

WAT-2300 Control Software Operation Manual

[version 1.00]

Watec Co., Ltd.

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Contents

1	Overview.....	3
2	Disclaimer.....	3
3	Operating environment	4
4	Specification of communication	4
5	Communication cable	5
6	How to Install	6
7	How to Start	8
8	How to uninstall	8
9	Operation Description	9
9-1	Setting the port number	9
9-2	Function in the menu bar.....	10
9-2-1	“File” menu.....	10
9-2-2	“Camera” menu	11
9-2-3	About.....	12
9-3	Change the camera settings	13
9-3-1	Exposure	13
9-3-2	WhiteBalance	18
9-3-3	PictureAdjust.....	19
9-3-4	Function	21
9-3-5	Save/Load.....	23
9-3-6	Privacy Mask.....	24
9-3-7	Special	27
9-3-8	Save/Restore[PrivacyMask/Special] tab.....	28
10	Change history	29

1 Overview

'WAT-2300 Control Software' is software for setting and firmware update for WAT-2300 by RS-232 communication.

2 Disclaimer

For any damages caused by using the "WAT-2300 Control Software", Watec Co., Ltd. does not guarantee.

3 Operating environment

It has been confirmed the operation in the following environment.

Table 1 System requirements

OS	Windows XP*, Windows Vista, Windows 7, Windows 8, Windows 8.1 (*)When using in Windows XP, install the .Net Framework 2.0 at first.
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4 Specification of communication

The specification of communication is below.

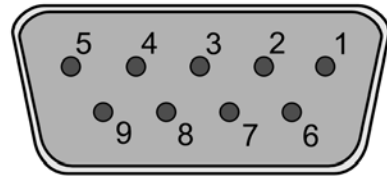
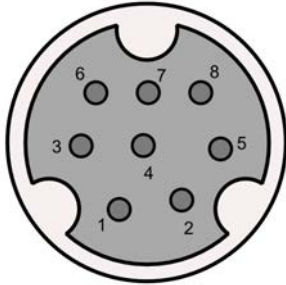
Table 2 Communication protocol

COM port	-Data rate : 38400bps -Data bit : 8bits -Parity : none -Stop bit : 1bit -Flow control : none
limitation	- Cannot communicate with the camera on starting after about 10 seconds. - At some USB-COMM converter cable, "firmware update" might be fail. Please use the officially supported converter cable at your OS.

5 Communication cable

The pin assign and the connections of the serial communication cable are below.

Table 3 pin-assignment of the communication cable



Mini-Din 8pin		
No.	Name	Description
3	TXD (out)	Transmit Data (from Camera)
5	RXD (in)	Receive Data (from Host)
4	GND	Ground
1, 2, 6, 7, 8		for RC-02

D-Sub 9pin		
No.	Name	Description
2	RXD (in)	Receive Data (from Camera)
3	TXD (out)	Transmit Data (from Host)
5	GND	Ground
1, 4, 6, 7, 8, 9	NC	No connection

Mini-Din 8p

TxD 3 ----- 2

RxD 5 ----- 3

GND 4 ----- 5

D-Sub 9p

RxD

TxD

GND

6 How to Install

1. Start the WAT-2300 Control Software installer by double-clicking the *.msi file in the downloaded file.

*On Windows XP, please install .Net Framework 2.0 before installing this software.

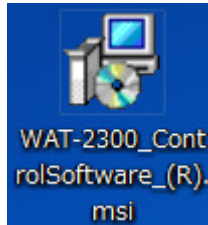


Fig. 1 installer icon

2. Click Next.

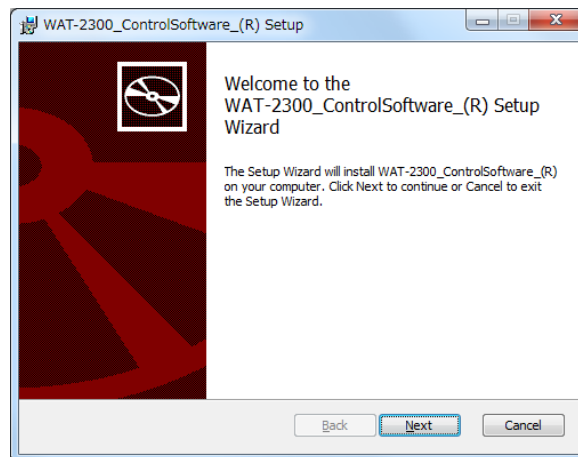


Fig. 2 installer(1)

3. Click Next. (In this window, the install folder can be chosen manually.)

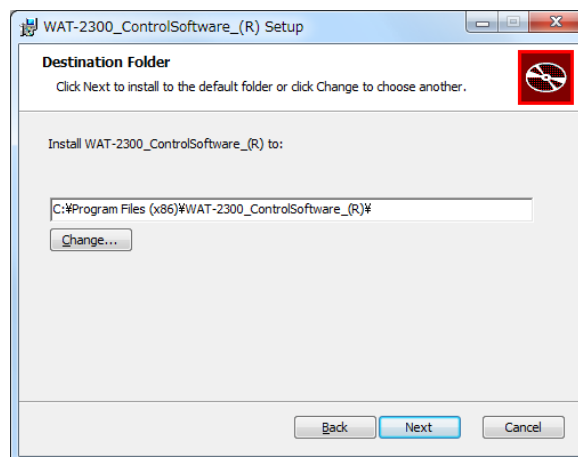


Fig. 3 installer(2)

4. Click Install button and then installation will be started.

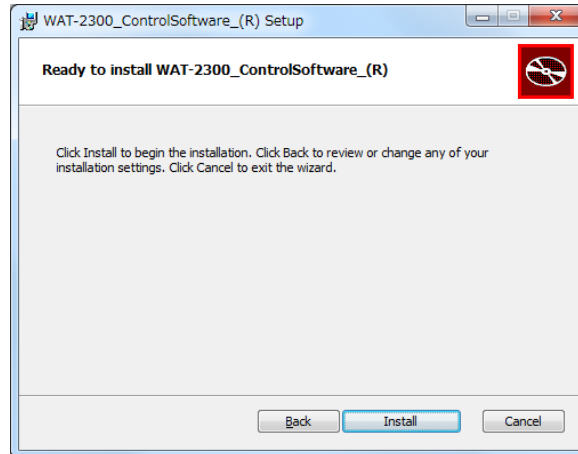


Fig. 4 installer (3)

5. At install process, the User Access Control (UAC) window may pop-up. Then please click the Yes button.

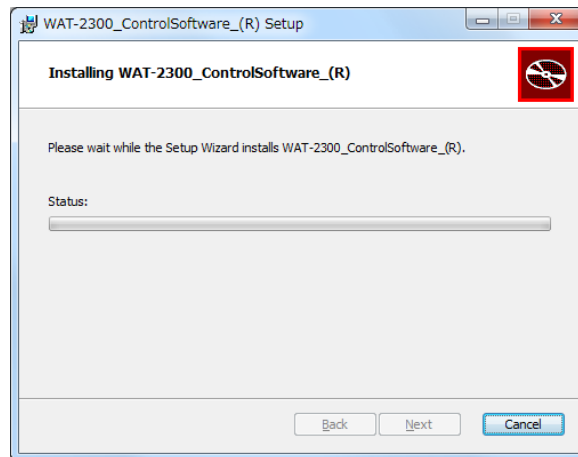


Fig. 5 installer (4)

6. After a few moments, the installer will complete the installation. Click the Finish button to exit the setup wizard.

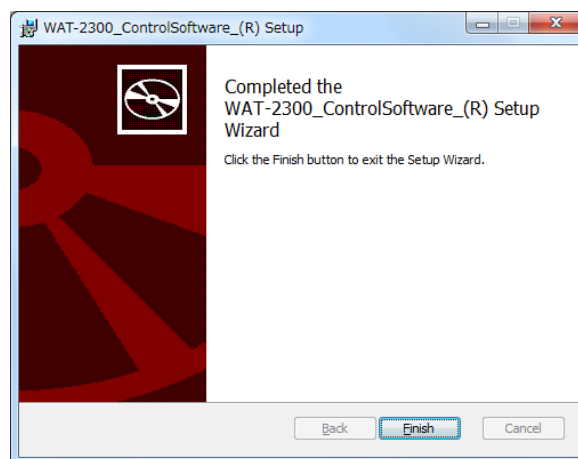


Fig. 6 installer (5)

7 How to Start

-Double click the application's icon in the desktop.



Fig. 7 application's icon

Or, Click the application's icon in the "start menu -> all programs -> Watec -> WAT-2300_ControlSoftware_(R)".

8 How to uninstall

1. Open Control Panel.
(Start -> Control Panel -> Programs -> Uninstall a program)
2. Select "WAT-2300_ControlSoftware_(R)" from the list, right-click and click Uninstall.
3. Click "YES" in the confirmation window.
(The UAC window will be pop-up. Then click the "Yes" button.)

9 Operation Description

9-1 Setting the port number

After software start-up, select the serial port which connected the camera.
The port number can be showed with device manager.

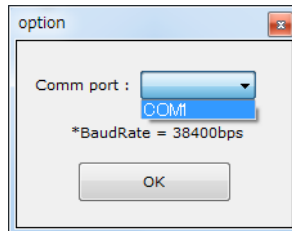


Fig. 8 port option

9-2 Function in the menu bar

9-2-1 “File” menu

9-2-1-1 “File -> load file...” function

The camera settings saved to csv file can be retrieved on “load file...” function.
(This csv file is created by the “save file...” function.)

Click “File (F) – load file...”, then file open dialog will be displayed.

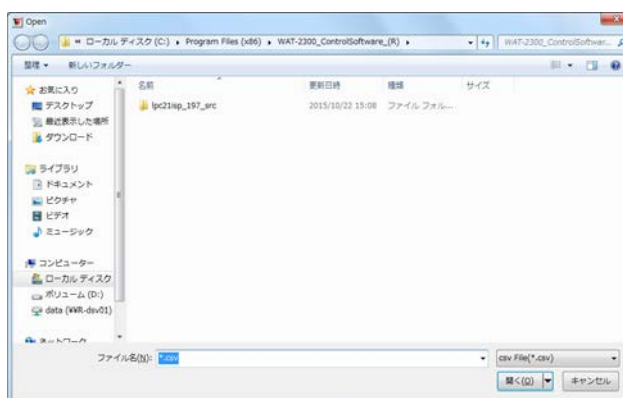


Fig. 9 open dialog

Select the exported file and click the “open” button, then the camera settings will load.

9-2-1-2 “File -> save file...” function

The current state of user-interfaces (such as selections of buttons) can be saved to csv file.

Click “File (F) – save file...”, then file save dialog will be displayed.

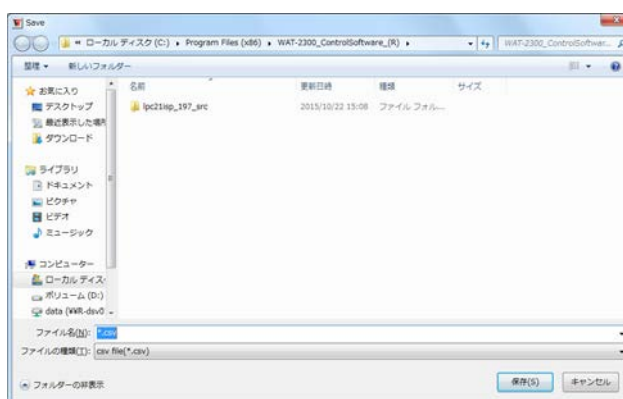


Fig. 10 save dialog

Choose the storage place of the file in save dialog. Click the “save” button to save the current user-interface state to csv file.

9-2-2 “Camera” menu

9-2-2-1 “Camera -> get settings (from camera)” function

It is possible to get the current camera parameters from the camera on “get settings (from camera)” function.

The current camera parameters obtained from the camera will be displayed in the user-interfaces (such as selections of buttons) of the software.

9-2-2-2 “Camera -> send all settings (to camera)” function

It is possible to send the current state of the user-interfaces (such as selections of buttons) to the camera on “send all settings (to camera)” function.

The camera parameters will be changed to the same state as the current state of the user-interfaces.

9-2-2-3 Firmware update

Update the firmware for additional functions or bug fixes.

Update procedure is following.

1. Plug the RC-02 to the camera.
2. Keep pushing the button of the UP and the DOWN.
3. Reboot the camera.
4. Unplug the RC-02 and plug the communication cable.
5. Click the ‘Camera->Firmware Update’.
6. Click ‘OK’, when the new window is pop-up.



Fig. 11 Firmware Update (confirm)

7. Select the firmware file (.hex), and click OPEN.
8. The firmware update will start.
9. When finished, click OK and reboot the camera.

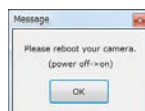


Fig. 12 Firmware Update (finish)

9-2-3 **About..**

This menu will display version information for this program.

9-3 Change the camera settings

9-3-1 Exposure

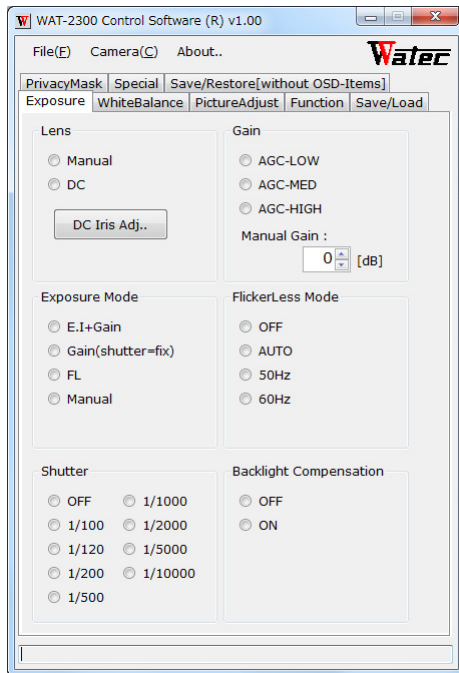


Fig. 13 exposure tab

9-3-1-1 Lens

Select the lens type.

Table 4 Selection of lens type

MODE	FUNCTION
Manual	For manual iris lens.
DC	For DC-drive iris lens. Need to make the automatic adjustment.

When the DC iris lens is attached, iris will be open if you select the “Manual”.

When the Manual iris lens is attached, “DC” cannot be selected.

[Automatic adjustment]

The aperture amount and speed of iris automatically adjusts and optimizes the performance of the lens.

1. Attach the DC iris lens.
2. Shoot a bright subject (E.g. Light boxes and light bulbs, etc.) in full screen.
3. Click the [DC Iris Adj..] button and click the [start] on adjustment window.
4. Adjustment is success, if the message window with "dc iris adj completed." is pop-up.

(*) If the "error" message is pop-up, please make sure the DC iris lens cable is connected correctly, or a subject is brightly enough.

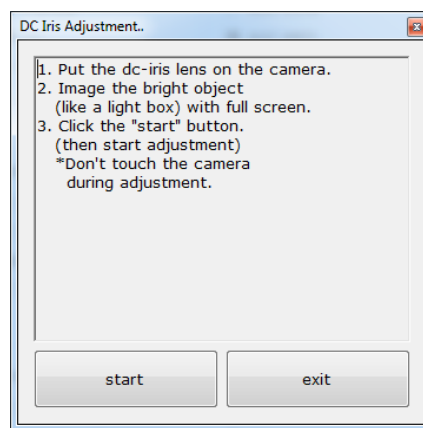


Fig. 14 Dc Iris Adjustment Window

9-3-1-2 Exposure Mode

Select the EXPOSURE MODE.

Each modes function by the combination of the shutter and gain as the following.

If the manual iris lens attached to the camera (DC iris lens cable is not connected), FL cannot be selected.

Table 5 Selection of exposure modes

MODE	Shutter	Gain
E.I+GAIN	Auto	Auto
GAIN	Arbitrary	Auto
FL	Auto [*]	Auto
MANUAL	Arbitrary	Arbitrary

*1/100(1/120)s or OFF

[E.I+GAIN]

The exposure is adjusted automatically by the electronic Iris and the automatic gain control.

[GAIN]

The exposure is adjusted by the automatic gain control. Electronic shutter control is fixed, and speed is arbitrary. According to photographic subject's brightness, image of camera may be overexposed by choosing a slow-side shutter speed. Then use the dc iris lens together.

[FL]

The exposure is adjusted automatically by the electronic iris and the automatic gain control.

Basically, the electronic iris will be fixed in the shutter speed of flickerless(1/100 or 1/120).

At that time, image of camera will be overexposed. Therefore, the dc iris lens is required.

[MANUAL]

The electronic iris control and the gain control are fixed. Shutter speed and gain can be chosen arbitrarily.

9-3-1-3 Shutter

In EXPOSURE MODE, when choosing the GAIN or MANUAL, you can choose the shutter speed by your preference.

Table 6 electronic shutter speed

1/10000s	1/5000s	1/2000s	1/1000s	1/500s	1/200s	1/120s	1/100s	OFF
----------	---------	---------	---------	--------	--------	--------	--------	-----

9-3-1-4 Gain

In EXPOSURE MODE, when choosing the MANUAL, you can choose the gain by your preference. At other modes, need to select the operating range of AGC.

Table 7 fixed gain

0 dB	2 dB	4 dB	6 dB	8 dB	10 dB	12 dB	14 dB
16 dB	18 dB	20 dB	22 dB	24 dB	26 dB	28 dB	30 dB

Table 8 AGC range

MODE	GAIN RANGE
AGC LOW	0~32 dB
AGC MED	0~42 dB
AGC HIGH	0~66 dB

9-3-1-5 Flickerless Mode

When FL is chosen in EXPOSURE MODE, need to choose the frequency commercial power supply considering the FLICKERLES. By setting the AUTO, 50/60Hz is automatically detected. Other than the FL mode, OFF setting is fixed.

Table 9 Flickerless mode

MODE	FUNCTION
OFF	This mode is chosen when EXPOSURE MODE is other than FL.
AUTO	The frequency of a flicker is detected from a camera image and 50 Hz or 60 Hz are set up automatically.
50Hz	This mode is chosen when it is an area whose commercial frequency is 50 Hz.
60Hz	This mode is chosen when it is an area whose commercial frequency is 60 Hz.

9-3-1-6 Backlight Compensation

BACKLIGHT COMPENSATION is performed by center-weighted exposure. When choosing the

MANUAL in EXPOSURE MODE, BACKLIGHT COMPENSATION fixed OFF.

9-3-2 White Balance

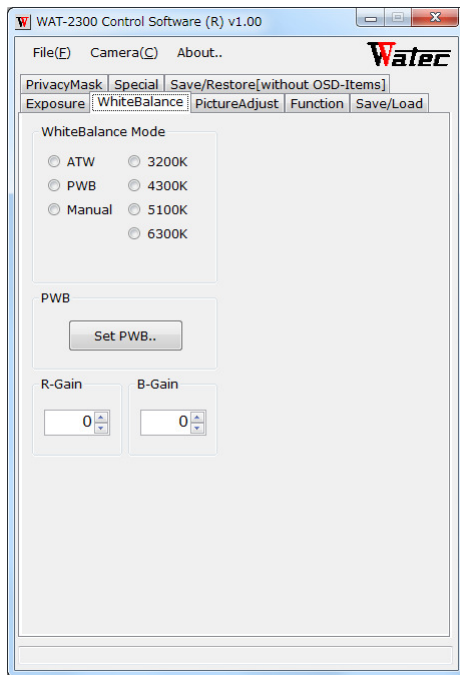


Fig. 15 White Balance tab

9-3-2-1 White Balance Mode

Switch the white balance mode.

Table 10 White Balance mode

MODE	FUNCTION
ATW	Automatically follows and adjusts to the changing color temperature of the illumination of the object.
PWB	Set the corrected value following the actual color temperature of the illumination of the object. Imaging the object that color is achromatic at the full screen, and press the [Set PWB]. The corrected value is set.
3200K	(Bulb mode) Corrects the white balance based on the white under the incandescent bulb.
4300K	(Fluorescent light mode1) Corrects the white balance based on the white under the reddish fluorescent light.
5100K	(Fluorescent light mode2) Corrects the white balance based on the white under the bluish fluorescent light.
6300K	(Sun light mode) Corrects the white balance based on the white under the sun light.
Manual	Set the R-Gain and the B-Gain by manually.

9-3-3 PictureAdjust

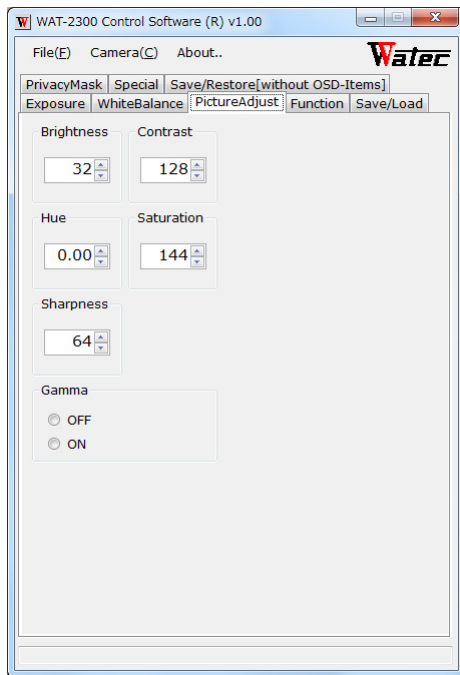


Fig. 16 Picture Adjust tab

9-3-3-1 Brightness

Adjust the brightness of image.

Table 11 brightness

0	32	64	96	128	160	192	224	255
---	----	----	----	-----	-----	-----	-----	-----

9-3-3-2 Contrast

Adjust the contrast of the image.

Table 12 contrast

0	16	32	48	64	80	96	112	128
144	160	176	192	208	224	240	255	

9-3-3-3 Hue

Adjust the hue.

Table 13 hue

-2.00	-1.75	-1.50	-1.25	-1.00	-0.75	-0.50	-0.25	0.00
0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	

9-3-3-4 Saturation

Adjust the color strength.

Table 14 saturation

0	16	32	48	64	80	96	112	128
144	160	176	192	208	224	240	255	

9-3-3-5 Sharpness

By emphasizing the contoured part, resolution is improved.

Table 15 sharpness

0	32	64	96	128	160	192	224	255
---	----	----	----	-----	-----	-----	-----	-----

9-3-3-6 Gamma

Switch the GAMMA correction.

The correction coefficient is ON \doteq 0.45.

9-3-4 Function

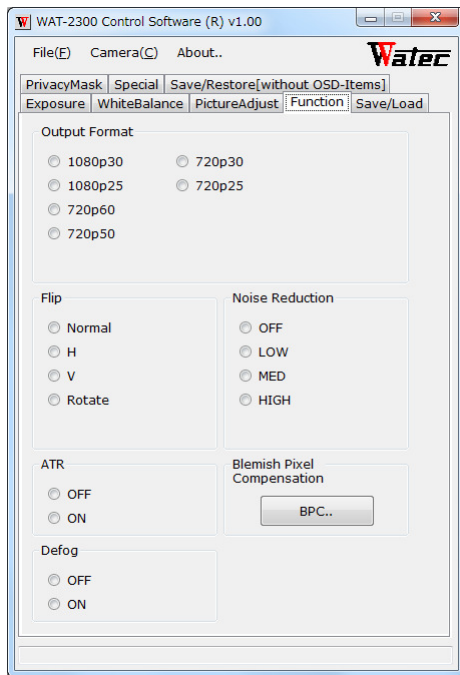


Fig. 17 Function tab

9-3-4-1 Output Format

Select the format supported by the connected monitor (Receiver equipment).
If the output format is changed, after a camera reboot, it is enabled.

Table 16 Details of the Output Format

Mode	Resolution		FRAME RATE [fps]	Interlace / Progressive
	H	V		
1080p30	1920	1080	30	P
1080p25			25	
720p60	1280	720	60	
720p50			60	
720p30			30	
720p25			25	

9-3-4-2 Flip

Flip the image at left/right (H), up/down (V) and Rotate (left/right/up/down).

9-3-4-3 ATR

Correct the contrast, and reduce the whitening-out/ black defects.

9-3-4-4 Defog

Correct the image that the contrast is not clear by fog. In parallel, the ATR is ON.

9-3-4-5 Noise Reduction

By image processing, noise under the dark site is reduced.

9-3-4-6 Blemish Pixel Correction

By automatically detection, blemish pixel is corrected.

Press the [start] at the light-shielding state (by closing the lens iris). When using DC IRIS LENS, the iris is full closed automatically.

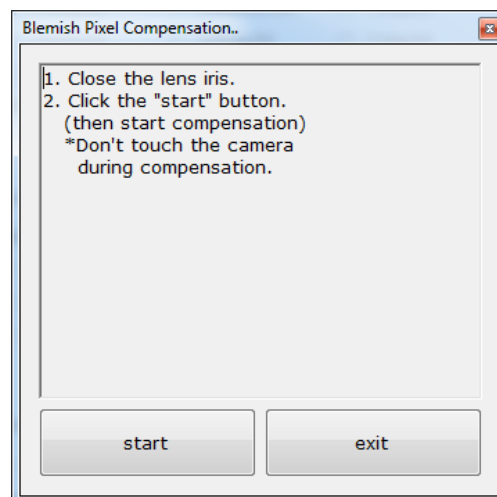


Fig. 18 Blemish Pixel Adjustment window

9-3-5 Save/Load

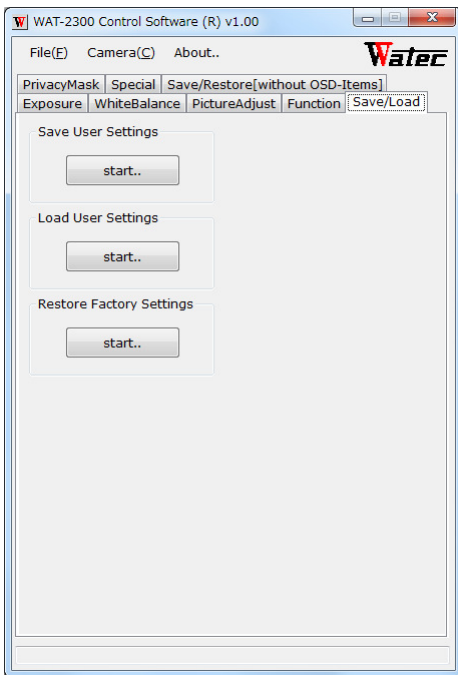


Fig. 19 Save/Load tab

9-3-5-1 Save User Settings

Save the current settings of the setting window to the camera. When the power is ON at next time, the camera will be started on saved settings.

9-3-5-2 Load User Settings

The above saved setting is read out.

9-3-5-3 Restore Factory Settings

Back to the factory default settings.

9-3-6 Privacy Mask

Show the privacy mask. The basic setting procedure is as follows.

1. Click on the top of the button to select the number of the privacy mask to be set. (Mask 0-15 to be set individually)
2. Put a check to show.
3. Set the opaque. (Above 0.5)
4. Set the 'start X', 'end X', 'start Y' and 'end Y'.
5. Set the 'color Y', 'color Cb', 'color Cr' and 'outline width'.

The mask color also can be select from the preset.

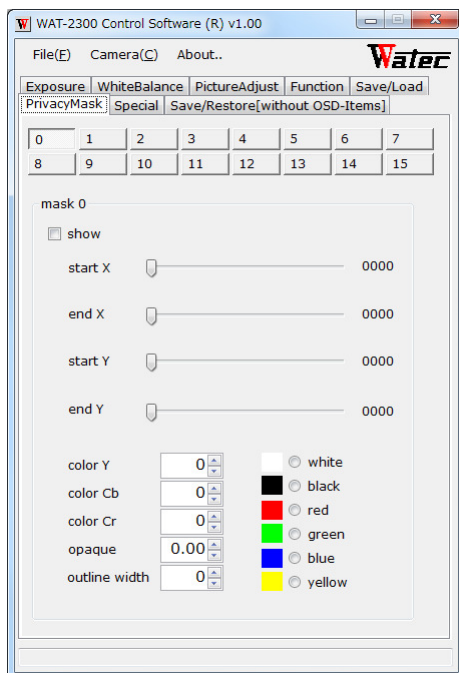


Fig. 20 Privacy Mask tab

[Application of privacy mask]

The privacy mask function, not only hide the specific part of the subject, you can be the following of such applications.

ex1) Inverted mask

Mask the entire screen. Then open the window to the viewing area.

* When set the multiple privacy masks, mask 0 is visible on top. In this example, set mask 0 and mask 1 as a window, set mask 2 as the entire mask.



Fig. 21 Inverted mask

Setting example of the inverted masks is below.

Table 17 Setting example of the inverted mask

Number of mask	show	start X	end X	start Y	end Y	color Y	color Cb	color Cr	opaque	outline width
0	checked	0080	0862	0120	0560	0	0	0	0.00	0
1	checked	0226	0791	0606	0913	0	0	0	0.00	0
2	checked	0000	1920	0000	1080	0	0	0	1.00	0

ex.2) Cross line

Display some lines for measuring or positioning.

*The start X and the end X are valid only even.

*Mask width is 2 pixels minimum.



Fig. 22 Cross line

Setting example of the cross lines is below

Table 18 Setting example of the cross lines

Number of mask	show	start X	end X	start Y	end Y	color Y	color Cb	color Cr	opaque	outline width
0	checked	0640	0642	0000	1080	8	8	8	1.00	0
1	checked	1280	1282	0000	1080	8	8	8	1.00	0
2	checked	0000	1920	360	362	8	8	8	1.00	0
3	checked	0000	1920	720	722	8	8	8	1.00	0

9-3-7 Special

Adjust the correction level of the contrast and defog.

- ATR-Level

Select the correction strength of the ATR. (Low, Medium, High)

* If the 'high' is selected, an artificial noise might visible.

- Defog-Level

Select the correction strength of the compensation level of the defog. (Low, Medium, High)

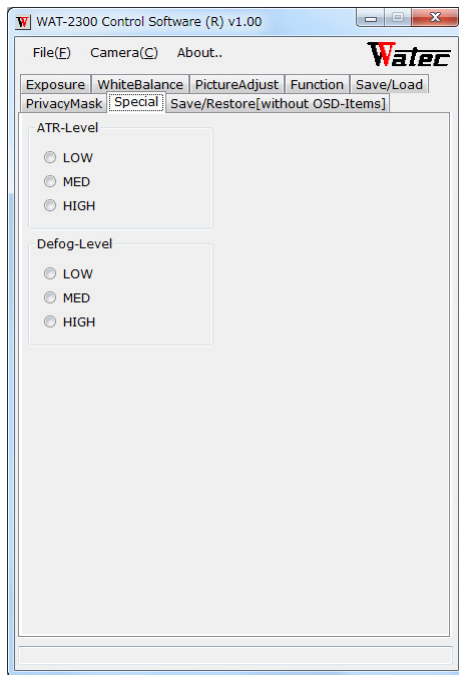


Fig. 23 Special tab

9-3-8 Save/Restore[PrivacyMask/Special] tab

Save the settings of the privacy mask and the special. Can also delete and restore. The saved settings are automatically loaded at the camera boot process.

- Save Settings[PrivacyMask/Special]
- Delete Settings[PrivacyMask]
- Restore Factory Settings: ATR-Level/Defog-Level (not save in the camera)

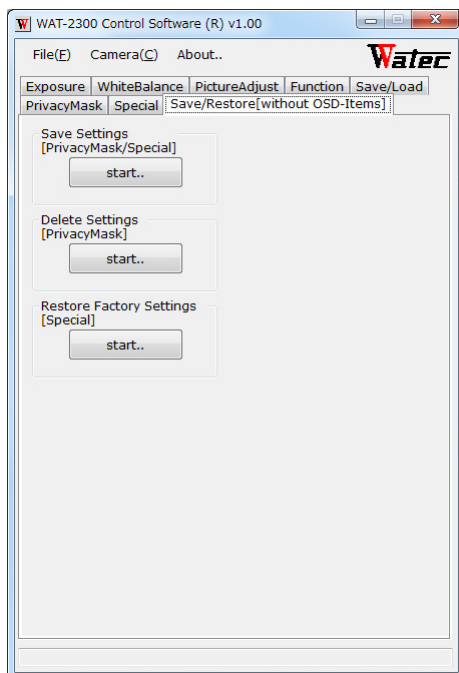


Fig. 24 Save/Restore tab[without OSD-Items]

10 **Change history**

- 2015/10/23 [version 1.00] 1st release.