



Operating Instructions

Extension Software

AI Face Detection

AI People Detection

AI Vehicle Detection



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AI Face Detection

Preface

Outline

This Extension Software "AI Face Detection" (hereinafter referred to as "this product") is designed to enhance the value of network cameras with AI engine (hereinafter referred to as "camera"). By installing this product on the camera, notification of person's face information to multi AI server, by the face detection function and the feature extraction function.

Refer to the i-PRO configuration tool (hereinafter referred to as "iCT") *1 V2.0 or greater for how to configure the settings of this product.

*1 Refer to the following URL for iCT.

<https://i-pro.com/global/en/surveillance/tools/ict>

Important:

- This product cannot be installed on multiple cameras.
- Refer to the following URL for models that support this product, software version information and notes about installing multiple extension software.

https://i-pro.com/global/en/surveillance/training_support/support/technical_information/

<Control No.: C0103>

Features

- This product extracts face feature of detected person and transmits the best-shot images and the feature value to the VMS server.
- This product has the following features.
 1. Extracts person's face feature.
 2. Transmits best-shot images of up to 8 people and feature value.
 3. Up to 8 mask areas can be set to prevent false detection.

About the Operating Instructions

This manual explains the method of installing this product in a camera, settings that need to be made before starting to operate this product, and the method of operation for using this product. Since this product is used after being installed on a camera, before using this product always be sure to also read the Operating Instructions of the camera with which this product is to be used.

- Depending on the version of iCT to use, its screen may be different from the screen shown in this manual.
- In this manual, a personal computer is referred to as a PC.

System requirements for a PC

For the requirements of PC which are used for settings, refer to the Operating Instructions of a camera.

Open source software used

- This product uses the following open source software.

Name of software	Name of license
OpenCV	License Agreement For Open Source Computer Vision Library (3-clause BSD License)
libjpeg-turbo	- The IJG (Independent JPEG Group) License - The Modified (3-clause) BSD License - The zlib License

- For the corresponding license statement, refer to “Open Source Software” on page 64.

Copyright

Distributing, copying, disassembling, reverse compiling and reverse engineering of the software provided with this product are all expressly prohibited. In addition, exporting any software provided with this product violating export laws is prohibited.

Disclaimer of warranty

IN NO EVENT SHALL i-PRO Co., Ltd. BE LIABLE TO ANY PARTY OR ANY PERSON, EXCEPT FOR REPLACEMENT OR REASONABLE MAINTENANCE OF THE PRODUCT, FOR THE CASES INCLUDING BUT NOT LIMITED TO BELOW:

- (1) ANY LOSS OR DAMAGE, INCLUDING WITHOUT LIMITATION, DIRECT OR INDIRECT, SPECIAL, CONSEQUENTIAL OR EXEMPLARY, ARISING OUT OF OR RELATING TO THE PRODUCT;
- (2) INCONVENIENCE OR ANY LOSS ARISING WHEN IMAGES ARE NOT DISPLAYED, DUE TO ANY REASON OR CAUSE INCLUDING ANY FAILURE OR PROBLEM OF THE PRODUCT;
- (3) ANY PROBLEM, CONSEQUENTIAL INCONVENIENCE, OR LOSS OR DAMAGE, ARISING OUT OF THE SYSTEM COMBINED WITH THIRD PARTY DEVICES;
- (4) ANY CLAIM OR ACTION FOR DAMAGES BROUGHT BY ANY PERSON OR ORGANIZATION AS A PHOTOGRAPHED SUBJECT DUE TO VIOLATION OF PRIVACY CONCERNING A SURVEILLANCE CAMERA'S PICTURE OR SAVED DATA, FOR SOME REASON (INCLUDING USE WHEN USER AUTHENTICATION ON THE AUTHENTICATION SETTING SCREEN IS SET TO OFF), BECOMING PUBLIC OR BEING USED FOR ANY PURPOSE;
- (5) LOSS OF REGISTERED DATA CAUSED BY ANY FAILURE (INCLUDING INITIALIZATION OF THE PRODUCT DUE TO FORGOTTEN AUTHENTICATION INFORMATION SUCH AS A USER NAME AND PASSWORD).

Limitation of liability

THIS PUBLICATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THE THIRD PARTY'S RIGHT.

THIS PUBLICATION COULD INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS. CHANGES ARE ADDED TO THE INFORMATION HEREIN, AT ANY TIME, FOR THE IMPROVEMENTS OF THIS PUBLICATION AND/OR THE CORRESPONDING PRODUCT(S).

Before using this product

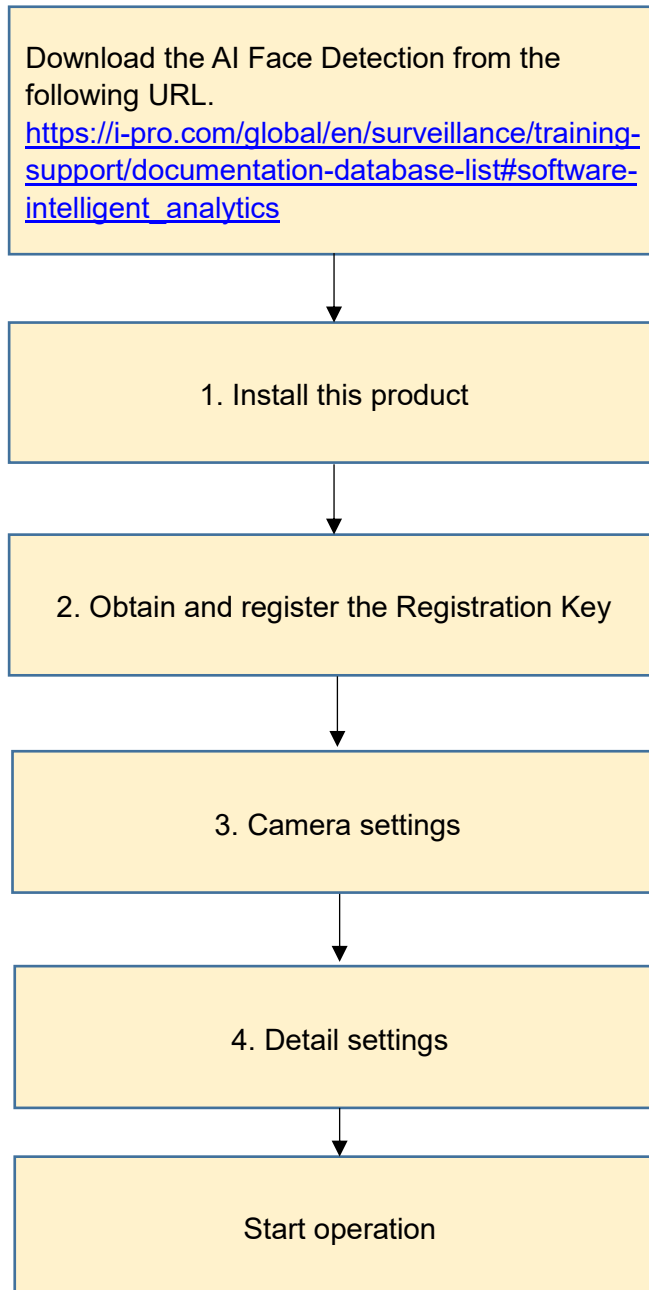
The following may cause detection failure, false detection or false attribute classification.

- Luminance level of image is too low (During nighttime, etc.)
- A backlight is projected in the image.
- A strong light is projected in the image.
- Movement of the object is too fast.
- Affected by irregular light irradiation, for example, only a part of the object is lighted or shaded.
- The object is too big or too small.
- A part of the object is hidden.
- The face of the object is not directed to the camera.
- The object is out of focus.
- A poster containing a doll or person is in the image.
- There are too many objects.
- A plurality of persons are crossing with each other or crowded.
- Dirt or water droplets are on the dome cover of the camera.
- The camera is shaking.
- Weather condition is extremely poor.

Other precautions are as follows.

- When the shooting areas (the screen) have objects that can cause false detections, false detections can be reduced by setting mask areas.
- Update to the latest firmware to prevent unexpected access to the camera by the third party, which may cause infringement of privacy rights, leaking of information, and other issues.
- In no event shall we be liable to any party or any person for any problem, consequential inconvenience, or loss or damage, arising out of the settings of this product.
- In no event shall we be liable for any accidents or loss.

Operations flow



1. Install this product

Download and install this product on the camera in use in the following procedure.

(1) Download the “AI Face Detection” from the following URL and save it onto the PC.

https://i-pro.com/global/en/surveillance/training-support/documentation-database-list#software-intelligent_analytics

<Model Name: Multi-AI System - Camera extension software>

Important:

- Do not use a blank (space) and double-byte characters for the name of the destination directory.

(2) Select “Ext. Software Management” from the sub menu of iCT and then click [App. Installation/Update].

(3) Select target cameras to install the application. Multiple cameras can be selected.

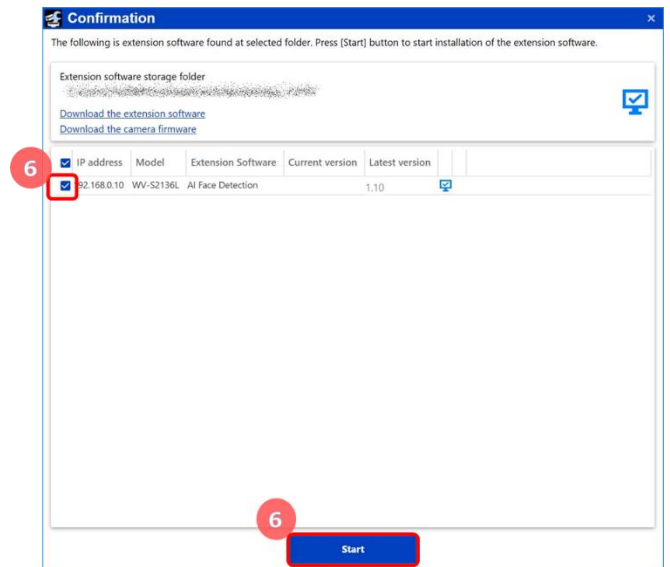
(4) Fill out the following items on the setting menu.

- Extension software: Select “AI Face Detection”
- Folder: Specify the destination directory of the extension software downloaded in (1).

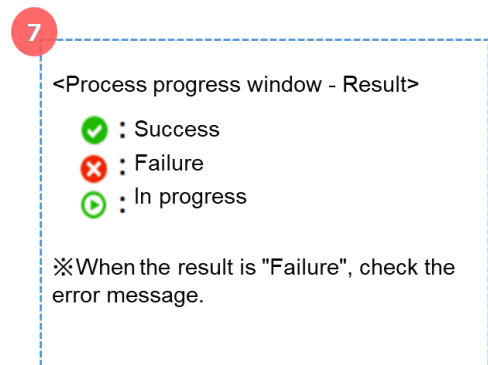
(5) Click the [Confirm] button.

The screenshot displays the I-PRO Configuration Tool interface. The title bar reads "I-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]". The main window is titled "App. Installation/Update". On the left, a sidebar menu lists various functions, with "Ext. Software Management" and "App. Installation/Update" highlighted. The main area shows a table of devices with columns for Message, IP address, Model, AI Face Detection, Version, AI People Detection, and another Version. A red circle with the number 3 highlights the selection checkboxes in the table. On the right, a settings panel is open, showing fields for Model (WV-S2136L), IP address (192.168.0.10), and a dropdown menu for Extension software set to "AI Face Detection". A red circle with the number 4 highlights the Folder field. At the bottom right, a blue "Confirm" button is highlighted with a red box and the number 5.

(6) Check to be sure that a check mark is on the target camera and the version of the application to be registered/updated is correct on the confirmation window and then click the [Start] button.



(7) When the process progress window will be displayed, check to be sure that the installation is correctly completed.



Important:

- Do not turn off the power of the camera during the installation process.
- Do not perform any operation during the installation process and wait until it completes.
- When the installation is failed, check the message in the error content of the message field.

2. Obtain and register the Registration Key

This product needs to be activated by "Registration Key" issued by Key Management System before you start using.

Follow the steps below to obtain the Registration Key.

<If you do not have your User ID and password for the Key Management System>

- * Access the website of the Key Management System and create your User ID and password.
Then start reading from STEP 1 below.

<If you already have your User ID and password for the Key Management System>

- * Access the website of the Key Management System and "Issue Registration Key" with the User ID and password that you have obtained.
Then start reading from STEP 2 below.

STEP1 Sign up

(1) Access the URL for PC below and sign up.

- For PC

<https://kms.business.panasonic.net/ipkms/pc/home.htm>

(2) Login as a temporary user using the User ID and password written on the web page.

(3) Register required information and create your User ID and password.

Important:

- Keep your User ID and password safe. You do not need to obtain a new User ID from the next time. Use the User ID already issued.
- It is recommended to change the password periodically.

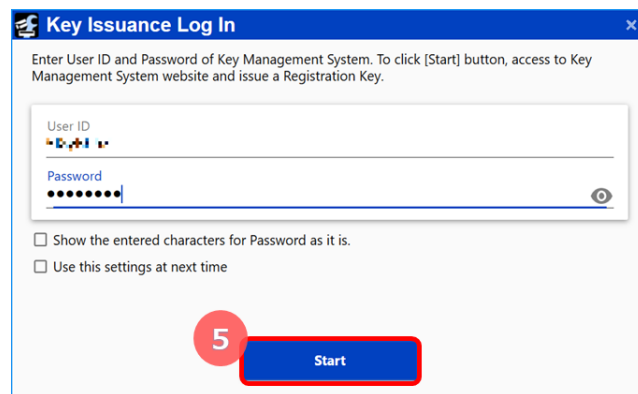
STEP2 Issue a registration key.

- (1) Select "Ext. Software Management" from the sub menu of iCT and then click [Issuance of Reg. Key].
- (2) Select target cameras to issue Registration Key. Multiple cameras can be selected.
- (3) Fill out the following on the setting menu.
 - Extension: Select "AI Face Detection"
 - Activation Key No.: Enter the right 16-digit number "3182-0065-0121-1401".
 - Registration ID: Enter the right 8-digit number "262D-66A4".
- (4) Click the [Next] button.

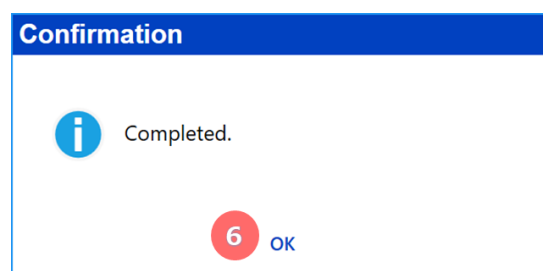
The screenshot displays the i-PRO Configuration Tool interface. The sidebar on the left contains a menu with 'Issuance of Reg.Key' highlighted by a red circle and box labeled '1'. The main area shows a table of camera devices with columns for Message, IP address, Model, AI Face Detection, Reg.Key State, Reg.Key No., and Activation. A red circle and box labeled '2' highlights the checkboxes for selecting a camera. The right panel shows the 'Issuance of Reg.Key' settings, with a red circle and box labeled '3' highlighting the 'Extension software' (AI Face Detection), 'Activation Key No.' (3182-0065-0121-1401), and 'Registration ID' (262D-66A4). A red circle and box labeled '4' highlights the 'Next' button at the bottom right. A red circle and box labeled '5' highlights the 'Save' button in the top menu bar.

Message	IP address	Model	AI Face Detection	Reg.Key State	Reg.Key No.	Activation
<input checked="" type="checkbox"/>	192.168.0.10	WV-S2136L	Trial period is expired.	Not registered	-	3182-0065

(5) When the registration key issuance login window is displayed, enter the user ID and password of the key management system and then click the [Start] button.



(6) When the confirmation window is displayed, check to be sure that issuance is completed correctly.



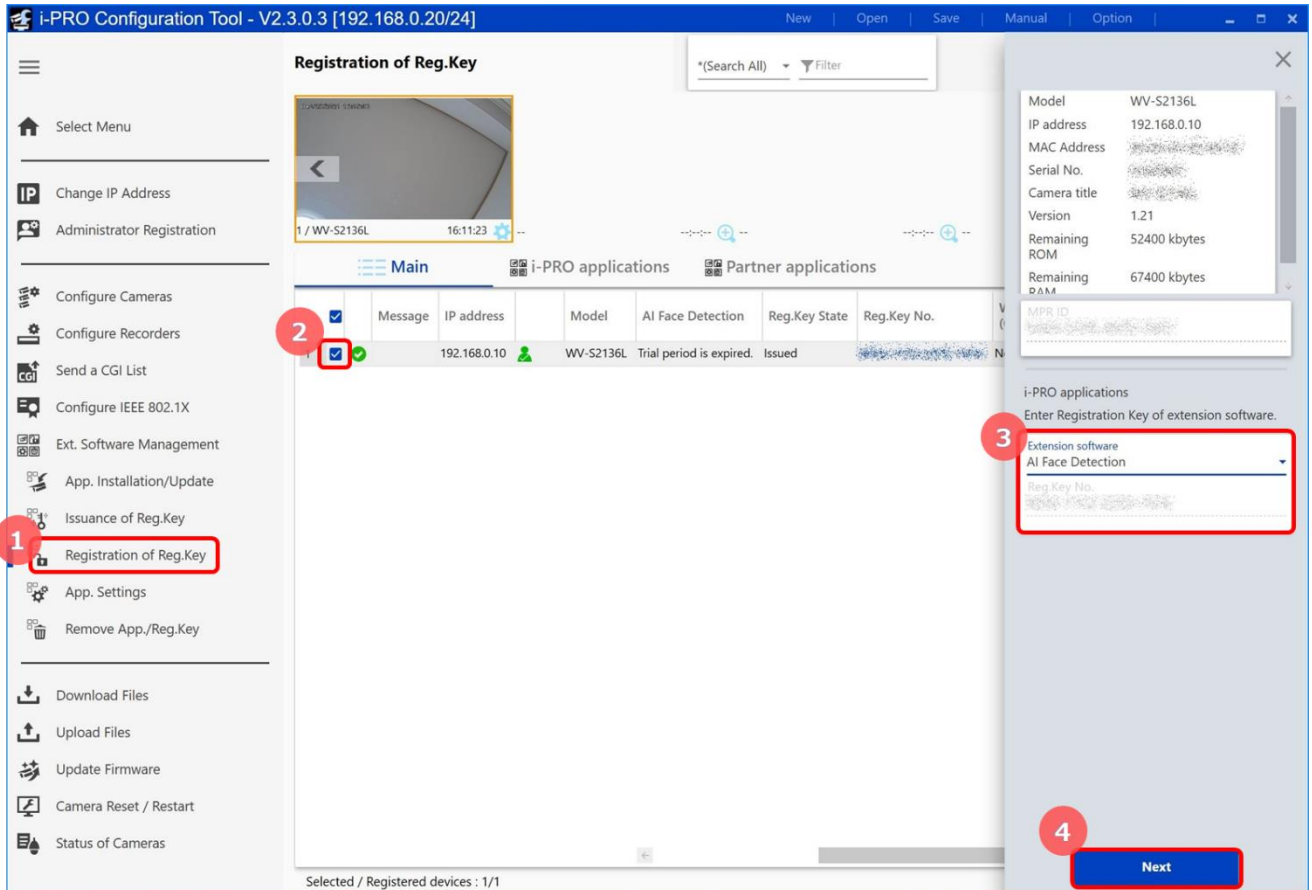
(7) When the issuance is completed, click the [Save] button to save the listed information including the registration key.

Note:

- To issue a key, the Internet environment is required.
-

STEP3 Register the Registration Key.

- (1) Select “Ext. Software Management” from the sub menu of iCT and then click [Registration of Reg. Key].
- (2) Select target cameras to activate. Multiple cameras can be selected.
- (3) Check the following on the setting menu.
 - Extension: Select “AI Face Detection”
 - Registration Key: Check to be sure that the 16-digit number is displayed.
- (4) Click the [Start] button.



- (5) When the process progress window is displayed, check to be sure that the registration of the registration key is correctly completed.
- (6) When the registration is completed, “AI Face Detection” will be enabled.

5

<Process progress window - Result>

- ✔ : Success
- ✘ : Failure
- ⏸ : In progress

※When the result is "Failure", check the error message.

Note:

- The registration key can be registered only by users whose access level is “1. Administrator”. Refer to the operating instructions of the camera for how to configure the access level.
- When the installation is failed, check the message in the error content of the message field.

3. Camera settings

(1) Open the Camera Advanced Settings menu

Double-click the thumbnail of camera to set.

The Camera Advanced Settings menu will open.

The screenshot shows the I-PRO Configuration Tool interface. The top navigation bar includes a 'Select Menu' button, which is highlighted by a red arrow. Below the navigation bar, there is a grid of camera thumbnails. The second thumbnail, labeled '2 / WV-S3531L', is selected and highlighted with a blue border. Below the thumbnails, a table lists the details of the selected camera and other registered devices.

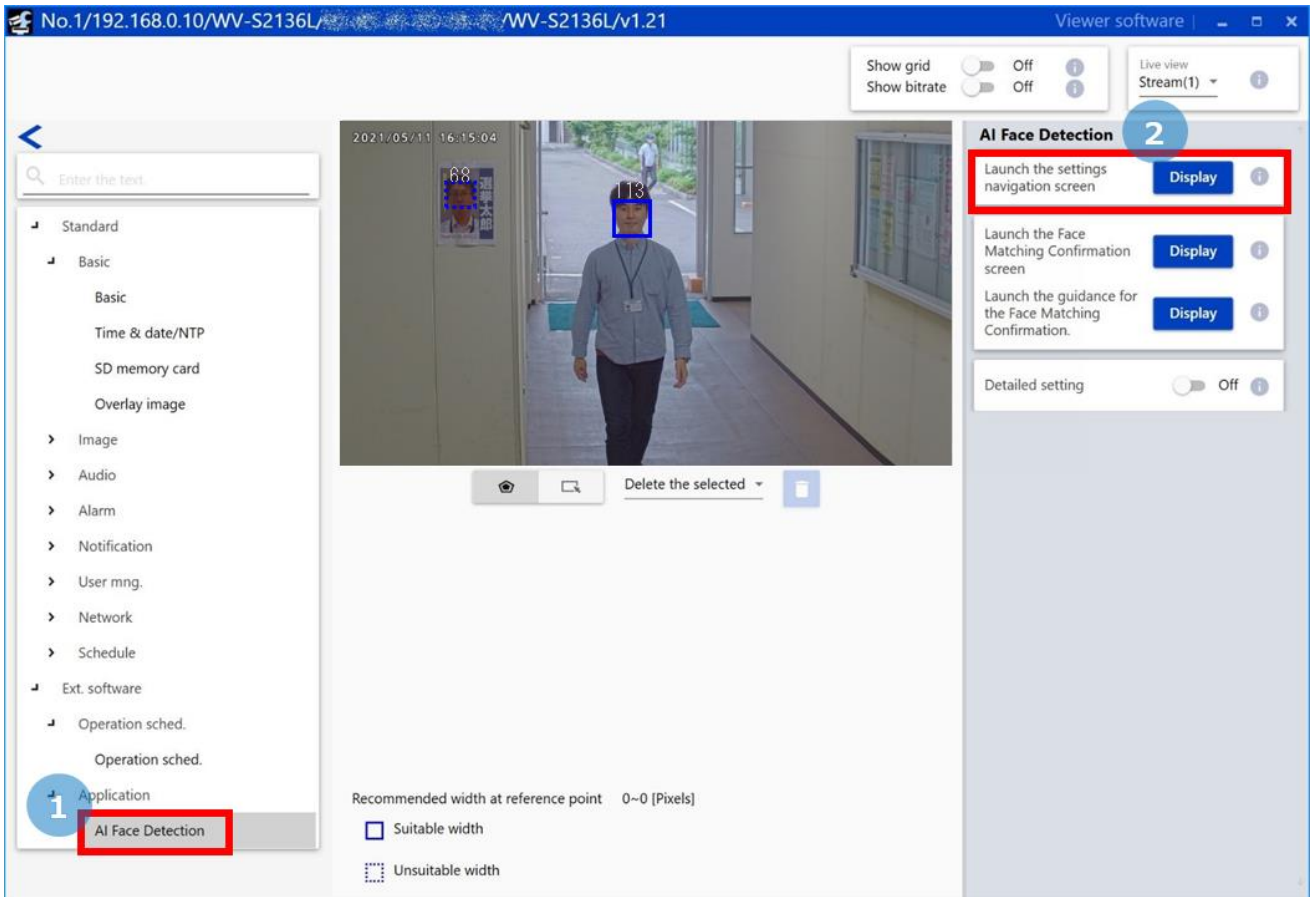
	Message	IP address	Model	Camera title	MAC Address	Serial No.	Version	HTTP(S)	Username	
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.142	WV-U1142	WV-U1142	4C-58-42-33-01-88	7540754	1.00	80	admin
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.53	WV-S3531L	WV-S3531L	8C-C1-42-1D-05-C2	5A411000	4.25	80	admin
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.31	WV-SPN311A	WV-SPN311A	08-00-23-43-43-68	02448000	4.10	80	admin
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.132	WV-U1132	WV-U1132	4C-58-42-33-01-88	7540754	1.00	80	admin
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.112	WV-S1112	WV-S1112	8C-C1-42-1D-05-C2	04925004	77.7	80	admin
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.10	X2271L	X2271L	4E-1B-44-37-6A-14	81904000	0.46	80	
7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.225	WV-S2531L	WV-S2531L	08-00-23-43-43-68	02448000	1.93	80	admin

Selected / Registered devices : 7/7

(2) Adjust the camera

Adjust the camera on the Camera Advanced Settings menu.

1. Click [AI Face Detection] under [Ext. software] of the iCT. The setting menu of the AI Face Detection will open.
2. On the setting menu of the AI Face Detection, click the "Display" button of "Launch the settings navigation screen".



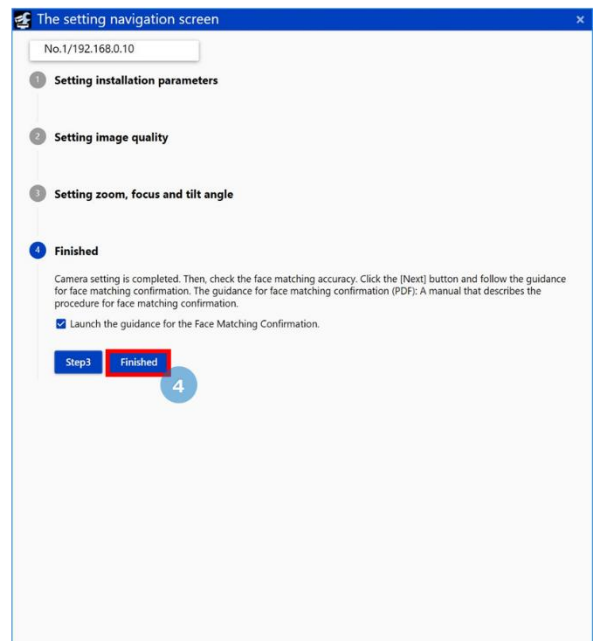
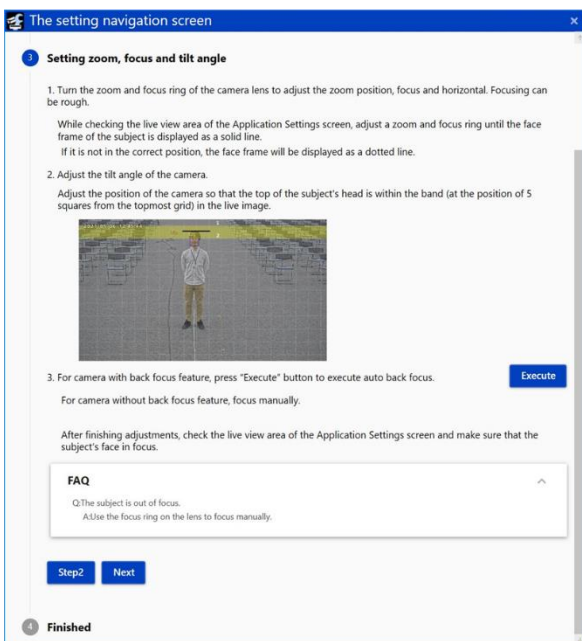
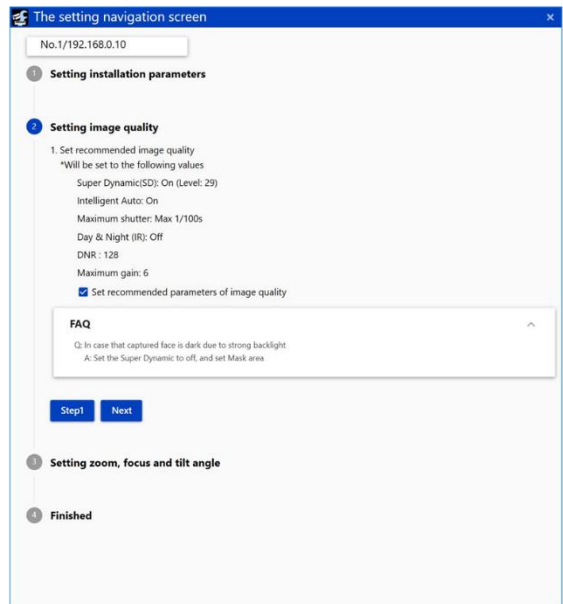
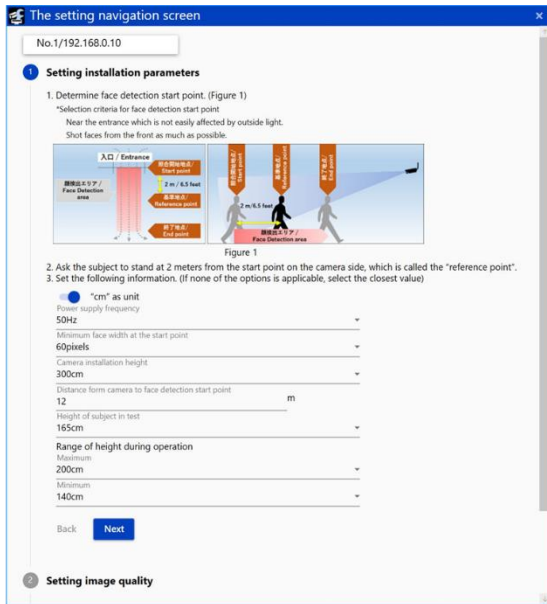
3. According to the instructions on the screen, adjust installation parameters, image quality, and zoom/focus/tilt angle of the camera.

- Refer to the following URL for the recommended size.

https://i-pro.com/global/en/surveillance/training_support/support/technical_information/

<Control No.: C0320>

4. Click the [Finished] button.



(3) Check bestshot images

Check if the face matching is performed correctly, by matching the registered face image and the bestshot image received from the camera.

1. Register the face image

As the face image, choose the bestshot received from the camera or image file in PC.

2. Click the [Start] button. Receiving the bestshot from the camera will start.

3. Bestshot images and the following items will be displayed.

- The time when the image was taken.
- Face matching score.
- The width of the bestshot image.

4. Result of face matching will be displayed.

The screenshot shows the 'Confirmation' software interface. The main window displays a list of bestshot images with their corresponding matching results. The interface includes a 'Quick Guidance' section, a 'Matching result' section, and a 'Face registration' section. The 'Matching result' section shows a green checkmark and a score of 11/28. The 'Face registration' section shows a 'Registration' button and a 'Selected best shot image' dropdown menu. The 'Registration' section shows a registered face image and a checkbox for 'Display only for registered face'.

Time	Similarity	Width
12:11:41	0	107
12:11:41	100	99
12:11:40	0	103
12:11:40	99	99
12:11:40	100	94
12:11:39	0	99
12:11:39	83	96
12:11:38	83	88

4. Detail settings

(1) Open the Camera Advanced Settings menu

Double-click the thumbnail of camera to set.

The Camera Advanced Settings menu will open.

The screenshot shows the 'i-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]' interface. A red arrow points to the 'Select Menu' button in the top navigation bar. Below the navigation bar, there are four camera thumbnails. The second thumbnail, labeled '2 / WV-S3531L', is highlighted with a red dashed border. Below the thumbnails is a table titled 'Main' listing registered devices. The table has columns for Message, IP address, Model, Camera title, MAC Address, Serial No., Version, HTTP(S), and Username. The second row is highlighted, corresponding to the selected camera.

Message	IP address	Model	Camera title	MAC Address	Serial No.	Version	HTTP(S)	Username
1	192.168.0.142	WV-U1142	WV-U1142	4C-5B-4E-23-01-0E	T5412754	1.00	80	admin
2	192.168.0.53	WV-S3531L	WV-S3531L	8C-CE-4E-D4-05-C2	5A411000	4.25	80	admin
3	192.168.0.81	WV-SPN311A	WV-SPN311A	08-00-20-48-4E-08	02440000	4.70	80	admin
4	192.168.0.132	WV-U1132	WV-U1132	4E-2B-1A-33-4B-C2	92427782	1.00	80	admin
5	192.168.0.112	WV-S1112	WV-S1112	8C-CE-4E-23-01-0E	04425004	77.7	80	admin
6	192.168.0.10	X2271L	X2271L	4E-2B-1A-33-4B-14	84458758	0.46	80	
7	192.168.0.225	WV-S2531L	WV-S2531L	08-00-20-48-25-40	02440004	1.93	80	admin

Selected / Registered devices : 7/7

■ Open the setting menu

Click [AI Face Detection] under [Ext. software] of the iCT. The setting menu of the AI Face Detection will open.

The screenshot shows the 'Viewer software' interface for a camera. The top bar displays the IP address 'No.1/192.168.0.10/WV-S2136L/v1.21' and the title 'Viewer software'. On the left is a navigation menu with categories like 'Standard', 'Basic', 'Image', 'Audio', 'Alarm', 'Notification', 'User mng.', 'Network', 'Schedule', 'Ext. software', 'Operation sched.', and 'Application'. The 'AI Face Detection' option under 'Application' is highlighted with a red box. The main area shows a live video feed of a person walking in a hallway, with two faces detected and labeled with numbers '68' and '113'. Below the video are controls for 'Delete the selected' and a trash icon. On the right, the 'AI Face Detection' settings panel is open, showing three 'Display' buttons for launching settings, face matching confirmation, and guidance screens, and a 'Detailed setting' toggle set to 'Off'. Below the video feed, technical specifications are listed:

Recommended width at reference point	71-117 [Pixels]
<input type="checkbox"/> Suitable width	
<input type="checkbox"/> Unsuitable width	
[Calculation result of the navigation screen settings]	
Focal length suitable for recognition	13.7-22.2 (mm)
Face detection area	4-5.2[m]
Tilt angle at face detection end point	12.8-15[deg]

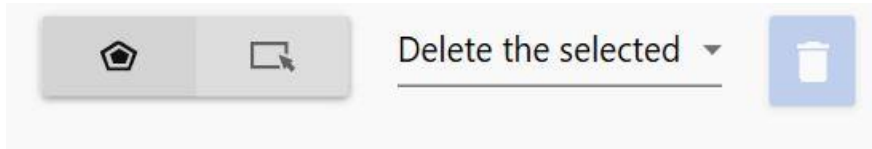
Important:

- The “AI Face Detection Setup” page cannot be opened even by clicking [AI Face detection] or [Setting Menu] on the “Extension Software” page of the setting menu of the camera. To open the “AI Face Detection Setup” page, use the iCT.

(2) Mask area settings

■ Mask area settings


A mask area can be specified and set by drawing an area where object detection is not to be performed. Up to 8 mask areas can be specified and up to 16 vertices can be set for each area. The set mask areas will be displayed translucent.




Default: No mask area is set.

Note:

- In case that the midpoint at the bottom of the object detection frame is in the mask area, the object is judged to exist in the mask area.
-


 : Click to create a new mask area.

 : Click to select a mask area.

[Mask area deletion]

An existing mask area can be deleted. "Delete the selected" and "Delete all" are available.

Default: Delete the selected motion detection mask area

 : Click after selecting "Delete the selected" or "Delete all" to delete the existing mask area(s).

Note:

- Mask area settings is unavailable when "Show grid" is on.
-

(3) Detail settings

■ Launch the settings navigation screen

[Display] button: Click to open the settings navigation screen as a separate window.

■ Launch the Face Matching Confirmation screen

[Display] button: Click to open the face matching confirmation screen as a separate window.

■ Launch the guidance for the Face Matching Confirmation

[Display] button: Click to open the guidance for face matching confirmation as a separate window.

■ Detailed setting

When “On” is selected, adjustment of the camera and the bestshot setting will become available.

The bestshot setting is used to set the detection threshold, the size of face to detect and so on.

Default: Off

■ Camera adjustment

[Image quality adjustment]: Click to shift to the image adjustment page of the camera.

[Zoom/focus adjustment]: Click to shift to the zoom/focus adjustment page of the camera.

■ Bestshot setting

[Bestshot transmission interval]

Set the number of bestshot images and interval to be transmitted per person.

Default: 1pic/1s

[Upper limit of detection face width]

Set the maximum size (width) of an object (face) to be detected.

Default: 300

AI Face Detection

Launch the settings navigation screen **Display** ⓘ

Launch the Face Matching Confirmation screen **Display** ⓘ

Launch the guidance for the Face Matching Confirmation. **Display** ⓘ

Detailed setting On ⓘ

Camera adjustment ^

image quality ⓘ
[Image quality adjustment](#)

Adjust the angle of view / focus ⓘ
[Zoom / focus adjustment](#)

Bestshot setting ^

Bestshot transmission interval 1pic/1s ⓘ

Upper limit of detection face width 300 ⓘ

Lower limit of detection face width 30 ⓘ

Detection threshold 20 ⓘ

Image size of bestshot 320x320 ⓘ

Address ^

Set

[Lower limit of detection face width]

Set the minimum size (width) of an object (face) to be detected.

Default: 30

Note:

- When 0 is set for the maximum or minimum frame size, it means that there is no limit in the detection size.
-

[Detection threshold]

Set the detection threshold. The smaller the value is, the easier the detection of person presence becomes. However, false detection may also increase.

1 - 99

Default: 20

[Image size of bestshot]

Select the size of bestshot images to be transmitted.

160x160, 320x320

Default: 320x320

■ Address

Not used for transmitting to multi AI server.

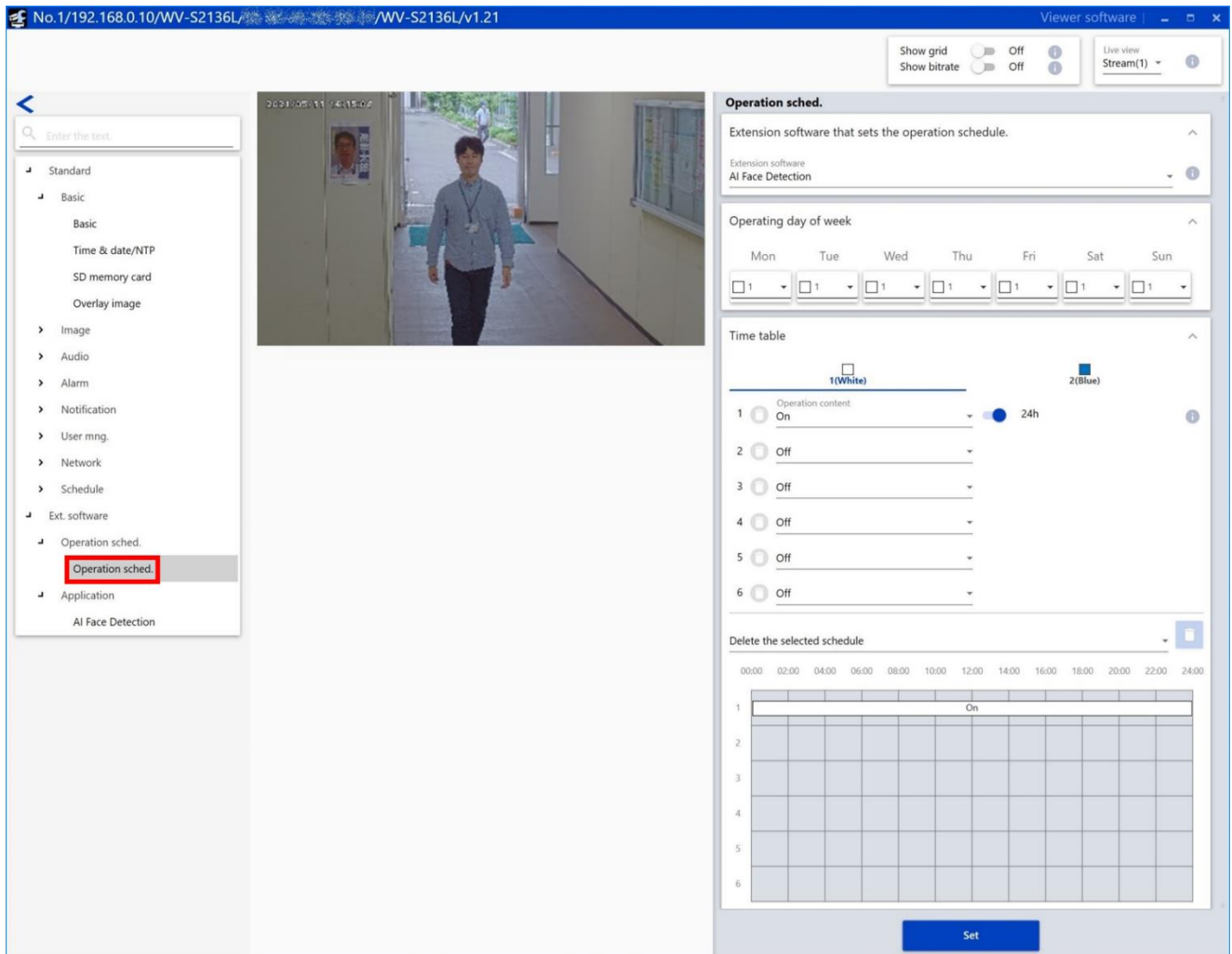
■ [Set]

Click to enable the content of the bestshot setting and the mask area setting.

(4) Schedule settings

■ Open the setting menu

Click [Operation sched.] under [Ext. software] of the iCT. The setting menu on the schedule will open.



■ Schedule settings

[Extension software that sets the operation schedule]

Select "AI Face Detection".

[Operating day of week]

Set the days of the week to operate the AI Face Detection.

Select the days of the week when the AI Face Detection is performed on "Time table 1" and "Time table 2" respectively. When "Off" is selected for a day of the week, it will not be performed on the corresponding day of the week.

Default: Time table 1 for all days of the week

[Time table]

Set the time when the AI Face Detection is performed and the operation content.

Up to 6 time periods can be set on each of "Time table 1" and "Time table 2".

• Operation content

Determine whether to perform the AI Face Detection.

On: Performs the AI Face Detection.

Off: Does not perform the AI Face Detection.

Set the operation time for the item set to "On". When "24h" is set, the AI Face Detection performs all day.

Default:

[Time table 1]

- Time 1: On, "24h" is set

- Time 2 to Time 6: Off

[Time table 2]

- Time 1 to Time 6: Off

[Set]

Click to enable the setting content of the operating schedule.

Important:

- When "Off" is set for the operating schedule on the camera side, it makes impossible to open the setting menu of the AI Face Detection.

AI People Detection

Preface

Outline

This Extension Software "AI People Detection" (hereinafter referred to as "this product") is designed to enhance the value of network cameras with AI engine (hereinafter referred to as "camera"). By installing this product on the camera, notification of person's information to multi AI server, by the people detection function and the attribute classification function.

Refer to the i-PRO configuration tool (hereinafter referred to as "iCT") *1 V2.0 or greater for how to configure the settings of this product.

*1 Refer to the following URL for iCT.

<https://i-pro.com/global/en/surveillance/tools/ict>

Important:

- This product cannot be installed on multiple cameras.
- Refer to the following URL for models that support this product, software version information and notes about installing multiple extension software.

https://i-pro.com/global/en/surveillance/training_support/support/technical_information/

<Control No.: C0103>

Features

- This product classifies attribute of detected person and transmits the best-shot images and the attribute information to the VMS server.
- This product has the following features.
 1. Classifies person's attributes of 14 items and 65 types.
 2. Transmits best-shot images of up to 20 people and attribute information.
 3. Up to 8 mask areas can be set to prevent false detection.

Following is a list of the attributes.

- Gender (Male/Female)
- Age (0-10/11-20/21-60/60-)
- Hair length (Long/Short/Hat)
- Hair color (Black/Brown/White/Gray/Gold)
- Sunglasses (Sunglass/No Sunglass)
- Beard (Beard/No Beard)
- Mask (Mask/No Mask)
- Tops type (Long/Short)
- Tops color (Black/Brown/White/Gray/Green/Red/Blue/Yellow/Orange/Purple/Pink)
- Bottom type (Long/Short)
- Bottom color (Black/Brown/White/Gray/Green/Red/Blue/Yellow/Orange/Purple/Pink)
- Bag (Bag/No Bag)
- Bags color (Black/Brown/White/Green/Red/Blue/Yellow/Orange/Purple/Pink)
- Shoes (Black/Brown/White/Green/Red/Blue/Yellow)

About the Operating Instructions

This manual explains the method of installing this product in a camera, settings that need to be made before starting to operate this product, and the method of operation for using this product. Since this product is used after being installed on a camera, before using this product always be sure to also read the Operating Instructions of the camera with which this product is to be used.

- Depending on the version of iCT to use, its screen may be different from the screen shown in this manual.
- In this manual, a personal computer is referred to as a PC.

System requirements for a PC

For the requirements of PC which are used for settings, refer to the Operating Instructions of a camera.

Open source software used

- This product uses the following open source software.

Name of software	Name of license
libjpeg-turbo	- The IJG (Independent JPEG Group) License - The Modified (3-clause) BSD License - The zlib License

- For the corresponding license statement, refer to “Open Source Software” on page 64.

Copyright

Distributing, copying, disassembling, reverse compiling and reverse engineering of the software provided with this product are all expressly prohibited. In addition, exporting any software provided with this product violating export laws is prohibited.

Disclaimer of warranty

IN NO EVENT SHALL i-PRO Co., Ltd. BE LIABLE TO ANY PARTY OR ANY PERSON, EXCEPT FOR REPLACEMENT OR REASONABLE MAINTENANCE OF THE PRODUCT, FOR THE CASES INCLUDING BUT NOT LIMITED TO BELOW:

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- (3) ANY PROBLEM, CONSEQUENTIAL INCONVENIENCE, OR LOSS OR DAMAGE, ARISING OUT OF THE SYSTEM COMBINED WITH THIRD PARTY DEVICES;
- (4) ANY CLAIM OR ACTION FOR DAMAGES BROUGHT BY ANY PERSON OR ORGANIZATION AS A PHOTOGRAPHED SUBJECT DUE TO VIOLATION OF PRIVACY CONCERNING A SURVEILLANCE CAMERA'S PICTURE OR SAVED DATA, FOR SOME REASON (INCLUDING USE WHEN USER AUTHENTICATION ON THE AUTHENTICATION SETTING SCREEN IS SET TO OFF), BECOMING PUBLIC OR BEING USED FOR ANY PURPOSE;
- (5) LOSS OF REGISTERED DATA CAUSED BY ANY FAILURE (INCLUDING INITIALIZATION OF THE PRODUCT DUE TO FORGOTTEN AUTHENTICATION INFORMATION SUCH AS A USER NAME AND PASSWORD).

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THIS PUBLICATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THE THIRD PARTY'S RIGHT.

THIS PUBLICATION COULD INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS. CHANGES ARE ADDED TO THE INFORMATION HEREIN, AT ANY TIME, FOR THE IMPROVEMENTS OF THIS PUBLICATION AND/OR THE CORRESPONDING PRODUCT(S).

Before using this product

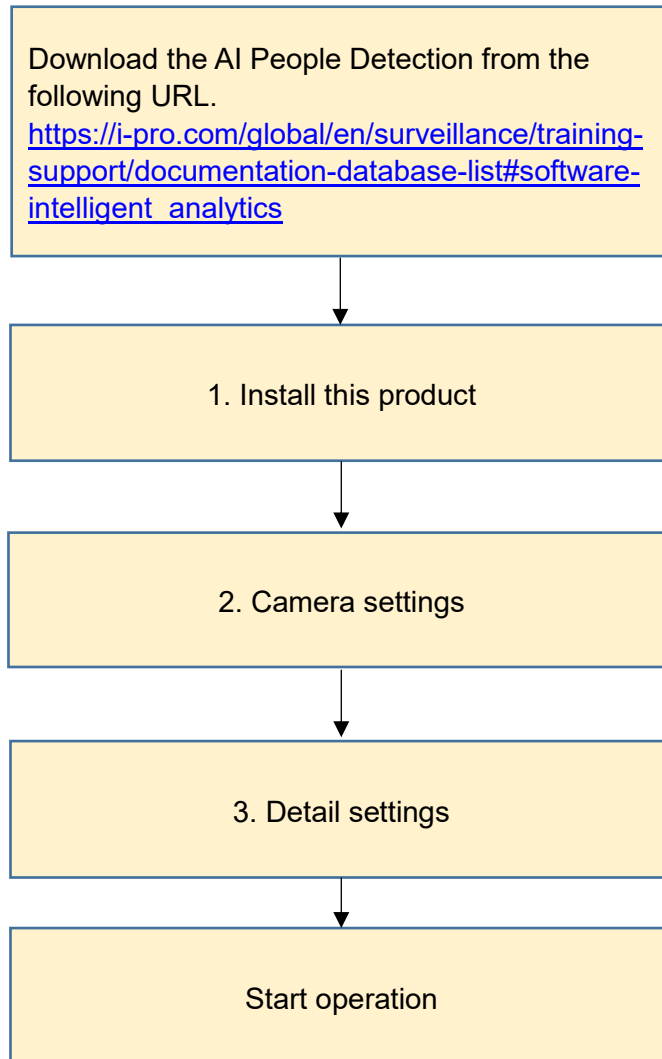
The following may cause detection failure, false detection or false attribute classification.

- Luminance level of image is too low (During nighttime, etc.)
- In case of the input video is black and white.
- White balance of the image is shifted.
- A backlight is projected in the image.
- A strong light is projected in the image.
- Movement of the object is too fast.
- Affected by irregular light irradiation, for example, only a part of the object is lighted or shaded.
- The object is too big or too small.
- A part of the object is hidden.
- The object is not standing upright, for example, the object is squatting down, lying down or falling down.
- The object is bending the arms or legs greatly.
- The object may not be classified correctly depending on the type of clothes and ornaments and how they are worn.
- The object may not be classified correctly due to the belongings.
- The face of the object is not directed to the camera.
- The object is out of focus.
- A poster containing a doll or person is in the image.
- There are too many objects.
- A plurality of persons are crossing with each other or crowded.
- Dirt or water droplets are on the dome cover of the camera.
- The camera is shaking.
- Weather condition is extremely poor.

Other precautions are as follows.

- When the shooting areas (the screen) have objects that can cause false detections, false detections can be reduced by setting mask areas.
- Update to the latest firmware to prevent unexpected access to the camera by the third party, which may cause infringement of privacy rights, leaking of information, and other issues.
- In no event shall we be liable to any party or any person for any problem, consequential inconvenience, or loss or damage, arising out of the settings of this product.
- In no event shall we be liable for any accidents or loss.

Operations flow



1. Install this product

Download and install this product on the camera in use in the following procedure.

(1) Download the “AI People Detection” from the following URL and save it onto the PC.

https://i-pro.com/global/en/surveillance/training-support/documentation-database-list#software-intelligent_analytics

<Model Name: Multi-AI System - Camera extension software>

Important:

- Do not use a blank (space) and double-byte characters for the name of the destination directory.

(2) Select “Ext. Software Management” from the sub menu of iCT and then click [App. Installation/Update].

(3) Select target cameras to install the application. Multiple cameras can be selected.

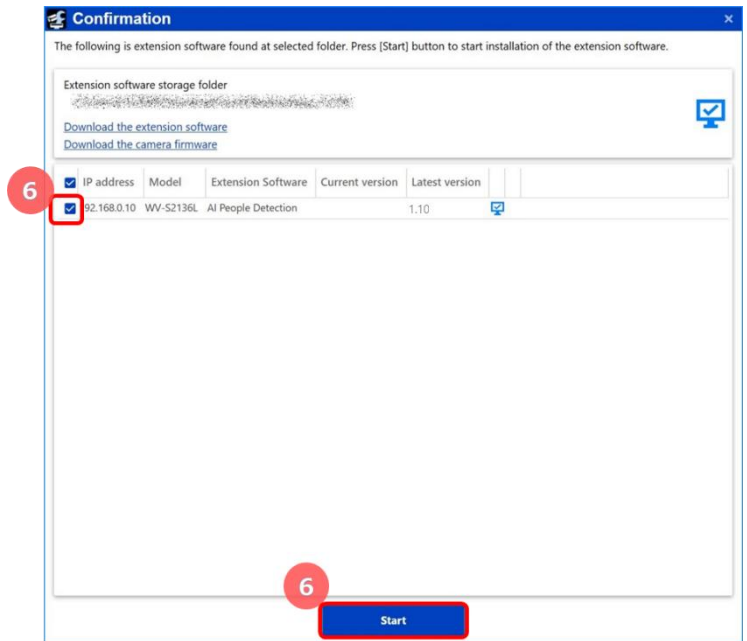
(4) Fill out the following items on the setting menu.

- Extension software: Select “AI People Detection”
- Folder: Specify the destination directory of the extension software downloaded in (1).

(5) Click the [Confirm] button.

The screenshot shows the i-PRO Configuration Tool interface. The title bar reads "i-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]". The main window is titled "App. Installation/Update". On the left, a sidebar menu lists various functions, with "App. Installation/Update" highlighted by a red box and a red circle labeled "2". The main area displays a table of devices with columns for Message, IP address, Model, AI People Detection, Version, AI Vehicle Detection, and Version. A red box and red circle labeled "3" highlight the selection of a camera (1 / WV-S2136L) and the "Message" checkbox. The right panel shows a settings menu for "i-PRO applications" with a red box and red circle labeled "4" highlighting the "Extension software" dropdown (set to "AI People Detection") and the "Folder" input field. A red box and red circle labeled "5" highlight the "Confirm" button at the bottom right.

(6) Check to be sure that a check mark is on the target camera and the version of the application to be registered/updated is correct on the confirmation window and then click the [Start] button.



(7) When the process progress window will be displayed, check to be sure that the installation is correctly completed.

7

<Process progress window - Result>

- : Success
- : Failure
- : In progress

※When the result is "Failure", check the error message.

Important:

- Do not turn off the power of the camera during the installation process.
- Do not perform any operation during the installation process and wait until it completes.
- When the installation is failed, check the message in the error content of the message field.

2. Camera settings

(1) Open the Camera Advanced Settings menu

Double-click the thumbnail of camera to set.

The Camera Advanced Settings menu will open.

The screenshot shows the 'i-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]' interface. The 'Select Menu' section displays four camera thumbnails. A red arrow points to the second thumbnail, labeled '2 / WV-S2531L'. Below the thumbnails is a table of registered devices.

	Message	IP address	Model	Camera title	MAC Address	Serial No.	Version	HTTP(S)	Username
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.142	WV-U1142	4C-5B-4E-23-61-88	75410754	1.00	80	admin
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.53	WV-S2531L	8C-C1-4E-D4-85-C2	5A411000	4.25	80	admin
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.31	WV-SPN311A	08-00-11-4A-4E-68	12440000	4.10	80	admin
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.132	WV-U1132	4C-5B-1E-33-4B-C2	92427000	1.00	80	admin
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.112	WV-S1112	8C-C1-4E-18-1E-04	04425000	77.7	80	admin
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.10	X2271L	4C-5B-44-1E-6A-18	84440000	0.46	80	admin
7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.225	WV-S2531L	08-00-11-4B-23-48	12440000	1.93	80	admin

Selected / Registered devices : 7/7

(2) Adjust the camera

Adjust image and zoom/focus of the Camera Advanced Settings menu.

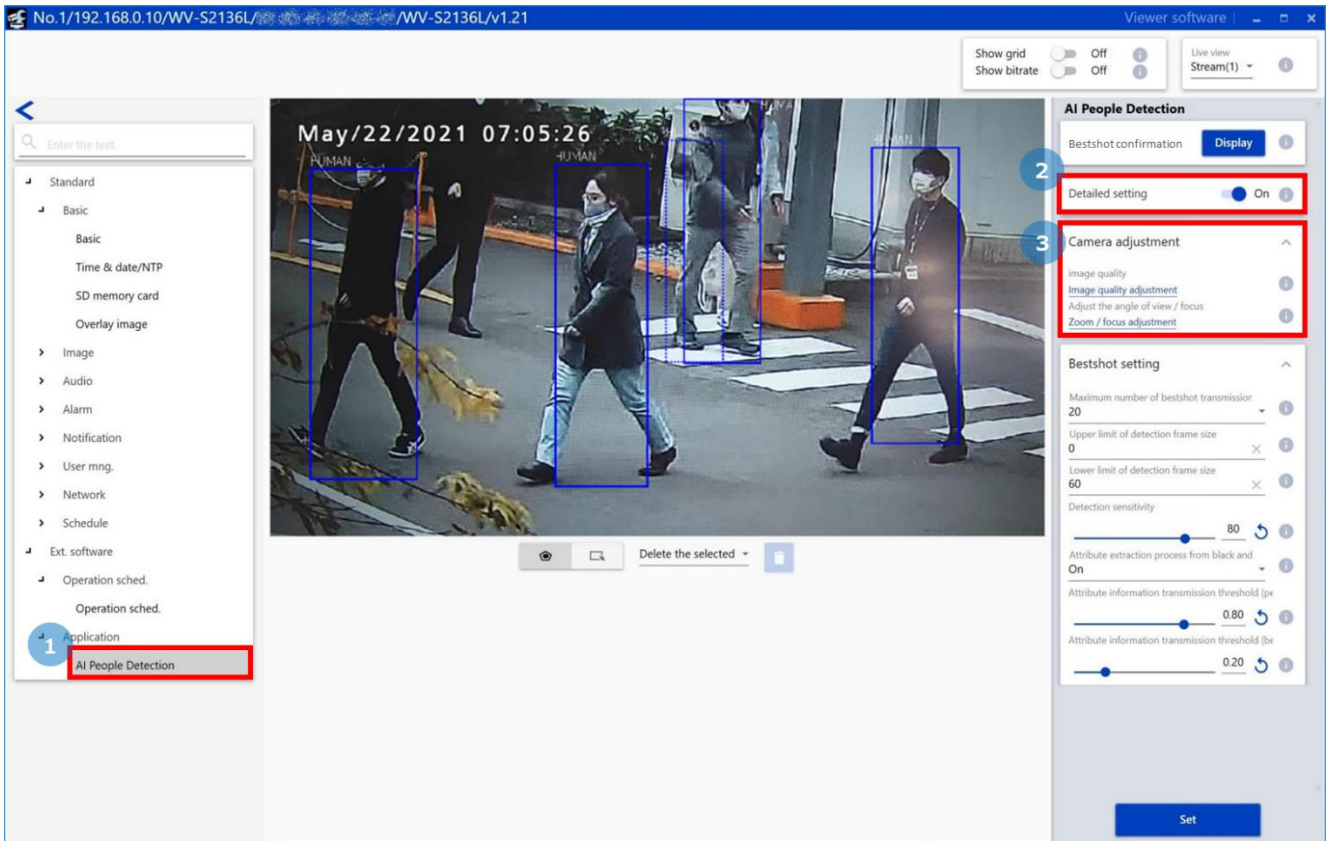
1. Click [AI People Detection] under [Ext. software] of the iCT. The setting menu of the AI People Detection will open.

2. Set [Detailed setting] to On.

3. Adjust the camera.

[To image quality adjustment]: Click to shift to the image adjustment page of the camera.

[To zoom/focus adjustment]: Click to shift to the zoom/focus adjustment page of the camera.



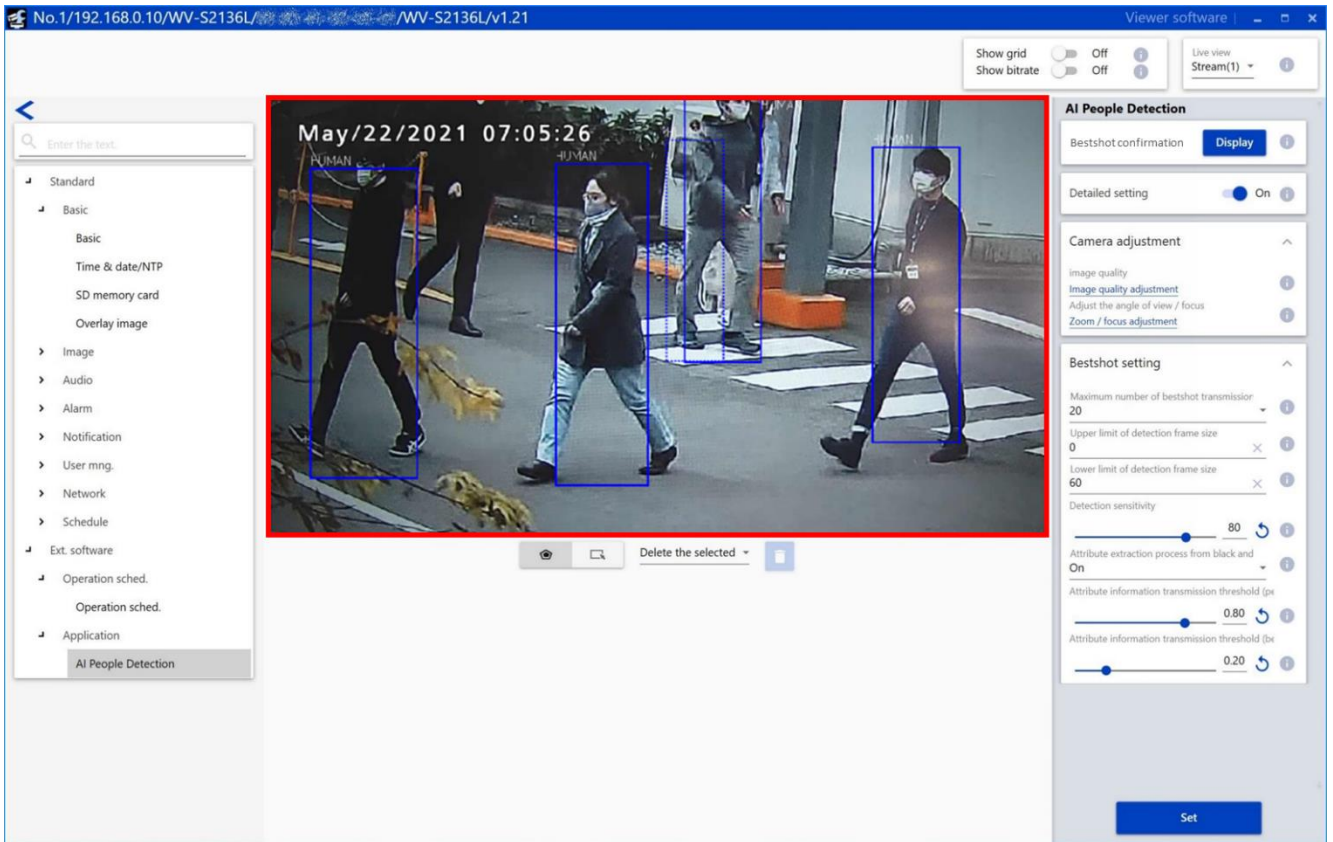
Note:

- The color of the image may change, when the super dynamic is turned on.
- Manual zoom/focus adjustment is required for some cameras.

(3) Check if people can be detected

Adjust the camera while shooting person so that the following items are satisfied.

- Whether the person can be detected.
- Whether the size of the person is the recommended size for the attribute classification.



Blue frame will be attached to the detected person.

The solid frame shows that it is the recommended size, and the dotted frame shows that it is not the recommended size.

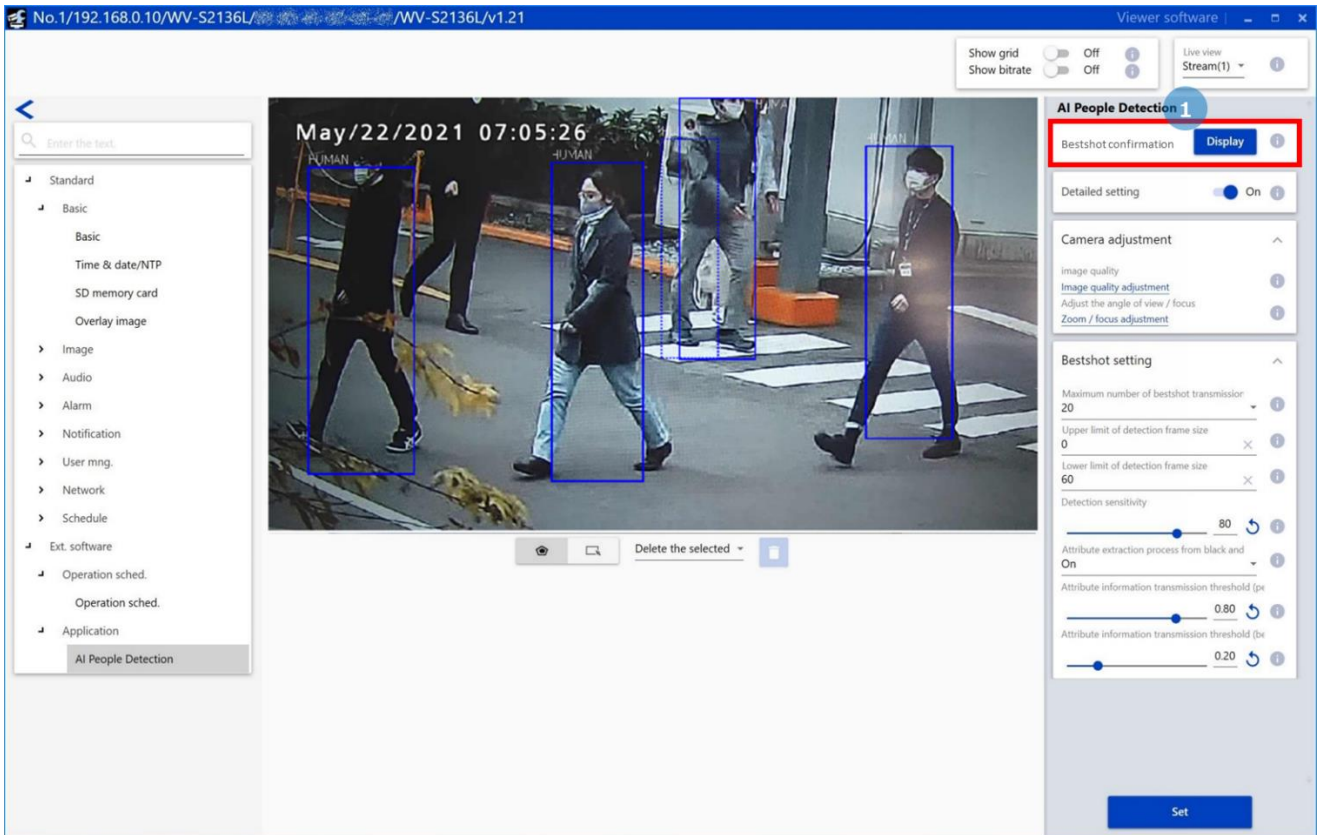
- Refer to the following URL for the recommended size.

https://i-pro.com/global/en/surveillance/training_support/support/technical_information/

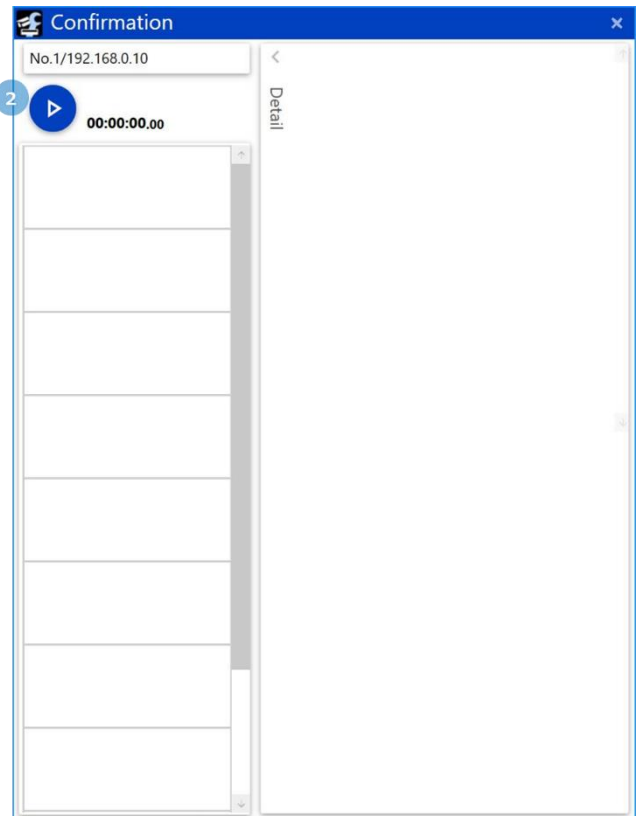
<Control No.: C0320>

(4) Check bestshot images and attribute

1. Click the [Display] button on the setting menu of the AI People Detection. Check if the frame is attached to people. If not, adjust the installation position of the camera.



2. Click the start button on the bestshot confirmation window.



3. Bestshot images and the following items will be displayed.

- The time when the person is detected.
- Whether the size of the person is the recommended size.
- The size of the bestshot image.

For more accurate classification, adjust the camera so that "Size" is OK as possible.

4. Click the bestshot image to show the detailed attribute.

Following is a list of the detailed attributes.

- Gender (Male/Female)
- Age (0-10/11-20/21-60/60-)
- Hair length (Long/Short/Hat)
- Hair color (Black/Brown/White/Gray/Gold)
- Sunglasses (Sunglass/No Sunglass)
- Bear (Beard/No Beard)
- Mask (Mask/No Mask)
- Tops type (Long/Short)
- Tops color (Black/Brown/White/Gray/Green/Red/Blue/Yellow/Orange/Purple/Pink)
- Bottoms type (Long/Short)
- Bottoms color (Black/Brown/White/Gray/Green/Red/Blue/Yellow/Orange/Purple/Pink)
- Bag (Bag/No Bag)
- Bags color (Black/Brown/White/Green/Red/Blue/Yellow/Orange/Purple/Pink)
- Shoes (Black/Brown/White/Green/Red/Blue/Yellow)

The screenshot shows a 'Confirmation' window with a blue header. On the left, there is a list of bestshot images with their corresponding timestamps and sizes. The third image is highlighted with a blue border and a '3' in a blue circle. On the right, there is a 'Detail' panel with a '4' in a blue circle, showing various attributes for the selected image. At the bottom, there are three buttons: 'Bestshot images' (blue), 'Meta information' (green), and 'Detailed attribute' (purple).

Image	Time	Size
	23:58:57	Size OK 214x650
	23:58:54	Size OK 135x637
	23:58:53	Size OK 118x526
	23:58:52	Size OK 124x475
	23:58:52	Size OK 124x449
	23:58:50	Size OK 109x415
	23:58:49	Size NG 99x364
	23:58:42	Size NG 89x296

Detail

- Gender: Male 82%
- Age: N/A
- Hair Length: Short_Bald 92% Hat 39%
- Hair Color: Black 99%
- Tops type: LongSleeve 99%
- Tops color: Black 99%
- Bottoms type: Trousers 100%
- Bottoms color: Green 45% Blue 51%
- Sunglasses: NoSunglass 99%
- Beard: N/A
- Mask: Mask 99%
- Bag: No Bag 99%
- Bag color: N/A
- Shoes color: Black

Recommended size: Yes
Detect size: 118x526
Detect wholebody: Yes
Detect upperbody: Yes
Detect face: Yes

Bestshot images Meta information Detailed attribute

3. Detail settings

(1) Open the Camera Advanced Settings menu

Double-click the thumbnail of camera to set.

The Camera Advanced Settings menu will open.

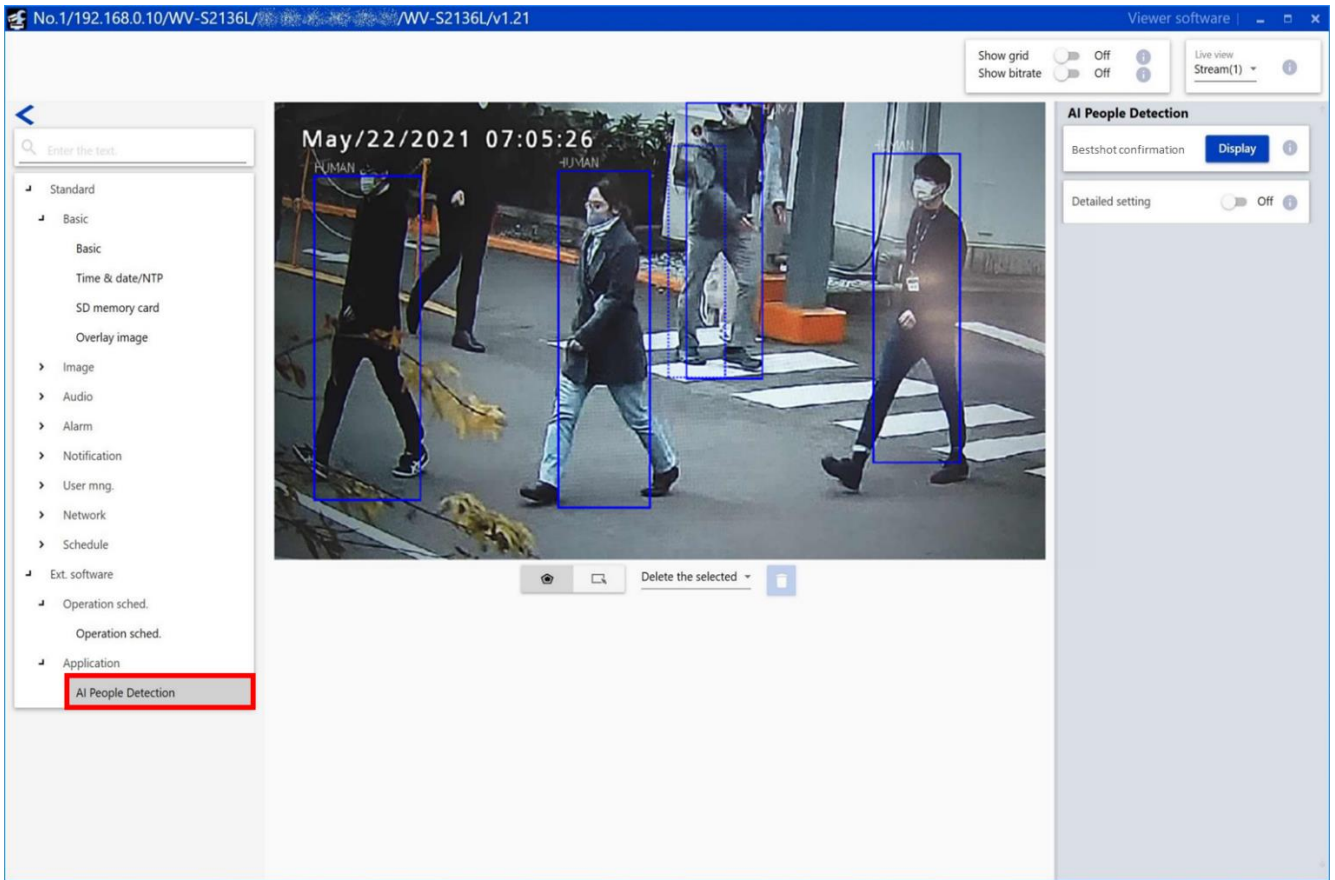
The screenshot shows the 'i-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]' interface. The 'Select Menu' section displays four camera thumbnails. The second thumbnail, labeled '2 / WV-S2531L', is highlighted with a dashed blue border and a red arrow points to it. Below the thumbnails is a table of registered devices.

	Message	IP address		Model	Camera title	MAC Address	Serial No.	Version	HTTP(S)	Username	
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.142		WV-U1142	WV-U1142	4C-5B-4E-22-61-88	75410754	1.00	80	admin
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.53		WV-S2531L	WV-S2531L	5C-C1-42-D4-85-C2	5A411000	4.25	80	admin
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.31		WV-SPN311A	WV-SPN311A	08-00-44-4D-4E-68	12440000	4.10	80	admin
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.132		WV-U1132	WV-U1132	45-2B-16-33-4B-C2	9202788	1.00	80	admin
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.112		WV-S1112	WV-S1112	5C-C1-42-D4-85-C2	04425904	77.7	80	admin
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.10		X2271L		4C-5B-4E-22-61-88	84400754	0.46	80	
7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.225		WV-S2531L	WV-S2531L	08-00-44-4D-4E-68	12440000	1.93	80	admin

Selected / Registered devices : 7/7

■ Open the setting menu

Click [AI People Detection] under [Ext. software] of the iCT. The setting menu of the AI People Detection will open.



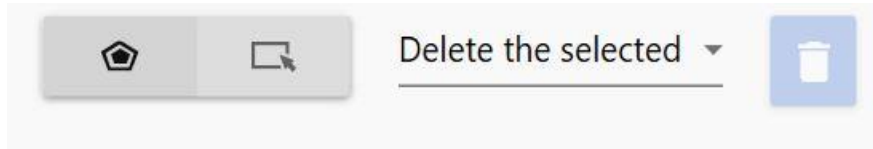
Important:

- The “AI People Detection Setup” page cannot be opened even by clicking [AI People detection] or [Setting Menu] on the “Extension Software” page of the setting menu of the camera. To open the “AI People Detection Setup” page, use the iCT.

(2) Mask area settings

■ Mask area settings


A mask area can be specified and set by drawing an area where object detection is not to be performed. Up to 8 mask areas can be specified and up to 16 vertices can be set for each area. The set mask areas will be displayed translucent.




Default: No mask area is set.

Note:

- In case that the midpoint at the bottom of the object detection frame is in the mask area, the object is judged to exist in the mask area.
-


 : Click to create a new mask area.

 : Click to select a mask area.

[Mask area deletion]

An existing mask area can be deleted. "Delete the selected" and "Delete all" are available.

Default: Delete the selected motion detection mask area

 : Click after selecting "Delete the selected" or "Delete all" to delete the existing mask area(s).

Note:

- Mask area settings is unavailable when "Show grid" is on.
-

(3) Detail settings

■ Bestshot confirmation

[Display] button: Click to open the bestshot confirmation window as a separate window.

■ Detailed setting

When “On” is selected, adjustment of the camera and the bestshot setting will become available.

The bestshot setting is used to set the detection threshold, the size of person to detect and so on.

Default: Off

■ Camera adjustment

[Image quality adjustment]: Click to shift to the image adjustment page of the camera.

[Zoom/focus adjustment]: Click to shift to the zoom/focus adjustment page of the camera.

■ Bestshot setting

[Maximum number of bestshot transmission]

Set the number of bestshot images to be transmitted at once.

Default: 20

[Upper limit of detection frame size]

Set the maximum size (width) of an object (person) to be detected.

Default: 0

[Lower limit of detection frame size]

Set the minimum size (width) of an object (person) to be detected.

Default: 60

Note:

- When 0 is set for the maximum or minimum frame size, it means that there is no limit in the detection size.

AI People Detection

Bestshot confirmation **Display** ⓘ

Detailed setting On ⓘ

Camera adjustment ^

image quality ⓘ
[Image quality adjustment](#)
Adjust the angle of view / focus ⓘ
[Zoom / focus adjustment](#) ⓘ

Bestshot setting ^

Maximum number of bestshot transmission 20 ⓘ

Upper limit of detection frame size 0 × ⓘ

Lower limit of detection frame size 60 × ⓘ

Detection threshold 20 ⓘ

Attribute extraction process from black and On ⓘ

Attribute information transmission threshold (pe) 0.80 ⓘ

Attribute information transmission threshold (be) 0.20 ⓘ

Period to become bestshot target (sec) 1.0 ⓘ

Distance moved to become bestshot target (%) 50 ⓘ

Attribute extraction for bag and shoes On ⓘ

Set

[Detection threshold]

Set the detection threshold. The smaller the value is, the easier the detection of person presence becomes. However, false detection may also increase.

1 - 99

Default: 20

[Attribute extraction process from black and white video]

Determine whether to execute the attribute classification of person when the input video is black and white.

Default: On

[Attribute information transmission threshold (periodic transmission)]

Transmit attribute information having a score higher than the threshold value together with detection result information scheduled to transmit periodically.

0.00 - 1.00

Default: 0.80

[Attribute information transmission threshold (bestshot transmission)]

Transmit attribute information having a score higher than the threshold value together with bestshot images.

0.00 - 1.00

Default: 0.20

[Period to become bestshot target] • available for iCT V2.4 or later

Set the period until detected object becomes bestshot target.

0.1 - 6553.5

Default : 1.0 (sec.)

[Distance moved to become bestshot target] • available for iCT V2.4 or later

Set the distance moved (as a percentage of the width of the detection frame) until detected object becomes bestshot target.

1 - 65535

Default : 50 (%)

[Attribute extraction for bag and shoes]

Determine whether to perform attribute classification of shoes and bags.

Default: On

■ [Set]

Click to enable the content of the bestshot setting and the mask area setting.

(4) Schedule settings

■ Open the setting menu

Click [Operation sched.] under [Ext. software] of the iCT. The setting menu on the schedule will open.

The screenshot shows the 'Viewer software' interface. On the left, a navigation menu lists various settings, with 'Operation sched.' under 'Ext. software' highlighted in red. The central area displays a live video feed of a street scene with people walking. On the right, the 'Operation sched.' configuration panel is visible. It includes a dropdown for 'Extension software' set to 'AI People Detection', a section for 'Operating day of week' with dropdowns for each day (Mon-Sun) set to '1', and a 'Time table' section with 6 rows and 2 columns (1(White) and 2(Blue)). The first row is set to 'On' for 24h, while rows 2-6 are set to 'Off'. A 'Set' button is located at the bottom of the configuration panel.

■ Schedule settings

[Extension software that sets the operation schedule]

Select "AI People Detection".

[Operating day of week]

Set the days of the week to operate the AI People Detection.

Select the days of the week when the AI People Detection is performed on "Time table 1" and "Time table 2" respectively. When "Off" is selected for a day of the week, it will not be performed on the corresponding day of the week.

Default: Time table 1 for all days of the week

[Time table]

Set the time when the AI People Detection is performed and the operation content.

Up to 6 time periods can be set on each of "Time table 1" and "Time table 2".

• Operation content

Determine whether to perform the AI People Detection.

On: Performs the AI People Detection.

Off: Does not perform the AI People Detection.

Set the operation time for the item set to "On". When "24h" is set, the AI People Detection performs all day.

Default:

[Time table 1]

- Time 1: On, "24h" is set
- Time 2 to Time 6: Off

[Time table 2]

- Time 1 to Time 6: Off

[Set]

Click to enable the setting content of the operating schedule.

Important:

- When "Off" is set for the operating schedule on the camera side, it makes impossible to open the setting menu of the AI People Detection.

AI Vehicle Detection

Preface

Outline

This Extension Software "AI Vehicle Detection" (hereinafter referred to as "this product") is designed to enhance the value of network cameras with AI engine (hereinafter referred to as "camera"). By installing this product on the camera, notification of vehicle's information to multi AI server, by the vehicle detection function and the attribute classification function.

Refer to the i-PRO configuration tool (hereinafter referred to as "iCT") *1 V2.0 or greater for how to configure the settings of this product.

*1 Refer to the following URL for iCT.

<https://i-pro.com/global/en/surveillance/tools/ict>

Important:

- This product cannot be installed on multiple cameras.
- Refer to the following URL for models that support this product, software version information and notes about installing multiple extension software.

https://i-pro.com/global/en/surveillance/training_support/support/technical_information/

<Control No.: C0103>

Features

- This product classifies attribute of detected vehicle and transmits the best-shot images and the attribute information to the VMS server.
- This product has the following features.
 1. Classifies vehicle's attributes from 7 car types and 10 colors.
 2. Transmits best-shot images of up to 20 vehicles and attribute information.
 3. Up to 8 mask areas can be set to prevent false detection.

Following is a list of the attributes.

- Type (Truck/Bus/SUV/Van/Sedan/Pickup/Two wheels)
- Color (Black/Brown/White/Gray/Green/Red/Blue/Yellow/Purple/Pink)

About the Operating Instructions

This manual explains the method of installing this product in a camera, settings that need to be made before starting to operate this product, and the method of operation for using this product. Since this product is used after being installed on a camera, before using this product always be sure to also read the Operating Instructions of the camera with which this product is to be used.

- Depending on the version of iCT to use, its screen may be different from the screen shown in this manual.
- In this manual, a personal computer is referred to as a PC.

System requirements for a PC

For the requirements of PC which are used for settings, refer to the Operating Instructions of a camera.

Open source software used

- This product uses the following open source software.

Name of software	Name of license
libjpeg-turbo	- The IJG (Independent JPEG Group) License - The Modified (3-clause) BSD License - The zlib License

- For the corresponding license statement, refer to “Open Source Software” on page 64.

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Before using this product

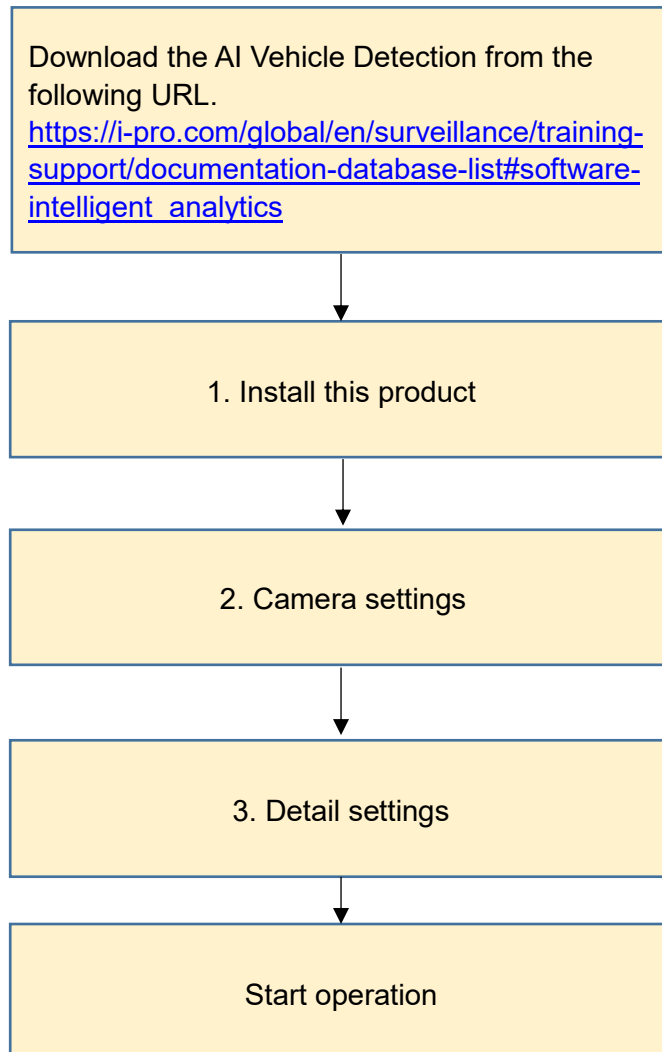
The following may cause detection failure, false detection or false attribute classification.

- Luminance level of image is too low (During nighttime, etc.)
- White balance of the image is shifted.
- A backlight is projected in the image.
- A strong light is projected in the image.
- Movement of the object is too fast.
- Affected by irregular light irradiation, for example, only a part of the object is lighted or shaded.
- The object is too big or too small.
- A part of the object is hidden.
- The object is out of focus.
- A signboard containing vehicle is in the image.
- There are too many objects.
- A plurality of vehicles are crossing with each other or crowded.
- Dirt or water droplets are on the dome cover of the camera.
- The camera is shaking.
- Weather condition is extremely poor.

Other precautions are as follows.

- When the shooting areas (the screen) have objects that can cause false detections, false detections can be reduced by setting mask areas.
- Update to the latest firmware to prevent unexpected access to the camera by the third party, which may cause infringement of privacy rights, leaking of information, and other issues.
- In no event shall we be liable to any party or any person for any problem, consequential inconvenience, or loss or damage, arising out of the settings of this product.
- In no event shall we be liable for any accidents or loss.

Operations flow



1. Install this product

Download and install this product on the camera in use in the following procedure.

(1) Download the “AI Vehicle Detection” from the following URL and save it onto the PC.

https://i-pro.com/global/en/surveillance/training-support/documentation-database-list#software-intelligent_analytics

<Model Name: Multi-AI System - Camera extension software>

Important:

- Do not use a blank (space) and double-byte characters for the name of the destination directory.

(2) Select “Ext. Software Management” from the sub menu of iCT and then click [App. Installation/Update].

(3) Select target cameras to install the application. Multiple cameras can be selected.

(4) Fill out the following items on the setting menu.

• Extension software: Select “AI Vehicle Detection”

• Folder: Specify the destination directory of the extension software downloaded in (1).

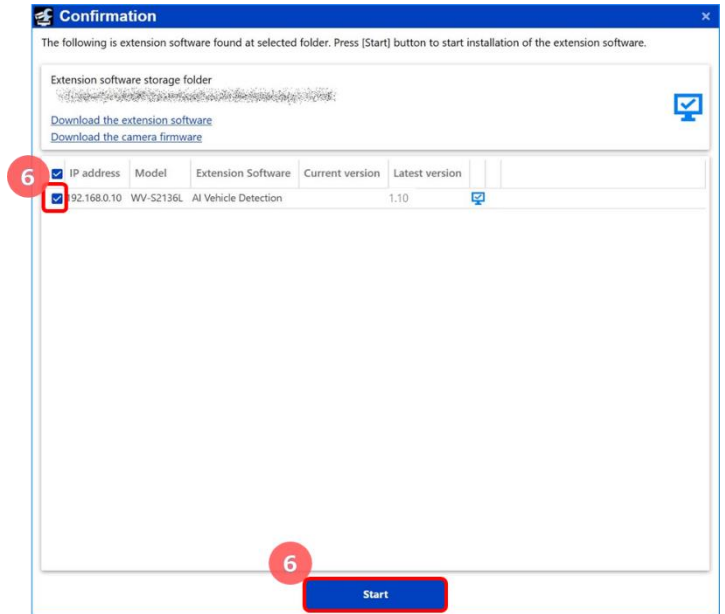
(5) Click the [Confirm] button.

The screenshot displays the 'i-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]' window. The main area is titled 'App. Installation/Update' and features a search bar at the top right. A sidebar on the left contains various configuration options, with 'App. Installation/Update' selected. The central part of the screen shows a table of camera devices with columns for Message, IP address, Model, AI Vehicle Detection, and Version. A table with one row is visible:

Message	IP address	Model	AI Vehicle Detection	Version	WV-XAE203W AI Non Mask (Only sold in certain areas)
1	192.168.0.10	WV-S2136L	Not installed.		Not installed.

On the right side, there is a configuration panel for the selected device (Model: WV-S2136L). It includes fields for IP address (192.168.0.10), MAC Address, Serial No., Camera title (WV-S2136L), Version (1.21), Remaining ROM (102400 kbytes), and Remaining PAM (102400 kbytes). Below these fields, there are radio buttons for 'i-PRO applications' (selected) and 'Partner Applications'. A text box prompts the user to select the software type and folder for installation, with 'AI Vehicle Detection' chosen in the dropdown and a folder path entered in the text box. A 'Confirm' button is located at the bottom right of the panel.

(6) Check to be sure that a check mark is on the target camera and the version of the application to be registered/updated is correct on the confirmation window and then click the [Start] button.



(7) When the process progress window will be displayed, check to be sure that the installation is correctly completed.

7

<Process progress window - Result>

- : Success
- : Failure
- : In progress

※When the result is "Failure", check the error message.

Important:

- Do not turn off the power of the camera during the installation process.
- Do not perform any operation during the installation process and wait until it completes.
- When the installation is failed, check the message in the error content of the message field.

2. Camera settings

(1) Open the Camera Advanced Settings menu

Double-click the thumbnail of camera to set.

The Camera Advanced Settings menu will open.

The screenshot displays the i-PRO Configuration Tool interface. The title bar shows 'i-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]'. The interface is divided into a left sidebar and a main content area. The sidebar contains various configuration options such as 'Select Menu', 'Change IP Address', 'Administrator Registration', 'Configure Cameras', 'Configure Recorders', 'Send a CGI List', 'Configure IEEE 802.1X', 'Ext. Software Management', 'Download Files', 'Upload Files', 'Update Firmware', 'Camera Reset / Restart', and 'Status of Cameras'. The main content area is titled 'Select Menu' and features a search bar and a grid of camera thumbnails. A red arrow points to the thumbnail of camera 2 (WV-S3531L). Below the thumbnails is a 'Main' section with a table of registered devices.

	Message	IP address	Model	Camera title	MAC Address	Serial No.	Version	HTTP(S)	Username	
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.142	WV-U1142	WV-U1142	42-58-42-01-01-08	7544754	1.00	80	admin
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.53	WV-S3531L	WV-S3531L	80-C1-42-01-02-C2	1A611000	4.25	80	admin
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.31	WV-SPN311A	WV-SPN311A	08-00-42-01-01-08	12447800	4.10	80	admin
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.132	WV-U1132	WV-U1132	42-58-42-01-01-08	00007780	1.00	80	admin
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.112	WV-S1112	WV-S1112	80-C1-42-01-01-08	0400004	77.7	80	admin
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.10	X2271L	X2271L	42-58-42-01-01-08	18004000	0.46	80	
7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	192.168.0.225	WV-S2531L	WV-S2531L	08-00-42-01-01-08	00000000	1.93	80	admin

Selected / Registered devices : 7/7

(2) Adjust the camera

Adjust image and zoom/focus of the camera on the Camera Advanced Settings menu.

1. Click [AI Vehicle Detection] under [Ext. software] of the iCT. The setting menu of the AI Vehicle Detection will open.

2. Set [Detailed setting] to On.

3. Adjust the camera.

[To image quality adjustment]: Click to shift to the image adjustment page of the camera.

[To zoom/focus adjustment]: Click to shift to the zoom/focus adjustment page of the camera.

The screenshot displays the iCT viewer software interface. The main window shows a live video feed of a street scene with several vehicles. The interface includes a left sidebar with a search bar and a menu tree. The 'Ext. software' section is expanded, and 'AI Vehicle Detection' is highlighted with a red box and a blue '1'. The 'AI Vehicle Detection' settings panel is open on the right, showing 'Detailed setting' set to 'On' (highlighted with a red box and a blue '2'). Below it, the 'Camera adjustment' section is expanded, showing options for 'Image quality', 'Image quality adjustment', 'Adjust the angle of view / focus', and 'Zoom / focus adjustment', all of which are highlighted with a red box and a blue '3'. The 'Bestshot setting' section is also visible, showing various parameters like 'Maximum number of bestshot transmitter' and 'Detection sensitivity'. The top of the interface shows the date and time 'May/22/2021 07:15:46' and the text 'VEHICLE' above the detected vehicles. The bottom of the interface has a 'Set' button.

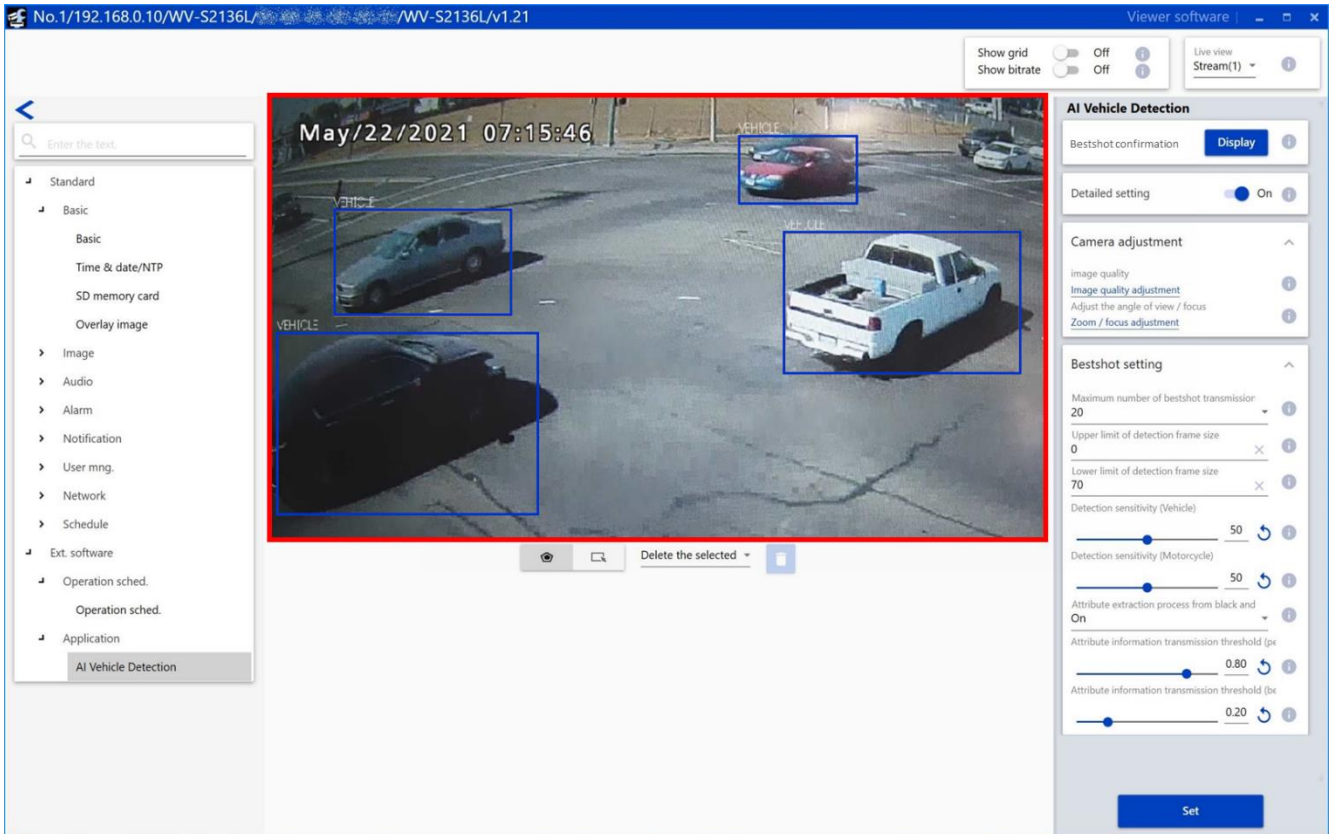
Note:

- The color of the image may change, when the super dynamic is turned on.
- Manual zoom/focus adjustment is required for some cameras.

(3) Check if vehicle can be detected

Adjust the camera while shooting vehicle so that the following items are satisfied.

- Whether the vehicle can be detected.
- Whether the size of the vehicle is the recommended size for the attribute classification.



Blue frame will be attached to the detected vehicle.

The solid frame shows that it is the recommended size, and the dotted frame shows that it is not the recommended size.

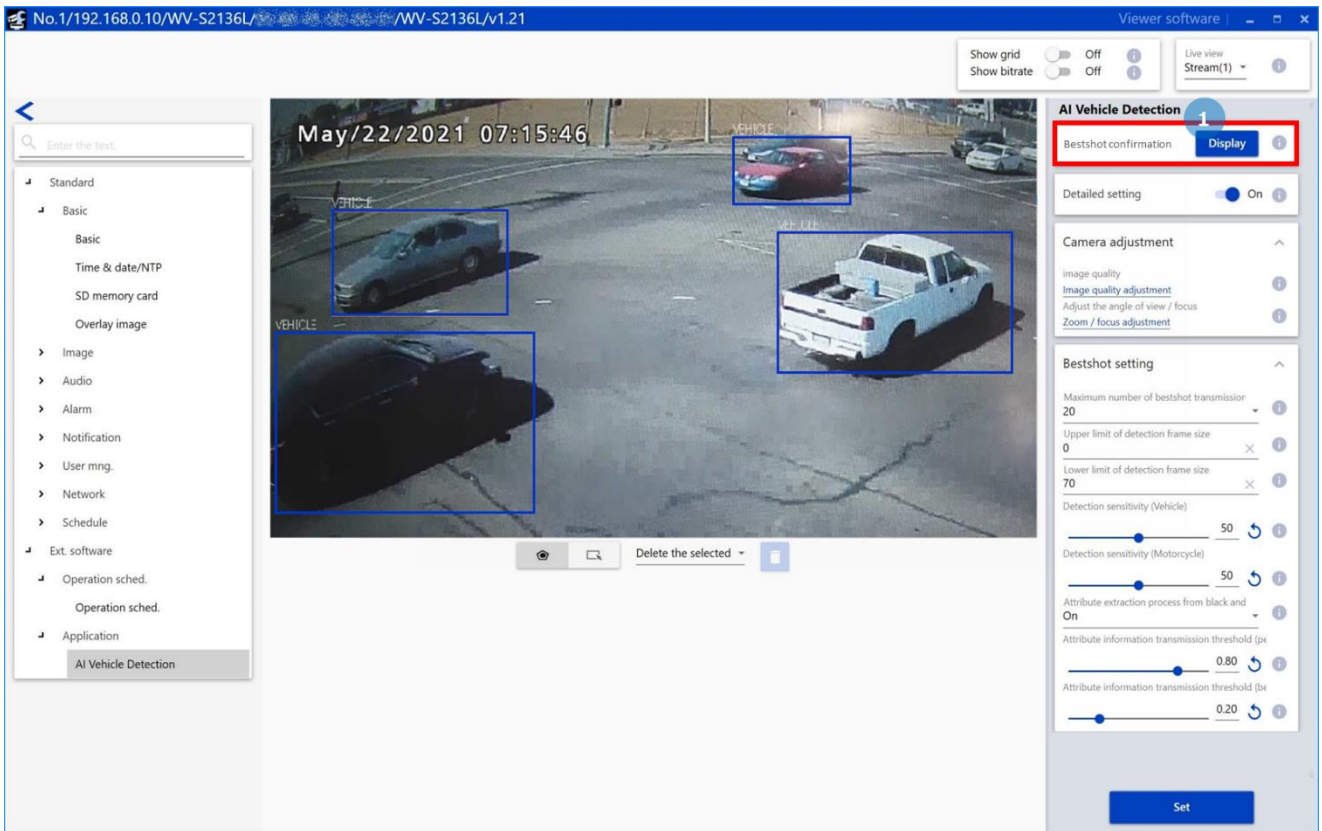
- Refer to the following URL for the recommended size.
https://i-pro.com/global/en/surveillance/training_support/support/technical_information/
<Control No.: C0320>

Note:

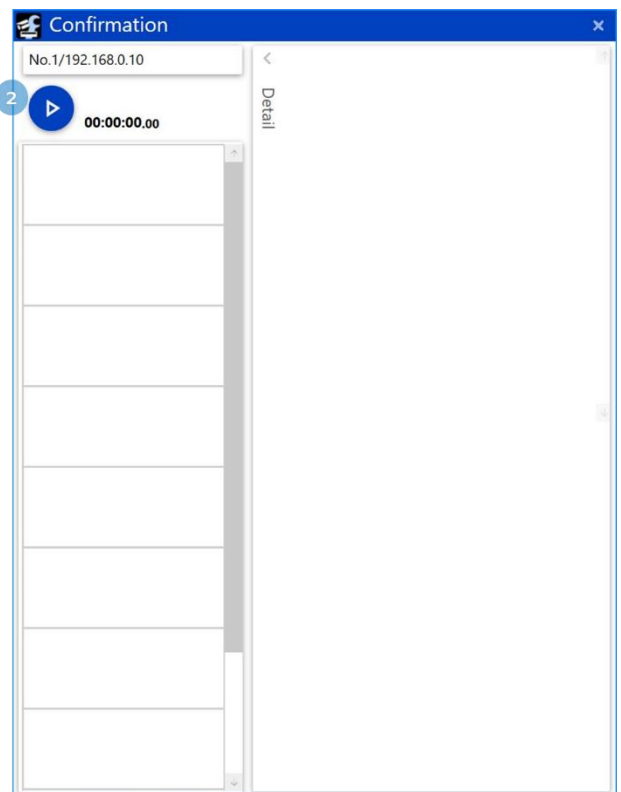
- In the following cases, the frame for vehicle may not be displayed.
 - WV-XAE200W and AI People Detection are running.
 - More than 20 people and more than 20 vehicles are detected.

(4) Check bestshot images and attribute

1. Click the [Display] button on the setting menu of the AI Vehicle Detection. Check if the frame is attached to vehicle. If not, adjust the installation position of the camera.



2. Click the start button on the bestshot check window.



3. Bestshot images and the following items will be displayed.

- The time when the vehicle is detected.
- Whether the size of the vehicle is the recommended size.
- The size of the bestshot image.

For more accurate classification, adjust the camera so that "Size" is OK as possible.

4. Click the bestshot image to show the detailed attribute.

Following is a list of the detailed attributes.

- Type (Truck/Bus/SUV/Van/Sedan/
Pickup/Two wheels)
- Color (Black/Brown/White/Gray/
Green/Red/Blue/Yellow/Purple/Pink)

The screenshot shows a 'Confirmation' window with a list of vehicle detections and a detailed attribute panel. The list includes timestamps, 'Size OK' status, and image dimensions. The detailed attribute panel shows classification results for a selected item.

Timestamp	Size OK	Image Dimensions
23:55:15	Size OK	431×162
23:55:11	Size OK	227×82
23:55:10	Size OK	263×86
23:55:10	Size OK	429×155
23:55:03	Size OK	608×199
23:55:06	Size OK	188×110
23:55:06	Size OK	388×179
23:55:06	Size OK	353×149

Confirmation

00:00:33.30

3

4

Detail

Type: Sedan 83%
Color: Black 24% Gray 39% Blue 33%

Recommended size: Yes
Detect size: 263×86

Detailed attribute

Bestshot images **Meta information**

3. Detail settings

(1) Open the Camera Advanced Settings menu

Double-click the thumbnail of camera to set.

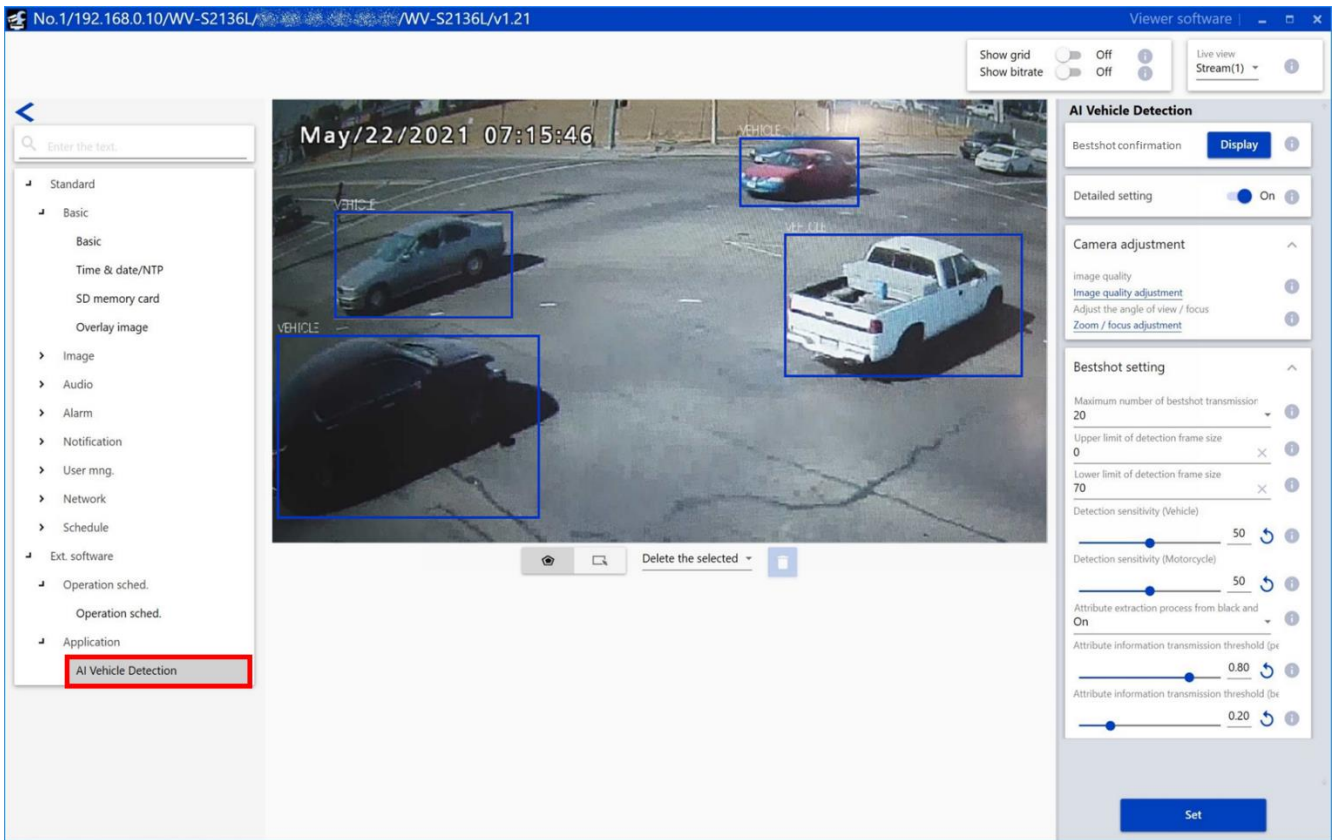
The Camera Advanced Settings menu will open.

The screenshot shows the 'i-PRO Configuration Tool - V2.3.0.3 [192.168.0.20/24]' interface. A 'Select Menu' window is open, displaying a grid of camera thumbnails. A red arrow points to the thumbnail of camera 2, 'WV-S3531L'. Below the thumbnails is a 'Main' section with a table of registered devices. The table has columns for Message, IP address, Model, Camera title, MAC Address, Serial No., Version, HTTP(S), and Username. All devices are listed with a 'Message' status of 'OK' and a green person icon. The status bar at the bottom indicates 'Selected / Registered devices : 7/7'.

Message	IP address	Model	Camera title	MAC Address	Serial No.	Version	HTTP(S)	Username
1 [OK]	192.168.0.142	WV-U1142	WV-U1142	8C-5B-4E-83-01-88	T244751	1.00	80	admin
2 [OK]	192.168.0.53	WV-S3531L	WV-S3531L	8C-C1-42-D1-09-C2	1A611000	4.25	80	admin
3 [OK]	192.168.0.31	WV-SPN311A	WV-SPN311A	08-00-27-1A-4E-48	11447800	4.10	80	admin
4 [OK]	192.168.0.132	WV-U1132	WV-U1132	8C-2B-16-33-8C-07	9202780	1.00	80	admin
5 [OK]	192.168.0.112	WV-S1112	WV-S1112	8C-C1-42-19-1E-04	0465200	77.7	80	admin
6 [OK]	192.168.0.10	X2271L		4E-2B-44-17-6A-14	11447800	0.46	80	
7 [OK]	192.168.0.225	WV-S2531L	WV-S2531L	08-00-27-0E-25-49	02447800	1.93	80	admin

■ Open the setting menu

Click [AI Vehicle Detection] under [Ext. software] of the iCT. The setting menu of the AI Vehicle Detection will open.



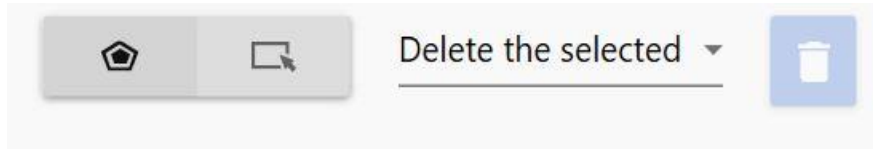
Important:

- The “AI Vehicle Detection Setup” page cannot be opened even by clicking [AI Vehicle detection] or [Setting Menu] on the “Extension Software” page of the setting menu of the camera. To open the “AI Vehicle Detection Setup” page, use the iCT.

(2) Mask area settings

■ Mask area settings


A mask area can be specified and set by drawing an area where object detection is not to be performed. Up to 8 mask areas can be specified and up to 16 vertices can be set for each area. The set mask areas will be displayed translucent.




Default: No mask area is set.

Note:

- In case that the midpoint at the bottom of the object detection frame is in the mask area, the object is judged to exist in the mask area.
-


 : Click to create a new mask area.

 : Click to select a mask area.

[Mask area deletion]

An existing mask area can be deleted. "Delete the selected" and "Delete all" are available.

Default: Delete the selected motion detection mask area

 : Click after selecting "Delete the selected" or "Delete all" to delete the existing mask area(s).

Note:

- Mask area settings is unavailable when "Show grid" is on.
-

(3) Detail settings

■ Bestshot confirmation

[Display] button: Click to open the bestshot confirmation window as a separate window.

■ Detailed setting

When “On” is selected, adjustment of the camera and the bestshot setting will become available.

The bestshot setting is used to set the detection threshold, the size of vehicle to detect and so on.

Default: Off

■ Camera adjustment

[Image quality adjustment]: Click to shift to the image adjustment page of the camera.

[Zoom/focus adjustment]: Click to shift to the zoom/focus adjustment page of the camera.

■ Bestshot setting

[Maximum number of bestshot transmission]

Set the number of bestshot images to be transmitted at once.

Default: 20

[Upper limit of detection frame size]

Set the maximum size (width) of an object (vehicle) to be detected.

Default: 0

[Lower limit of detection frame size]

Set the minimum size (width) of an object (vehicle) to be detected.

Default: 70

Note:

- When 0 is set for the maximum or minimum frame size, it means that there is no limit in the detection size.

AI Vehicle Detection

Bestshot confirmation **Display** ⓘ

Detailed setting On ⓘ

Camera adjustment ^

image quality ⓘ
[Image quality adjustment](#)
Adjust the angle of view / focus ⓘ
[Zoom / focus adjustment](#) ⓘ

Bestshot setting ^

Maximum number of bestshot transmission 20 ⓘ

Upper limit of detection frame size 0 × ⓘ

Lower limit of detection frame size 70 × ⓘ

Detection threshold (Vehicle) 50 ⓘ

Detection threshold (Motorcycle) 50 ⓘ

Attribute extraction process from black and white On ⓘ

Attribute information transmission threshold (pe) 0.80 ⓘ

Attribute information transmission threshold (be) 0.20 ⓘ

Distance moved to become bestshot target (%) 50 ⓘ

Set

[Detection threshold (Vehicle)]

Set the detection threshold. The smaller the value is, the easier the detection of car presence becomes. However, false detection may also increase.

1 - 99

Default: 50

[Detection threshold (Motorcycle)]

Set the detection threshold. The smaller the value is, the easier the detection of two wheeled vehicle presence becomes. However, false detection may also increase.

1 - 99

Default: 50

[Attribute extraction process from black and white video]

Determine whether to execute the attribute classification of person when the input video is black and white.

Default: On

[Attribute information transmission threshold (periodic transmission)]

Transmit attribute information having a score higher than the threshold value together with detection result information scheduled to transmit periodically.

0.00 - 1.00

Default: 0.80

[Attribute information transmission threshold (bestshot transmission)]

Transmit attribute information having a score higher than the threshold value together with bestshot images.

0.00 - 1.00

Default: 0.20

[Distance moved to become bestshot target] • available for iCT V2.4 or later

Set the distance (as a percentage of the width of the detection frame) moved until detected object becomes bestshot target.

1 - 65535

Default : 50 (%)

■ [Set]

Click to enable the content of the bestshot setting and the mask area setting.

(4) Schedule settings

■ Open the setting menu

Click [Operation sched.] under [Ext. software] of the iCT. The setting menu on the schedule will open.

The screenshot displays the 'Operation sched.' settings menu. The left sidebar shows a navigation tree with 'Operation sched.' highlighted under 'Ext. software'. The main panel shows a live video feed of a parking lot. The 'Operation sched.' panel on the right includes the following sections:

- Operation sched.:** Extension software that sets the operation schedule. (AI Vehicle Detection)
- Operating day of week:** A grid for selecting days of the week (Mon-Sun) with dropdown menus set to '1'.
- Time table:** A table for setting operation content for two time tables: 1(White) and 2(Blue).

Time table	Operation content	Duration
1 (White)	On	24h
2 (Blue)	Off	
3	Off	
4	Off	
5	Off	
6	Off	
- Delete the selected schedule:** A button to delete the selected schedule.

■ Schedule settings

[Extension software that sets the operation schedule]

Select "AI Vehicle Detection".

[Operating day of week]

Set the days of the week to operate the AI Vehicle Detection.

Select the days of the week when the AI Vehicle Detection is performed on "Time table 1" and "Time table 2" respectively. When "Off" is selected for a day of the week, it will not be performed on the corresponding day of the week.

Default: Time table 1 for all days of the week

[Time table]

Set the time when the AI Vehicle Detection is performed and the operation content.

Up to 6 time periods can be set on each of "Time table 1" and "Time table 2".

• Operation content

Determine whether to perform the AI Vehicle Detection.

On: Performs the AI Vehicle Detection.

Off: Does not perform the AI Vehicle Detection.

Set the operation time for the item set to "On". When "24h" is set, the AI Vehicle Detection performs all day.

Default:

[Time table 1]

- Time 1: On, "24h" is set
- Time 2 to Time 6: Off

[Time table 2]

- Time 1 to Time 6: Off

[Set]

Click to enable the setting content of the operating schedule.

Important:

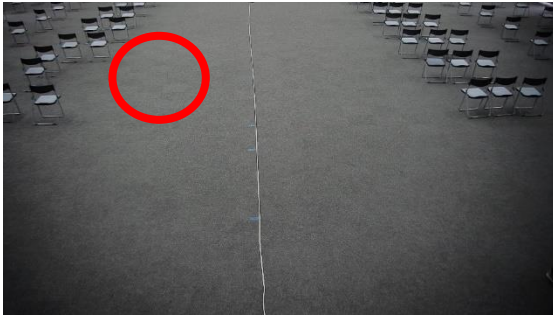
- When "Off" is set for the operating schedule on the camera side, it makes impossible to open the setting menu of the AI Vehicle Detection.

Appendix

Note about false detection of objects

Software : AI Face Detection, AI People Detection, AI Vehicle Detection

False detection may occur for floor pattern or object shape and bestshot images of those objects may be transmitted.



Solution

1. When the position of the object is where people or vehicles do not pass, set the position to mask area to suppress the false detection.
2. When the size of the object is obviously smaller (or larger) than people or vehicles, adjust the value of “Lower limit of detection frame size” (or “Upper limit of detection frame size”) in “Bestshot setting” to suppress the false detection.
3. Higher the value of “Detection threshold” in “Bestshot setting” to suppress the false detection. However, it may become difficult to detect objects.

AI People Detection

Bestshot confirmation Display i

Detailed setting On i

Camera adjustment ^

image quality i

[Image quality adjustment](#) i

Adjust the angle of view / focus i

[Zoom / focus adjustment](#) i

Bestshot setting ^

Maximum number of bestshot transmission 20 i

2 Upper limit of detection frame size 0 x i

Lower limit of detection frame size 60 x i

3 Detection threshold 80 ↻ i

Attribute extraction process from black and On i

Attribute information transmission threshold (pe) 0.80 ↻ i

Attribute information transmission threshold (be) 0.20 ↻ i

Period to become bestshot target (sec) 1.0 ↻ i

Distance moved to become bestshot target (%) 50 ↻ i

Set

Note about people attribute classification

Software : AI People Detection

Attribute classification may be performed incorrectly for the people detected in a position looking down from above, or the people that the part of their body are not shown (for example, they are at the edge of the image).



Solution

Set the position to mask area to acquire bestshot image that is more suitable for the attribute classification.



Note about stopped vehicles

Software : AI Vehicle Detection

When the stopped vehicles are shown overlapping, bestshot images of the vehicles may be transmitted continuously because the vehicles are detected incorrectly.



Solution

Set the area to mask area to suppress transmission of the bestshot images.



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