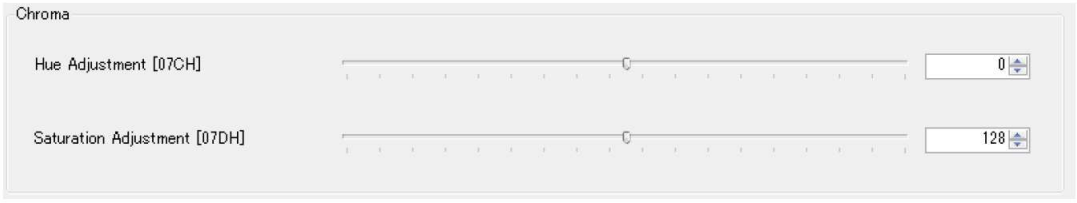
Gamma Output Selection

Gamma Converted Output or Gamma un-Converted Output can be selected. When Gamma Converted Output is selected, Output video image output from Gamma Mode's value.

DSP: Chroma



Hue Adjustment

The hue can be adjusted.

Saturation Adjustment

The Saturation can be adjusted.

DSP: AE Other

Flickerless mode

Flicker is generated when shooting under fluorescent lights whose flickering periods differ from the shutter periods. This is function capable of reducing the flicker by adjusting the shutter speed(Auto,50Hz,60Hz) so as to match the light-emitting frequency of the fluorescent lights.

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Photometry mode

In order to achieve the optimum luminance, this photometry mode automatically adjusts the gain value and exposure time to achieve the optimum luminance level by detecting the luminance signals in the screen region using 9 frames (3 horizontal x 3 vertical frames) and giving weighting to this region on the screen or, alternatively, it adds up the total number of luminance levels, measures the histograms and gives weight to them. Among the former modes are the average photometry, weighted photometry modes.

DSP: Other

Resolution/FrameRate

Select the output video format.

Image Output Inversion

Select the H,V Inversion image.

Sharpness Gain

Set the Sharpness value.

ATR-EX function

When both low-luminance areas and high-luminance areas exist on one screen, AE controls the exposure in such a way that the exposure is appropriate for the high-luminance areas, loss of dark detail will occur; conversely, overexposure will occur if AE controls the exposure so that it is appropriate for the low-luminance areas. This happens because the luminance of images tends toward either the high-luminance side or low-luminance side. Both overexposure and loss of dark detail can be avoided and images with the appropriate contrast can be achieved by compressing the low- and high-luminance areas for the image components in one field toward medium luminance and compensating the high-visibility medium-luminance areas toward the appropriate gray scale. The function used to achieve this is called ATR-EX (Augmenting Tone Reproduction) or WDR (Wide Dynamic Range).

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Color/Black and white
Select the Color or Monochrome image..

Contrast
Set the Contrast value.

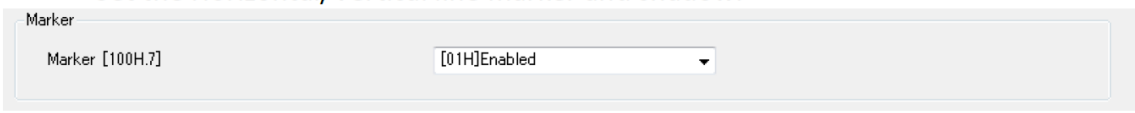
RGB offset
Set the offset on Video image.

DSP: Aperture

The aperture compensation function is used to enhance the perceived resolution by emphasizing the edge areas of the images. To emphasize the edges, increase the aperture compensation gain value. However, if this gain is increased too much, noise which manifests as a roughness of the images becomes noticeable. Adjust the parameter changes while monitoring the actual images.

DSP: Marker

Set the Horizontal/Vertical line marker and shadow.



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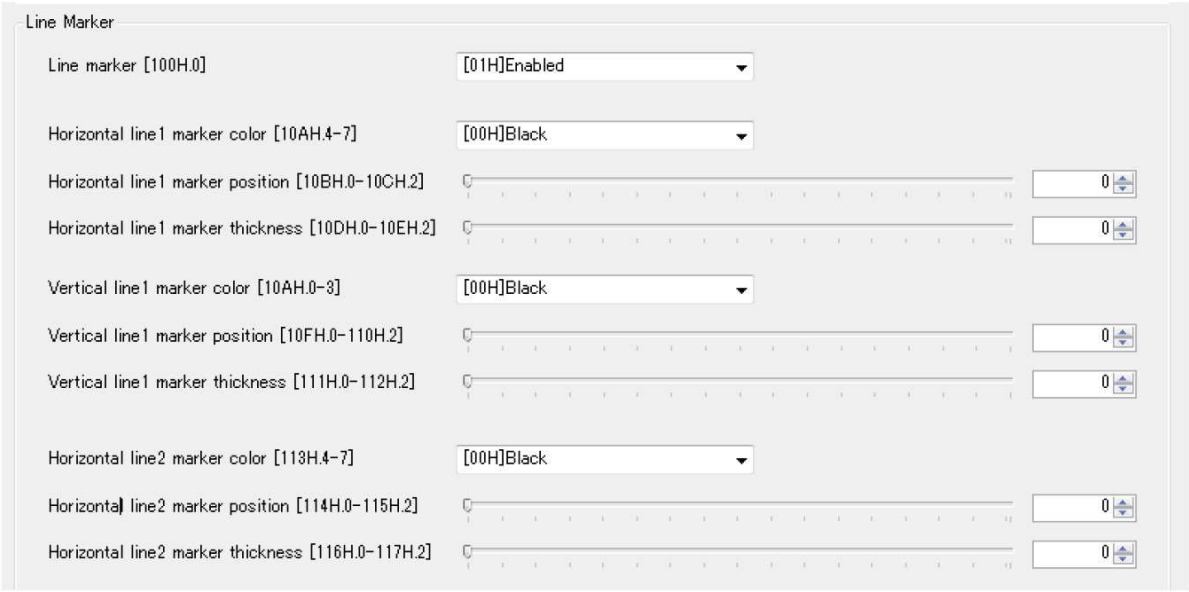
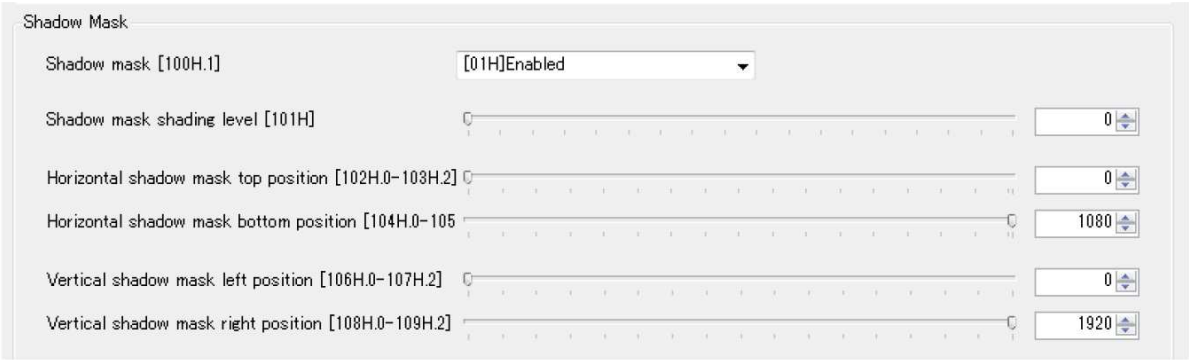
Marker

Set the line marker and shadow.



Line Marker

Set the color, position, size of two line markers.



Shadow Mask

Set the shadow mask on top, bottom, left, right side.

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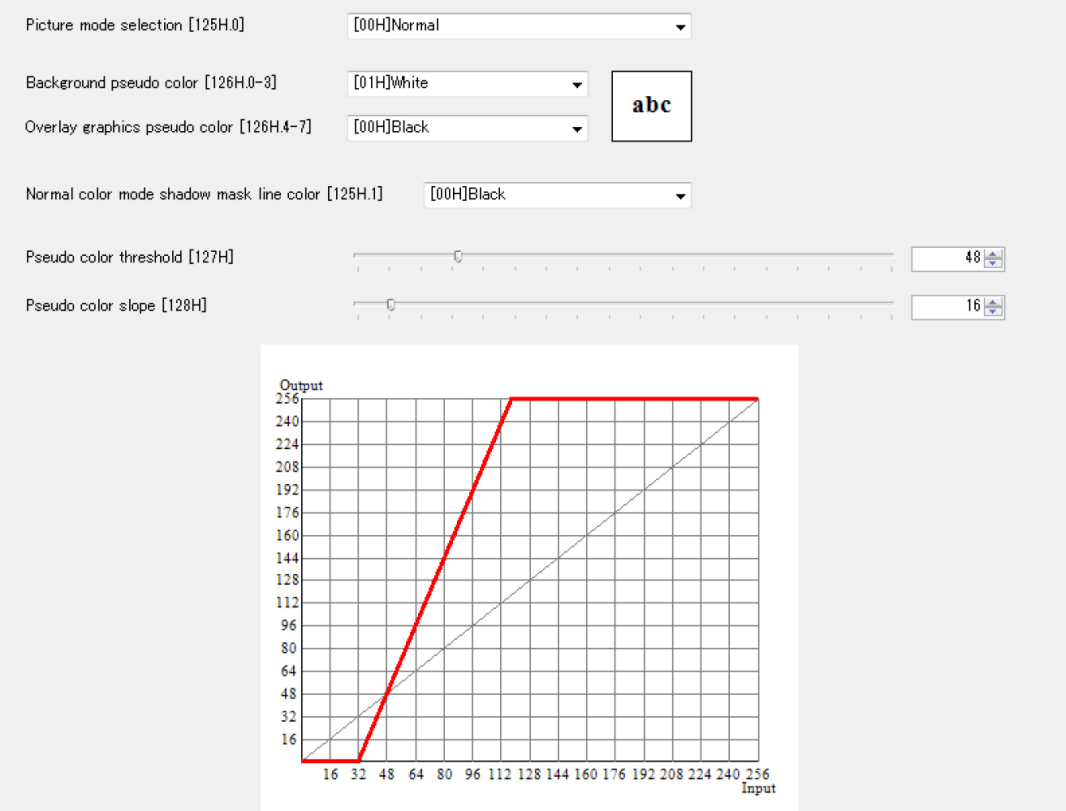
DSP: Pseudo



Picture mode selection

Select the Normal color or Pseudo color mode. When Pseudo is selected, bipolarization video image is output.

Background pseudo color

Convert the brighter image into selected color.

Over graphics pseudo color

Convert the darker image into selected color.

Normal color mode shadow mask line color

Select the line color of shadow mask from black or Over graphics pseudo color.

Pseudo color threshold

Set the threshold to bipolarize the input video image.

Pseudo color slope

Set the slope of bipolarization.

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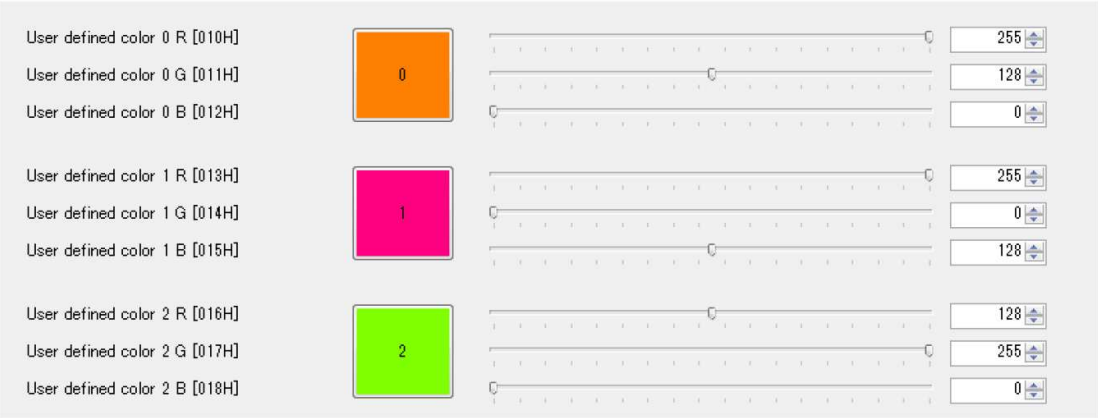
uCOM: User Color



Define the eight color table. The defined color can be used as Pseudo color.

uCOM: Other

User Preset

Set the DSP setting from eight Preset0 to Preset7. All of DSP setting parameter may reflect after readout.

Digital Zoom

Set the Digital Zoom.

Digital zoom pan

Set the offset on horizontal direction.

Digital zoom tilt

Set the offset on vertical direction.

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Set the OSD function, actual OSD control can be through remote controller.

Still image

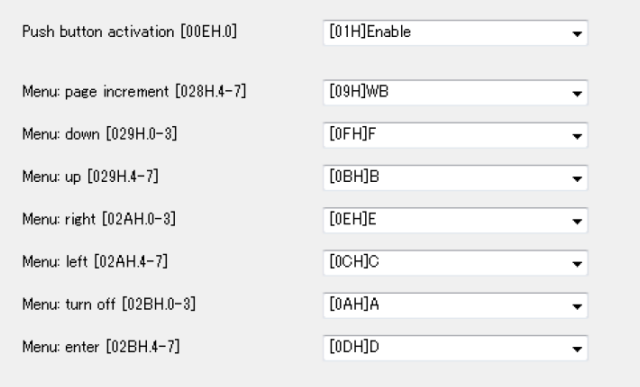
Set the Still video image.

Test pattern selection

Set the test pattern on video output.

uCOM: Push Button

Button



Single push/Hold can be assigned on remote controller's push button.

Marker shadow

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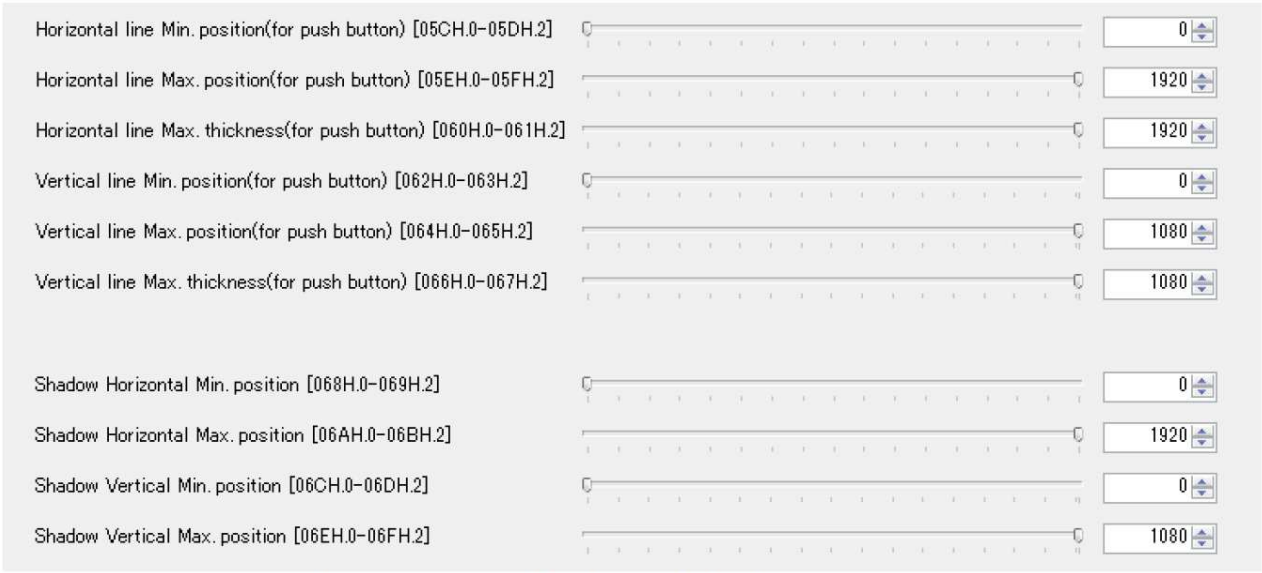
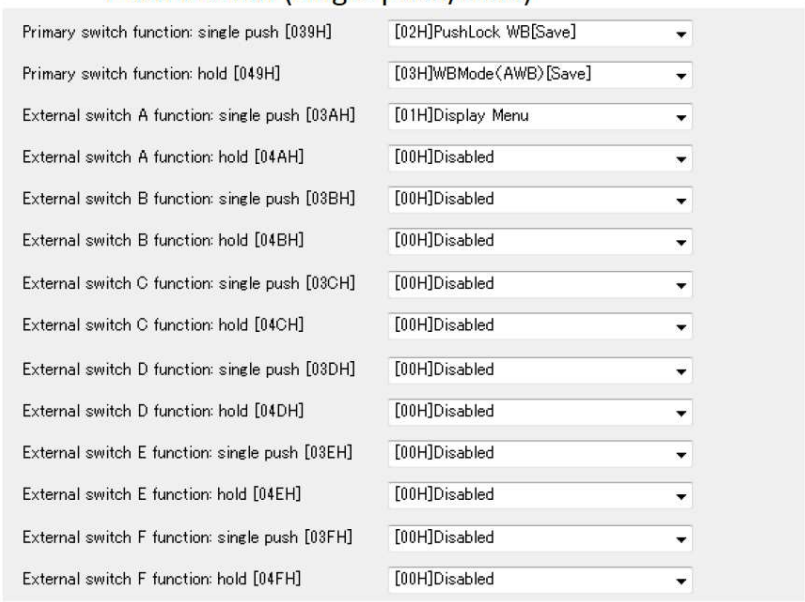


Remote controller can set the Marker and Shadow parameters.

Push button (single push/hold)



Allows the user to select the function for each button.

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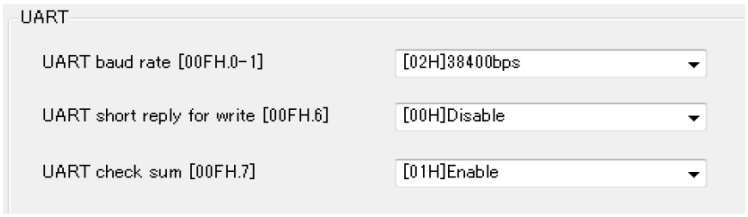
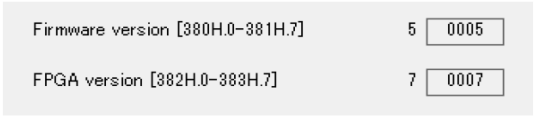
uCom: UART



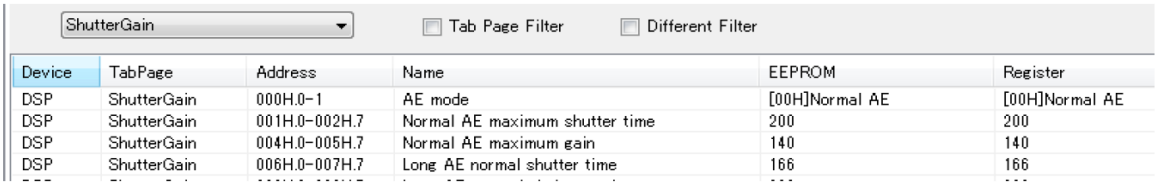
Allows the user to set the camera communication.

uCom: ReadOnly



Allows the user to read the Firmware and FPGA revision on the camera.

Field: Table



Device	TabPage	Address	Name	EEPROM	Register
DSP	ShutterGain	000H.0-1	AE mode	[00H]Normal AE	[00H]Normal AE
DSP	ShutterGain	001H.0-002H.7	Normal AE maximum shutter time	200	200
DSP	ShutterGain	004H.0-005H.7	Normal AE maximum gain	140	140
DSP	ShutterGain	006H.0-007H.7	Long AE normal shutter time	166	166

This functions shows all of the register settings from the registers.

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5 Communication Protocol Specifications

5.1 Communication Settings

Setting	Value
Baud rate	9,600 bps / 19,200 bps / 38,400 bps (Default)
Data bit	8 bits
Parity	None
Stop bit	1 bit
Flow control	None

5.2 Communication Format

The format for sending and receiving data between the PC and the camera is shown below:

SOF 8 bits	Command 8 bits	Direction 1 bit	Data length 15 bits	Data [Data length] byte (Variable)	Check sum 8 bits	EOF 8 bits

Details of the format:

	Details
SOF	Start of the Frame. This value is always "0x02".
Command	Command Code Refer to: "The Camera Control Command"
Direction	"0": Reading or receiving data from the camera is always a "0" value. "1": Writing or sending data to the camera is always a "1" value. Note: This value is always "0" when the Camera responds.
Data length	This "Data Length" value tells how many bytes the "Data" will contain. The "Data Length" must be specified in bytes.
Data	This field is for option, set value and/or acquired value. The size must be specified as "Data Length".
Check sum	The "Check sum" functions to verify the integrity of the communication transmission. The "Check sum" value should equal the last (low) 8 bits of the summary of ["Command" + "Direction" + "Data Length" + "Data"]. If this value of "Check sum" does not match with last (low) 8 bits of the summary data of ["Command" + "Direction" + "Data Length" + "Data"], the camera will generate the error message: "Check Sum Error".
EOF	End of the Frame. This value is always "0x03".

Ryf-Nummer	**Beschreibung**
R-FHD-1080-1001	Digitale High Definition HD Video-Farbkamera in FHD 1080 P Video Standard, HDMI Stecker, robuste Bauweise für die Makroskopie und Mikroskopie, kein PC erforderlich, kompatibel mit Monitoren mit HDMI Schnittstelle.
R-HD-720-1003	Kabelgebundene Fernbedienung für OSD-Menü zu R-FHD-1080-1001.
R-HD-720-1004	Stecker-Netzgerät 100-240VAC/12VDC mit Hohlstecker zu R-FHD-1080-1001.