WAT-1000

USER MANUAL

Rev. 1.00

September 16, 2008

Watec Co., Ltd
## 0. Change History

<table>
<thead>
<tr>
<th>Rev. No.</th>
<th>Date</th>
<th>Changes</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>2008.09.16</td>
<td>-</td>
<td>First edition</td>
</tr>
</tbody>
</table>


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1. Introduction

- The WAT-1000 user manual describes the functions and the adjustment method using the On Screen Display (OSD)
- When the settings of the WAT-1000 is changed according to the WAT-1000 user manual, check to see that the operation and the effects of the changes made to the camera are acceptable.
- The WAT-1000 user manual is subject to change by design and the specifications of the product without notice.
- The copyright of the WAT-1000 user manual shall belong to Watec Co, Ltd. Copying in whole or in part without the authorization of the holders permission is prohibited.
2. Example of screen menu configuration and basic operation

2.1 Screen menu configuration example

The basic screen menu configuration is as follows.

![Screen menu configuration diagram](image)

**Title of menu**
The title of the menu page for AUTOMATIC EXPOSURE

**Item name**
- Selectable items are shown on the indicated page.
- The cursor position is highlighted in gray.
- When ".." is added to the end of an item name, it means it is continued on to the next page.

**List of item**
The indicated item next to item name is the current setting.
**Slider**

The slider is used to set the required value of an item.

Increase or decrease the parameter value using the slider.
2.2 Jog dial basic operation

Chart 1. Jog dial basic operation

<table>
<thead>
<tr>
<th>Operation and Name</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONGPUSH</td>
<td>Push the center of the jog-dial for a few seconds</td>
</tr>
<tr>
<td>PUSH</td>
<td>Push the center</td>
</tr>
<tr>
<td>Roll up</td>
<td>Roll up</td>
</tr>
<tr>
<td>Roll down</td>
<td>Roll down</td>
</tr>
</tbody>
</table>

**Camera ID**

See the “CAMERA ID SETTING” section for the operation method of the CAMERA ID.

**Zone setting**

See the “ACTIVITY DETECTION SETTING” section for the ACTIVITY DET. ZONE operation method.
2.3 Example of the operation menu

How to Displayed/Nondisplayed the MENU

How to Select/Cancel

How to move the cursor up and down

How to item change
3. Functions and Adjustment method

3.1. Automatic Exposure

3.1.1. Wide dynamic range

“Dynamic range” is to describe the intensity ratio between maximum and minimum illumination in an image. Standard cameras have narrow dynamic range; therefore, white out and/or silhouetting phenomenon occurs when a subject contains any objects with excessive difference in illumination intensity, for example, backlight circumstances. The WAT-1000 is able to provide a natural image to the human eye by greatly reducing white out and silhouetting occurring. The wider the dynamic range, the more the camera is able to cope with high contrast situations and present a clear picture of the contrasting areas; however, if the dynamic range is too wide, a blur image with low contrast will be evident. The WAT-1000 prevents contrast degradation by automatically controlling its dynamic range according to the illuminance ratio of a subject. In addition, the maximum value of the WAT-1000 dynamic range can be fixed on the OSD menu, “DYNAMIC RANGE”.

To take an image with excessively varied intensity of illuminations and the desire to have a clear picture in both bright and dark areas at the same time, select “HI” on the DYNAMIC RANGE setting. Meanwhile, to take an image with less varied intensity of illumination or paying attention to either the bright area or the dark area, select “MEDIUM” or “LOW”. The default setting is MEDIUM.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>Standard camera</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>Typical</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>HIGH</td>
<td>Max</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Fig. 3 Example of Dynamic Range Configuration

<table>
<thead>
<tr>
<th>DYNAMIC RANGE</th>
<th>LOW</th>
<th>MEDIUM</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Example Image" /></td>
<td><img src="image2.png" alt="Example Image" /></td>
<td><img src="image3.png" alt="Example Image" /></td>
<td></td>
</tr>
</tbody>
</table>

AEPrefs: HIGHLIGHTS
- The setting of the dynamic range is only available when the shutter mode is set to E.I.
- When using the slow shutter mode (ESS), the wide dynamic range will not be available.
- As for information and setting of the shutter mode, see “section 3.1.2. (p.11)”

[Operating procedure]
3.1.2. Electronic shutter

The WAT-1000 has an electronic shutter function with changeable exposure times. There are two kinds of shutter mode, electronic iris mode (E.I) and slow shutter mode (ESS). The electronic iris mode automatically controls the shutter speed according to the illumination of the object. Each pixel adjusts itself individually to give the best available picture regarding light and dark in a single image. (This is the wide dynamic range mode).

In the slow shutter mode, all the pixels adjust to the slow shutter speed regardless of the lighting condition of the object. When an auto iris lens is used, the aperture of the lens is fully opened regardless of the lighting condition of the object. Because the electronic shutter speed is not controlled independently for each pixel, the wide dynamic range will not be available. The slow shutter mode can be used only when an object is very dark, and a stable lighting condition is present. The default setting is set to E.I.

Chart 3. Shutter mode setting list

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHUTTER MODE</td>
<td>E.I Electronic shutter</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>ESS Slow shutter</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>
## [Operating procedure]

### ADVANCED SETTING

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAT-1000 MAIN MENU</td>
<td>EASY SETTING..</td>
</tr>
<tr>
<td></td>
<td>ADVANCED SETTING..</td>
</tr>
<tr>
<td></td>
<td>LOAD USER SETTINGS..</td>
</tr>
<tr>
<td></td>
<td>SAVE USER SETTINGS..</td>
</tr>
<tr>
<td></td>
<td>RESTORE FACTORY SETTINGS..</td>
</tr>
<tr>
<td></td>
<td>EXIT MENU</td>
</tr>
</tbody>
</table>

#### ADVANCED SETTING

- **AUTOMATIC EXPOSURE**:
  - SHUTTER MODE: E.I.
  - AGC: LOW
  - DYNAMIC RANGE: MEDIUM
  - AE PREFERENCE: HIGHLIGHTS
  - BACKLIGHT: OFF
  - CONTROL SPEED: NORMAL

- **WHITE BALANCE**:

- **DAY/NIGHT SETTING**:

- **IMAGE SETTING**:

- **FUNCTIONS**:

  - RETURN TO MAIN MENU

---

E.I. ESS
When the Electronic iris mode (E.I) is selected in the shutter mode setting section, the following settings can be also set.

**Shutter limit (Slow shutter in EASY SETTING)**

This function is set to the minimum value of the electronic shutter speed control range with electronic iris control. When the shutter limit is set to OFF, the minimum value of the shutter speed is 1/60s. Noise will occur with dark objects, but the resolution of a moving object will be preserved. If the setting value of the shutter limit is selected other than OFF, the selected slow shutter mode will be available when an object gets dark. If a slower shutter mode is required, shift the shutter limit value from X2 to X32. The resolution of a moving object may be lower, but the object under dark lighting condition can be clearly monitored. As long as the slow shutter mode is activated, wide dynamic range mode will not be available. The default setting is set to X2.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHUTTER LIMIT</td>
<td></td>
<td>NTSC</td>
<td>PAL</td>
</tr>
<tr>
<td>[SLOW SHUTTER]</td>
<td>OFF</td>
<td>Min.: 1/60s</td>
<td>Min.: 1/50s</td>
</tr>
<tr>
<td></td>
<td>X2</td>
<td>Min.: 1/30s</td>
<td>Min.: 1/25s</td>
</tr>
<tr>
<td></td>
<td>X4</td>
<td>Min.: 1/15s</td>
<td>Min.: 1/12.5s</td>
</tr>
<tr>
<td></td>
<td>X8</td>
<td>Min.: 1/7.5s</td>
<td>Min.: 1/6.25s</td>
</tr>
<tr>
<td></td>
<td>X16</td>
<td>Min.: 1/3.75s</td>
<td>Min.: 1/3.125s</td>
</tr>
<tr>
<td></td>
<td>X32</td>
<td>Min.: 1/1.875s</td>
<td>Min.: 1/1.5625s</td>
</tr>
</tbody>
</table>
### Operation Procedure

**Advanced Setting**

<table>
<thead>
<tr>
<th>Operation</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic Exposure</td>
<td><strong>E.I.</strong></td>
</tr>
<tr>
<td>Shutter Mode</td>
<td>X2</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>Low</td>
</tr>
<tr>
<td>AE Pre-l</td>
<td>Medium</td>
</tr>
<tr>
<td>Backlight</td>
<td>Off</td>
</tr>
<tr>
<td>Control Speed</td>
<td>Normal</td>
</tr>
</tbody>
</table>

**E.I. Setting**

| Shutter Limit | X2 |
| Lowlight Scene | Auto PRI |
| Flickerless Mode | Off |

**Previous Page**

- Push
- Off
- X2
- X4
- X8
- X16
- X32
Lowlight scene

This function is used to set the operation order mode, which will operate by priority in slow shutter mode, when the SHUTTER LIMIT mode is set to any other than OFF.

If SHUT PRI is selected, slow shutter mode operates first, and then gain up mode operates. The resolution of a moving object will become decreased, but noise will be inconspicuous.

If GAIN PRI is selected, gain up mode operates first, and then the slow shutter mode operates. Noise will be present compared with the SHUT PRI mode, but doesn't decrease the resolution of a moving object. The default setting is set to SHUT PRI.

Chart 5. Lowlight scene setting list

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOWLIGHT SCENE</td>
<td>SHUT PRI</td>
<td>Slow shutter priority</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>GAIN PRI</td>
<td>Gain up priority</td>
<td>○</td>
</tr>
</tbody>
</table>

[Operation procedure]

ADVANCED SETTING

[Diagram of menu settings with options for E.I and SHUT PRI/GAIN PRI]
Flickerless mode

This function reduces the flicker occurring on the screen when an NTSC system camera is used under fluorescent lighting conditions at 50Hz power supply frequency. When flickerless mode is set to ON, flicker mitigation mode becomes available. Flickerless mode is only available with NTSC mode. This mode is not selectable with PAL. The default setting is OFF.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLICKER</td>
<td>OFF</td>
<td>Flicker mitigation OFF</td>
<td>○</td>
</tr>
<tr>
<td>LESS MODE</td>
<td>ON</td>
<td>Flicker mitigation ON</td>
<td>○</td>
</tr>
</tbody>
</table>

[Operation procedure]

![Diagram of Advanced Setting Menu with E.I, Shutter Limit, Low Light Scene, and Flickerless Mode settings]
When slow shutter (ESS) is selected in the shutter mode setting section, the following settings can also be set if required.

**Shutter speed**

This is the function that selects the exposure time for a slow shutter speed. The default setting is X2.

<table>
<thead>
<tr>
<th>SHUTTER SPEED</th>
<th>NTSC</th>
<th>PAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>X2</td>
<td>1/30s</td>
<td>1/25s</td>
</tr>
<tr>
<td>X4</td>
<td>1/15s</td>
<td>1/12.5s</td>
</tr>
<tr>
<td>X8</td>
<td>1/7.5s</td>
<td>1/6.25s</td>
</tr>
<tr>
<td>X16</td>
<td>1/3.75s</td>
<td>1/3.125s</td>
</tr>
<tr>
<td>X32</td>
<td>1/1.875s</td>
<td>1/1.5625s</td>
</tr>
</tbody>
</table>

[Operation procedure]
3.1.3. Auto gain control (AGC)

This is a function that sets the maximum value of the auto gain control. When the manual gain value is enlarged, the sensitivity will increase and also noise will increase. MANUAL mode is only available when stable lighting conditions around the object is obtained. The dynamic range of the dark area might be decreased depending on the object. LOW/MEDIUM/HIGH mode is recommended for normal use. The default setting is LOW.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>0~22dB (Automatic control)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>MEDIUM</td>
<td>0~32dB (Automatic control)</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>HIGH</td>
<td>0~40dB (Automatic control)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>MANUAL</td>
<td>Fixed gain</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

Chart 9. Fixed gain setting in MANUAL mode

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAIN</td>
<td>0~40dB (1dB STEP)</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

⚠️ When auto gain control is set to MANUAL, AUTO mode cannot be selected with the DAY/NIGHT control section
[Operation procedure]

**EASY SETTING**

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAT-1000 MAIN MENU</td>
<td></td>
</tr>
<tr>
<td>EASY SETTING.</td>
<td>ADVANCED SETTING.</td>
</tr>
<tr>
<td>LOAD USER SETTINGS.</td>
<td>SAVE USER SETTINGS.</td>
</tr>
<tr>
<td>RESTORE FACTORY SETTINGS.</td>
<td></td>
</tr>
<tr>
<td>EXIT MENU</td>
<td></td>
</tr>
</tbody>
</table>

**ADVANCED SETTING**

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAT-1000 MAIN MENU</td>
<td></td>
</tr>
<tr>
<td>EASY SETTING.</td>
<td>ADVANCED SETTING.</td>
</tr>
<tr>
<td>LOAD USER SETTINGS.</td>
<td>SAVE USER SETTINGS.</td>
</tr>
<tr>
<td>RESTORE FACTORY SETTINGS.</td>
<td></td>
</tr>
<tr>
<td>EXIT MENU</td>
<td></td>
</tr>
</tbody>
</table>

**EASY SETTING (1/2)**

- DYNAMIC RANGE: MEDIUM
- AE PRE: HIGHLIGHTS
- SLOW SHUTTER: ON
- AGC: LOW
- CONTROL SPEED: NORMAL
- NEXT PAGE...

**ADVANCED SETTING**

- AUTO EXPOSURE
- WHITE BALANCE:
- DAY/NIGHT SETTING:
- IMAGE SETTING:
- FUNCTIONS:

**RETURN TO MAIN MENU**

**EASY SETTING (2/2)**

- DYNAMIC RANGE: MEDIUM
- AE PRE: HIGHLIGHTS
- SLOW SHUTTER: ON
- AGC: LOW
- CONTROL SPEED: NORMAL
- NEXT PAGE...

**ADVANCED SETTING**

- AUTO EXPOSURE
- SHUTTER MODE: E.I.
- AGC: LOW
- DYNAMIC RANGE: MEDIUM
- AE PRE: HIGHLIGHTS
- BACKLIGHT: OFF
- CONTROL SPEED: NORMAL
- PREVIOUS PAGE...

**PREVIOUS PAGE...**

**RETURN TO MAIN MENU**

**LOW**

**HIGH**

**LOW**

**MEDIUM**

**HIGH**

**MANUAL**
3.1.4. Contrast preference setting for exposure control

This is a function that selects the reference setting for the auto exposure control (AE) and dynamic range control.

Set to SHADOWS when the dark part of an object is needed to be monitored. When the bright part of an object is to be monitored, set to HIGHLIGHT. The default setting is HIGHLIGHT.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE SHADOWS</td>
<td>Dark part preference</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>AE HIGHLIGHTS</td>
<td>Bright part preference</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Fig. 4

<table>
<thead>
<tr>
<th>SHADOWS</th>
<th>HIGHLIGHTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Image 1" /></td>
<td><img src="image2" alt="Image 2" /></td>
</tr>
</tbody>
</table>

DYNAMIC RANGE set to MEDIUM
[Operation procedure]
3.1.5. Control speed

This is the function that sets the control speed of the AE control and white balance control. The control speed setting of both the AE control and the white balance control can be set in the CONTROL SPEED at EASY SETTING section. As for the ADVANCED SETTING section, the control speed of the AE control is set by AUTOMATIC EXPOSURE, and the control speed of the white balance control is set by WHITE BALANCE. Therefore, if detailed settings of each control speed independently are needed, set them using the ADVANCED SETTING section.

When the control speed is set to SLOW, the monitored image becomes slow to react to the environment, and it takes time for the adjustment. However, the changing process becomes smooth due to small control steps.

When set to NORMAL, the control speed and the control steps become normal.

When set to FAST, the control speed becomes fast, and the time adjustment becomes short.

The default setting is NORMAL. Refer to ATW for a more detailed explanation.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLOW</td>
<td>Low speed control</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>NORMAL</td>
<td>Normal</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>FAST</td>
<td>High speed control</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>SLOW</td>
<td>Low speed control</td>
<td>×</td>
<td>○</td>
</tr>
<tr>
<td>NORMAL</td>
<td>Normal</td>
<td>×</td>
<td>○</td>
</tr>
<tr>
<td>FAST</td>
<td>High speed control</td>
<td>×</td>
<td>○</td>
</tr>
</tbody>
</table>
**[Operation procedure]**

### EASY SETTING

<table>
<thead>
<tr>
<th>Operation</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy Setting</td>
<td>Easy Setting Menu</td>
</tr>
<tr>
<td>Load User Settings</td>
<td>Load User Settings Menu</td>
</tr>
<tr>
<td>Save User Settings</td>
<td>Save User Settings Menu</td>
</tr>
<tr>
<td>Restore Factory Settings</td>
<td>Restore Factory Settings Menu</td>
</tr>
<tr>
<td>Exit Menu</td>
<td>Exit Menu</td>
</tr>
</tbody>
</table>

**Easy Setting (1/2)**
- Dynamic Range: Medium
- AE Pref: Highlights
- Slow Shutter: On
- Control Speed: Normal

**Easy Setting (2/2)**
- Dynamic Range: Medium
- AE Pref: Highlights
- Slow Shutter: On
- Control Speed: Normal

### ADVANCED SETTING

<table>
<thead>
<tr>
<th>Operation</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy Setting</td>
<td>Easy Setting Menu</td>
</tr>
<tr>
<td>Advanced Setting</td>
<td>Advanced Setting Menu</td>
</tr>
<tr>
<td>Load User Settings</td>
<td>Load User Settings Menu</td>
</tr>
<tr>
<td>Save User Settings</td>
<td>Save User Settings Menu</td>
</tr>
<tr>
<td>Restore Factory Settings</td>
<td>Restore Factory Settings Menu</td>
</tr>
<tr>
<td>Exit Menu</td>
<td>Exit Menu</td>
</tr>
</tbody>
</table>

**Advanced Setting**
- Automatic Exposure
- White Balance
- Day/Night Setting
- Image Setting
- Functions
- Return to Main Menu

**Automatic Exposure**
- Shutter Mode: EI
- AGC: Low
- Dynamic Range: Medium
- AE Pref: Highlights
- Control Speed: Normal
- Previous Page

**Automatic Exposure**
- Shutter Mode: EI
- AGC: Low
- Dynamic Range: Medium
- AE Pref: Highlights
- Control Speed: Normal
- Previous Page

**Automatic Exposure**
- Shutter Mode: EI
- AGC: Low
- Dynamic Range: Medium
- AE Pref: Highlights
- Control Speed: Normal
- Previous Page

**SLOW NORMAL FAST**

---

23
3.2. White balance

The white balance is a function to correct color temperature of a white object under various lighting environments.

ATW mode automatically follows and adjusts to the changing color temperature of the illumination. This mode is effective when the lighting environment changes.

In PWB mode, the correction value of the white balance of the camera is calculated by using white paper and the achromatic color object to fix the correct color balance.

MANUAL mode is set to the correction value of the white balance by the slider as required.

PRESET mode: There are four kinds of white balance modes in PRESET, select the required color temperature from 3200K, 4300K, 6500K and 9300K.

The default setting is ATW.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATW</td>
<td>Automatically follows and adjusts to the changing color temperature of the illumination</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>PWB</td>
<td>The correction value of the white balance is calculated.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>MANUAL</td>
<td>Manually adjust for the correction value of the white balance.</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>PRESET</td>
<td>Select the color temperature in the Preset</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
### EASY SETTING

**OPERATION**

- LONGPUSH
- PUSH
- NEXT PAGE

**MENU**

- WAT-1000 MAIN MENU
- EASY SETTING
- ADVANCED SETTING
- LONG USER SETTINGS
- RESTORE FACTORY SETTINGS
- EXIT MENU

**EASY SETTING(1/2)**

- DYNAMIC RANGE MEDIUM
- AE PREV. HIGHLIGHTS ON
- SLOW SHUTTER LOW
- CONTROL SPEED NORMAL

**EASY SETTING(2/2)**

- WHITE BALANCE ATW
- DAY/NIGHT OFF
- BACKLIGHT OFF
- FLICKERLESS MODE OFF

### ADVANCED SETTING

**OPERATION**

- LONGPUSH
- PUSH
- DOWN

**MENU**

- WAT-1000 MAIN MENU
- EASY SETTING
- ADVANCED SETTING
- LOAD USER SETTINGS
- SAVE USER SETTINGS
- RESTORE FACTORY SETTINGS
- EXIT MENU

**ADVANCED SETTING**

- AUTO MATIC EXPOSURE
- WHITE BALANCE
- DAY/NIGHT SETTING
- IMAGE SETTING
- FUNCTIONS

**WHITE BALANCE**

- MODE: ATW

**RETURN TO MAIN MENU**

### ATW PWB

- 3200K
- 4300K
- 6500K
- 9300K

**ATW PWB MANUAL PRESET**
The ATW has the following additional settings.

LOWLIGHT is a parameter that is set to the minimum value of the control range when controlling the color temperature using ATW.

HIGHLIGHT is a parameter that is set to the maximum value of the control range when controlling the color temperature using ATW.

The CONTROL SPEED is a parameter setting the ATW adjustment speed. There are three settings, slow, normal and fast. With slow and Normal settings, the adjustment changes smoothly. In fast mode, the speed of the adjustment is fast, but it will not be as smooth as normal and slow. The adjustment will be in short steps.

Chart 13. ATW setting list

<table>
<thead>
<tr>
<th>SETTING</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOWLIMIT</td>
<td>The setting for the minimum correction value of the correction range of the ATW</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>2000K ~ 5500K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIGHLIMIT</td>
<td>The setting for the maximum correction value of the correction range of the ATW</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>5500K ~ 11000K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONTROL</td>
<td>The control speed of the ATW set to slow</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>SPEED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLOW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NORMAL</td>
<td>The control speed of the ATW set to normal</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>FAST</td>
<td>The control speed of the ATW set to fast</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>
[Operation procedure]

LOW LIMIT/HIGH LIMIT

CONTROL SPEED

WHITE BALANCE

MODE

ATW

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.

LOW LIMIT

HIGH LIMIT

CONTROL SPEED

NORMAL

PREVIOUS PAGE.
MANUAL mode has the following additional settings.
KELVIN sets the required correction value of the white balance using the slider.
The range of color temperature can be set from 2500K to 11000K.

<table>
<thead>
<tr>
<th>SETTING</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>KELVIN</td>
<td>2.5K ~ 11K</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Manually adjusts the correction value of the white balance.

[Operation procedure]

![Diagram of operation procedure]

2500K ~ 11000K
PRESET mode has the following additional settings.

3200K: This white balance correction value is suitable when using incandescent lighting and halogen bulbs.

4300K: This white balance correction value is suitable when using fluorescent lighting (white color: W).

5600K: This white balance correction value is suitable when using fluorescent lighting (daylight color: D).

9300K: This white balance correction value is suitable when using LED etc. with high color temperature.

Chart 15. Preset setting list

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLOR TEMP.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3200K</td>
<td>When using incandescent lighting</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4300K</td>
<td>When using fluorescent lighting (white color: W)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6500K</td>
<td>When using fluorescent lighting (daylight color: D)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>9300K</td>
<td>When using LED etc. with high color temperature</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

[Operation procedure]
3.3. DAY/NIGHT Setting

The image sensor, which is used by the WAT-1000 has a sensitivity for near infrared. Usually, the near-infrared rays are not visible to the human eye. Therefore, it needs to block the infrared light entering the image sensor to perform the color reproduction according to the human eye by the color camera. The infrared cut filter is effective for the above purpose. The infrared cut filter operates effectively when adequate lighting is obtained for the object. However, when the object becomes dark, the infrared cut filter cannot operate effectively since the incident light is not enough for the near-infrared light to be cut.

In the WAT-1000, this function can switch over to the Day mode (color mode with infrared filter) and Night mode (monochrome mode without infrared filter) by the infrared cut filter switching unit.

There are four selectable modes as shown below. The default setting is DAY(OFF).

<table>
<thead>
<tr>
<th>D/N CONTROL (DAY/NIGHT)</th>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO</td>
<td>Mode changing according to the lighting condition</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>DAY (OFF)</td>
<td>Day mode / Color</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>NIGHT</td>
<td>Night mode / Monochrome</td>
<td>○</td>
<td>×</td>
<td></td>
</tr>
<tr>
<td>EXT</td>
<td>Mode changing from external signal</td>
<td>○</td>
<td>×</td>
<td></td>
</tr>
</tbody>
</table>

( ): EASY SETTING

In AUTO mode, DAY/NIGHT mode is automatically changed according to the illumination of the object. For the determination of brightness, it uses the gain value of the auto gain control.

Under the DAY mode condition, when the object becomes dark, and the gain value of the AGC exceeds the set value, the camera mode becomes NIGHT mode automatically. On the other hand, when the object becomes bright, and the gain value of AGC becomes less than the set value, DAY mode is automatically selected. At this time, when the preset value of both the AGC gain is the same, "hunting" may occur. For the WAT-1000, to prevent hunting, the adjustment difference of the AGC gain uses the parameters [INTO NIGHT] and [HYSTERESIS].

The INTO NIGHT mode sets the switching level from the day mode to the night mode. It becomes night mode when the AGC gain of the camera exceeds the setting value of the INTO NIGHT mode. In HYSTERESIS, the switch level from day mode to night mode is set by the difference of the INTO NIGHT mode. The default setting is 19dB for INTO NIGHT and 6dB for HYSTERESIS.
Adjustment method

The adjustment procedure of INTO NIGHT and HYSTERESIS are as follows.

1. Set the INTO NIGHT to 19dB and set the HYSTERESIS to 6dB.
2. Adjust the aperture of the lens and/or the illumination while watching the monitor to duplicate the light level of the night mode.
3. Until switching to night mode, keep increasing the level of the INTO NIGHT mode slowly.
4. If hunting does not occur, go on to step ⑥.
5. When hunting is generated, keep rising the value of HYSTERESIS step by step until the hunting stops. If hunting does not stop with the maximum value of the HYSTERESIS mode, AUTO mode may not be available. Therefore, please change the object or the illumination, or use EXT mode.
6. Confirm the switching of Day/Night mode operates properly without any problems by adjusting the aperture of a lens and/or the illumination. Save the above mentioned setting by “Save user setting” if there is no problem.
7. The set value of HYSTERESIS may be too large if it is not switching into the DAY mode. Please readjust from ①. If it still does not switch normally, use another object or change the illumination condition, or use EXT mode.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTO NIGHT</td>
<td>The switch level to monochrome from color</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>HYSTERESIS</td>
<td>The blind sector of the switching level</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>
### EASY SETTING

- **OPERATION MENU**
  - UPDATED
  - EASY SETTING
  - ADVANCED SETTING
  - LOAD USER SETTING
  - SAVE USER SETTING
  - RESTORE FACTORY SETTING
  - EXIT MENU

### ADVANCED SETTING

- **OPERATION MENU**
  - UPDATED
  - EASY SETTING
  - ADVANCED SETTING
  - LOAD USER SETTING
  - SAVE USER SETTING
  - RESTORE FACTORY SETTING
  - EXIT MENU

#### EASY SETTING (1/2)

- **Dynamic Range**: Medium
- **AE Pref.**: Highlight
- **Slow Shutter**: On
- **AGC**: Low
- **Control Speed**: Normal

### PREVIOUS PAGE

#### EASY SETTING (2/2)

- **White Balance**: ATW
- **Day/Night**: Off
- **Backlight**: Off
- **Flickerless Mode**: Off

#### PREVIOUS PAGE

#### PREVIOUS PAGE

#### PREVIOUS PAGE

#### PREVIOUS PAGE
INPUT DURATION is set to 1 second before the camera switches over to NIGHT MODE. This one-second delay means that in an environment with changing light the camera doesn’t switch over to NIGHT MODE by mistake. The default setting is one second, but can be changed to suite your needs.

HOLD TIME, sets a period to stop the switching behavior after the DAY/NIGHT mode is switched. This mode prevents switching back again accidentally until the exposure control becomes stable after the infrared cut filter has been switched. The default setting is 800ms.

![Fig. 5](image)

**Chart 18. DURATION setting list**

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT DURATION[s]</td>
<td>Switch level duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOLD TIME[ms]</td>
<td>Hold time after switched</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### DAY/NIGHT SETTING

**AUTO MENU**

- **OPERATION:**
  - Day/Night Setting

- **DAY/NIGHT AUTO SETTING**
  - D/N CONTROL: AUTO

- **DAY/NIGHT THRESHOLD SETTING**
  - INTO NIGHT: 19
  - HYSTERESIS: 6
  - SET INTO NIGHT GAIN LESS THAN AGC MAX.
  - THE PRESENT AGC MAX is 22

- **INPUT DURATION [s]**
- **HOLD TIME [ms]**

**EXT MENU**

- **OPERATION:**
  - Day/Night Setting

- **DAY/NIGHT EXT SETTING**
  - INPUT DURATION [s]
  - HOLD TIME [ms]

**PREVIOUS PAGE..**

### DAY/NIGHT EXT SETTING

**AUTO MENU**

- **INPUT DURATION [s]**
- **HOLD TIME [ms]**

**PREVIOUS PAGE..**

### DAY/NIGHT EXT SETTING

**EXT MENU**

- **INPUT DURATION [s]**
- **HOLD TIME [ms]**

**PREVIOUS PAGE..**

---

**AGC MAX-1**

- **0~255**
- **0~65200**
3.4. Image Setting

3.4.1. Digital zoom

The WAT-1000 has a Digital Zoom/Pan/Tilt function. The required area on the monitor can be zoomed into. Automatic exposure control, dynamic range control and white balance mode are available within the zoom area assigned by digital zoom.

The digital zoom is available when ON is selected in the ZOOM section. When OFF is selected, the digital zoom is not available. The default setting is OFF.

<table>
<thead>
<tr>
<th>Chart 19. ZOOM mode setting list</th>
</tr>
</thead>
<tbody>
<tr>
<td>SETTING VALUE</td>
</tr>
<tr>
<td>ZOOM</td>
</tr>
<tr>
<td>OFF</td>
</tr>
</tbody>
</table>

When zoom mode is set to ON, push the center of the jog-dial, the following additional settings are available.

ZOOM : Setting the magnification percentage. An indicated value of the magnification ratio. (Max: 4)
PAN : Setting Left/Right position. (Left: extremity: -100, Right extremity: 100)
TILT : Setting Upper/Lower position. (Lower limit: -100, Upper limit: 100)

<table>
<thead>
<tr>
<th>Chart 20. ZOOM setting list</th>
</tr>
</thead>
<tbody>
<tr>
<td>SETTING VALUE</td>
</tr>
<tr>
<td>ZOOM</td>
</tr>
<tr>
<td>PAN</td>
</tr>
<tr>
<td>TILT</td>
</tr>
</tbody>
</table>

⚠️ ZOOM mode is not available with ACTIVITY DETECTION mode.
**[Operation procedure]**

### ZOOM

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUSH</td>
<td>WAT-1000 MAIN MENU</td>
</tr>
<tr>
<td></td>
<td>EASY SETTING</td>
</tr>
<tr>
<td></td>
<td>ADVANCED SETTING</td>
</tr>
<tr>
<td></td>
<td>LOAD USER SETTINGS</td>
</tr>
<tr>
<td></td>
<td>SAVE USER SETTINGS</td>
</tr>
<tr>
<td></td>
<td>RESTORE FACTORY SETTINGS</td>
</tr>
<tr>
<td></td>
<td>EXIT MENU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PUSH</th>
<th>ADVANCED SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AUTOMATIC EXPOSURE.</td>
</tr>
<tr>
<td></td>
<td>WHITE BALANCE.</td>
</tr>
<tr>
<td></td>
<td>DAY/NIGHT SETTING.</td>
</tr>
<tr>
<td></td>
<td>IMAGE SETTING.</td>
</tr>
<tr>
<td></td>
<td>FUNCTIONS.</td>
</tr>
<tr>
<td></td>
<td>RETURN TO MAIN MENU</td>
</tr>
</tbody>
</table>

### IMAGE SETTING

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>ZOOM</th>
<th>FLIP</th>
<th>BW MODE</th>
<th>GAMMA MODE</th>
<th>SHARPNESS SETTING</th>
<th>CHROMA SETTING</th>
<th>PREVIOUS PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUSH</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>PREVIOUS PAGE</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>PREVIOUS PAGE</td>
</tr>
</tbody>
</table>

### PREVIOUS PAGE

<table>
<thead>
<tr>
<th>PUSH</th>
<th>ZOOM</th>
<th>FLIP</th>
<th>BW MODE</th>
<th>GAMMA MODE</th>
<th>SHARPNESS SETTING</th>
<th>CHROMA SETTING</th>
<th>PREVIOUS PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>PREVIOUS PAGE</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
<td>PREVIOUS PAGE</td>
</tr>
</tbody>
</table>

**ON OFF**
3.4.2. Flip

This mode is to flip an image horizontally and to flip an image vertically. It is used when using a back monitoring system for vehicles or to monitor a mirror image. Neither Camera ID nor OSD menu are inverted.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Normal image</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>HORIZ</td>
<td>Flip horizontal</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>VERT</td>
<td>Flip vertical</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>BOTH</td>
<td>Flip horizontal/vertical</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

Fig. 6  Flip image

![Flip image](image-url)
**[Operation procedure]**

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>←</td>
<td>WAT-1000 MAIN MENU</td>
</tr>
<tr>
<td></td>
<td>EASY SETTING</td>
</tr>
<tr>
<td></td>
<td>ADVANCED SETTING</td>
</tr>
<tr>
<td></td>
<td>LOAD USER SETTINGS,</td>
</tr>
<tr>
<td></td>
<td>SAVE USER SETTINGS,</td>
</tr>
<tr>
<td></td>
<td>RESTORE FACTORY SETTINGS</td>
</tr>
<tr>
<td></td>
<td>EXIT MENU</td>
</tr>
<tr>
<td></td>
<td>ADVANCED SETTING</td>
</tr>
<tr>
<td></td>
<td>AUTOMATIC EXPOSURE,</td>
</tr>
<tr>
<td></td>
<td>WHITE BALANCE,</td>
</tr>
<tr>
<td></td>
<td>DAY/NIGHT SETTING,</td>
</tr>
<tr>
<td></td>
<td>IMAGE SETTING,</td>
</tr>
<tr>
<td></td>
<td>FUNCTIONS</td>
</tr>
<tr>
<td></td>
<td>RETURN TO MAIN MENU</td>
</tr>
<tr>
<td>x3</td>
<td>IMAGE SETTING</td>
</tr>
<tr>
<td></td>
<td>ZOOM</td>
</tr>
<tr>
<td></td>
<td>FLIP</td>
</tr>
<tr>
<td></td>
<td>BW MODE</td>
</tr>
<tr>
<td></td>
<td>GAMMA MODE</td>
</tr>
<tr>
<td></td>
<td>SHARPNESS SETTING,</td>
</tr>
<tr>
<td></td>
<td>CHROMA SETTING,</td>
</tr>
<tr>
<td></td>
<td>PREVIOUS PAGE</td>
</tr>
<tr>
<td></td>
<td>IMAGE SETTING</td>
</tr>
<tr>
<td></td>
<td>ZOOM</td>
</tr>
<tr>
<td></td>
<td>FLIP</td>
</tr>
<tr>
<td></td>
<td>BW MODE</td>
</tr>
<tr>
<td></td>
<td>GAMMA MODE</td>
</tr>
<tr>
<td></td>
<td>SHARPNESS SETTING,</td>
</tr>
<tr>
<td></td>
<td>CHROMA SETTING,</td>
</tr>
<tr>
<td></td>
<td>PREVIOUS PAGE</td>
</tr>
<tr>
<td></td>
<td>IMAGE SETTING</td>
</tr>
<tr>
<td></td>
<td>ZOOM</td>
</tr>
<tr>
<td></td>
<td>FLIP</td>
</tr>
<tr>
<td></td>
<td>BW MODE</td>
</tr>
<tr>
<td></td>
<td>GAMMA MODE</td>
</tr>
<tr>
<td></td>
<td>SHARPNESS SETTING,</td>
</tr>
<tr>
<td></td>
<td>CHROMA SETTING,</td>
</tr>
<tr>
<td></td>
<td>PREVIOUS PAGE</td>
</tr>
</tbody>
</table>

**OFF**

**HORIZ**

**VERT**

**BOTH**
3.4.3. BW mode

This function is used to set the color output format of the video signal output mode. The default setting is OFF.
When OFF is selected, the BW mode output is color.
When B/W is selected, the BW mode output is monochrome.
When B/W w/Burst is selected, BW mode output is monochrome and the color burst signal is added.
B/W w/Burst mode is used for a monitor which needs color burst to indicate an image.

Chart 22. BW mode setting list

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>Color output</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>B/W</td>
<td>Monochrome output</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>B/W w/Burst</td>
<td>Monochrome output with burst</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

[Operation procedure]
3.4.4. Gamma correction

In general, the output of the CRT monitor and LCD monitor has nonlinearity against the input signal. Therefore, the correction of the characteristic opposite to the monitor is put on the output signal on the camera side beforehand so that the output by the monitor will become linear. This is called gamma correction. There are five kinds of gamma correction modes for the WAT-1000.

AUTO is the mode that automatically switches to 0.45 for PAL and 0.36 for NTSC according to the output format of the camera. Select this mode for normal usage.
0.36: The standard correction factor for PAL format
0.45: The standard correction factor for NTSC
0.6: The correction factor which emphasizes the tone of the bright part of the standard setting
OFF: Linear output with no correction (For image processing use)

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAMMA MODE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTO</td>
<td>0.36/0.45 (Automatic switch)</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>0.36</td>
<td>PAL (Standard setting)</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>0.45</td>
<td>NTSC (Standard setting)</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>0.6</td>
<td>Emphasized bright area</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>OFF</td>
<td>Linear output</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

Chart 23. Gamma correction setting list
[Operation procedure]

**ADVANCED SETTING**

**OPERATION**
- **WAT-1000 MAIN MENU**
  - EASY SETTING
  - ADVANCED SETTING

**EASY SETTING**
- LOAD USER SETTINGS
- SAVE USER SETTINGS
- RESTORE FACTORY SETTINGS
- EXIT MENU

**ADVANCED SETTING**
- AUTOMATIC EXPOSURE
- WHITE BALANCE
- DAY/NIGHT SETTING
- IMAGE SETTING
- FUNCTIONS
- RETURN TO MAIN MENU

**IMAGE SETTING**
- ZOOM
- FLIP
- BW MODE
- GAMMA MODE
- SHARPNESS SETTING
- CHROMA SETTING
- PREVIOUS PAGE

**IMAGE SETTING**
- ZOOM
- FLIP
- BW MODE
- GAMMA MODE
- SHARPNESS SETTING
- CHROMA SETTING
- PREVIOUS PAGE

**IMAGE SETTING**
- ZOOM
- FLIP
- BW MODE
- GAMMA MODE
- SHARPNESS SETTING
- CHROMA SETTING
- PREVIOUS PAGE

**IMAGE SETTING**
- ZOOM
- FLIP
- BW MODE
- GAMMA MODE
- SHARPNESS SETTING
- CHROMA SETTING
- PREVIOUS PAGE

**IMAGE SETTING**
- ZOOM
- FLIP
- BW MODE
- GAMMA MODE
- SHARPNESS SETTING
- CHROMA SETTING
- PREVIOUS PAGE
### 3.4.5. Sharpness

This function is used to correct the sharpness of the picture.

When DETAIL BOOST ON is selected, the edge enhancement processing is increased when an object has enough lighting. The image becomes sharp, but noise may increase around the dark part. When DETAIL BOOST OFF is selected, the edge enhancement mode is not available.

<table>
<thead>
<tr>
<th>DETAIL BOOST</th>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>DETAIL BOOST</td>
<td>ON</td>
<td>Edge enhancement is available in bright conditions</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>DETAIL BOOST</td>
<td>OFF</td>
<td>Edge enhancement is not available</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

When NOISE REDUCTION ON is selected, noise is reduced and a soft image can be obtained. When OFF is selected, noise is visible, but a sharper image is obtained.

<table>
<thead>
<tr>
<th>NOISE REDUCTION</th>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOISE REDUCTION</td>
<td>ON</td>
<td>The noise control ON</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>NOISE REDUCTION</td>
<td>OFF</td>
<td>The noise control OFF</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>
## Operation Procedure

### DETAIL BOOST MENU

<table>
<thead>
<tr>
<th>Operation</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy Setting</td>
<td>ADVANCED SETTING</td>
</tr>
<tr>
<td>Load User Settings</td>
<td>Save User Settings</td>
</tr>
<tr>
<td>Restore Factory Settings</td>
<td>Exit Menu</td>
</tr>
</tbody>
</table>

### NOISE REDUCTION MENU

<table>
<thead>
<tr>
<th>Operation</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy Setting</td>
<td>ADVANCED SETTING</td>
</tr>
<tr>
<td>Load User Settings</td>
<td>Save User Settings</td>
</tr>
<tr>
<td>Restore Factory Settings</td>
<td>Exit Menu</td>
</tr>
</tbody>
</table>
When the SHARPNESS setting value is raised, the level of edge enhancement of the whole screen goes up and becomes sharper, but noise is highly visible.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHARPNESS</td>
<td>-7~7</td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>

The level of edge enhancement on the whole screen

When the APERTURE setting value is raised, the level of the horizontal edge enhancement goes up and becomes a sharper image.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>APERTURE</td>
<td>-7~7</td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>

The level of horizontal edge object enhancement
[Operation procedure]

**SHARPNESS**

**OPERATION**

- PUSH

**MENU**

- EASY SETTING
- LOAD USER SETTINGS
- SAVE USER SETTINGS
- RESTORE FACTORY SETTINGS
- EXIT MENU

**ADVANCED SETTING**

- AUTOMATIC EXPOSURE
- WHITE BALANCE
- DAY/NIGHT SETTING
- IMAGE SETTING
- FUNCTIONS

**IMAGE SETTING**

- ZOOM
- FLIP
- BW MODE
- GAMMA MODE
- SHARPNESS SETTING
- CHROMA SETTING
- PREVIOUS PAGE

**SHARPNESS SETTING**

- DETAIL BOOST
- NOISE REDUCTION
- APERTURE
- PREVIOUS PAGE

**APERTURE**

- PUSH

**MENU**

- EASY SETTING
- LOAD USER SETTINGS
- SAVE USER SETTINGS
- RESTORE FACTORY SETTINGS
- EXIT MENU

**ADVANCED SETTING**

- AUTOMATIC EXPOSURE
- WHITE BALANCE
- DAY/NIGHT SETTING
- IMAGE SETTING
- FUNCTIONS

**IMAGE SETTING**

- ZOOM
- FLIP
- BW MODE
- GAMMA MODE
- SHARPNESS SETTING
- CHROMA SETTING
- PREVIOUS PAGE

**SHARPNESS SETTING**

- DETAIL BOOST
- NOISE REDUCTION
- APERTURE
- PREVIOUS PAGE

-7~7
3.4.6. Chroma

CHROMA LEVEL is the parameter adjusting the vividness of the color of the video signal. When the chroma level is increased, the color of the video signal becomes more vivid. The default setting is 0.

CHROMA LIMIT is the parameter for setting the maximum value of color saturation degree. When the setting value of the chroma limit is increased, it can reduce the color fade around high luminance in extreme backlight conditions. However, with a standard object, the color may change slightly in some areas due to the high luminance area on the screen.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHROMA LEVEL</strong></td>
<td>-7~7</td>
<td>Setting the vividness of the color of the video signal</td>
<td>○</td>
</tr>
<tr>
<td><strong>CHROMA LIMIT</strong></td>
<td>100~130</td>
<td>Setting the color saturation degree</td>
<td>○</td>
</tr>
</tbody>
</table>

**Fig. 7**

CHROMA LIMIT : 100

CHROMA LIMIT : 130
[Operation procedure]

CHROMA LEVEL

OPERATION

MENU

EASY SETTING

ADVANCED SETTING

LOAD USER SETTINGS.

SAVE USER SETTINGS.

RESTORE FACTORY SETTINGS.

EXIT MENU

ADVANCED SETTING

AUTOMATIC EXPOSURE.

WHITE BALANCE.

DAY/NIGHT SETTING.

IMAGE SETTING.

FUNCTIONS.

RETURN TO MAIN MENU

x3

PUSH

CHROMA SETTING

CHROMA LEVEL < 0 >

CHROMA LIMIT < 130 >

PREVIOUS PAGE.

-7~7

PREVIOUS PAGE.

LONGPUSH

LONGPUSH

CHROMA LIMIT

100~130

PREVIOUS PAGE.
3.5. Functions
3.5.1. Focus adjustment

When the back focus and the focus of the lens is adjusted, the meter displays the focus condition. The large meter value of the focus display means a better focus. When the lighting conditions change, the meter value of the focus will also change. Therefore, please adjust the focus under stable lighting conditions if possible.

[Operation procedure]
3.5.2. Video output format

The WAT-1000 has a NTSC version and PAL version for convenience. However, the video output format can be selected using the “On Screen Display” menu.

VIDEO STANDARD is a parameter selecting the video output format. An NTSC version or a PAL version can be selected as needed. Set the same version as the target system.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIDEO STANDARD</td>
<td>NTSC</td>
<td>NTSC output</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>PAL</td>
<td>PAL output</td>
<td>○</td>
</tr>
</tbody>
</table>
### Operation Procedure

**VIDEO STANDARD**

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONG/PUSH</td>
<td>WAIT-1020 MAIN MENU</td>
</tr>
<tr>
<td>DOWN</td>
<td>EASY SETTING</td>
</tr>
<tr>
<td></td>
<td>ADVANCED SETTING</td>
</tr>
<tr>
<td>PUSH</td>
<td>LOAD USER SETTINGS, SELL USER SETTINGS, RESTORE FACTORY SETTINGS</td>
</tr>
<tr>
<td></td>
<td>EXIT MENU</td>
</tr>
<tr>
<td>x2</td>
<td>ADVANCED SETTING</td>
</tr>
<tr>
<td></td>
<td>AUTOMATIC EXPOSURE, WHITE BALANCE, DAY/NIGHT SETTING, IMAGE SETTING</td>
</tr>
<tr>
<td></td>
<td>FUNCTIONS</td>
</tr>
<tr>
<td>PUSH</td>
<td>RETURN TO MAIN MENU</td>
</tr>
<tr>
<td>DOWN</td>
<td>FUNCTIONS</td>
</tr>
<tr>
<td></td>
<td>FOCUS</td>
</tr>
<tr>
<td></td>
<td>VIDEO OUTPUT</td>
</tr>
<tr>
<td></td>
<td>CAMERA ID SETTING, ACTIVITY DETECTION, BAUDRATE 38400</td>
</tr>
<tr>
<td></td>
<td>RETURN TO MAIN MENU</td>
</tr>
<tr>
<td>PUSH</td>
<td>VIDEO OUTPUT</td>
</tr>
<tr>
<td></td>
<td>VIDEO STANDARD</td>
</tr>
<tr>
<td></td>
<td>NTSC, FRAME STRUCTURE</td>
</tr>
<tr>
<td></td>
<td>RETURN TO MAIN MENU</td>
</tr>
<tr>
<td>UP</td>
<td>VIDEO OUTPUT</td>
</tr>
<tr>
<td></td>
<td>VIDEO STANDARD</td>
</tr>
<tr>
<td></td>
<td>PAL, FRAME STRUCTURE</td>
</tr>
<tr>
<td></td>
<td>RETURN TO MAIN MENU</td>
</tr>
<tr>
<td>PUSH</td>
<td>VIDEO OUTPUT</td>
</tr>
<tr>
<td></td>
<td>VIDEO STANDARD</td>
</tr>
<tr>
<td></td>
<td>NTSC, FRAME STRUCTURE</td>
</tr>
<tr>
<td></td>
<td>RETURN TO MAIN MENU</td>
</tr>
<tr>
<td>LONG/PUSH</td>
<td>ologue</td>
</tr>
<tr>
<td></td>
<td>EXIT MENU</td>
</tr>
</tbody>
</table>

**NTSC, PAL**
After the VIDEO STANDARD has been selected, push the center of the jog dial, which will you take you to the video output format list.

SETUP LEVEL is set to the reference level of black. This mode is only available with NTSC. 7.5IRE is equivalent of NTSC-M, which is mainly applied in US. For 0IRE, it is equivalent of NTSC-J, which is mainly applied in Japan. Select the SETUP LEVEL according to the specification of the target system. The default setting is 7.5IRE.

Chart 30. SETUP LEVEL setting list

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SETUP LEVEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5IRE</td>
<td>NTSC-M worth</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>0IRE</td>
<td>NTSC-J worth</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

[Operation procedure]
VIDEO LEVEL is set to a standard level of the video output. 75IRE is the standard video output level.
For 100IRE, when it is selected, high contrast images can be seen, but over exposure may occur with bright parts depending on the connected devices. The default setting is 100IRE

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIDEO LEVEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75IRE</td>
<td>Normal output</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>100IRE</td>
<td>High contrast output</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

[Operation procedure]
When the COLOR BAR ON is selected, the adjustment color bar signal is shown on the monitor. This mode is used when the brightness and the color of the monitor needs calibrating. The default setting is OFF.

Chart 32. COLOR BAR setting list

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLOR BAR</td>
<td>OFF Normal video output</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>ON Color bar output</td>
<td></td>
<td>×</td>
</tr>
</tbody>
</table>

[Operation procedure]
3.5.3. Frame structure

This function is set to the frame construction of the video output. The video signal of the NTSC/PAL format is an interlace format that composes of one frame per two fields of an even number line and an odd number line. In the WAT-1000, the method of generating two fields can be selected from three modes.

In the NORMAL mode, one field is generated from information exposed at 1/60 second. When capture is complete using a PC etc. because former information on the two fields that compose one frame is different, a gap (combing noise) between lines is generated.

In the PROGRESSIVE mode, two fields of the even number line and odd number lines are generated from information exposed at 1/60 second. The gap between lines does not occur at capture because the exposure timing of the two fields that composes one frame is the same. However, because the exposure becomes intermittent, the resolution of the moving object becomes decreased.
In the FREEZE mode, it generates the field the same as the PROGRESSIVE mode. However, it doesn't expose the second frame, the following frame is generated from the first exposure information.

![Chart 33. FRAME STRUCTURE setting list](image)

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL</td>
<td>Normal output</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>PROGRESSIVE</td>
<td>Progressive output</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td>FREEZE</td>
<td>Still image output</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>
## Operating procedure

### FRAME STRUCTURE

**OPERATION** | **MENU**
--- | ---
Long push | MAIN-1000 MAIN MENU
Down | EASY SETTING
 | ADVANCED SETTING
 | LOAD USER SETTINGS,
 | SAVE USER SETTINGS,
 | RESTORE FACTORY SETTINGS,
 | EXIT MENU
PUSH | ADVANCED SETTING
 | AUTO EXPOSURE,
 | WHITE BALANCE,
 | DAY/NIGHT SETTING,
 | IMAGE SETTING
 | RETURN TO MAIN MENU
x2 | FUNCTIONS
 | FOCUS,
 | VIDEO OUTPUT,
 | CAMERA ID SETTING,
 | ACTIVITY DETECTION,
 | BALANCE
 | RETURN TO MAIN MENU
PUSH | VIDEO OUTPUT
 | VIDEO STANDARD
 | NTSC,
 | FRAME STRUCTURE
 | NORMAL
 | RETURN TO MAIN MENU
PUSH | VIDEO OUTPUT
 | VIDEO STANDARD
 | NTSC
 | FRAME STRUCTURE
 | FREEZE
 | RETURN TO MAIN MENU
Long push | MAIN-1000 MAIN MENU
3.5.4. Camera ID

CAMERA ID function is to display the arbitrary characters on the screen. When several cameras are used with different parameter settings, it is effective to identify a camera on the screen.

ID DISPLAY is set to ON/OFF for the camera ID. ON is for the display, and OFF is for nondisplay.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID DISPLAY</td>
<td>ON</td>
<td>Camera ID display</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Camera ID nondisplay</td>
<td>○</td>
</tr>
</tbody>
</table>

The CAMERA ID can use various characters for the camera ID. The available character numbers are up to 8 characters for the camera ID, and the available characters are alphabet (capital letters), numerals and symbols (" ", +", ":", ",", ",&", "#", ",@"). The operation method of the CAMERA ID setting is a little different to the basic operation; therefore, please refer to the operation procedure as shown on the next page.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAMERA ID</td>
<td>The setting for character string of the camera ID</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

ID POSITION is to set the display position of camera ID on the OSD.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID POSITION</td>
<td>UP-LEFT</td>
<td>Upper left portion of the screen</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>UP-CENTER</td>
<td>Upper center of the screen</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>UP-RIGHT</td>
<td>Upper right portion of the screen</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>DOWN-LEFT</td>
<td>Lower left portion of the screen</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>DOWN-RIGHT</td>
<td>Lower right of the screen</td>
<td>○</td>
</tr>
</tbody>
</table>
### Operation Procedure

#### ID DISPLAY

<table>
<thead>
<tr>
<th>Operation</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longpush</td>
<td>Longpush</td>
</tr>
<tr>
<td>Push</td>
<td>Push</td>
</tr>
</tbody>
</table>

**Advanced Setting**

- Automatic Exposure...
- White Balance...
- Day/Night Setting...
- Image Setting...
- Return to Main Menu

**Functions**

- Focus...
- Video Output...
- Activity Detection...
- Baud Rate: 38400
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

#### ID POSITION

<table>
<thead>
<tr>
<th>Operation</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longpush</td>
<td>Longpush</td>
</tr>
<tr>
<td>Push</td>
<td>Push</td>
</tr>
</tbody>
</table>

**Advanced Setting**

- Automatic Exposure...
- White Balance...
- Day/Night Setting...
- Image Setting...
- Return to Main Menu

**Functions**

- Focus...
- Video Output...
- Activity Detection...
- Baud Rate: 38400
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu

**Camera ID Setting**

- ID Display: Off
- Camera ID: Camera 1
- ID Position: Up – Left
- Return to Main Menu
CAMERA ID

OPERATION

LONGPUSH

PUSH

ADVANCED SETTING

LOAD USER SETTINGS.
SAVE USER SETTINGS.
RESTORE FACTORY SETTINGS.

EASY SETTING

ADVANCED SETTING

CAMERA ID

WAT-1000 MAIN MENU

EASY SETTING

ADVANCED SETTING

LOAD USER SETTINGS.
SAVE USER SETTINGS.
RESTORE FACTORY SETTINGS.

ADVANCED SETTING

AUTOMATIC EXPOSURE.
WHITE BALANCE.
DAY/NIGHT SETTING.

IMAGE SETTING

FUNCTION

RETURN TO MAIN MENU

FUNCTIONS

FOCUS.
VIDEO OUTPUT.
CAMERA ID SETTING.
ACTIVITY DETECTION.
SCHEDULE.

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU

CAMERA ID

ID DISPLAY

OFF

CAMERA ID: CAMERA1
ID POSITION: UP - LEFT

RETURN TO MAIN MENU
3.5.5. Activity detection

This function outputs an alarm signal and operates the digital zoom when motion is detected.

When ACTIVITY DETECTION is ON, the motion detection is available. When OFF is selected, motion detection mode is not available.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVITY DETECTION</td>
<td>ON</td>
<td>The motion detection is available</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>The motion detection is not available</td>
<td>○</td>
</tr>
</tbody>
</table>

When FULL SCREEN is selected, motion on the full screen is detected. When CUSTOM is selected, the area where motion is detected can be specified.

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>DETECTION ZONE</td>
<td>FULLSCREEN</td>
<td>The detection area is set to full screen.</td>
<td>○</td>
</tr>
<tr>
<td></td>
<td>CUSTOM</td>
<td>The detection area can be specified</td>
<td>○</td>
</tr>
</tbody>
</table>

RESPONSE ZOOM is the function that is to zoom to a required area when a moving body is detected. Specify the zoom ratio in DIG.ZOOM, horizontal position in DIG.PAN and vertical position in DIG.TILT. The zoom ratio can be set up to X4. When RESPONSE ZOOM is not needed, set DIG.ZOOM to 1 (left extremity)

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIG.ZOOM</td>
<td>X1 ~ X4</td>
<td>The settings for zoom ratio</td>
<td>○</td>
</tr>
<tr>
<td>DIG.PAN</td>
<td>-100 ~ 100</td>
<td>The settings for horizontal position</td>
<td>○</td>
</tr>
<tr>
<td>DIG.TILT</td>
<td>-100 ~ 100</td>
<td>The settings for vertical position</td>
<td>○</td>
</tr>
</tbody>
</table>
THRESHOLD & DURATION is used to set the duration of the sensitivity of the motion detection and alarm signal.

ACTIVITY THR is used to set the sensitivity of the motion detection. The sensitivity become high when the set value is low, and it can detect a moving body with a slight change. The default setting is 25.

The DURATION sets the operation period of the alarm signal output and the digital zoom after the motion detection. The default setting is 5 seconds. (Unit: second)

<table>
<thead>
<tr>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTIVITY THR.</td>
<td>0 ~ 255 The sensitivity setting of detection</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>DURATION</td>
<td>3 ~ 60 Alarm output period[s]</td>
<td>○</td>
<td></td>
</tr>
</tbody>
</table>
[Operation procedure]

**Activity Detection**

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longpush</td>
<td>WAT-1000 MAIN MENU</td>
</tr>
<tr>
<td>Longpush</td>
<td>EASY SETTING..</td>
</tr>
<tr>
<td>Longpush</td>
<td>ADVANCED SETTING..</td>
</tr>
<tr>
<td>Longpush</td>
<td>LOAD USER SETTINGS..</td>
</tr>
<tr>
<td>Longpush</td>
<td>SAVE USER SETTINGS..</td>
</tr>
<tr>
<td>Longpush</td>
<td>RESTORE FACTORY SETTINGS..</td>
</tr>
<tr>
<td>Longpush</td>
<td>EXIT MENU</td>
</tr>
</tbody>
</table>

**Advanced Setting**

- Automatic Exposure.. |
- White Balance.. |
- Day/Night Setting.. |
- Image Setting.. |
- Function.. |
- Return to Main Menu

**Functions**

- Focus.. |
- Video Output.. |
- Camera ID Setting.. |
- Activity Detection.. |
- Synchronous 30400 |
- Return to Main Menu

**Activity Detection Setting**

- Activity Detection: OFF  |
- Detection Zone: Fullscreen.. |
- Response Zoom:  |
- Threshold & Duration: N. |
- Return to Main Menu

**Activity Detection Setting**

- Activity Detection: OFF |
- Detection Zone: Fullscreen.. |
- Response Zoom:  |
- Threshold & Duration: N. |
- Return to Main Menu
3.5.6. Baudrate

This function is used to set the communication speed of the serial communication (Unit: bps). Set the BAUDRATE according to the host side.

<table>
<thead>
<tr>
<th>BAUD RATE</th>
<th>SETTING VALUE</th>
<th>DESCRIPTION</th>
<th>ADVANCED</th>
<th>EASY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>115200</td>
<td>115,200bps</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>57600</td>
<td>57,600bps</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>38400</td>
<td>38,400bps</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>19200</td>
<td>19,200bps</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>9600</td>
<td>9,600bps</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>4800</td>
<td>4,800bps</td>
<td>○</td>
<td>×</td>
</tr>
<tr>
<td></td>
<td>2400</td>
<td>2,400bps</td>
<td>○</td>
<td>×</td>
</tr>
</tbody>
</table>

Chart 41. Communication speed setting list
### Operation Procedure

<table>
<thead>
<tr>
<th>BAUDRATE</th>
<th>OPERATION</th>
<th>MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOCK/PUSH</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PUSH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LOCK/PUSH</td>
<td></td>
</tr>
</tbody>
</table>

- **BAUD RATE**
  - **115200**
  - **57600**
  - **38400**
  - **19200**
  - **9600**
  - **4800**
  - **2400**

- **Advanced Setting**
- **Automatic Exposure**
- **White Balance**
- **Day/Night Setting**
- **Image Setting**
- **Functions**
- **Return to Main Menu**
4. Saving, Loading and Restoring

There are three areas in the WAT-1000, which are called the “work area”, the “user area” and the “default area”. The explanation of each area is as follows.

For the work area, this is the setting parameter that is running at the present and has been changed. This area is synchronized with the OSD menu, therefore, when the parameter setting on the OSD menu changes, the parameters in the work area will also change. If the work area parameter is changed but not saved and the camera is turned off the settings will be lost and the camera, when turned on again will return to the parameter set before.

For the user area, this is the area to save a setting parameter of the work area. The setting saved to the user area is retrieved to the work area at the time of startup. Also, a setting of the user area can be retrieved using the OSD menu at times other than startup. The factory setting, the default parameter is saved to the user area.

The default area, this is the area where the factory setting is saved. The factory setting can be retrieved to the work area by using the OSD menu. The default area is a read-only setting.
4.1. Loading a saved setting parameter

Retrieve the saved setting parameter in the user area to work area. Then, the work area is updated, and the retrieved setting is installed into the camera.

[Operation procedure]
4.2. Saving a setting parameter

Save a current work area setting to the user area.

[Operation procedure]
4.3. Restoring the factory default settings

Retrieve the factory setting to the work area. The work area will be updated and the retrieved setting will be shown on the OSD.
If the user area also needs to be restored to the factory settings, operate same as the previous page.

[Operation procedure]