Web Guide

Extension software
(AI Video Motion Detection)

Ver 1.0

Contents

1 Introduction

This manual explains how to register extension software AI video motion detection application WV-XAE200WUX (hereinafter referred to as this product) with AI network cameras (sold separately, hereinafter referred to as camera), the settings required prior to starting operation, and how to operate AI network cameras. The camera must be registered before use. Be sure to read the camera's instruction manual when using the camera. The settings shown in this manual may differ depending on the camera model used and the i-PRO Setting Tool version (hereinafter referred to as iCT).

1.1 Product Overview

This product is software for more convenient use of the camera. You can use the following functions by installing the product on the camera.

- Count with the [Cross Line Counting function] that counts the number of human, cars (four-wheel vehicles),
  motorcycles and bicycles (two-wheel vehicles) that cross a line.
- Activate an alarm with the "AI-VMD function (hereinafter, AI-VMD)" that automatically identifies the detected moving
  bodies.

・This product is required for each camera.
・Refer to the following URL for information on the compatible models and software versions of this product.
→Equipment compatibility <C0103>
※<Control number: Cxxxx> The number used when searching for the appropriate information on our support website.

1.2 Features

1.2.1 Cross Line Counting function

It counts human, vehicles (four-wheel vehicles), motorcycles and bicycles (two-wheel vehicles) crossing a line, and
can provide statistics on the count data.

1.2.2 AI-VMD

- With AI technology, AI-VMD determines whether the detected moving body is a vehicle (four-wheel), a motorcycle or a
  bicycle (two-wheel), or a human.
- AI-VMD can detect moving bodies in the four modes below and then alarms occur.
  - INTRUDER: Detects if moving bodies intrude into the predetermined area
  - LOITERING: Detects if moving bodies loiter in the predetermined area beyond the fixed time.
  - DIRECTION: Detects if moving bodies move in the direction you specified within the predetermined area.
  - CROSS LINE: Detects if moving bodies cross the predetermined line in the direction you specified.

Below are examples of each detection. The example of DIRECTION is a case where bicycles are set as the detection
objects.

INTRUDER: An alarm occurs when moving bodies are detected intruding into the predetermined area

DIRECTION: An alarm is generated when the movement of a moving object in the specified direction is detected in the specified area.

LOITERING: An alarm occurs when moving bodies are detected intruding into the predetermined area.

CROSS LINE: Alarm is generated by detecting that the set line has exceeded the specified line.

1.3 Before using this product

The following cases may cause difficulty in detecting a subject or motion, or cause lost or false alarms or reduce
measurement accuracy.

- There is no difference in brightness between the background and moving subject.
- Image brightness is low, such as at night.
- The subject moves too fast or too slowly.
- The subject is too small or too large.
- Light conditions, such as outdoors and windows, are easily changed.
- External light such as sunlight and car headlights enters.
- Fluorescent light flickers.
- The dome of the camera is stained with water droplets.
- The subject moves straight toward the camera.
- Too many moving objects.
- The camera is swinging.
- The weather is extremely bad.
- Multiple people intersect.
- Shadows fall into the Detection area.
- The subject is out of focus.
- The subject is blurred.
- The subject is moving toward or away from the camera at the periphery of the image.
- Only a part of the subject is hidden in the privacy zone or other subject. (Reference: Less than two-thirds of vehicles are visible.)

- Too many subjects. (Guideline: Accuracy may deteriorate if the number exceeds 40 (units).
- Multiple subjects intersect.
- Strong external light is inserted to create a subject and other shadows.
- Illumination fluctuates when the lamp is turned on or off.
- Vehicle signs and posters are displayed.
- Vehicles come into the glass.
- If the vehicle is equipped with XX, such as a tow truck. (e.g. vehicle towing, boat etc.)
- The human lies or falls.
- The human is short. (Reference: 120cm or less)
- The human has a big baggage. (e.g., pushing carts, baby strollers, wheelchairs)
- The human is not walking independently. (e.g. an infant)
- Light conditions, such as near windows, are subject to change.
- Animals and insects are seen.
- A human's poster and mannequin are shown.

Other cautions are explained below.

- If the camera [Data Encryption] is on, the camera image may not be displayed on the camera image screen or demonstration screen.
- If there are false detection factors in the screen, such as trees shaking, roadway (passing by automobile), or water surface (reflected light), you can reduce false detection by setting the mask area.
  Refer to the following page for the mask area settings.
  →3.3 AI motion detection setting
- When setting the AI-VMD, check the operation during daytime and nighttime after setting the area according to the installation status of the cameras and the expected movement of the subject.
  Refer to the following pages for area settings.
  →3.3 AI motion detection setting
- If the camera's image angle changes after turning on the power, after changing the camera settings, the camera may detect incorrectly for approximately 1 minute.
- The alarm is repeatedly activated every specified time while the target is on the screen. Thus, e-mails and proprietary alarms are also notified at intervals (see [Alarm deactivation time] on the [Alarm] tabs in the Camera Settings window).
- Based on the camera which is used, the transmission frame rate is limited when using AI-VMD. Refer to the following
  URL for details.

→Equipment compatibility<C0103>

- i-PRO Co., Ltd. shall not be responsible for any inconveniences, losses, or damages caused by the settings of AI-VMD
  or as a result thereof.
- AI-VMD is not for preventing theft, disaster, etc. i-PRO Co., Ltd. shall not bear any liabilities whatsoever for any accidents or losses.

2 Preparation

The flow to operation is as follows. This chapter describes ①, ②, ③, and ④.

① Check compatible models and software versions

→2.1 Check compatible models and software versions

② Install the product

→2.2 Install the product

③ Configure the required settings.

→3 Basic settings

④ Start of operation

→6 Operation

When using a camera with this product pre-installed, refer to the following pages.

→AI Video Motion Detection

2.1 Check compatible models and software versions

Check the compatible model and software version in the following URL.

→Equipment compatibility<C0103>

2.2 Install the product

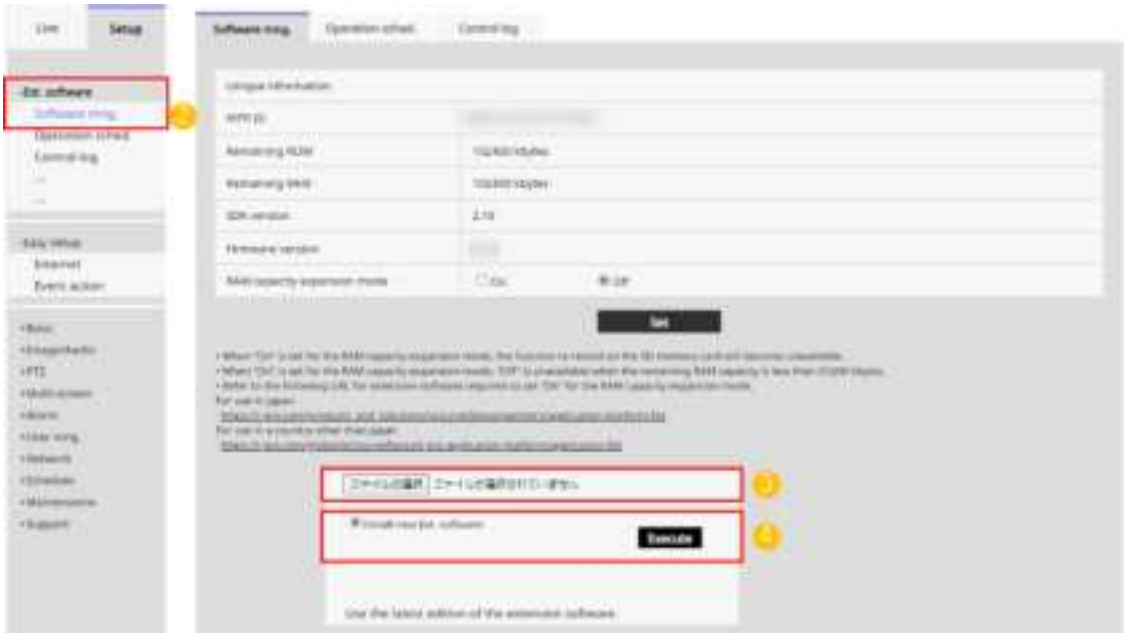
Download the product and install it on your camera according to the following procedures.

1. Access the download site of the product, download the [AI Video Motion Detection], and save it to a PC.

Refer to the following for the download site of this product.

→Click here for downloads

Do not use spaces or double-byte characters in the name of the destination directory.



2. Go to the [Setup] menu > [Ext. software] page > [Software mng.] tab.

Check the [Remaining ROM] [Remaining RAM]. If you are running out of space, uninstall another installed extension software. For the uninstallation procedure, refer to the operation manual and settings of the camera.

3. Click [Browse...] to specify the [AI Video Motion Detection] that was downloaded.
4. Make sure that [Install new Ext. software] is selected and press [Execute].
   - Installation of the software starts. Upon completion of the installation, [AI-VMD] will be added to the extended software list and the [Software mng.] screen.

・Do not turn off the camera during installation.
・Do not perform any operation during installation until the installation is completed.

3 Basic settings

The procedure for configuring Basic settings is as follows.

① Open the setting menu
→3.1 Open the setting menu

② Select the mode
→3.2 Select the mode

③ Set the AI-VMD
→3.3 AI motion detection setting

④ Set the count function
→3.4 Set the count function

⑤ If you want to set the AI-VMD detection sensitivity, detection duration, and size of the human you want to detect:
Make detailed settings
→3.5 Detailed setting (if necessary)

⑥ Set a schedule
→3.6 Schedule setting

⑦ Set an alarm
→3.7 Alarm setting

For settings on cameras that support Internet Explorer, the display plug-in software [Network Camera View 4S (ActiveX)] must be installed on the PC in advance.
For details, refer to the Operation and Settings section of the camera's operation manual.

3.1 Open the setting menu

When the AI motion detection application is installed, the AI-VMD menu is added to the Cameras [Setup] menu > [Ext. software] page > [Software mng.] tab.
Clicking the [AI-VMD] tab or the [Setup >>] button moves the tab to the [AI-VMD Settings] tab.

The [AI-VMD Settings] window has six setup windows: Select [① Mode selection], [② AI motion detection Setting], ③ [Count function Setting], [④ Detailed setting], [⑤ Schedule setting], and [⑥ Alarm setting].

If you do not select [① Mode selection], the settings after [② AI motion detection Setting] cannot be made.

3.2 Select the mode

Select the image angle mode of the camera to be used.
There are two modes, Normal angle mode and Perpendicular angle mode, and the following functions are available for each mode.

- Normal angle mode: AI motion detection, count function (Detection object: Human, vehicles, two-wheel vehicles)
- Perpendicular angle mode: AI motion detection, count function (Detection object: Human)

・If you want to count people more accurately, we recommend Perpendicular angle mode. However, the camera must be positioned directly downward.
・When using the Perpendicular angle mode at the same time as a extension software other than this product, pay attention to the condition of use of the extension software that is used at the same time.

3.3 AI motion detection setting

Set the area for detecting moving object by AI-VMD and the detection condition.
Select the Detection object of the Detection area from the human, car, and motorcycle. Select INTRUDER, LOITERING, DIRECTION, or CROSS LINE as the Detection mode. You can set up to 8 Detection area and 8 mask areas for each setting. You can set up to two combinations of areas and detection conditions and save them as [Detection program 1] and [Detection program 2].

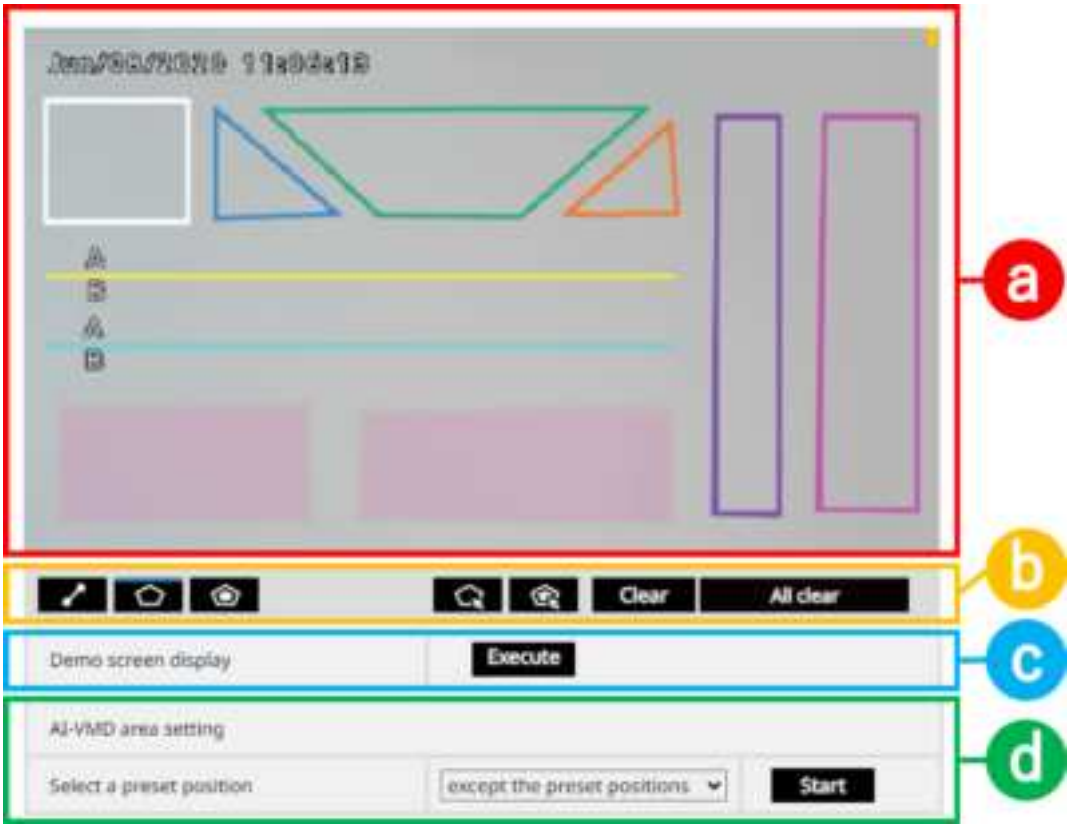
a: alarm occurrence notification area, b: drawing area, and c: detection condition setting

3.3.1 Alarm notification area

When AI-VMD detects moving bodies, the alarm icon and the icons for the four detection modes turn on. Click the alarm icon to clear the alarm state and turn off all the icons.

① Alarm ICON
② CROSS LINE
③ INTRUDER
④ LOITERING
⑤ DIRECTION

3.3.2 Drawing area (for setting the detection areas)



a: camera image screen, b: Paint type, c: Demo screen display, d: Position selection

Camera video screen

This window draws the detection area or detection lines.

To draw, select the [Detection area (polygon)] or [CROSS LINE] icons you want to draw from the [Paint type] and drag them to the [Camera video screen].

An alarm is generated when the actuator is identified within the Detection area set by drawing.

An alarm is generated when the movement traverses the set detection line.

Paint type

Click the icon to select the drawing format.

① CROSS LINE: Draws detection lines for CROSS LINE.

② Detection area: Draws Detection area as a polygon (up to 16 sides).

③ Mask Area (polygon): Draws the mask area as a polygon (up to 16 sides).

④ Detection area: Select the drawn Detection area.

⑤ Mask Area (Select): Select the drawn mask area.

⑥ Delete: Deletes the selected Detection area and mask areas.

⑦ All Delete: Deletes all drawn Detection area and mask areas.

- When you draw a Detection area (polygon) or mask area (polygon), you complete the area setting by selecting the start point at the end.
- The Detection area, detection line, and mask area selected in the Detection area, Mask Area (Select) can be changed in size, length, and shape by dragging the corners and end points of the frames. You can also move by dragging the inside of the frame or the line.
- To delete a Detection area or detection line, when several Detection area or detection lines overlap, left-click the mouse in the overlapping area to switch the selected frames in turn.
- The center under the detection frame is the position of the detection frame. Set Detection area so that the position of this detection frame is Detection area. Refer to the following pages for the detection frame.

  →6 Operation
- Multiple Detection area, detection lines, and mask areas cannot be selected at the same time.
- By default, the entire drawing area is set to Detection area.
- If you change the [Image capture mode] [Image rotation] in the [Setup] menu of the camera, the Detection area and mask area settings return to the default settings.
- The mask area is the same in [detection program 1] and [detection program 2], and the count function setting.

Demo screen display

Click to display the demo screen.

Select a preset position (for PTZ cameras only)

For PTZ cameras, set the Detection area and mask area for each preset position.

Select the preset position to be set as follows.

Preset positions 1 to 16: Preset positions 1 to 16

Out of preset position: Preset positions 17 to 256 and out of preset position (common)

Start (PTZ camera only)

Click to move to the selected preset position.

No alarm is notified during camera PTZ operation.

3.3.3 Detection condition setting

Detection program 1 and Detection program 2

Select the [Detection program 1] and [Detection program 2] tabs to set one or two detection criteria.

The two conditions can be executed simultaneously or separately, depending on the scheduling.

See the following pages for schedule settings.

→3.6 Schedule setting

・In the initial setting of the schedule, Detection program 1 and Detection program 2 are always valid

・When using i-PRO Active Guard, only alarms generated by Detection program 1 will be notified as events.

Detection area

Up to eight Detection area and detection lines are distinguished by line colors.

The colors of drawing lines are set in order from [1 (White)].

Detection object

For each Detection area, check the objects (moving objects) you want to detect.

Three types of Detection object are available:

- Humam
- Vehicle (ordinary car, bus, truck)
- Biycle (Motorcycle, bicycle)

Default setting: Human, Bicycle, and Vehicle are checked

・The three Detection object can also be used in combination.

・If you want to detect all motion, check all three.

・If more than one Detection object is selected, the result is output in the order of precedence of the vehicles, bicycles, and humans. Unchecking for unnecessary Detection object may result in better results. For example, if a human stands in

front of a car, the human may be output as a vehicle. Unchecking the vehicle may result in output as a human.

Detection mode

Select the detection modes for the set Detection area and detection lines.

INTRUDER: Detects that moving bodies have intruded the detection area.

LOITERING: Detects that moving bodies have loitered in the detection area for the fixed time.

DIRECTION: Detects that moving bodies have moved in the direction you specified within the detection area.

CROSS LINE: Detects that moving bodies have crossed the detection line in the direction you specified.

Default setting: INTRUDER

Direction setup

If Detection mode is [DIRECTION] or [CROSS LINE], set the detection orientation.

For [DIRECTION], you can choose from the following eight directions:

Upper: Detected when moving upward.

Upper right: Detected when moving in the upper right direction.

Right: Detected when moving in the right direction.

Lower right: Detected when moving in the lower right direction.

Lower: Detected when moving downward.

Lower left: Detected when moving in the lower left direction.

Left: Detected when moving to the left.

Upper left: Detected when moving in the upper left direction.

Default setting: Left

For [CROSS LINE], select from the following three directions.

A→B: Detected when moving from A to B.

B→A: Detected when moving from B to A.

A⇔B: Detected when moving from A to B or from B to A.

Default setting: B→A

[Set] buttons

Click to save the contents of the currently displayed area settings tab.

3.3.4 Area setting procedure

1. Confirm that the [AI motion detection Settings] window is selected.
2. Ensure that the [Detection program 1] tabs are selected.
3. Draw an area for detection (hereinafter referred to as "Detection area") in the drawing area.
   Draw a location (hereinafter referred to as the mask area) that you do not want to detect in the Detection area.
   Eight Detection area and eight mask armatures can be set respectively.
4. Configure four Detection mode for each Detection area: INTRUDER, LOITERING, DIRECTION and CROSS LINE, respectively.
5. If Detection mode is [DIRECTION] or [CROSS LINE], configure [Direction setup].
6. Save the [Detection program 1] detection condition by clicking [Setup].
7. Select the [Detection program 2] tabs and save the [Detection program 2] detection criteria in steps (3) to (6).

3.4 Set the count function

Configures the count function.
Select a Detection object of humans, vehicles, and bicycles as the lines. You can set up to 8 lines and up to 8 mask areas for each setting.

a: Camera video screen, b: Paint type, c: Demo screen display, d: Line setting

Camera video screen

This screen draws the detection line.

To draw, select the [Detection line] icon from the [Paint type] and drag the icon to the [Camera video screen].

When the set detection line is crossed, the number of movement is counted.

Paint type

Click the icon to select the drawing format.

① Detection Line: Draws a detection line for count function.

② Mask Area (polygon): Draws the mask area as a polygon (up to 16 sides).

③ Detection line (Select): Select the drawn detection line.

④ Mask Area (Select): Select the drawn mask area.

⑤ Delete: Deletes the selected Detection area and mask areas.

⑥ All Delete: Deletes all drawn Detection area and mask areas.

Demo screen display

Click to display the demo screen.

3.4.1 Line setting

Detection object

For each Detection area, select the object (moving object) that you want to detect.

Three types of Detection object are available:

- Humam
- Biycle (Motorcycle, bicycle)
- Vehicle (standard car, bus, truck)

Default setting:

When Perpendicular angle mode is selected: Human

When Normal angle mode is selected: Vehicle

Detectable objects differ depending on the selected mode.

Perpendicular angle mode: Human

Normal angle mode: Human, vehicles, two-wheel vehicles

Direction setup

Specifies the direction in which to count.

- Inward
- Outward
- In/Outward

Default setting: In/Outward

Detection line name

The name of each line is set to 20 characters or less. The configured Detection line name is displayed on the i-PRO Active

Guard dashboard.

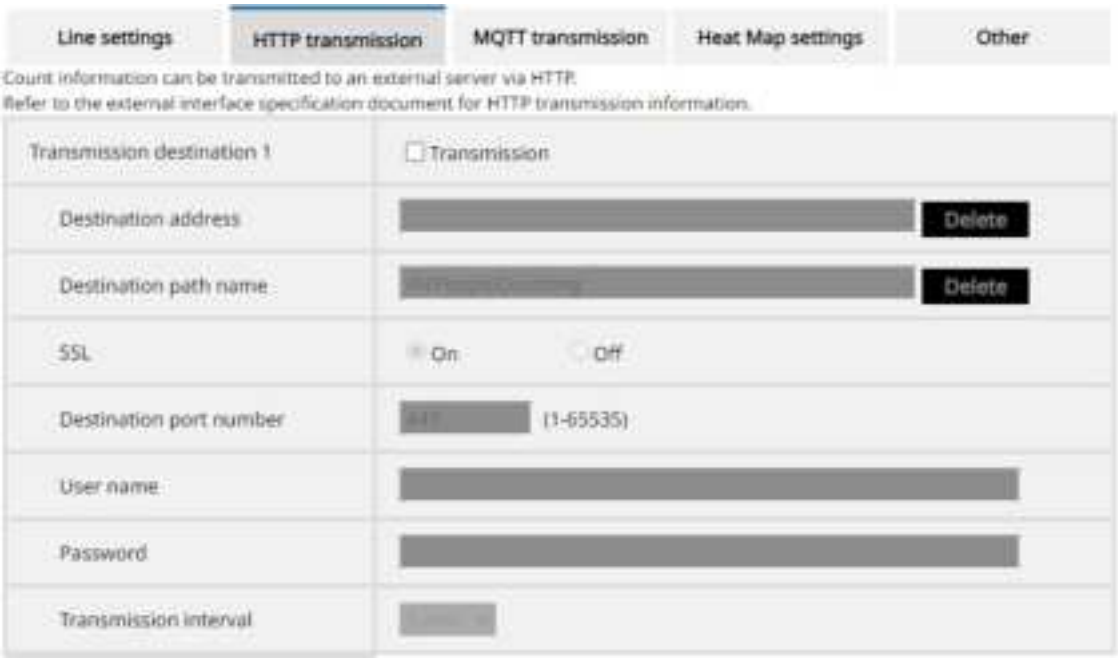
Default setting: Line 1 to 8

Inputtable Characters: One-byte symbol [″][&]

[Set] button

Click to save the contents of the currently displayed Line Settings tab.

3.4.2 HTTP transmission



Set the Transmission destination (1 to 4) and notification intervals for HTTP to send counts.

Transmission destination 1, Transmission destination 2, Transmission destination 3, Transmission destination 4

You can notify the count data individually to up to four locations. The settings of the four

notification destinations are the same.

Transmission

When the check box is checked, the message is sent.

Default setting: Unchecked

Destination addresses

Enter the IP address or host name of the notification destination. Enter up to 128 half-pitch alphanumeric characters and symbols.

Default setting: blank

Destination pathname

Enter the path name of the notification destination. Enter up to 128 half-pitch alphanumeric characters and symbols.

SSL

Select whether to use SSL for notification.

Default setting: On

Destination port number

Set the port number of the notification destination.

1 ～ 65535

User name

Enter the user name for authentication with the notification destination. Enter up to 128 half-pitch alphanumeric characters and symbols.

Transmission Password

Enter the password for authentication with the notification destination. Enter up to 63 half-pitch alphanumeric characters and symbols.

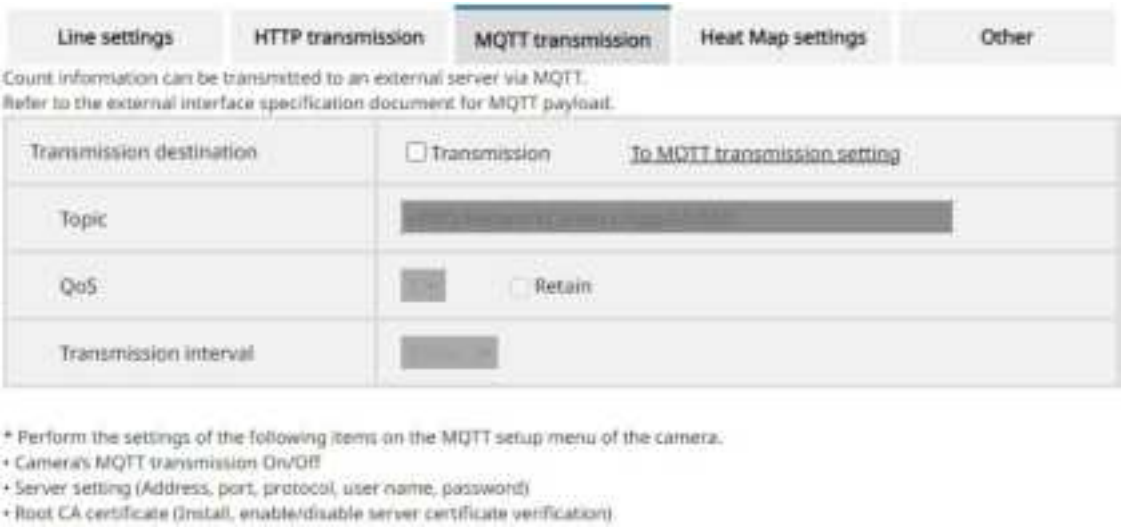
Transmission interval

Select the time interval to send.

5 s, 10 s, 15 s, 1 min, 5 min, 10 min, 15 min, 30 min, 60 min

Default setting: 5 min

3.4.3 MQTT transmission



Set the notification content and notification interval for MQTT to send count data.

Transmission

When the check box is checked, the message is sent.

Default setting: Unchecked

To the MQTT transmission setting

Click this button to display the MQTT setting screen of the camera.

Topic

Enter the name of the MQTT topic to be sent. Enter up to 128 half-pitch alphanumeric characters and symbols.

QoS

Select the level of QoS from 0, 1 and 2. Communication quality is high with 0<1<2.

0:QoS0 delivers up to one message. Messages are not guaranteed to reach the server.

1:In QoS1, messages are delivered at least once. Messages are guaranteed to reach the Transmission destination, but may be duplicated.

2:QoS2 delivers the message exactly once. Messages are guaranteed to arrive only once without excess or deficiency.

Default setting: 1

Retain

Check this box to have the last notified message saved on the MQTT server.

Default setting: Unchecked

Transmission interval

Select the time interval to send.

5 s, 10 s, 15 s, 1 min, 5 min, 10 min, 15 min, 30 min, 60 min

Default setting: 5 min

3.4.4 Heat map setting

Set the heat map function to aggregate the count data of the human and visualize the passage and retention as a heat map.

Heat Map Funcion

Select whether to use the heat map function or not.

Default setting: Off

Display a confirmation screen

When [Execute] is clicked, a confirmation window is displayed in another window.

The confirmation screen displays the latest heat map.

Confirmation window for heat map setting

Displaying map information

Displays the latest pass map or residence map. Immediately after opening the confirmation screen, the pass map is displayed.

Date and time of the displayed heat map information

The date and time when the heat map information displayed on the confirmation screen was measured is displayed.

Type of heat map

Displays the type of heat map information displayed on the confirmation screen.

Passage map and Loitering map

Upper limit

Displays the area where a value exceeding the value set was counted in red.

This value represents "The number of people passing through [person]" in the case of a passing map, and "The average

loitering time [sec] of the loitering people″ in the case of a loitering map.

(Passing Map) 3–65535, and (Loitering Map) 1–655

Default setting: 50 (Passing map), 5 (Loitering map)

[Update] buttons

Update the heat map information displayed on the confirmation screen to the latest map information.

The heat map data is saved for each [Count data storage interval] based on the UTC time of 00:00:30 ± time zone after 5 minutes have passed since the [Heat Map Function] was changed to [On].

3.4.5 Others

Count data storage interval

Sets the measurement interval of the count data. Creates a file for each measurement interval.

15 minutes, 1 hour, 12 hours, 24 hours

Default setting: 1 hour

Target to store of count data

Set the function to save the count data.

- Cross Line Counting
- Cross Line Counting + Heat Map

Default: Cross Line Counting

The storage period of the count data is as follows.

•When [Cross Line Counting] is selected: 732 days

•When [Cross Line Counting + Heat Map] is selected:

Cross Line Counting: 732 days

Heat map: 3 days (1 day if [Count data storage interval] is set to [15 min])

※In fact, the data will be stored for a longer period than the above storage period. The extra storage period depends on the camera time zone setting (up to 23 hours).

Example: Time zone +9.00

・When [Cross Line Counting] is selected: 732 days + 9 hours

・When [Cross Line Counting + Heat Map] is selected:

Cross Line Counting: 732 days + 9 hours

Heat map: 3 days + 9 hours (1 day + 9 hours when [Count data storage interval] is set to [15 min])

The interval for the transmission of ONVIF®

Set the ONVIF Metadata transmission interval.

(CROSS LINE count) 5 s, 10 s, 15 s, 1 min

(heat map) 1 min, 5 min, 15 min

Default setting:(CROSS LINE count) 5 s,

(heat map) 1 min

3.5 Detailed setting (if necessary)

Set the detection sensitivity and duration of the AI-VMD and the size of the human to be detected.

Click [④ Detailed setting] at the top of the window to open the [Detailed setting] window.

3.5.1 Image quality setting

[Batch change to the appropriate setting]

Click [Execute] to automatically set the appropriate image quality for AI-VMD in a batch. The items changed in the batch setting are the following.

Super Dynamic: Off
Light control speed : 8
White balance adjustment speed: 8
Digital noise reduction: 128
Intelligent Auto : Off
Automatic contrast adjust : Off

If you select values larger than "Max. 1/30s" on [Image adjust] – [Light control mode] – [Maximum shutter], there may be loss of recognizability.

3.5.2 AI-VMD alarm notification operation setting

Sets notification behavior for when alarm notification conditions are met.
An alarm is issued only when a motion is detected for the first time:
Notification the first time the alarm conditions are met only.
An alarm is issued every time a motion is detected:
Notification continuously as long as alarm conditions are met.
Default setting: An alarm is issued every time a motion is detected

3.5.3 Threshold setting

Sets AI-VMD thresholds. This setting is common to all detection conditions.

[Human identification threshold]

Set the detection threshold for detecting as a human.
The smaller the value, the easier it is to detect as a human, but it is easier to detect incorrectly.
1~99

[Vehicle identification threshold]

Set the detection threshold for detecting as a vehicle.
The smaller the value, the easier it is to detect as a vehicle, but it is easier to detect incorrectly.
1~99

[Bicycle identification threshold]

Set the detection threshold for detecting as a bicycle.

The smaller the value, the easier it is to detect it as a bicycle, but it is easier to detect it incorrectly.

1~99

3.5.4 Time setting

Sets the time from detection to alarm generation.

[Intruder detection time]

Sets the time from the detection of intrusion to the alarm generation.

0.2s, 0.4s, 1s, 2s, 3s, 4s, 5s, 10s

Default setting: 1s

[Loitering detection time]

Sets the time from the detection of stagnation until the alarm is generated.

10s, 20s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min, 40min, 50min, 60min

Default setting: 10s

Make sure that the detection frame continues to be displayed stably within the set time.

[Direction detection time]

Sets the time until the object continues to move in the specified direction and the alarm is generated.

1s, 2s, 3s, 4s, 5s, 10s

Default setting: 1s

Depending on the movement of the object, the time until the alarm is generated may be longer than the setting.

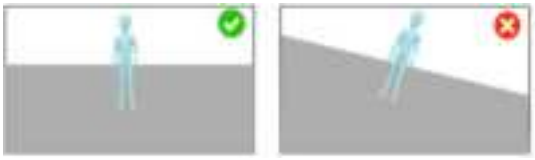
3.5.5 Speed setting

Set the alarm threshold for the speed to be detected. This is only valid for Detection area or detection lines where INTRUDER, DIRECTION or CROSS LINE is selected for Detection mode.

Click [Setup >>] to display the [Speed setting] screen.

・The camera used for this function must satisfy the following installation conditions.
  ・The camera is not tilted to the right or left.
  ・Flatten around the Detection area

・When this function is used, the Detection object must be displayed for 3 seconds or longer in the field of view.



The camera is not tilted to the right or left.

Flatten around the Detection area

・The speed detection accuracy depends on the viewing method of the subject and the environment. Be sure to check the operation at the installation site.
・Use Normal angle mode.

On/Off the Speed setting

On or Off the Speed setting threshold.

On:Set the alarm threshold for the speed to be detected.

Off:No Speed setting is set.

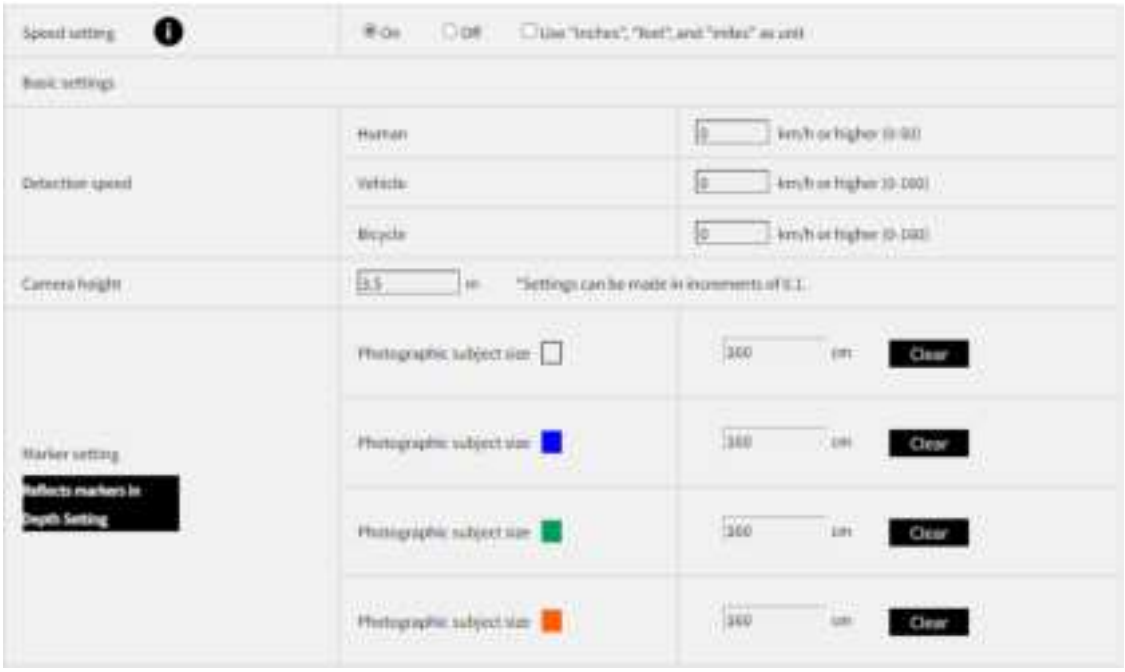
Default setting: Off

[Use "inches", "feet", and "miles" as unit]

When checked, the km display changes to mile display, m display changes to ft display and cm display changes to inch display.

Default setting: Unchecked

3.5.5.1 When [Speed setting] is [On]



Basic settings

[Detection speed]

Set the detection speed as an alarm condition for the detected object. An alarm is triggered only when the moving speed of the detected object exceeds the detection speed.

Human

Set alarm threshold for the speed of a human.

0~50

Vehicle

Set alarm threshold for the speed of a vehicle.

0~160

Bicycle

Set alarm threshold for the speed of a bircycle.

0~160

- When 0 is set, the speed is set to [Off].
- The speed correspondence range depends on the viewing method of the subject and the environment. Estimated speeds are displayed on the demonstration screen.

[Camera height]

Set the height at which the camera is installed.

Default setting: 3.5 m

[Marker setting]

■ **Setting procedure**

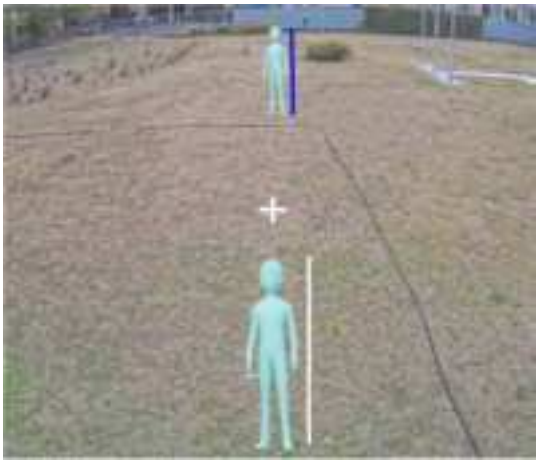
Draw markers in at least two locations in the drawing area. Up to four markers can be drawn.

Next, enter a [Photographic subject size] for the drawn markers.

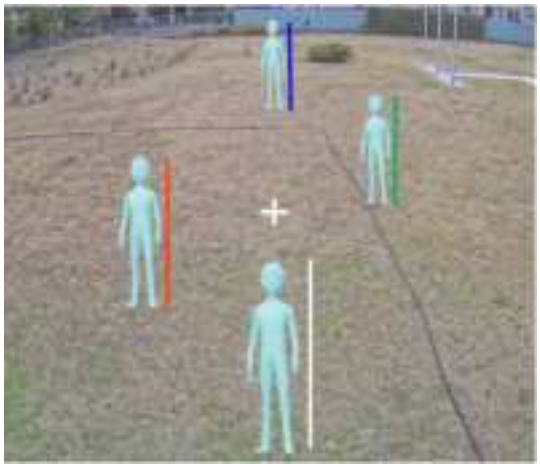
Clicking [Clear] clears the drawn markers.

When [Reflects markers in Depth Setting] is clicked, the markers set in the depth setting window are drawn.

Example of Marker Setting



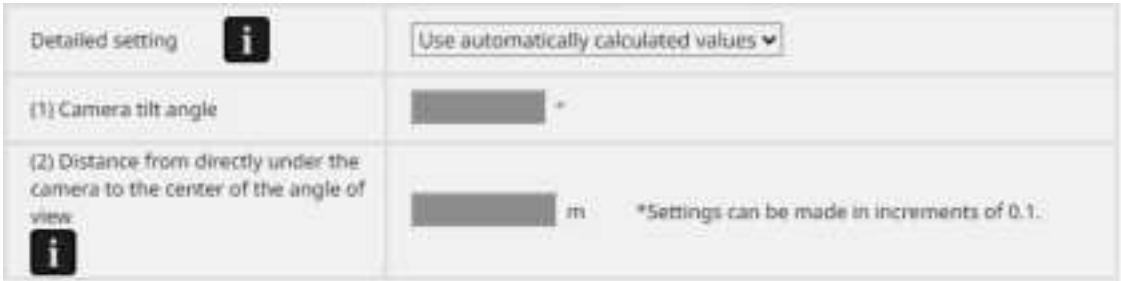
For two markers



For four markers

- For [Photographic subject size], draw a straight line marker at a position corresponding to the actual height or height of the subject.
- Draw the marker in the drawing area at two distances: the front and the back. If the two markers are close, the speed setting may not be correct.
- The position where the marker is drawn should be drawn near the center of the horizontal direction of the screen without lens distortion.

Detailed setting



The value to be set here can be calculated automatically by the product. However, direct input may improve the calculation accuracy of the speed. If you want to enter the data directly, select [Use the value directly entered in ①] or [Use the value directly entered in ②] on the [Detailed setting].

[① Camera tilt corner]

Enter the tilt angle at which the camera is located.

Recommended range is 10° to 45°

[② Distance from directly under the camera to the center of the angle of view]

Enter the distance from the bottom where the camera is located to the center of the angle of view.

The center of the field angle is displayed as + in the live image.

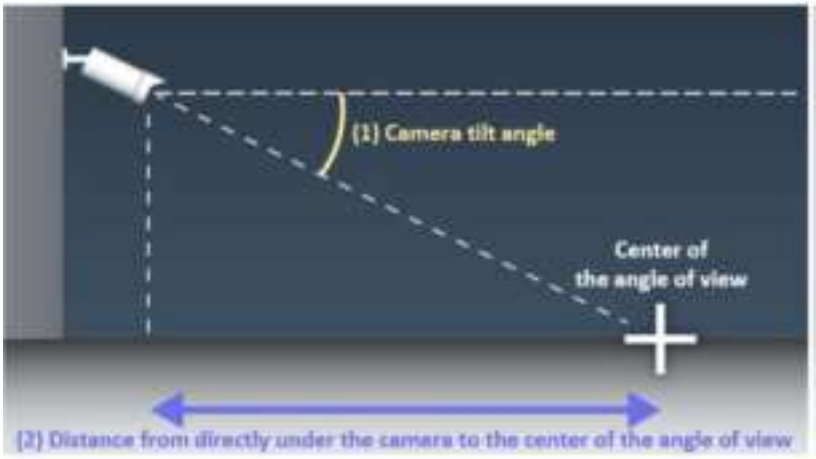


Image of detailed setting

3.5.6 Depth

Set the depth. The depth setting is common to both Detection program 1 and Detection program 2.

By setting the depth, objects detected as [humans] that are clearly not of the [humans] size are excluded from the target of alarm generation.

Click [Setup >>] to display [Depth setting] screen.

Depth setting method

Select the depth setting method.

On:Set the depth to the camera manually.

Off:The depth is not set.

Default setting: Off

・Use Normal angle mode.
・When it is often impossible to detect a human by setting it to [On], you may be able to detect it by selecting [Off].

[Use "inch" as unit]

When checked, the cm display changes to the inch display.

Default setting: Unchecked

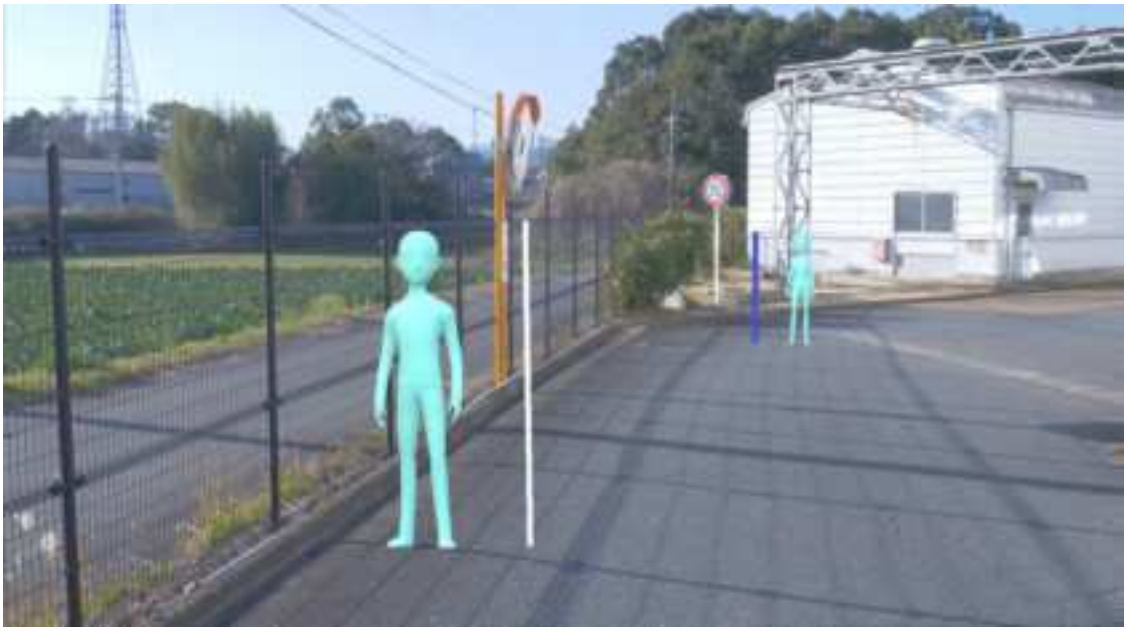
3.5.6.1 When [Depth setting] is [On]

■ **Setting procedure**

Draw marker 1 and marker 2 at two points in the drawing area.

Next, enter each [Photographic subject size] for Marker 1 and Marker 2.

Clicking [Clear] clears the drawn markers.



Example of Depth Setting

- Enter the [Photographic subject size] between 100 cm and 200 cm. In addition, draw the marker in a straight line to the position corresponding to the actual height.
- Draw the marker in the drawing area at two distances: the front and the back. If the two markers are close, the depth may not be set correctly.

Size setting

When the depth setting is enabled, only the humans detected with sizes between the maximum and the minimum sizes trigger alarms.

Set the maximum size and the minimum size as the reference sizes (100%) for people 160 centimeters (63 inches) in height.

Max. size

Set the maximum size of the human to be detected.

100%, 150%, 200%, 250%, 300%, no limit

Default setting: 300%

Min. size

Set the minimum size of the human to be detected.

10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%

Default setting: 50%

The following is an example of the setting.

e.g. Max. size: 150%, Min. size: 30%

An alarm is generated for a human between 48 cm (160×30%) and 240 cm (160×150%).

3.5.7 Position selection (for PTZ cameras only)

For PTZ cameras, depth setting and Size setting are performed for each preset position.

Select the preset position to be set as follows.

Preset positions 1 to 16:Preset positions 1 to 16

Out of preset position:

Preset positions 17 to 256 and out-of-preset positions (common)

3.5.8 Movement amount judgment

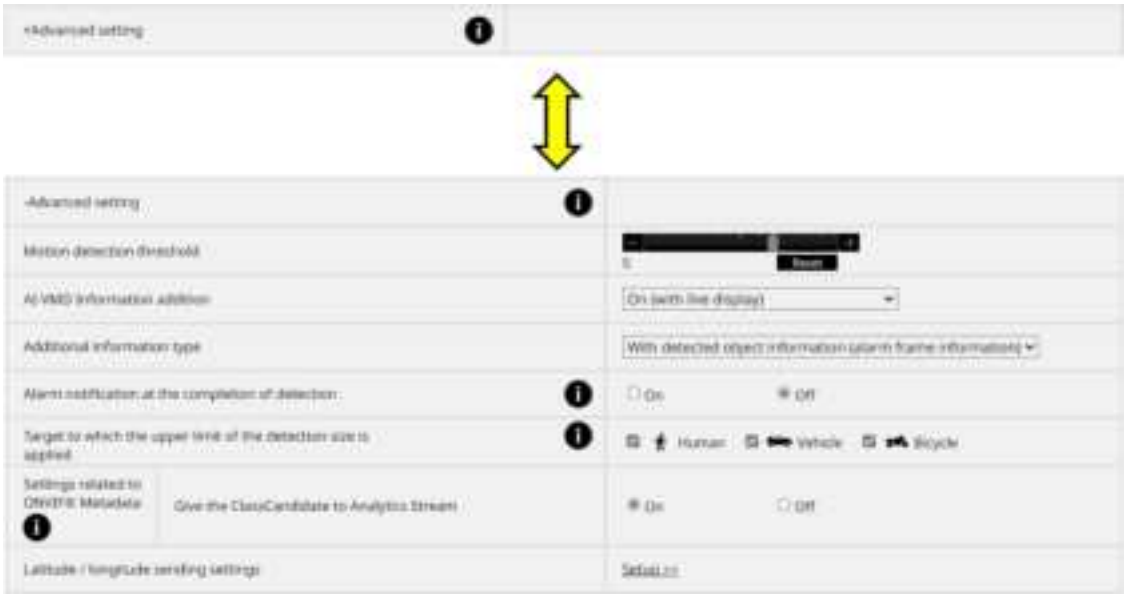
The alarm threshold for the movement to be detected can be set.

- Off:This alarm sounds even if the movement of the object is very small.
- Low:This alarm sounds even if the movement of the object is small.
- Middle: Default setting
- High:This alarm sounds when a large movement of an object is detected.

[Off] and [Low] may be useful for scenes where objects move forward from the rear when the camera is at a small angle. [High] may help reduce false alarms due to minor movements.

Movement amount judgment is valid only for Detection object who have selected INTRUDER for Detection mode.

3.5.9 Advanced setting



Advanced setting the AI-VMD. Clicking + on the left side of the Advanced setting expands the items and displays the detailed settings.

Clicking the - mark on the left side of the Advanced setting will return to the previous window.

[Motion detection threshold]

Set the detection threshold for the movement of the object to be detected. This setting is reflected in the detection threshold for all objects.

The smaller the value, the easier it is to detect, but it is easier to detect incorrectly.

1~7

[AI-VMD information addition]

You can set whether to add AI-VMD data (detection frame, Detection object type) to video data or to display detection frame and Locus in live video of web browser.

When set to [On (with live display [with blue frame])], a blue frame is displayed when a movement is detected in the screen. When the detected motion enters the Detection area and an alarm is generated, the frame color turns red. The Locus of the detected moving object is indicated by a green line. Displays the Locus for the most recent 3 seconds.

From * V3.20, Locus is hidden.

The setting of adding AI-VMD data does not affect the alarm operation.

Off: AI-VMD does not add data. Also, the detection frame and Locus are not displayed.

On: Adds AI-VMD data, but does not display detection frame or Locus.

On(with live display):

Adds AI-VMD information and displays detection frame and Locus information. The blue

frame is not displayed.

On(with live display [with blue frame]):

Adds AI-VMD data and displays detection frame and Locus. In addition to the red frame, the blue frame is also displayed.

Default setting: On (with live image display)

[Additional information type]

Sets the information to be added to the video data and the type of frame to be displayed in the live image of the web browser.

This setting is enabled when the above [AI-VMD Information addition] setting is set to [On (with live display)] or [On (with live display [blue frame]] or [On].

After * V3.20, the AI frame (green frame) will not be displayed.

With detection object information (alarm frame information):

Position information of detected object (human, vehicles, bicycles), the location of alarm frame (red frame), and motion detection frame (blue frame) is added.

With detection object information (AI frame information):

Adds information about the detected object (human, vehicles, bicycles) and the location of AI detected AI frames (green frame).

Without detected object information:

Only the positional information of the location of alarm frame (red frame) and the motion detection frame (blue frame) is added. The detected object information (human, vehicles, bicycles) is not added.

Default setting: With detection object information (alarm frame information)

[Alarm notification at the completion of detection]

Select whether to send an alarm when INTRUDER or LOITERING is finished.

Default setting: Off

When [Alarm notification at the completion of detection] is set to ON, the alarm may be notified regardless of the [Alarm deactivation time] of the camera.

[Target to which the upper limit of the detection size is applied]

Apply the upper limit to the selected Detection object size among humans, vehicles, or bicycles.

The selected Detection object excludes detection results with width or height of 1000 pixels or more.

Default setting: humans, vehicles, and bicycles are checked

[Settings related to ONVIF® Metadata]

Set the settings related to ONVIF Metadata.

Give the ClassCandidate to Analytics Stream

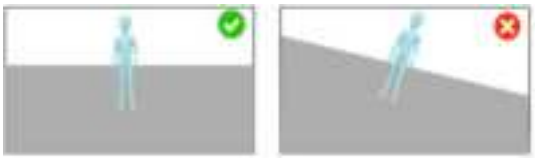
Select whether to attach a Class Candidate tag to the Analytics Stream.

Default setting: On

[Latitude / longitude sending settings]

Sets the latitude and longitude to be transmitted. Click [Setup >>] to display [Latitude / longitude sending settings] screen.

- The camera used for this function must satisfy the following installation conditions.
  - The camera is not tilted to the right or left.
  - Flatten around the Detection area



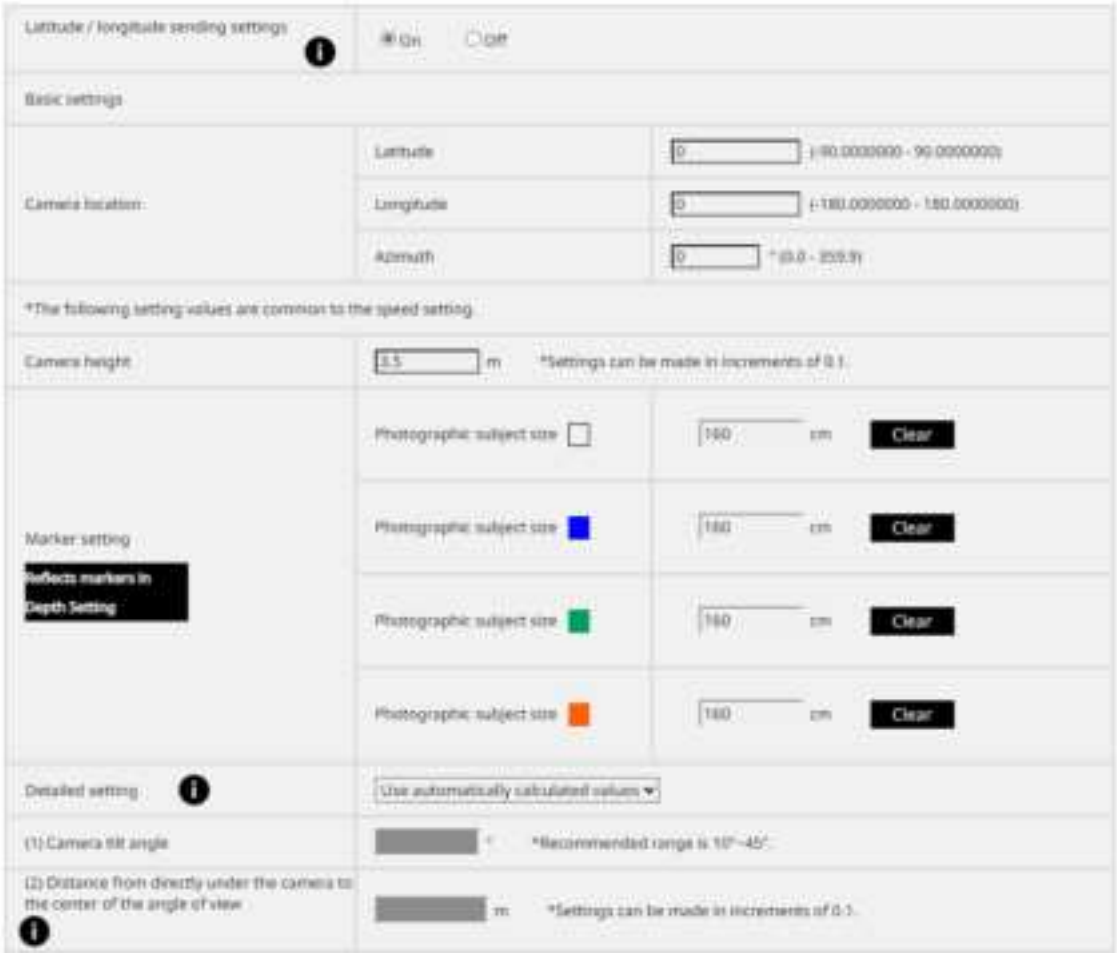
The camera is not tilted to the right or left.

Flatten around the Detection area

- The accuracy of detecting latitude and longitude depends on how the subject is viewed and the environment. Be sure to check the operation at the installation site.
- Use Normal angle mode.

When [Latitude / longitude sending settings] is enabled

For cameras other than the PTZ camera, the following setting screen is displayed. For PTZ cameras, the [Marker setting] and [Detailed setting] menus are not displayed. [Marker setting] and [Detailed setting] are not required for PTZ cameras.



Basic settings

[Camera location]

Set the camera position.

[Latitude]

Set the latitude of the camera's installation position.

−90.0000000 ~ 90.0000000

Default setting: 0

[Longitude]

Set the longitude of the camera's installation position.

−180.0000000 ~ 180.0000000

Default setting: 0

[Azimuth]

Set the azimuth angle of the camera's installation position.

0.0 ~ 359.9

Default setting: 0

・The latitude and longitude information of the camera installation location should be obtained from the map information such as the Google map.
・The azimuth angle is the angle of the camera's center clockwise with the north at 0 degrees. Measure using a compass.

The following settings are the same as those of [Speed setting].

[Camera height]

Set the height at which the camera is installed.

Default setting: 3.5 m

[Marker setting]

■ **Setting procedure**

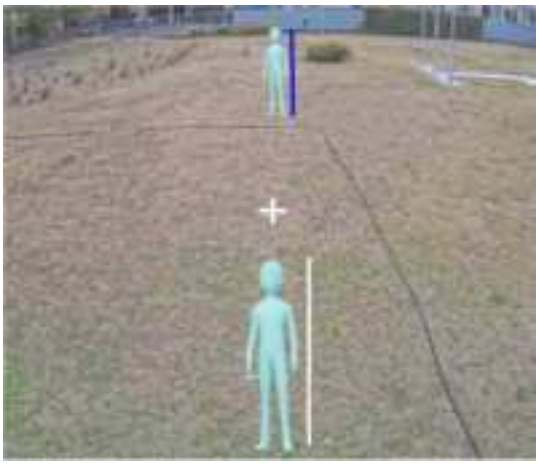
Draw markers in at least two locations in the drawing area. Up to four markers can be drawn.

Next, enter a [Photographic subject size] for the drawn markers.

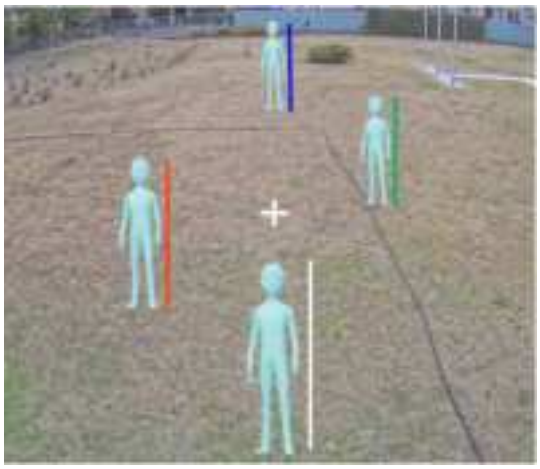
Clicking [Clear] clears the drawn markers.

When [Reflects markers in Depth Setting] is clicked, the markers set in the depth setting window are drawn.

Example of Marker Setting



For two markers



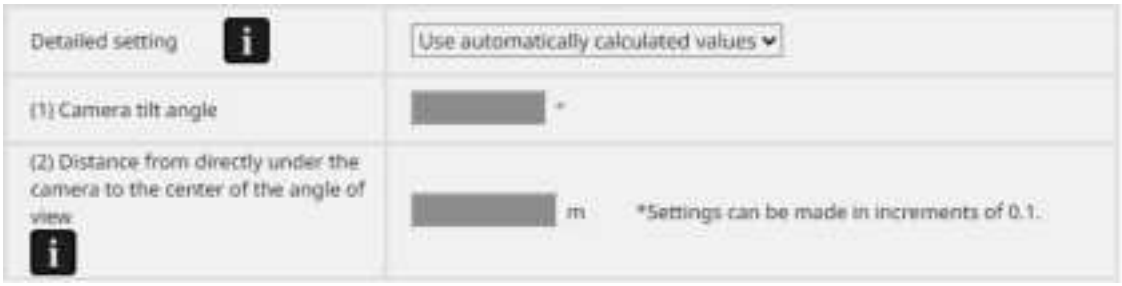
For four markers

・For [Photographic subject size], draw a straight line marker at a position corresponding to the actual height or height of the subject.

・Draw the marker in the drawing area at two distances: the front and the back. If the two markers are close, the latitude and longitude transmission setting may not be set correctly.

・The position where the marker is drawn should be drawn near the center of the horizontal direction of the screen without lens distortion.
・For PTZ cameras, [Marker setting] is not required.

Detailed setting



The value to be set here can be calculated automatically by the product. However, direct input may improve the calculation accuracy of latitude and longitude. If you want to enter the data directly, select [Use the value directly entered in ①] or [Use the value directly entered in ②] on the [Detailed setting].

[① Camera tilt angle]

Enter the tilt angle at which the camera is located.

Recommended range is 10° to 45°

[② Distance from directly under the camera to the center of the angle of view]

Enter the distance from the bottom where the camera is located to the center of the angle of view.

The center of the field angle is displayed as + in the live image.

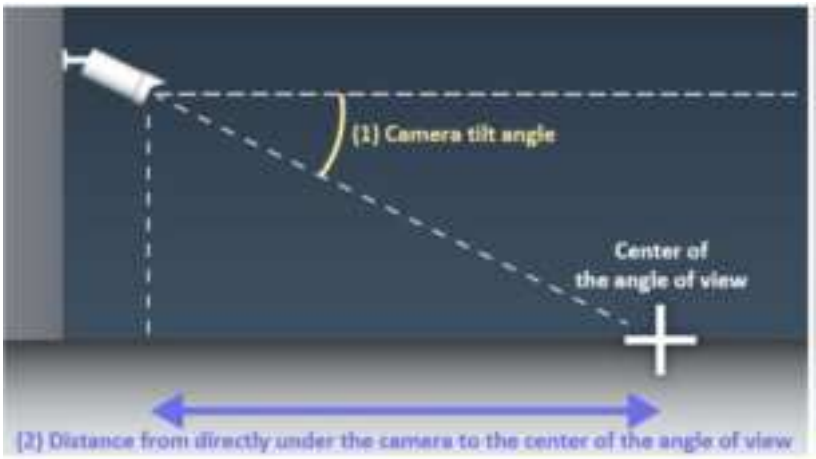


Image of detailed setting

・For PTZ cameras, [Detailed setting] is not required.

[Setup]

Click to save the contents of the advanced tab currently displayed.

[Setting data initialization]

Clicking this button initializes all AI-VMD settings.

3.6 Schedule setting

The initialization of AI-VMD schedules is always enabled by the Detection setting 1 and Detection setting 2.

To change the operation schedule, use the setting screen of the camera main unit to make the settings.

Refer to the camera operation manual for details.

3.7 Alarm setting

Refer to the operation manual of the camera for the basic TCP alarm notification settings and other alarm settings.

Clicking [⑥ Alarm setting] at the top of the window opens the [Alarm Settings] window.

Alarm E-mail notification

[E-mail notification setup]

Click to display the mail setting screen of the camera.

Alarm image recording(SD memory card)

[SD memory card setup]

Click this button to display the SD Memory Card setting screen on the camera.

TCP alarm notification

[TCP alarm notification setup]

Clicking this button displays the TCP alarm notification settings window for the camera.

HTTP alarm notification

[HTTP alarm notification setup]

Clicking this button displays the HTTP alarm notification settings window for the camera.

MQTT alarm notification

[MQTT alarm notification setup]

Click this button to display the MQTT setting screen of the camera.

[Transmission]

When the check box is checked, the message is sent.

Default setting: Unchecked

[Topic]

Enter the name of the MQTT topic to be sent. Enter up to 128 half-pitch alphanumeric characters and symbols.

[QoS]

Select the level of QoS from 0, 1 and 2. 0<1<Communication quality is high with 2.

0:QoS0 delivers up to one message. Messages are not guaranteed to reach the server.

1:In QoS1, messages are delivered at least once. Messages are guaranteed to reach the Transmission destination, but may be duplicated.

2:QoS2 delivers the message exactly once. Messages are guaranteed to arrive only once without excess or deficiency.

Default setting: 1

[Retain]

Select to save the last message to the MQTT server.

Default setting: Off

4 Demo screen

The AI motion detection and count function have Demo screen display buttons, respectively, and the demo screen can be displayed by clicking on them.

4.1 AI motion detection

[Setup] button

Click to show/hide configuration items displayed on the demo screen.

Setting button

[Detection frame and set area/line display]

Select the detection results to be displayed on the demo screen.

AI motion detection (Detection setting 1): Displays a demo screen with the detection results set in AI motion detection (Detection setting 1)

AI motion detection (Detection setting 2): Displays a demo screen with the detection results set in AI motion detection (Detection setting 2)

Count function: Displays a demo screen with the detection results set in the Count function.

[Display score]

When the switch is set to [On], the detection score is displayed in the upper left of the detection frame.

[**] may be displayed when the detection score is below the threshold.

[Measure score]

When set to [On], the maximum and minimum values of the detection score are measured and the measurement results (MAX/MIN) are displayed on the demonstration screen. When set to [Off], measurement is stopped.

[Display speed]

This is only displayed when [Detection frame and set area/line display] is set to AI motion detection (Detection setting 1) or AI motion detection (Detection setting 2).

When the switch is set to [On], the estimated speeds of people, vehicles and motorcycles are displayed in the upper left corner of the icon.

If [Speed setting] is set to [Off], it is not displayed. If the estimated speed is too small, it may not be displayed.

[Display latitude / longitude]

This is only displayed when [Detection frame and set area/line display] is set to AI motion detection (Detection setting 1) or AI motion detection (Detection setting 2).

When the switch is set to [On], the estimated speeds of people, vehicles and motorcycles are displayed in the upper left corner of the icon.

If [Latitude / longitude sending settings] is set to [Off], it is not displayed.

[Threshhold setting]

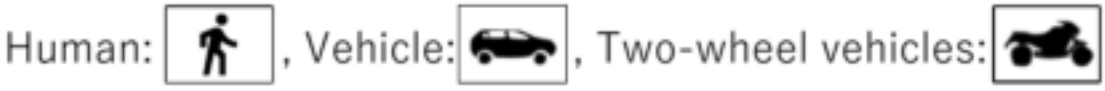
Human identification threshold: Detects when the MIN of [Mesure score] of a human exceeds this threshold.

Vehicle identification threshold: Detects when the Min of [Mesure score] of a vehicle exceeds this threshold.

Bicycle identification threshold: Detects when the Min of [Mesure score] of a bicycle exceeds this threshold.

[Icons]

If the score is [On], the Detection object icon is displayed in the upper left corner of the detection frame.



[Detection area]

The set Detection area is displayed in color.

Area 1: white, Area 2: blue, Area 3: green,

Area 4: red, Area 5: yellow, Area 6: light blue,

Area 7: purple, Area 8: pink

Solid Line: Areas set to [On]

Dashed line: Areas set to [Off]

[Detection line]

The set detection line is displayed in color.

Line 1: white, Line 2: blue, Line 3: green,

Line 4: red, Line 5: yellow, Line 6: light blue,

Line 7, purple; Line 8, pink

Solid Line: Lines set to [On]

Dashed line: Lines set to [Off]

[Direction label]

Cross line detection displays the orientation (Cross line detection: A, B count function: In, Out) in which the number of people is counted.

[Detection frame]

When the target object is detected, a frame is displayed.

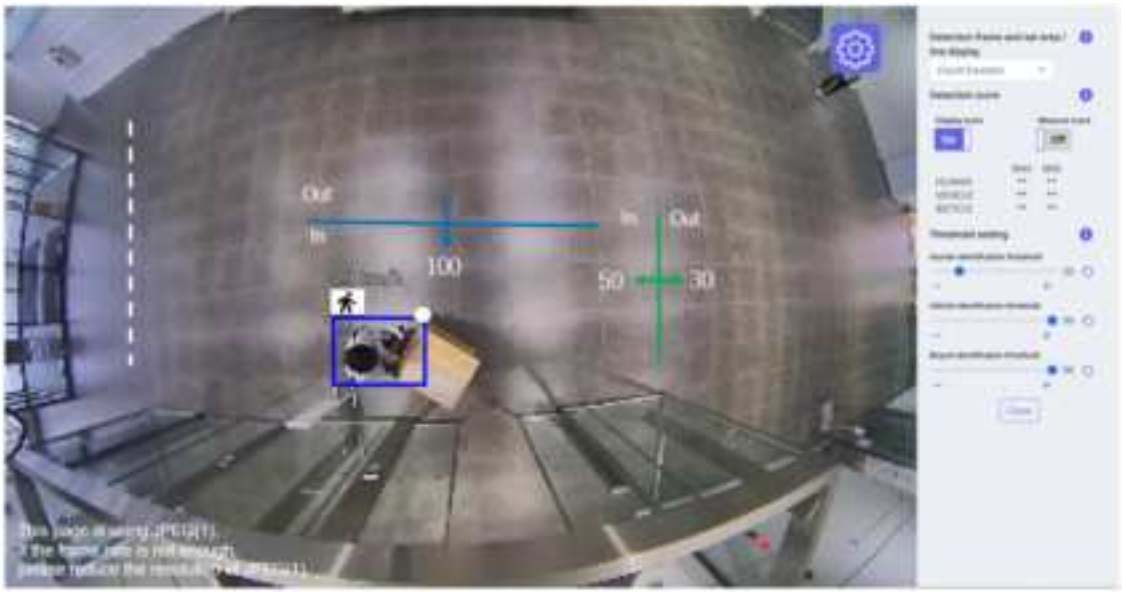
Red frame:Displays the object in the area where the alarm was generated and the object crossing the line in the setting direction.

Blue box: Displays detected objects.

[White dots in detection frame]

Shows the foot position of the human's detection frame.

4.2 Count function



[Number of counts] (count function only)

The number of objects counted in the set direction is displayed in color for each line.

Line 1: white, Line 2: blue, Line 3: green,

Line 4: red, Line 5: yellow, Line 6: light blue,

Line 7, purple; Line 8, pink

The speed and latitude / longitude displayed on the demo screen is the estimated values calculated with this product. This may differ from the actual values.

- Use Mozilla Firefox, Google™ Chrome™, and Microsoft Edge to display the demo screen.
  It does not support Internet Explorer.
- Only one browser can display the demo screen. Simultaneous access by multiple browsers is not supported.
  Simultaneous display of AI-VMD and count function demo screens is not supported.
- The detection frame cannot be displayed simultaneously on the setting screen/demo screen of AI-VMD/count function.
- If [On] is selected for data encryption, no image is displayed on the demo screen.
- If used at the same time as the other extension software, the position of the

detection frame may be misaligned with the human on the demo screen.

・It is not recommended to use the demonstration screen in actual operation because it is intended for demonstration.

・If the score display is set to [Off], the score measurement cannot be set to [On].

5 Linking with AI On-site Learning applications

This system can be used in conjunction with the AI On-site Learning application to perform the following:

- Add a new Detection object
- Improve misdetection and omission of human, cars and motorcycles

For information about using the AI On-site Learning application, see the following.
→AI On-site Learning Application Web-Guide

For information on the combinations and constraints of AI On-site Learning applications and cameras, please see the following.
→Equipment compatibility<C0103>

5.1 Add a new Detection object

(AI motion detection) Detection Condition Setting

(Count function) Line-up

List of On-site learning object

On-site learning object

Object number	Object name	Detection function
1	Forklift	Adding a new detection object
2	Unused	Unused
3	Unused	Unused
4	Unused	Unused
5	Unused	Unused

The new Detection object (On-site learning object) added in the AI On-site Learning application is added as the Detection object of the product. Up to five additional items can be added.
Only On-site learning object for which [Adding a new detection object] is selected as the detection function is added as the Detection object of this product. The On-site learning object name and detection function can be checked from the On-site learning object list.

Advanced settings

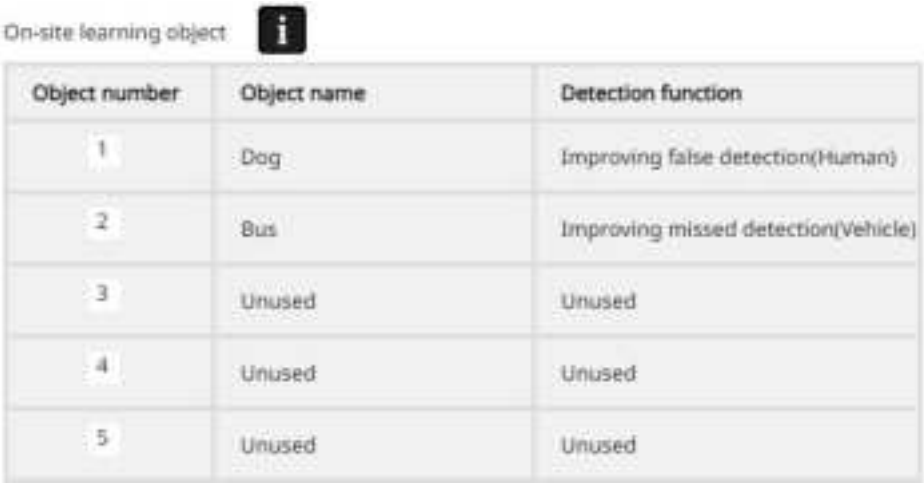
[Object 1~5 identification threshold]

Only the On-site learning object for which [Adding a new detection object] is selected for the detection function is added to the thresholding of the product. The name of On-site learning object is displayed in parentheses. The smaller the value, the easier it is to detect objects 1 to 5, but the easier it is to detect incorrectly.

1~99

- Use Normal angle mode.
- The On-site learning object name and detection function can only be set in the AI On-site Learning application.
- If you change the On-site learning object settings in the AI On-site Learning application, open the Setup window to update the settings.

5.2 Improve misdetection and omission of human, cars and motorcycles


On-site learning object

Object number	Object name	Detection function
1	Dog	Improving false detection(Human)
2	Bus	Improving missed detection(Vehicle)
3	Unused	Unused
4	Unused	Unused
5	Unused	Unused

If a human, car, or motorcycle is incorrectly detected or missed, the AI On-site Learning application can be used to learn the appropriate scenes to improve accuracy.
The On-site learning object after learning can be viewed from the On-site learning object list.
The Detection object (human, car, motorcycle) selected for improvements is displayed in parentheses of the detection function.

- In the On-site learning object that improves incorrect detection or improves detection leakage is selected by the detection function, this product is not added as a Detection object.
- The On-site learning object name and detection function can only be set in the AI On-site Learning application.
- If you change the On-site learning object settings in the AI On-site Learning application, open the Setup window to update the settings.

5.3 Demo screen

Please refer to the AI On-site Learning application web guide for details on the demo screen.
→AI On-site Learning Application Web-Guide

6 Operation

When the required settings are completed, open the camera's web browser to display the image and start operation.

a: Locus, b: detection frame, c: alarm notification

Alarm notification

When the AI-VMD detects an alarm, the alarm message is displayed.

1: CROSS LINE (CROSS LINE), 2: INTRUDER (INTRUDER), 3: LOITERING (LOITERING), 4:

When alarm notification is clicked while alarm is generated, all alarms are reset.

Alarm is also notified when an alarm input is received with a terminal alarm or when a command alarm is received.

"Detection frame (red frame, blue frame)"

When a motion is detected, this motion is displayed in a blue frame. When the detected movement enters the Detection area and an alarm is generated, this movement is displayed in a red frame. [AI-VMD Information addition] can be set to ON/OFF.

Locus

The Locus where the alarm frame (red frame) moves is displayed in green.

Displays the Locus for the most recent 3 seconds.

Displayed when the alarm frame (red frame) is set to be displayed in the [AI-VMD Information addition] and [Additional information type] settings.

※After V3.20, Locus is hidden.

- For cameras that support Internet Explorer, alarm notification may be delayed in some networked environments, even if [Basic]-[Status update mode] is set to [Real time] in the camera setting menu.
- If you configure the AI-VMD Detection area and then change the [Image/Audio]-[Image capture mode] or [Basic]-[Image rotation] in the Camera Settings menu, the Detection area, mask area and depth may be misaligned or initialized. If the [Image capture mode] or [Image rotation] is changed, check the Detection area and mask area settings and the depth settings again.
- If you change the zoom settings after you configure the Detection area for AI-VMD, the Detection area and mask area may be misaligned. If you change the zoom settings, check the Detection area, mask area, and depth settings again.

7 Others

7.1 Specifications

7.1.1 PC environment required

For information about the PC environment, requirements, and supported browsers used for settings, refer to the camera's instruction manual.

7.1.2 Compatible cameras

Refer to the following for the combinations and restrictions of this product and camera.

→Equipment compatibility<C0103>

7.2 For trademarks and registered trademarks

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7.3 External interface specifications

- Refer to the [AI Motion Detection I/F Specifications] in the following URLs for the specifications of the external interface.

  →AI motion detection interface specifications<C0323>

7.4 Open Source Software

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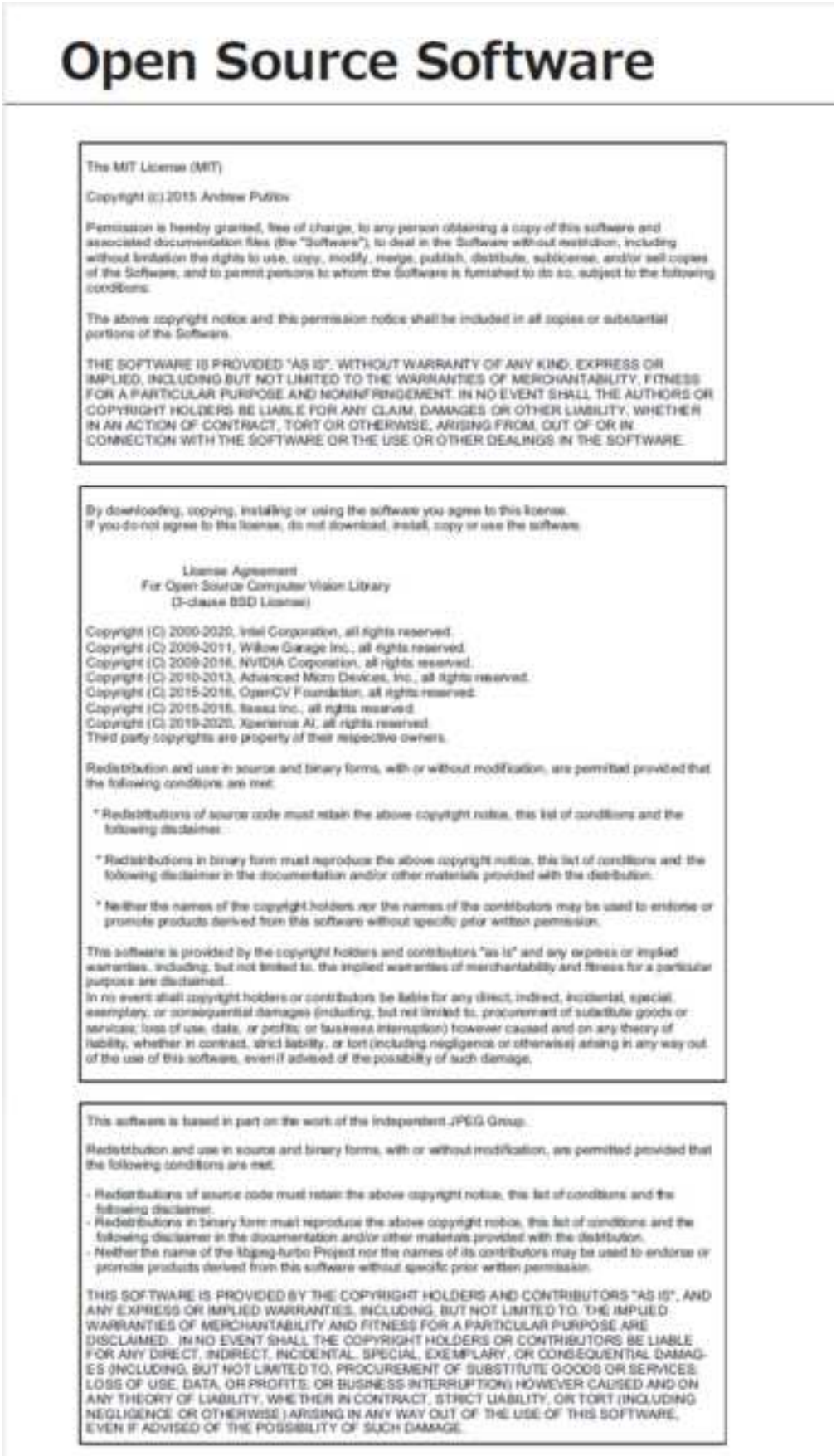

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