

Auto Tracking System Web API Specifications

Version 1.6

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Panasonic Corporation

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1 Introduction

1.1 Purpose of this Document

This document stipulates the specifications of the IFs used for communication between the Web applications configuring the Auto Tracking System and external systems.

2 Interface

2.1 Specifications

In this document, the communication IFs specified as Web APIs conform to the communication specifications of HTTP1.1, and the control for the system is implemented in the form of HTTP requests issued to the URLs on the Web server. Excluding some commands (Register Scene File), all HTTP requests are issued as the GET method.

2.2 Format

The format (URL) of control commands provided to an external system as a Web API is specified as below.

[Transmission]

http://[IP Address]:[PortNo]/cgi-bin/auto_tracking?cmd=[Command]&[Parameter]=[Value]&...

Table 2.2-1 Details of Transmission Format

No.	Name	Description
1	IP Address	This is the IP address of the Web application.
2	PortNo	This is the standby port number of the Web application (default: 1337)
3	Command	This is the control command string. A list of commands that can be used is provided in 2.3 List of Commands.
4	Parameter	This is the control command parameter. You can use an "&" to specify several parameters. Since it is specified in each command, refer to each section in 3 Details of Commands.
5	Value	This is the value set in the control command parameter. Since it is specified in each command, refer to each section in 3 Details of Commands.

[Reception]

The following three patterns are specified for the format of the response data received by an external system.

Pattern 1: Return of only the response value

200 OK [Response]:[Response value]

Pattern 2: Return of the response value and response parameter value (string)

200 OK [Response]:[Response value],[Parameter]:[Parameter value], [Parameter]:[Parameter value],...

Pattern 3: Return of the response value and response parameter value (binary data)

200 OK [Response]:[Response value],[Binary data]

Table 2.2-2 Details of Reception Format

No.	Name	Description	Related command
1	Response	"resp" is saved as a fixed string.	All commands
2	Response value	"ack" or "nack" is saved as the response value.	All commands
3	Parameter	Since it is specified in each command, refer to each section in 3 Details of Commands.	Camera Control Camera Setting Camera State, etc.
4	Parameter value	Since it is specified in each command, refer to each section in 3 Details of Commands.	Camera Control Camera Setting Camera State, etc.
5	Binary data	Since it is specified in each command, refer to each section in 3 Details of Commands.	Thumbnail Image

2.3 List of Commands

This section describes the list of commands stipulated in these specifications.

For details on each command, refer to 3 Details of Commands.

Table 2.3-1 List of Commands

No.	Name	Description
1	CameraControl	Used to establish a connection or disconnect the connection with the target camera.
2	CameraSetting	Used to acquire or change the settings of the target camera.
3	Detect	Used to set the tracking target.
4	Tracking	Used to start or stop the tracking process.
5	Target	Used to set the display position of the tracking process target.
6	Angle	Used to perform PTZ control (automatic) of the target camera.
7	CameraState	Used to acquire the state information of the camera.
8	Image	Used to acquire a shot of camera images.
9	TrackingControl	Used to enable or disable the tracking process.
10	CameraControlView	Used to establish a connection or disconnect the connection with the target camera, and to display the tracking applications on the screen.
11	RegisterSceneFile	Used to register a new scene file or update an existing scene file.
12	GetFaceRecognition	Used to acquire the system information list (face recognition information).
13	EditFaceRecognition	Used to edit the system information (face recognition information).
14	ClipFacelImage	Used to extract the face image data.

3 Details of Commands

3.1 Camera Control

The Camera Control command is used to start or stop communication with the target camera. The list of transmission parameters is as shown below.

Table 3.1-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
control	Mandatory	String	Either start or stop is saved.

The reception response parameter during communication with the camera is specified as below.

message:[1]

The information shown below is saved in [1].

Table 3.1-2 List of Values

No.	Name	Type	Description
1	message	String	In the case of a negative acknowledgment, the cause is saved as a message.

3.2 Camera Setting

The Camera Setting command is used to acquire or change the settings of the camera managed by Tracking Control.

3.2.1 Acquiring the Settings

The list of transmission parameters during acquisition of camera settings is described below.

Table 3.2-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.

The reception response parameters during acquisition of camera settings are specified as below.

id:[1],name:[2],ip_addr:[3],port_no:[4],login:[5],password[6],zoom:[7],height:[8],distance:[9],angle:[10],angle_mode:[11],angle_zoom:[12],detection:[13],lost:[14],lost_action_wait_sec:[15],auto_start:[16],sensitivity:[17],disable_area[18],detect_area[19],template_matching_level[20],scene_file_name:[21], face_recognition:[22],face_recognition_id:[23],upper_body_detection:[24]

The camera setting information is saved in the below-mentioned format at the locations corresponding to the numbers enclosed within "[]". Note that when the camera ID is invalid, "nack", which indicates a negative acknowledgment, is saved, and the response parameter described above is not saved.

Table 3.2-2 List of Values

No.	Name	Type	Description
1	id	Integer value	This is the camera ID.
2	name	String	This is the name of the camera.
3	ip_addr	String	This is the IP address or host name of the camera.
4	port_no	Integer value	This is the port number of the camera.
5	login	String	This is the login account of the camera.
6	password	String	This is the login password of the camera.
7	zoom	Integer value	This is the upper-limit value (0 to 100) of magnification during the tracking process.
8	height	Integer value	This is the installation height of the camera (T.B.D)
9	distance	Integer value	This is the installation distance of the camera from the platform (T.B.D)
10	angle	Integer value	This is the installation angle of the camera from the platform (T.B.D)
11	angle_mode	Integer value	Indicates the automatic calculation setting of the Angle command for the Upper Body, Full Body, and Full Shot by delimiting with a comma. 0: Manual (use the value set by the user) 1: Auto

No.	Name	Type	Description
			Example: When automatic setting is made only for the Upper Body: 1,0,0 When automatic setting is made only for the Full Shot: 0,0,1
12	angle_zoom	Integer value	Indicates the magnification value (0 to 100) during manual setting for the Upper Body, Full Body, and Full Shot by delimiting with a comma. Example: All 100%: 100, 100, 100
13	detection	String	This is the execution setting of the DETECT process. Either of the following values is saved. "manual": Manual "auto": Auto
14	lost	String	This is the process setting during LOST detection. Either of the following values is saved. "home": The HOME position is called "none": No operation is performed.
15	lost_action_wait_sec	Integer value	The standby time (seconds) until the HOME position is called after LOST detection is saved.
16	auto_start	Integer value	This is the automatic execution setting of the Tracking process after the Detect process. Either 0 (disabled) or 1(enabled) is saved.
17	sensitivity	Integer value	This is the dead-zone setting of the tracking region.
18	disable_area	Integer value	The information about the region in which the automatic tracking process is not allowed to start is saved by delimiting with a comma. 0: Indicates the information of the top left position (X coordinate) of the region information. 1: Indicates the information of the top left position (Y coordinate) of the region information. 2: Indicates the width of the region information. 3: Indicates the height of the region information.
19	detect_area	Integer value	The coordinate information of the top end and bottom end of the automatic detection setting region is saved by delimiting with a comma. 0: Indicates the information of the top end position (Y coordinate) of the region information. 1: Indicates the information of the bottom end position (Y coordinate) of the region information.
20	template_matching_level	Integer value	This is the template processing priority level (1 to 10) of the tracking process.
21	scene_file_name	String	This is the scene file name that is used as a tracking process parameter. A blank character (" ") is saved in the default state.
22	face_recognition	Integer value	This is the setting of the facial recognition. Either 0 (disabled) or 1(enabled) is saved.
23	face_recognition_id	Integer value	This is the ID of the image for the facial recognition. If the image is not set, NULL is saved.

No.	Name	Type	Description
24	upper_body_detection	Integer value	This is the setting of the upper body detection. Either 0 (disabled) or 1(enabled) is saved.

3.2.2 Changing the Settings

The list of transmission parameters when changing the camera settings is described below.

Table 3.2-3 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
name	Optional	String	This is the name of the camera.
ip_addr	Optional	String	This is the IP address or host name of the camera.
port_no	Optional	Integer value	This is the port number of the camera.
login	Optional	String	This is the login account of the camera.
password	Optional	String	This is the login password of the camera.
zoom	Optional	Integer value	This is the upper-limit value (0 to 100) of magnification during the tracking process.
height	Optional	Integer value	This is the installation height of the camera (T.B.D)
distance	Optional	Integer value	This is the installation distance of the camera from the platform (T.B.D)
angle	Optional	Integer value	This is the installation distance of the camera from the platform (T.B.D)
angle_mode	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
angle_zoom	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
detection	Optional	String	For details on the setting string, refer to 3.2.1 Acquiring the Settings.
lost	Optional	String	For details on the setting string, refer to 3.2.1 Acquiring the Settings.
lost_action_wait_sec	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
auto_start	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
sensitivity	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
disable_area	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
detect_area	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
template_matching_level	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
scene_file_name	Optional	String	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
face_recognition	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.
face_recognition_id	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.

Name	Usage	Type	Description
upper_body_detection	Optional	Integer value	For details on the setting value, refer to 3.2.1 Acquiring the Settings.

The reception response when changing the camera settings is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.3 Detect

The Detect command is used when detection of the tracking target is started. The list of transmission parameters is as shown below.

Table 3.3-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
process	Mandatory	String	Either start or stop is saved.
mode	Optional	String	Either auto or manual is saved. * This value is not required when "stop" is specified in "process".
position_x	Optional	Integer value	This value is saved when "manual" is specified in "mode". It is the X coordinate of the tracking target. * This value is not required when "auto" is specified in "mode".
position_y	Optional	Integer value	This value is saved when "manual" is specified in "mode". It is the Y coordinate of the tracking target. * This value is not required when "auto" is specified in "mode".

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.4 Tracking

The Tracking command is used to start or stop the tracking process. The list of transmission parameters is as shown below.

Table 3.4-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
process	Mandatory	String	Either start or stop is saved.

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.5 Target

The Target command is used to set the display position of the tracking process target.

Table 3.5-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
position_x	Mandatory	Integer value	This is the X coordinate of the specified display position.
position_y	Mandatory	Integer value	This is the Y coordinate of the specified display position.

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.6 Angle

The Angle command is used for capturing the image of the person, who is the tracking target, by using any one of Upper Body / Full Body / Full / Zoom OFF when the PTZ control that is decided in accordance with the camera settings to be controlled is executed automatically. The list of transmission parameters is as shown below.

Table 3.6-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
mode	Mandatory	String	Any one of upper / body / full / off is saved.

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.7 Camera State

The Camera State command is used to acquire the automatic tracking process state of the camera managed by Tracking Control. The list of transmission parameters is as shown below.

Table 3.7-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.

The reception response parameters are specified as below.

id:[1],connection:[2],detection:[3],tracking:[4],lost:[5],angle:[6],preset:[7],angle_type:[8],target_position[9],target_position_area:[10],pan_tilt_limit:[11]

The camera state information is saved in the below-mentioned format at the locations corresponding to the numbers enclosed within "[]". Note that when the camera ID is invalid, "nack", which indicates a negative acknowledgment, is saved, and the response parameter described above is not saved.

Table 3.7-2 List of Values

No.	Name	Type	Description
1	id	Integer value	This is the camera ID.
2	connection	Integer value	Indicates the communication state with the camera. 0: No communication, or communication disruption 1: Communication in progress
3	detection	Integer value	Indicates the detection state of the tracking target. 0: The tracking target is not detected 1: The tracking target is already detected
4	tracking	Integer value	Indicates the execution state of the tracking process. 0: The tracking process has stopped 1: The tracking process is being executed
5	lost	Integer value	Indicates the existence of LOST detection for the tracking target. 0: LOST not detected 1: LOST detected
6	angle	Integer value	Indicates the feasibility of executing the Angle command. 0: Angle request is possible 1: Angle request is not possible
7	preset	Integer value	Indicates the feasibility of execution of the Preset command (playback) for Home, Preset 1, and Preset 2 by delimiting with a comma. 0: Cannot be executed 1: Can be executed Example: Can be executed only for Home: 1,0,0 Can be executed only for Preset 2: 0,0,1

8	angle_type	Integer value	Indicates the type of the angle of view during automatic tracking execution. 0: Upper Body Shot 1: Full Body Shot 2: Full Shot 3: Control Off
9	target_position	Integer value	Indicates the coordinate information of the control center of the tracking target by delimiting with a comma. Example: X coordinate of the control center: 100 Y coordinate of the control center: 200 => 100,200
10	target_position_area	Integer value	Indicates the information about the region in which the position of the tracking target can be set. Example: X coordinate of the top left position of the region: 100 Y coordinate of the top left position of the region: 200 Width of the region information: 500 Height of the region information: 300 => 100,200,300,500
11	pan_tilt_limit	Integer value	Indicates the setting state of the Pan/Tilt range of motion by delimiting with a comma (up, down, left, right). 0: Release 1: Set Example: Set only the upper direction : 1,0,0,0 Set all direction : 1,1,1,1

3.8 Image

The Image command is used to acquire a frame image of camera images. The command format is set as binary data configured by a header including the tracking process information, and a data part in which Jpeg-format binary data is saved. The list of transmission parameters is as shown below.

Table 3.8-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.

The reception response during a positive acknowledgment is set as binary data having the contents specified below. Note that when the camera ID is invalid, "nack", which indicates a negative acknowledgment is saved for a request corresponding to a camera ID with which either no communication is being performed, or the communication has been disrupted, and binary data is not saved.

Table 3.8-2 Reception Response Data Configuration

Name	Byte	Type	Description
Command information	32	ASCII	The type of command data and the command name are saved as "response,GetImage". "0" is saved in the region in which no string is saved.
Camera ID	2	ASCII	The information of IDs from "01" to "99" is saved.
Display magnification	3	ASCII	The magnification information [%] is saved as "000" to "100".
Tracking target rectangle information	32	ASCII	The rectangle information (X, Y coordinates, width, height) of the tracking target is saved in the format described below. "0" is saved in the region in which no string is saved. Example: 100,200,300,600 Note that when the rectangle information does not exist on the process, "0" is saved for each parameter.
Tracking region rectangle information	32	ASCII	The rectangle information (X, Y coordinates, width, height) of the tracking region is saved in the format described below. "0" is saved in the region in which no string is saved. Example: 1000,250,800,600 Note that when the rectangle information does not exist on the process, "0" is saved for each parameter.
Facial detection rectangle information	32	ASCII	The rectangle information (X, Y coordinates, width, height) of the detected face is saved in the format described below. "0" is saved in the region in which no string is saved. Example: 100,200,80,80
Upper body detection rectangle information	32	ASCII	The rectangle information (X, Y coordinates, width, height) of the detected upper body is saved in the format described below. "0" is

			saved in the region in which no string is saved. Example: 200,200,160,160
Frame image	Variable	Binary	The JPG binary of the frame image is saved.

3.9 Tracking Control

The Tracking Control command is used to enable or disable the tracking process.

The list of transmission parameters is as shown below.

Table 3.9-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
enable	Mandatory	String	<p>Either on or off is saved. The processing contents during parameter setting are same as those described below:</p> <p>For "on"</p> <ul style="list-style-type: none"> • Camera Setting: detection = auto • Tracking: process = start <p>For "off"</p> <ul style="list-style-type: none"> • Camera Setting: detection = manual • Tracking: process = stop

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.10 Camera Control View

The Camera Control View command is used for starting or stopping communication with the target camera, and for changing the screen display content of the tracking software. The list of transmission parameters is as shown below.

This command can be used only when the tracking software is a native application.

Table 3.10-1 List of Transmission Parameters

Name	Usage	Type	Description
id	Mandatory	Integer value	This is the camera ID.
control	Mandatory	String	<p>Either start or stop is saved.</p> <p>The process for starting communication with the camera is executed when "start" is specified, and the Camera View screen of the camera is displayed when the process is successful. If the process fails, the screen display is not updated.</p> <p>The process for stopping communication with the camera is executed when "stop" is specified, and the Camera Select screen is displayed when the process is successful. If the process fails, the screen display is not updated.</p>

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.11 Register Scene File

The Register Scene File command is used to register a new scene file, or perform overwrite update of an existing scene file.

This command can be executed by posting the scene file to the URL specified below.

http://[IP Address]:[portNo]/cgi-bin/auto_tracking?cmd=RegisterSceneFile

Therefore, the scene file must be transmitted as multi-part data such as that illustrated below.

-----8d3439d84d3f4b0

Content-Disposition: form-data; name="file"; filename="sample.scn"

Content-Type: application/octet-stream

(File content)

-----8d3439d84d3f4b0--

Note that the reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

3.12 Get Face Recognition

The Get Face Recognition command is used to acquire the list of face recognition information corresponding to the page no., search string, and number of elements per page. The list of transmission parameters is as shown below.

Table 3.12-1 List of Transmission Parameters

Name	Usage	Type	Description
page	Mandatory	Integer value	This is the specified page no.
query	Optional	String	This is the search string.
data_num	Mandatory	Integer value	This is the specified number of elements per page.

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

The reception response parameters are specified as below.

data_list:[1],page_num:[2]

The list information is saved in the below-mentioned format at the locations corresponding to the numbers enclosed within "[]". Note that when the specified parameter is invalid, "nack", which indicates a negative acknowledgment, is saved, and the response parameter described above is not saved.

Table 3.12-2 Reception Response Data Configuration

No.	Name	Type	Description
1	data_list	List information	<p>The face recognition information corresponding to the specified parameters is saved in the list format shown below. (Enclose the entire list between "[" and "]", each record between "{" and "}", and express the information of each field of the record as [Field name]:[Field value].)</p> <p>Example: data_list:[{id:1,target_name:"Target001",face_contents:"[*"]},{id:2,target_name:"Target002",face_contents:"[*"]},{id:3,target_name:"Target003",face_contents:"[*"]}]</p> <p>* This information is obtained by converting the JPEG binary of the face image data that is the source of the face recognition information into a BASE 64 string.</p>
2	page_num	Integer value	This is the total number of pages of list information.

3.13 Edit Face Recognition

The Edit Face Recognition command is used to edit the face recognition information (the `m_face_recognition` table on the database) that exists in the system. The list of transmission parameters is as shown below.

Table 3.13-1 List of Transmission Parameters

Name	Usage	Type	Description
method	Mandatory	String	The following values are saved depending on the contents of the editing operation: - Add: add - Update: edit - Delete: remove
id	Mandatory	Integer value	This parameter is mandatory for Update and Delete. Set the identification ID of the target record.
target_name	Mandatory	String	This parameter is mandatory for Add and Update. Set the target name of the target record.
face_contents	Mandatory	String	This parameter is mandatory for Add and Update. Set the information obtained by converting the JPEG binary of the face image data of the target record into a BASE 64 string.

The reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

The reception response parameters are specified as below.

message:[1]

The list information is saved in the below-mentioned format at the locations corresponding to the numbers enclosed within "[]".

Table 3.13-2 Reception Response Data Configuration

No.	Name	Type	Description
1	message	String	When the process is successful (ack), "OK" is saved and when the process fails (nack), the cause of failure of the process is saved as a string.

3.14 Clip Face Image

The Clip Face Image command is used for extraction of face image data from a JPEG-format input image.

This command can be executed by posting the input image to the URL specified below.

http://[IP Address]:[portNo]/cgi-bin/auto_tracking?cmd=ClipFacelImage

Therefore, the input image must be transmitted as multi-part data such as that illustrated below.

-----8d3439d84d3f4b0

Content-Disposition: form-data; name="file"; filename="input.jpg"

Content-Type: application/octet-stream

(File content)

-----8d3439d84d3f4b0--

Note that the reception response is saved as either "ack", which indicates a positive acknowledgment, or "nack", which indicates a negative acknowledgment.

The reception response parameters are specified as below.

face_contents:[1]

The extracted face image data is saved in the below-mentioned format at the locations corresponding to the numbers enclosed within "[]". Note that when the input image data is invalid, or it is not possible to extract the face image, "nack", which indicates a negative acknowledgment, is saved, and the response parameter described above is not saved.

Table 3.14-1 Reception Response Data Configuration

No.	Name	Type	Description
1	face_contents	String	The information obtained by converting JPEG binary of the face image data into a BASE 64 string is saved.

4 Processing of Error Commands

"nack", which indicates a negative acknowledgment, must be saved in the reception response to the transmission of all error commands that are not specified in 3 Details of Commands.