NETWORK CAMERA Protocol Spec.

HTTP WebView Protocol Specifications

Ver. 1.0

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CANON INC.

Change Tracking List

Version	Date	Page	Note
Ver. 1.0	April 16, 2009	-	The 1st version was issued.

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1 Overview

The WebView over HTTP protocol (referred to as “WV-HTTP” hereafter) is a protocol that provides video transmission and camera control functions for network cameras over HTTP. The VB-C60, VB-C500 network camera support both a system of commands that are compatible with the VB-C300 and VB-C50i, as well as a system of new commands that incorporate various types of functional improvements.

This document covers the specifications of both VB-C60 and VB-C500’s new commands and the compatible commands that are provided for previous models as well.

1.1 Requests and Responses

WV-HTTP involves the use of WV-HTTP commands to send video and control the camera. WV-HTTP commands are sent and received as HTTP requests, and video data, camera state information, and so on are sent and received as HTTP responses. Although the WV-HTTP specifications do not depend on any particular HTTP version, HTTP versions are determined for each individual network camera, and the WV-HTTP client must support the version in question. VB-C300, VB-C60 and VB-C500 are HTTP/1.1 compliant.[1] The VB-C50i series and previous models are HTTP/1.0 compliant, but if you examine the Host header field and how permanent connections are handled, there are no major differences.

WV-HTTP’s HTTP requests can be issued as HTTP methods, using either GET or POST.[2] A request URI starts with “/-wvhttp-01-”, and is comprised of a WV-HTTP command and command parameters. Other than the leading “wvhttp”, the request URI (GET and POST) and message body (POST) are not case-sensitive. The request formats for GET and POST are shown below.

Request Format (GET)
GET /-wvhttp-01-/<command>[?<parameter list>...] HTTP/1.1
Host: <host request header field value>
<other HTTP request header...>

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[1]Since they are HTTP/1.1 compliant, the Host header field is mandatory (although the content is ignored). Also, if there is no specification (unless it is Connection: close), the permanent connection will be activated. Note that even if WV-HTTP is HTTP/1.1 compliant, pipelines are not supported.
[2]The only differences between GET and POST in WV-HTTP is the order in which command parameters are evaluated. The request ring part of parameters is evaluated first (GET and POST), followed by the message body part (POST). To avoid GET methods with side effects, use a POST method instead. The client selects whether to use GET or POST.

<blank line>

Request Format (POST)
POST /-wvhttp-01-/<command>[?<parameter list>...] HTTP/1.1
Host: <host request header field value>
Content-Length: <message body length>
<other HTTP request header...>
<blank line>
<message body (parameter list)>

The HTTP request header fields related to WV-HTTP operations are Authorization, Connection, Content-Length, and If-Modified-Since.[3] All other HTTP request header fields are ignored.

The WV-HTTP response format is shown below (the actual content is determined by the WV-HTTP commands, etc.). The first line is the HTTP status line, with the HTTP response header field extending from the Date to the blank line, and the WV-HTTP response itself stored in the message body part.

HTTP/1.1 200 OK
Date: <time stamp>
Server: VB/4.0
Accept-Ranges: none
Cache－Control: no-cache
Pragma: no-cache
Connection: keep-alive
Keep-Alive: timeout=10
Livescope-Status: 0
Content-Length: <message body length>
Content-Type: <message body mime-type>
<blank line>
<message body>

[Note] Keep in mind that although the new line code used in the header part is CRLF (= 0x0d0a), the new line code used in the message body is just LF (= 0x0a).

Livescope-Status is an extended field that shows the result of executing the WV-HTTP command. Although the HTTP status (including Livescope-Status) is 200 OK with respect to the WV-HTTP response, the HTTP level may return another HTTP status. The main status possibilities are shown below.

HTTP Status	Meaning
304 Not Modified	Data was not updated (panorama image, etc.)
400 Bad Request	A host header field was not specified (HTTP/1.1)
401 Unauthorized	User access restrictions were violated
403 Forbidden	Host access restrictions were violated
404 Not Found	No resource exists that supports this request URI
411 Length Required	Content-Length was not specified (POST method)

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[3]The user information is extracted from Authorization. Content-Length only requires the POST method. Also, If-Modified-Since is referenced in panorama-related commands (and there is a possibility that it may be referenced by other commands in the future as well).

500 Internal Server Error	The request was refused due to an internal processing error
503 Service Unavailable	The request was refused due to temporary overload or memory shortage

1.1.1 Livescope-Status

The value of the Livescope-Status header field is “0” when the WV-HTTP command is processed normally, and is one of the following error codes/error messages when an error occurs:

Livescope-Status	Meaning
301 No Camera Control Right	The request was refused because no control privilege request was issued
302 Camera is not available	A camera that does not exist was specified in the camera_id parameter
303 Camera is not controllable	An anomaly in the camera part has caused it to enter an uncontrollable state
401 Unknown Operator	An undefined command was specified
403 Invalid Parameter Value	An invalid parameter value was specified
404 Operation Timeout	The command did not finish executing within the response timeout period
406 Parameter Missing	A mandatory parameter was not specified
407 Invalid Request	An invalidated session function was requested
408 Conflict	An exclusive operation was requested
501 Unknown Connection ID	The specified session does not exist
503 Too many clients	The maximum number of connections was exceeded
507 Insufficient Privilege	Cannot access due to access time period restrictions, etc.

WV-HTTP error responses appear as follows overall (the message body’s Content-Type is always text/plain).:

HTTP/1.1 200 OK
<HTTP response header field>
Livescope-Status: <error code> <error message>
Content-Length: <message body length>
Content-Type: text/plain

--- WebView Livescope Http Server Error ---
<error message>
<additional error information>

1.2 Differences among VB-C60/VB-C500 and Previous models

WV-HTTP of VB-C60 and VB-C500 is basically forward compatible with VB-C300 and VB-C50i, except the following changes. The details are described in the explanation of each command and parameter.

- Addition of a new command system[4]
- Elimination of command limits on permanent connections
- Modification of interpretations of some parameters
- Change to ignore all undefined parameters
- Change of character encoding (changed to UTF-8)
- Change the ServerResponses header field to VB/4.0
- Elimination of VideoMode, SessionMode andGetStillImage commands

WV-HTTP of VB-C60 and VB-C500 is implemented to interpret the abbreviation[5] of all parameters, but this is not a formal protocol specification. Any applications using WV-HTTP must not use abbreviation of parameter names except for those which are described in this document, because if using abbreviations of parameter names, it will be impossible to ensure the compatibility when new parameters are added in the future.

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[4] It is also possible to use new commands and compatible commands at the same time.

[5] The abbreviation of parameter name is a text which is towards the front of the proper name. When there are more than one, follow the order described in the specification (example: 't' of the info.cgi command corresponds to 'type' and 'timeout', but it is interpreted as 'type' according to the order.)

2 WV-HTTP Specification Overview

2.1 Functions Provided by the WV-HTTP Protocol

WV-HTTP provides the following functions:

Starting and ending sessions
Acquiring video data
Camera control
Camera control privileges
Event processing
Acquiring various types of information

2.2 Commands and Parameters

Each WV-HTTP command is comprised of a command name and parameters. Parameters are given in the format “<name>=<value>”, and are specified in the request URI’s query string with ‘&’ as a delimiter (or delimited with carriage returns inside the message body).[6]

Example: http://192.168.100.1/-wvhttp-01-/image.cgi?pan=1000&tilt=1000

Although there are no restrictions in the order of specification for parameters, if the same parameter is specified multiple times, then the last parameter will be used (note: this excludes parameters that can be specified multiple times).

Each command parameter and response will be described below. Depending on the parameter, it may be possible to partially omit names or values. In this case, the part that can be omitted will be shown as “[...]”.

The majority of parameters may be omitted in WV-HTTP, but those that cannot be omitted are shown as “(mandatory)”.

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[6]Parameter values inside the query string must be URL-encoded.

2.3 New Commands and Compatible Commands

The new commands added in VB-C60 and later models (including VB-C500) make up a command system that includes the functions of previous compatible commands (refer to chapter 4) while incorporating a number of function expansions. Applications that mainly support VB-C60 and later models (including VB-C500) should use the new command system. WV-HTTP is a command system based on sessions (refer to the explanation in section 3.1.1, “open.cgi”), but since almost all of the new commands can be used sessionless as well, it is also comparatively easy to transition from network cameras made by other companies.

The compatible commands of VB-C60 and VB-C500 make up a command system that is compatible with previous models, such as VB-C300. Applications supporting previous models can be made to support VB-C60 as well with little work by using compatible commands.

Although it would be preferable to transition completely to the new command system in the future, in order to make transition easy with VB-C60 and VB-C500, the mixing of new commands and compatible commands is allowed. For this reason, support can be designed in a transitional manner by using compatible commands for those functions that are shared with previous models, and by using new commands for functions that are specific to VB-C60 and VB-C500.

3 WV-HTTP Specifications (New Commands)

WV-HTTP provides the following new commands:

Starting and ending sessions:	open.cgi, close.cgi, session.cgi
Acquiring video data:	image.cgi, video.cgi
Camera control:	control.cgi
Camera control privileges:	claim.cgi, yield.cgi
Acquiring various types of information:	info.cgi
External device operations:	Integrated into control.cgi and info.cgi
Event processing:	Integrated into info.cgi

control.cgi and info.cgi can be used sessionless. When control privileges are controlled using claim.cgi and yield.cgi, a session must be started using open.cgi.

3.1 Session Control Commands

3.1.1 open.cgi

Function Overview

This function creates a WV-HTTP session. When creating a privileged session, specify the priority with “priority”. This priority level is used for access management, control privileges management, and so on. Session life spans differ depending on the priority, with privileged sessions (those with a priority of 5 or higher) unlimited, and general sessions (those with a priority of 0) limited to the maximum connection time (the set value).

v can be used to specify the video stream for a session to be used for acquiring video. The specified value is used as the default video stream for video retrieval commands. The values which can be specified depend on the model and settings (refer to info.cgi). After the session is created, or after the video transmission starts, if a changeable session is successfully created (refer to session.cgi), then the session identifier, remaining time, and priority are returned as the response. When v is specified, as well as item, the related information is added to the response.

If the maximum connections limit is exceeded, a session will not be created (this will result in a 503 error). The session will also not be created if the access time period or some other connection restriction prevents the connection (this will result in a 507 error).

Parameters

[s.]priority	Priority level (0: general user, 5 to 50: privileged user). Value defaults to 0 when omitted. Priority levels between 1 and 4 are treated as 5 (1 to 4 are a reserved range). [Note] Root (administrator) users can unconditionally start sessions as a privileged user with priority=5 or over. Registered users can start sessions as a privileged user with priority=5 or over, only when [Privileged Camera Control] is set to ON in [User Authority] in VB-C60 [Access Control] setting page.

v	Used to specify the video stream, with the format <T>[:<W>[x<H>[:<Q>[:<R>]]]]. <T> is the type (jpg or mp4), <W> and <H> are the image size (the width and height in pixel units), <Q> is the image quality (step values specific to the model. Integer 1 ~ 5 for VB-C60 and VB-C500. 5 represents the highest quality.), and <R> is the frame rate (the number of frames per 1,000 seconds). If there is no match for a specified value, then the closest thing to the specified value (as long as the value is above the specified value, yet does not exceed the maximum value for the device) will be selected. WxH and Q can be left blank, in which case the device's default values will be used. When null is specified, a session without a video delivery function will be created (if a command related to video delivery is requested of this session, then a 407 error will result).

Responses

Content-Type	text/plain
Message body	s:=<session identifier> s.origin:=<camera address>:<HTTP port> s.duration:=<time remaining in the session> s.priority:=<session priority level > v:=<video stream>
Notes	s.duration is the remaining time in seconds (0 means no limit). v is only specified when the video stream is valid (when v is not null).

Example of Parameters and Responses

GET /-wvhttp-01-/open.cgi HTTP/1.1

⇒

HTTP/1.1 200 OK

...

s:=8a96-c09b18f0

s.origin:=172.20.28.60:80

s.duration:=0

s.priority:=0

v:=jpg:320x240:3:30000

3.1.2 close.cgi

Function Overview

This function deletes the WV-HTTP session.

Parameters

s (mandatory)	The session identifier.

Responses

Content-Type	text/plain
Message body	OK.

Example of Parameters and Responses

GET /-wvhttp-01-/close.cgi?s=8a96-c09b18f0 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

OK.

3.1.3 claim.cgi

Function Overview

This function requests camera control privileges. The control privilege allocation time is determined by the session's priority level, with privileged sessions unlimited, and others set to a finite value (the set value).

Privileged user level sessions can secure the control privilege even when another session with the same priority level has already secured the control privilege. The session forfeiting the control privilege will be informed with an event.

Parameters

s (mandatory)	The session identifier.

Responses (If the State of Control Privileges Has Changed)

Content-Type	text/plain
Message body	s.control:=<state of camera control privileges>
Notes	The camera control privileges can be in one of the following two states. If the allocated time and waiting time are both limited, then the time will be appended after the ':' in millisecond units. Control right successfully secured: enabled[:<allocated time>] Waiting to secure control privilege: waiting[:<waiting time>] The results are notified as an event as well (3.3.1 info.cgi).

Responses (If the State of Control Privileges Has Not Changed)

Content-Type	text/plain
Message body	s.control==<state of camera control privileges>
Notes	The camera control privileges can be in one of the following three states. The allocated time and waiting time are the same as above. While control privilege is secured: enabled[:<allocated time>] While waiting for control privilege: waiting[:<waiting time>] Failed to secure control privilege: disabled

Example of Parameters and Responses

GET /-wvhttp-01-/claim.cgi?s=8a96-c09b18f0 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

s.control:=enabled:20000

3.1.4 yield.cgi

Function Overview

This function releases camera control privileges, or cancels the state of waiting for camera control privileges.

Parameters

s (mandatory)	The session identifier.

Responses (If the State of Control Privileges Has Changed)

Content-Type	text/plain
Message body	s.control:=disabled
Notes	The results are notified as an event as well (3.3.1 info.cgi).

Responses (If the State of Control Privileges Has Not Changed)

Content-Type	text/plain
Message body	s.control==disabled

Example of Parameters and Responses

GET /-wvhttp-01-/yield.cgi?s=8a96-c09b18f0 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

s.control:=disabled

3.1.5 session.cgi

Function Overview

This function retrieves or changes session-specific attributes. The currently supported session-specific attributes are priority level and video stream.

The session's priority level is used in access management and control privilege management. When the priority level is changed, or a particularly low priority level is set, the following side effects may occur:

- Session deletion: When access is prohibited due to the setting, the session will be forcefully deleted.
- Camera control privilege: The state of the control privilege queue will change, and the control privilege may be forfeited or the waiting time may be lengthened. When a priority level for which camera control is prohibited is set, the control privilege will be forfeited.

Parameters

s (mandatory)	The session identifier.
[s.]priority	Priority level (0: general user, 5 to 50: privileged user). Value defaults to 0 when omitted. Priority levels between 1 and 4 are treated as 5 (1 to 4 are a reserved range). [Note] when using VB-C60 or VB-C500 Root (administrator) users can unconditionally start sessions as a privileged user with priority=5 or over. Registered users can start sessions as a privileged user with priority=5 or over, only when [Privileged Camera Control] is set to ON in [User Authority] in [Access Control] setting page.

v	Used to specify the video stream, with the format <T>[:<W>[x<H>[:<Q>[:<R>]]]]. <T> is the type (jpg or mp4), <W> and <H> are the image size (the width and height in pixel units. Integer 1 ~ 5 for VB-C60 and VB-C500. 5 represents the highest quality.), <Q> is the image quality (step values specific to the model), and <R> is the frame rate (the number of frames per 1,000 seconds). If there is no match for a specified value, then the closest thing to the specified value (as long as the value is above the specified value, yet does not exceed the maximum value for the device) will be selected. WxH and Q can be left blank, in which case the device's default values will be used. The type cannot be changed while the video retrieval command is being processed (this would cause a 408 error).

Responses

Content-Type	text/plain
Message body	s.priority:=<new priority level> v:=<new video stream>
Notes	The details of a changed item will be notified as an event as well (3.3.1 info.cgi). The response will be as follows for an item that is not changed, and no event notification will occur: s.priority==<current priority level> v==<current video stream>

Example of Parameters and Responses

GET /-wvhttp-01-/session.cgi?s=8a96-c09b18f0 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

s.priority==0

v==jpg:320x240:1:30000

3.2 Video Retrieval Commands

3.2.1 image.cgi

Function Overview

This function requests a JPEG still image. Operations differ as follows, depending on whether or not a session identifier is specified:

- When the session identifier is specified: The session's video stream setting is used.
- If, however, the type of the video stream set is mp4, then a usable jpg stream will be selected, and the session's video stream setting will be changed. This command is prohibited during the transmission of a video stream using video.cgi (this will result in a 408 error). Camera control parameters are ingnored.
- When the session identifier is not specified: Selection will be made based on the video stream specifier v. Camera control parameters can be used to specify the shooting position (note: this will be ignored if the control privilege cannot be secured).

Although it is up to the application to decide how to differentiate when using these, the method for specifying the session identifier is suited for use in displaying a pseudo video by repeatedly sending JPEG still images. To retrieve a single JPEG still image alone, you can use image.cgi without specifying a session identifier.

Parameters

s	The session identifier.
v	Used to specify the video stream, with the format <T>[:<W>[x<H>[:<Q>[:<R>]]]]. <T> is the type (jpg or mp4), <W> and <H> are the image size (the width and height in pixel units), <Q> is the image quality (step values specific to the model. Integer 1 ~ 5 for VB-C60 and VB-C500. 5 represents the highest quality.), and <R> is the frame rate (the number of frames per 1,000 seconds). If there is no match for a specified value, then the closest thing to the specified value (as long as the value is above the specified value, yet does not exceed the maximum value for the device) will be selected. WxH and Q can be left blank, in which case the device's default values will be used.

<table>
<tr><td>[c.<c>.]zoom</td><td>Specify the zoom position or operation<table>
<tr><td><position></td><td>Moves to <position> (the horizontal angle of view in 0.01 degree units)</td></tr>
<tr><td>d[±]<difference></td><td>Moves to a position that is the current position ±<difference></td></tr>
<tr><td>v[＋]<magnification ratio></td><td>Moves to the <magnification ratio> position based on the current angle of view. The <magnification ratio> is a relative value (50 means a magnification ratio of 1/2, and 200 means double) with the current position as 100.</td></tr>
</table></td></tr>
<tr><td>[c.<c>.]pan</td><td>Specifies the pan position.<table>
<tr><td><position></td><td>Moves to <position> (in 0.01 degree units, with the right side positive)</td></tr>
<tr><td>d[±]<difference></td><td>Moves to a position that is the current position ±<difference></td></tr>
<tr><td>V[±]<difference></td><td>Moves to a position that is the current position ±<difference></td></tr>
</table>VB-C60 only. It cannot be used in VB-C500.</td></tr>
<tr><td>[c.<c>.]tilt</td><td>Specifies the tilt position.<table>
<tr><td><position></td><td>Moves to <position> (in 0.01 degree units, with the up side positive)</td></tr>
<tr><td>d[±]<difference></td><td>Moves to a position that is the current position ±<difference></td></tr>
<tr><td>v[±]<difference></td><td>Moves to a position that is the current position ±<difference></td></tr>
</table>VB-C60 only. It cannot be used with VB-C500.</td></tr>
<tr><td>Notes</td><td>When this command is issued multiple times simultaneously, within the same session, each incident is serialized based on the order in which it is received. Although the same JPEG still image data will not be sent multiple times, since there is no guarantee that the order of sending and the order of receiving will be the same, the client side must sort by serial number.</td></tr>
</table>

Responses

Content-Type	image/jpeg
Extended header	Livescope-Frame-Number: <JPEG data serial number>
Message body	<JPEG data>
Notes	The extended header is only used when a session identifier is specified.

Example of Parameters and Responses

GET /-wvhttp-01-/image.cgi?v=jpg:320x240:5 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

{JPEG image data with a resolution of 320 x 240 and an image quality of 5}

3.2.2 video.cgi

Function Overview

This function requests transmission of the video stream. Operations differ as follows, depending on whether or not a session identifier is specified:

- When the session identifier is specified: The session's video stream setting is used. This command is prohibited during the transmission of a video stream or a JPEG still image (3.2.1 image.cgi) (this will result in a 408 error). The transmission process will continue until either the session ends or the client cuts the connection.
- When the session identifier is not specified: Selection will be made based on the video stream specifier v. The transmission process will continue until either the period specified by duration comes to an end, or the client cuts the connection.

The video stream can use type to specify the transmission control method (buffering policy). The transmission control method and the session identifier specification are unrelated to each other.

Parameters

s	The session identifier.
v	Used to specify the video stream, with the format <T>[:<W>[x<H>[:<Q>[:<R>]]]]. <T> is the type (jpg or mp4), <W> and <H> are the image size (the width and height in pixel units), <Q> is the image quality (step values specific to the model. Integer 1 ~ 5 for VB-C60 and VB-C500. 5 represents the highest quality.), and <R> is the frame rate (the number of frames per 1,000 seconds). If there is no match for a specified value, then the closest thing to the specified value (as long as the value is above the specified value, yet does not exceed the maximum value for the device) will be selected. WxH and Q can be left blank, in which case the device's default values will be used. [Supplementary Information] Refer to the appendix of this document for the specifications of mp4 (MPEG-4).
duration	The video transmission time (in seconds). 0 (the default setting) means there is no limit. In the case of general users, the limit is the maximum connection time setting for the device.

<table>
<tr><td>type</td><td>The transmission control method (buffering policy).
Specify either live (live) or rec (record). The default setting when this is omitted is live.
<table><tr><td>live</td><td>This control setting discards image data as it is collected, in order to send the newest image data possible.</td></tr><tr><td>rec</td><td>This control setting buffers image data as it is collected, in order to prevent the loss of data to the extent possible.</td></tr></table>
Since the buffer capacity is limited, when the buffer fills, data may be lost, even if rec is specified.
a) If the video stream format is mp4, b) if the frame rate exceeds 10 fps, or c) if it exceeds the maximum JPEG frame rate of camera's setting, then type=rec cannot be specified (this will result in a 407 error). Multiple video.cgi commands cannot simultaneously specify type=rec (this will result in a 408 error).</td></tr>
</table>

Responses (When the Stream Type Is jpg)

Content-Type	multipart/x-mixed-replace;boundary=boundary
Message body	--boundary Content-Type: image/jpeg Content-Length: <1st JPEG data size> <1st JPEG data> --boundary Content-Type: image/jpeg Content-Length: <2nd JPEG data size> <2nd JPEG data> ... --boundary Content-Type: image/jpeg Content-Length: <last JPEG data size> <last JPEG data> --boundary--

Parameters (When the Stream Type Is mp4)

Content-Type	video/3gpp2
Message body	The MPEG-4 data in MP4 fragment format.

Example of Parameters and Responses

GET /-wvhttp-01-/video.cgi?v=jpg:320x240:3:10000 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

--boundary

Content-Type: image/jpeg

Content-Length: ...

{JPEG image data with a resolution of 320 x 240 and an image quality of 3, at 10 fps}

--boundary

Content-Type: image/jpeg

Content-Length: ...

{JPEG image data}

...

3.3 Information Retrieval Commands

3.3.1 info.cgi

Function Overview

This function retrieves various types of information (refer to Appendix A and B). Operations differ as follows, depending on whether or not a session identifier is specified:

- When the session identifier is specified: All specified information is returned the first time, and differential information not yet retrieved is returned the second and subsequent times. Although any existing differential information which has not yet been retrieved will be returned immediately as a response, the command will wait until a change happens if none exists yet.
- When the session identifier is not specified: All specified information is returned immediately.

The response will be given in the format “item name:=value” or “item name ==value”.

- Item name:=value: An item checked for the first time, or changed by an external factor (controlled by another client, a setting change, etc.)
- Item name==value: An item changed by one’s own command (the command response is “item name:=value”)

When the session identifier is not specified, the format will always be “item name:=value”.

When the type parameter is used, the changed part can be retrieved in stream format (type=stream). In this case, the operation is as described above the first time, depending on whether or not there is a session identifier specification, and the differential is sent if a change happens from the second time on.

When the timeout parameter is used, it is possible to specify a time limit for the response. If the information that is to be notified does not occur during the prescribed time, then the response will occur with only a timestamp line.

Parameters

s	The session identifier.
item	This specifies the item with information to be retrieved. The item name is hierarchical, and is specified in the following format: c: Everything in c and under is included in the acquisition target. c!: Everything in c and under is excluded from the acquisition target. It is also possible to list items with item=s,c... (or item=s&item=c...) (the item specifications are evaluated in the order of specification). If there is no item specification, then this is processed as if all items were specified.
type	When stream is specified, the differential is notified in stream format.
timeout	This is the time limit for a response (in seconds). The upper and lower limit values are dependent on implementation. If no event occurs before the timeout period ends, then only the timestamp line will be sent. Even if there is no timeout specification, a timeout will still occur if there is no event within the prescribed time period.
Notes	It is not possible to simultaneously execute multiple event retrieval commands in the same session (this will cause a 408 error). When the item parameter is used, it is recommended to specify the same item throughout the session. Even if the item is changed during a session, this will not result in an error, but a mismatch may result in the order of updating and the order of retrieval.

Responses (Normal)

Content-Type	text/plain; charset=utf-8
Message body	timestamp=<time stamp(seconds.milliseconds)> <specified information or differential information>
Notes	The timestamp is a time specific to the network camera (the amount of time that has passed since startup).

Responses (Stream Format)

Content-Type	multipart/x-mixed-replace;boundary=boundary
Message body	--boundary Content-Type: text/plain; charset=utf-8 Content-Length: <data length> timestamp=<time stamp(seconds.milliseconds)> <specified information or differential information> --boundary Content-Type: text/plain; charset=utf-8 Content-Length: <data length> timestamp=<time stamp(seconds.milliseconds)> <differential information> --boundary ... --boundary Content-Type: text/plain; charset=utf-8 Content-Length: <data length> timestamp=<time stamp(seconds.milliseconds)> --boundary--
Notes	The timestamp line is sent alone the final time.

Example of Parameters and Responses

GET /-wvhttp-01-/info.cgi HTTP/1.1

⇒

```
HTTP/1.1 200 OK
...
timestamp=6114.884
s.epoch:=Tue, 13 Jan 2009 14:07:34 +0900
s.hardware:=Canon VB-C500D
s.firmware:=1.0.0
s.protocol:=02.00
v.list:=jpg:160x120:3:30000,jpg:320x240:3:30000,jpg:640x480:3:30000,mp4:320x240:3:30000
c:=1
c.count:=1
c.1.type:=Canon VB-C500D
c.1.status:=enabled
c.1.name.asc:=Camera
c.1.name.utf8:=
c.1.exp:=auto
c.1.exp.list:=auto,flickerfree,tv,manual
```

c.1.ae.autoss:=30
c.1.ae.autoss.list:=8,15,30
c.1.ae.shutter.list:=8,15,30,60,100,120,250,500,1000,2000,4000,8000
c.1.ae.brightness:=0
c.1.ae.brightness.min:=-6
c.1.ae.brightness.max:=6
c.1.ae.brightness.list:=-6,-4,-2,0,2,4,6
c.1.ae.photometry:=center
c.1.ae.photometry.list:=center,average,spot
c.1.me.shutter.list:=1,2,4,8,15,30,60,100,120,250,500,1000,2000,4000,8000
c.1.me.gain.min:=0
c.1.me.gain.max:=23
c.1.dn:=off
c.1.dn.mode:=manual
c.1.dn.mode.list:=manual,auto1
c.1.wb:=auto
c.1.wb.list:=auto,manual,one_shot,sodium,halogen,mercury,fluorescent_w,fluorescent_l,fluorescent_h
c.1.nr:=1
c.1.nr.min:=0
c.1.nr.max:=2
c.1.ac:=1
c.1.ac.min:=0
c.1.ac.max:=2
c.1.shade:=off
c.1.shade.param:=0
c.1.shade.param.min:=0
c.1.shade.param.max:=6
c.1.zoom:=152
c.1.zoom.d:=152
c.1.zoom.min:=152
c.1.zoom.max:=152
c.1.zoom.limit.min:=152
c.1.zoom.limit.max:=152
c.1.zoom.speed.min:=0
c.1.zoom.speed.max:=7
c.1.panorama.count:=0
i.count:=2
i.1:=0
i.1.name.asc:=
i.1.name.utf8:=
i.2:=0
i.2.name.asc:=
i.2.name.utf8:=
o.count:=2
o.1:=0
o.1.name.asc:=
o.1.name.utf8:=
o.2:=0
o.2.name.asc:=
o.2.name.utf8:=
m.count:=4
m.1:=0
m.1.name.asc:=
m.1.name.utf8:=

m.2:=0
m.2.name.asc:=
m.2.name.utf8:=
m.3:=0
m.3.name.asc:=
m.3.name.utf8:=
m.4:=0
m.4.name.asc:=
m.4.name.utf8:=
p.count:=0

3.3.2 panorama.cgi

Function Overview

This function retrieves panorama image data. If there is no session specification, then this is limited to administrators.

[Note] This command is unavailable for VB-C500, since VB-C500 is a fixed camera.

Parameters

s	The session identifier.
[c.<c>.]panorama	The panorama number of camera number c (1 or higher). 0 is interpreted as 1.

Responses

Content-Type	image/jpeg
Message body	<panorama image data>
Notes	If a panorama image exists, then the panorama image is subject to caching. The response header does not include Cache-Control, etc., but includes Last-Modified instead. The user agent can access conditionally with If-Modified-Since, and if there is no update (modification), then a no update response (304 Not Modified) will be returned. If no panorama image exists, then an HTTP error will occur (404 Not Found). [Note] VB-C500 returns HTTP 404.

Example of Parameters and Responses

GET /-wvhttp-01-/panorama.cgi HTTP/1.1

⇒

HTTP/1.1 200 OK

...

{Panorama image data}

3.4 Camera Control Commands

3.4.1 control.cgi

Function Overview

This function controls the camera and external output terminal. When the external output terminal is to be controlled (along with everything but pan, tilt, and zoom speed), camera control privileges are necessary (a 301 error occurs if camera control privileges cannot be secured). If camera control privileges are necessary, operations will differ as follows, depending on whether or not a session identifier is specified:

- When the session identifier is specified: The camera will be controlled based on the session's camera control privileges. The priority level specification is ignored.
- When the session identifier is not specified: An attempt is made to secure camera control privileges with the specified priority level, and if the attempt succeeds, camera control is performed. If the control privileges cannot be secured immediately, then the camera will not be controlled.

When only pan, tilt, and zoom speed are to be changed, there is no need to secure the camera control privileges. If, however, other control items are also to be controlled in combination with these, then camera control privileges will be required, and if the control privilege cannot be secured, then pan, tilt, and zoom speed will also remain unchanged.

The camera control parameter "<c>" is the camera number. When "c.<c>." is omitted, the currently selected camera is controlled. The values which can be specified for each control item depend on the model and operating state (for details, refer to the parameter description and Appendix A.3 and B.3).

[Note] If controlling pan, tilt, zoom, focus or backlight compensation using sessionless control.cgi during a preset tour based on VB-C60's preset tour function, the preset tour will be interrupted and then resumed after a specified time. (The interrupt time is decided according to the setting value of "Camera Control Time" on VB-C60 setting page. Preset tours are not interrupted more than 20 seconds.)

[Note] VB-C500 has no pan and tilt control, since VB-C500 is a fixed camera. Only zoom of the above specifications is applied.

Parameters

<table>
<tr><td>s</td><td>The session identifier.</td></tr>
<tr><td>s.priority</td><td>Priority level (0: general user, 5 to 50: privileged user).
Value defaults to 0 when omitted.
Priority levels between 1 and 4 are treated as 5 (1 to 4 are a reserved range).

[Note] when using VB-C60 or VB-C500
Root (administrator) users can unconditionally change the level to priority=5 or over.
Registered users can change the level to priority=5 or over, only when [Privileged Camera Control] is set to ON in [User Authority] in [Access Control] setting page.</td></tr>
<tr><td>c</td><td>The camera number of the camera to switch to (1 or higher).</td></tr>
<tr><td>[c.<c>.]exp</td><td>The exposure mode. One of the following may be specified:
<table><tr><td>auto</td><td>Automatic exposure (full auto)</td></tr><tr><td>flickerfree</td><td>Automatic exposure (flicker-free)</td></tr><tr><td>tv</td><td>Automatic exposure (priority given to shutter speed)</td></tr><tr><td>manual</td><td>manualExposure</td></tr></table></td></tr>
<tr><td>[c.<c>.]ae.autoss</td><td>Auto slow shutter. Specifies the shutter speed’s reciprocal number. Following values are available for VB-C60 and VB-C500.
8, 15, 30
This is ignored unless the exposure mode is auto.</td></tr>
<tr><td>[c.<c>.]ae.shutter</td><td>Shutter speed. Specifies the shutter speed’s reciprocal number. Following values are available for VB-C60 , VB-C500.
8, 15, 30, 60, 100, 120, 250, 500, 1000, 2000, 4000, 8000
This is ignored unless the exposure mode is tv.</td></tr>
<tr><td>[c.<c>.]ae.brightness</td><td>The backlight adjustment value. Specified as a numerical value (low [dark] to high [bright]; device-dependent).
Intger 6 ~ -6 can be specified for VB-C60. (-6,-4,-2,0,2,4,6 are used for Admin Viewer.)
This is ignored if the exposure mode is manual.</td></tr>
<tr><td>[c.<c>.]ae.photometry</td><td>The metering system. One of the following may be specified:
<table><tr><td>center</td><td>Center-weighted metering</td></tr><tr><td>average</td><td>Average metering</td></tr><tr><td>spot</td><td>Spot metering</td></tr></table>This is ignored if the exposure mode is manual.</td></tr>
</table>

<table>
<tr><td>[c.<c>.]me.shutter</td><td>Shutter speed. Specify the shutter speed’s reciprocal number. Following values can be specified for VB-C60 and VB-C500.
1, 2, 4, 8, 15, 30, 60, 100, 120, 250, 500, 1000, 2000, 4000, 8000
This is ignored unless the exposure mode is manual.</td></tr>
<tr><td>[c.<c>.]me.iris</td><td>The aperture value. Specify a numerical value (low [opened] to high [closed]; device-dependent).
Integer 6 ~ 32 can be specified for VB-C60.
This is ignored unless the exposure mode is manual.

[Note]
It is unavailable with VB-C500.
[Note]
when VB-C60 obtains an iris value using ino.cgi immediately after switching from auto exposure (auto, flickerfree, tv) to manual exposure (manual), the value may be beyond the controllable range, such as 5, 37 etc.</td></tr>
<tr><td>[c.<c>.]me.gain</td><td>AGC gain value. Specify a numerical value (low to high; device-dependent).
Integer 0 ~ 23 can be specified for VB-C60 and VB-C500.
This is ignored unless the exposure mode is manual.</td></tr>
<tr><td>[c.<c>.]wb</td><td>Specify the white balance. One of the following may be specified:

<table><tr><td>auto</td><td>Automatic white balance</td></tr><tr><td>manual</td><td>Manual white balance</td></tr><tr><td>fluorescent_l</td><td>Fluorescent White cool</td></tr><tr><td>fluorescent_h</td><td>Fluorescent H Daylight</td></tr><tr><td>fluorescent_w</td><td>Fluorescent Warm white</td></tr><tr><td>sodium</td><td>Sodium light</td></tr><tr><td>halogen</td><td>Halogen light</td></tr><tr><td>mercury</td><td>Mercury light</td></tr><tr><td>one_shot</td><td>One-shot white balance</td></tr></table>
When one_shot is specified, after white balance is corrected, it returns to manual white balance mode.</td></tr>
<tr><td>[c.<c>.]wb.value</td><td>RB gain. Specified in RRRR-BBBB format.
This is ignored in modes other than manual white balance.</td></tr>
<tr><td>[c.<c>.]dn</td><td>Day-night mode. Specify either on (or 1) or off (or 0).
This is ignored in auto day-night mode.
This item is restricted to privileged users.</td></tr>
<tr><td>[c.<c>.]dn.mode</td><td>Day-night switching mode. Specify either manual (for manual), or auto1 (auto).
This item is restricted to privileged users (administrator/privileged user).</td></tr>
</table>

<table>
<tr><td>[c.<c>.]is</td><td>Image stabilization function. Specify off, on1 (small) or on2(large)
[Note]
It is unavailable with VB-C500
[Note]
If changing the is setting with the digital zoom on using this command or from the setting page, the value of zoom telephoto side movement limit (zoom.limit.min) changes as follows.
off -- zoom.limit.min=38
on1-- zoom.limit.min=46
on2—- zoom.limit.min=76
The value of zoom,zoom.min may also change depending on the view restriction setting or the current zoom position.</td></tr>
<tr><td>[c.<c>.]nr</td><td>Noise reduction level. Specify a numerical value (device-dependent).</td></tr>
<tr><td>[c.<c>.]ac</td><td>Aperture correction value. Specify a numerical value (device-dependent).</td></tr>
<tr><td>[c.<c>.]shade</td><td>Shade correction. Specify either on (or 1) or off (or 0).</td></tr>
<tr><td>[c.<c>.]shade.param</td><td>Shade correction parameter. Specify a numerical value 0 or higher (a step value).
The numerical value indicates the strength of shade correction (low/weak to high/strong), but the actual effect will depend on the device settings and the image.</td></tr>
<tr><td>[c.<c>.]focus</td><td>Focus mode or focus operation specification.
<table><tr><td>auto</td><td>Auto focus</td></tr><tr><td>manual</td><td>Manual focus</td></tr><tr><td>infinity</td><td>Fixed at infinity</td></tr><tr><td>one_shot</td><td>One-shot AF</td></tr><tr><td>stop</td><td>Stop</td></tr><tr><td>near</td><td>Move to near distance side</td></tr><tr><td>far</td><td>Move to far distance side</td></tr></table>When one_shot is specified, after the device is focused at the current position, the mode reverts to manual focus.
When stop, near, or far is specified, after manual mode is switched to, the prescribed operation is performed (in particular, stop is the same as manual).
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>[c.<c>.]focus.value</td><td>Focus value. Specify a numerical value (device-dependent).
This is ignored in modes other than manual focus.
The focus value depends on the zoom position, and if the zoom position changes, then even if the focus value is the same, the focusing position will generally change as well.
[Note]
It is unavailable with VB-C500.</td></tr>
</table>

<table>
<tr><td>[c.<c>.]zoom</td><td>Specify the zoom position or operation.<table><tr><td><position></td><td>Moves to <position> (the horizontal angle of view in 0.01 degree units)</td></tr><tr><td>d[±] <difference></td><td>Moves to a position that is the current position ±<difference></td></tr><tr><td>v[＋] <magnification ratio></td><td>Moves to the <magnification ratio> position based on the current angle of view. The <magnification ratio> is a relative value (50 means a magnification ratio of 1/2, and 200 means double) with the current position as 100.</td></tr><tr><td>stop</td><td>Stop</td></tr><tr><td>tele</td><td>Move to the telephoto side</td></tr><tr><td>wide</td><td>Move to the wide angle side</td></tr></table></td></tr>
<tr><td>[c.<c>.]zoom.speed</td><td>Specifies the following pos and dir.</td></tr>
<tr><td>[c.<c>.]zoom.speed.pos</td><td>The operational speed when a position is specified in c.<c>.zoom.</td></tr>
<tr><td>[c.<c>.]zoom.speed.dir</td><td>The operational speed when either tele or wide is specified in c.<c>.zoom.</td></tr>
<tr><td>[c.<c>.]pan</td><td>Specifies the pan position or operation.<table><tr><td><position></td><td>Moves to <position> (in 0.01 degree units, with the right side positive)</td></tr><tr><td>d[±]<difference></td><td>Moves to a position that is the current position ±<difference></td></tr><tr><td>v[±]<difference></td><td>Moves to a position that is the current position ±<difference>. The difference is a relative position based on the screen, with 0 representing the center, -100 representing the left edge, and 100 representing the right edge.</td></tr><tr><td>stop</td><td>Stop</td></tr><tr><td>left</td><td>Move to the left</td></tr><tr><td>right</td><td>Move to the right</td></tr></table>[Note]
It is unavailable with VB-C500.
[Note]
The operation result notified using info.cgi may be a little different from the specified position, because the correction by specifying camera’s movement is applied when operating by position specification.</td></tr>
<tr><td>[c.<c>.]pan.speed</td><td>Specifies the following pos and dir.
[Note]
It is unavailable with VB-C500.</td></tr>
</table>

<table>
<tr><td>[c.<c>.]pan.speed.pos</td><td>The operational speed when a position is specified in c.<c>.pan.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>[c.<c>.]pan.speed.dir</td><td>The operational speed when either left or right is specified in c.<c>.pan.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>[c.<c>.]tilt</td><td>Specifies the tilt position or operation.
<table><tr><td><position></td><td>Moves to <position> (in 0.01 degree units, with the up side positive)</td></tr><tr><td>d[±]<difference></td><td>Moves to a position that is the current position ±<difference></td></tr><tr><td>v[±]<difference></td><td>Moves to a position that is the current position ±<difference>. The difference is a relative position based on the screen, with 0 representing the center, -100 representing the bottom edge, and 100 representing the top edge.</td></tr></table><table><tr><td>Stop</td><td>Stop</td></tr><tr><td>Up</td><td>Move up</td></tr><tr><td>down</td><td>Move down</td></tr></table>
[Note]
It is unavailable with VB-C500.
[Note] The operation result notified using info.cgi may be a little different from the specified position, because the correction by specifying camera’s movement is applied when operating by position specification</td></tr>
<tr><td>[c.<c>.]tilt.speed</td><td>Specifies the following pos and dir.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>[c.<c>.]tilt.speed.pos</td><td>The operational speed when a position is specified in c.<c>.tilt.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>[c.<c>.]tilt.speed.dir</td><td>The operational speed when either up or down is specified in c.<c>.tilt.
[Note]
It is unavailable with VB-C500.</td></tr>
</table>

[c.<c>.]view.restriction	Restriction on the viewable range. Specify on (or 1) to turn this on, or off (or 0) to turn this off. This item is restricted to administrators and the session identifier s is necessary (note: it is not necessarily a privileged session.). The restriction of the viewable range is not changed during session-less. When the session, in which the restriction on the viewable range is off, loses the control privilege, the restriction becomes automatically on. [Note] It is unavailable with VB-C500.
o.<o>	External output control. Specify on (or 1) to turn this on, or off (or 0) to turn this off. This item is restricted to privileged users.

Responses

Content-Type	text/plain
Message body	<item name>:=<value> ... An item whose state is changing <item name>==<value> ... An item whose state is not changing ...
Notes	If the state has changed, then this will be notified with an event. Parameters dependent on an ignored mode (dn, wb.value, etc.) result in the following response: <item name>==?. If there is no control item specification, then a 406 error will occur. In particular, if this is sessionless, then if an item other than pan, tilt, or zoom speed is not specified, then a 406 error will result.

Example of Parameters and Responses

GET /-wvhttp-01-/control.cgi?dn=0HTTP/1.1

⇒

HTTP/1.1 200 OK

...

c.1.dn==off

4 WV-HTTP Specifications (Compatible Commands)

WV-HTTP compatible commands are those which are functionally compatible with the WV-HTTP of VB-C300 or VB-C50i, and which are a subset of the new commands (see chapter 2) in terms of details.

The following compatible commands can be used (only major commands are listed):

Starting and ending a session -- OpenCameraServer, CloseCameraServer
Acquiring video data -- GetLiveImage, GetOneShot
Camera control -- OperateCamera, OperateCameraEx, Exposure, NightMode
Camera control privilege -- GetCameraControl, ReleaseCameraControl
Acquiring various types of information -- GetCameraServerInfo, GetVideoInfo, GetCameraInfo, GetCameraInfoEx
External device operation -- ExternalIOConfig, ExternalIOStatus, ExternalIO
Event processing -- GetNotice

4.1 Session Control Commands

4.1.1 OpenCameraServer

Function Overview

This function creates a WV-HTTP session. When creating a privileged session, specify the priority with “priority”. This priority level is used for access management, control privilege management, and so on. Session life spans differ depending on the priority, with privileged sessions (those with a priority of 5 or higher) unlimited, and general sessions (those with a priority of 0) limited to the maximum connection time (the set value).

v|image_size can be used to specify the video size for a session to be used for acquiring video (JPEG only). The specified value is used in the video retrieval command. The values which can be specified depend on the model and settings. They can also be changed after creation, or after the video transmission starts. If the maximum connections limit is exceeded, a session will not be created (this will result in a 503 error). The session will also not be created if the access time period or some other connection restriction prevents the connection (this will result in a 507 error).

Parameters

priority	Priority level (0: general user, 5 to 50: privileged user). Value defaults to 0 (general user) when omitted. Priority levels between 1 and 4 are treated as 5 (1 to 4 are a reserved range). [Note] This parameter is for use with the VB-C60 and VB-C500 only, and cannot be specified for other models.
v|image_size	Video size. Specify either “width” or “width x height”. If there is no match for a specified value, then the closest thing to the specified value (as long as the value is above the specified value, yet does not exceed the maximum value for the device) will be selected.
vc_host	When null_host is specified, a session without a video delivery function will be created (if a command related to video delivery is requested of this session, then a 407 error will result). Values other than null_host are ignored.

Notes	VB-C60 and VB-C500 will eliminate vc_port, cc_host, and cc_port, and ignore them even if they are specified. These should not be used on other models either. [Note] When registered users of VB-C60 or VB-C500 create a privileged session, the privileged camera control must be permitted to registered users using camera's access control setting. If prohibit the privileged camera control in the setting page, registered user's privileged session will be immediately terminated.

Responses

Content-Type	text/plain
Message body	connection_id=<connection identifier>

Example of Parameters and Responses

GET /-wvhttp-01-/OpenCameraServer HTTP/1.1

⇒

HTTP/1.1 200 OK

...

connection_id=910A-8E63626C

4.1.2 CloseCameraServer

Function Overview

This function deletes a WV-HTTP session.

Parameters

connection_id (mandatory)	The session identifier.

Responses

Content-Type	text/plain
Message body	OK.

Example of Parameters and Responses

GET /-wvhttp-01-/CloseCameraServer?connection_id=910A-FB9D30E3 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

OK.

4.1.3 Priority

Function Overview

This function specifies the session's priority level.

[Notes]

When the priority level is changed, or a particularly low priority level is set, the following side effects may occur:

- Session deletion: When access is prohibited due to the setting, the session will be forcefully deleted.
- Camera control privilege: The state of the control privilege queue will change, and the control privilege may be forfeited or the waiting time may be lengthened. When a priority level for which camera control is prohibited is set, the control privileges will be forfeited.

Parameters

connection_id (mandatory)	The session identifier.
p|priority	Priority level (0: general user, 1 or higher: privileged user). [Notes] Although the range of specifiable values varies depending on the model, in general, the use of the value 0 and values in the range of 5 to 50 is recommended. VB-C500 - 0,5 to 50 (priority levels 1 to 4 will be treated as 5) VB-C60 - 0, 5 to 50 (priority levels 1 to 4 will be treated as 5) VB-C300 – 0 to 255 VB150,VB-C50i series – 0, 5 to 55 (A priority level between 1 and 4 will result in an Invalid Parameter Value error) VB100,101,VB-C10 – 0, 5 to 50 (A priority level between 1 and 4 will result in an Invalid Parameter Value error)

Responses

Content-Type	text/plain
Message body	priority=<priority level>
Notes	If the priority parameter is omitted, then the current priority level will be returned.

Example of Parameters and Responses

GET /-wvhttp-01-/Priority?connection_id=910A-8CE687F5&priority=10

⇒

HTTP/1.1 200 OK

...

priority=10

4.1.4 GetCameraControl

Function Overview

This function requests camera control privileges. The control privileges allocation time is determined by the session's priority level, with privileged sessions unlimited, and others set to a finite value (the set value).

Privileged user level sessions can secure the control privilege even when another session with the same priority level has already secured the control privilege. The session forfeiting the control privilege will be informed with an event.

Parameters

connection_id (mandatory)	The session identifier.

Responses

Content-Type	text/plain
Message body	OK.
Notes	The result will be notified with an event (4.4.1 GetNotice: camera_control event). If the control privilege has already been requested (being secured or waiting), then this will be ignored.

Example of Parameters and Responses

GET /-wvhttp-01-/GetCameraControl?connection_id=910A-8CE687F5

⇒

HTTP/1.1 200 OK

...

OK.

4.1.5 ReleaseCameraControl

Function Overview

This function releases camera control privileges, or cancels the state of waiting for camera control privileges. If the control privileges have not been secured, then a 301 error will result.

Parameters

connection_id (mandatory)	The session identifier.

Responses

Content-Type	text/plain
Message body	OK.

Example of Parameters and Responses

GET /-wvhttp-01-/ReleaseCameraControl?connection_id=910A-8CE687F5

⇒

HTTP/1.1 200 OK

...

OK.

4.2 Commands Related to Video

4.2.1 GetOneShot

Function Overview

This function retrieves a JPEG data stream in multi-part format. When multiple frames are specified, the maximum connection time is the limit (although privileged users, which are identified with the HTTP request's header field Authorization, have no time limit).

Parameters

v|image_size	Video size. Specify either "width" or "width x height". If there is no match for a specified value, then the closest thing to the specified value (as long as the value is above the specified value, yet does not exceed the maximum value for the device) will be selected.
frame_rate	Frame rate. Specify the number of frames per 1,000 seconds. The default value (the set value) is used when this is omitted.
frame_count	Number of frames. This is unlimited when 0 (or no_limit) is specified. frame_count is set to 1 when this is omitted.
Notes	timeout and mux have been eliminated (are ignored) from VB-C60 and VB-C500.

Responses (Single Frame)

Content-Type	image/jpeg
Message body	<JPEG data>

Responses (Multiple Frames)

Content-Type	multipart/x-mixed-replace;boundary=boundary
Message body	--boundary Content-Type: image/jpeg Content-Length: <1st JPEG data size> <1st JPEG data> --boundary Content-Type: image/jpeg Content-Length: <2nd JPEG data size> <2nd JPEG data> ... --boundary Content-Type: image/jpeg Content-Length: <last JPEG data size> <last JPEG data> --boundary-- [Notes] Up until VB-C300, the boundary string between frames was: --LivescopeImage In VB-C60 and VB-C500, however, it has been changed to: --boundary

Example of Parameters and Responses

GET /-wvhttp-01-/GetOneShot?image_size=320x240 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

{JPEG image data with a resolution of 320 x 240}

4.2.2 GetLiveImage

Function Overview

This function retrieves JPEG data. A serial number starting with 1 (Livescope-Frame-Number header field) is appended to the JPEG data.

Parameters

connection_id (mandatory)	The session identifier.
timeout	Timeout time specification (in seconds) [Notes] This parameter cannot be used with the VB-C60 and VB-C500.

Responses

Content-Type	image/jpeg
Extended header	Livescope-Frame-Number: <JPEG data serial number> [Supplementary Information] In the case of VB150, the VB-C50i series, and VB-C300, Livescope-Channel: <camera number> is also appended.
Message body	<JPEG data>
Notes	

Example of Parameters and Responses

GET /-wvhttp-01-/GetLiveImage?connection_id=910A-8CE687F5 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

{JPEG image data}

4.2.3 ChangeImageSize

Function Overview

This function switches to the JPEG stream specified with v|image_size. This is effective in cases where JPEG streams with multiple sizes can be used.

[Notes]

This command can only be used with the following models:

The VB-C50i series, VB-C60, VB-C500

This cannot be used with the following models:

VB100,VB101,VB-C10,VB-C10R,VB150,VB-C300

Parameters

connection_id (mandatory)	The session identifier.
v|image_size	Video size. Specify either “width” or “width x height”. If there is no match for a specified value, then the closest thing to the specified value (as long as the value is above the specified value, yet does not exceed the maximum value for the device) will be selected.
Notes	

Responses

Content-Type	text/plain
Message body	OK.

Example of Parameters and Responses

```
GET /-wvhttp-01-/ChangeImageSize?connection_id=910A-8CE687F5&image_size=160x120
⇒

HTTP/1.1 200 OK
...
OK.
```

4.3 Information Reference Commands

4.3.1 GetProtocolVersion

Function Overview

This function retrieves the WV-HTTP protocol version.

Parameters

None.

Responses

Content-Type	text/plain
Message body	<major version>.<minor version> [Supplementary Information] The protocol versions for each model are as shown below (with the latest firmware version as of December 2008). VB-C500 - 02.00 VB-C60 - 02.00 VB-C300 - 01.08 VB-C50i series - 01.07 VB150 – 01.06 VB100, 101, VB-C10, C10R – 01.05
Notes	

Example of Parameters and Responses

GET /-wvhttp-01-/GetProtocolVersion HTTP/1.1

⇒

HTTP/1.1 200 OK

...

02.00

4.3.2 GetCameraServerInfo

Function Overview

This function retrieves camera server information.

Parameters

None.

Responses

Content-Type	text/plain
Message body	date_and_time=<current time (local time)> vc_host=<IP address of the video transmission server > vc_port=<port number of the video transmission server > cc_host=<IP address of the camera control server> cc_port=<port number of the camera control server> modelNumber=<model name of the camera server > firmVersion=<firmware version> number_of_available_cameras=<number of usable cameras> video_sources=<number of usable cameras> number_of_image_sizes=<number of JPEG streams> image_size=<image width (number of pixels)>x<image height (number of pixels)> image_quality=<image quality> ...

Notes	The following items are omitted, depending on the model: VB-C500 – vc_port,cc_port VB-C60 – vc_port, cc_port VB-C300 – vc_host, vc_port, cc_host, cc_port, number_of_image_sizes, image_size, image_quality VB150 - number_of_image_sizes, image_size, image_quality VB100, 101, VB-C10, C10R – modelNumber, firmVersion, number_of_image_sizes, image_size, image_quality The values of modelNumber are as follows for each model: VB-C500D: “VB-C500D” VB-C60: “VB-C60” VB-C300 (NTSC version): “VB-C300NA” VB-C300 (PAL version): “VB-C300PA” VB-C50i: “VB-C50i” VB-C50iR: “VB-C50iR” VB-C50Fi: “VB-C50Fi” VB-C50FSi: “VB-C50FSi” VB150 “VB150” The values of firmVersion are as follows for each model (these are the latest versions, current as of December 2008): VB-C500: 1.0.0 VB-C60: 1.0.0 VB-C300: 1.1.0 VB-C50i: 1.2.77 VB-C50iR: 1.2.77 VB-C50Fi: 1.0.77 VB-C50FSi: 1.0.77 VB150: 1.1.42 Each model’s value for ‘image_quality’ is as follows. VB-C500, VB-C60, VB-C300: integer 0 ~ 4 (4 represents the highest quality.) Others: integer 1 ~ 100 (100 represents the highest quality.)

Example of Parameters and Responses

GET /-wvhttp-01-/GetCameraServerInfo HTTP/1.1

⇒

HTTP/1.1 200 OK

...

date_and_time=Fri, 09 Jan 2009 15:19:18 +0900

vc_host=172.23.21.109

cc_host=172.23.21.109

modelNumber=VB-C500D

firmVersion=1.0.0

number_of_available_cameras=1

video_sources=1

number_of_image_sizes=3

image_size=160x120

image_quality=2

image_size=320x240

image_quality=2

image_size=640x480

image_quality=2

4.3.3 GetSystemInfo

Function Overview

This function retrieves system information.

Parameters

<table>
<tr><td>item</td><td>Specifies the information to be retrieved. Specify the following values (multiple specifications are possible).
This is processed as “all specified” when omitted.

<table><tr><td>version</td><td>Version</td></tr><tr><td>settings</td><td>applet_downloading to connection_time_limit</td></tr><tr><td>current_status</td><td>number_of_active_clients to wvhttp_server_status</td></tr></table></td></tr>
</table>

Responses

<table>
<tr><td>Content-Type</td><td>text/plain</td></tr>
<tr><td>Message body</td><td>version=<model name> Ver. <version>
applet_downloading=<whether or not there is java applet>
download_root=/
applet_location==-wvdoc-01-/
client_session_mode=local_server_only
connection_time_limit=<maximum connection time (in seconds)>
number_of_active_clients=<number of clients (0 or higher)>
number_of_active_camera_servers=1
total_number_of_clients=<total number of clients (0 or higher)>
camera_control_schedule=<number of camera control clients>/<camera control priority level>
start_time=<start-up time (local time)>
wvhttp_server_status=All services are available</td></tr>
</table>

Notes	The following items are omitted, depending on the model: VB-C500 – download_root,applet_location,camera_control_schedule VB-C60 – download_root,applet_location,camera_control_schedule VB-C300 – applet_downloading, download_root, applet_location, client_session_mode

Example of Parameters and Responses

GET /-wvhttp-01-/GetSystemInfo HTTP/1.1

⇒

HTTP/1.1 200 OK

…

version=VB-C500D Ver. 1.0.0

applet_downloading=OFF

client_session_mode=local_server_only

connection_time_limit=0

number_of_active_clients=1

number_of_active_camera_servers=1

total_number_of_clients=3

start_time=Tue, 13 Jan 2009 08:40:16 +0900

wvhttp_server_status=All services are available

4.3.4 GetVideoInfo

Function Overview

This function retrieves video stream information.

Parameters

connection_id	The session identifier.
item	Specifies the information to be retrieved. Specify the item name (multiple specifications are possible). This is processed as “all specified” when omitted.

Responses

Content-Type	text/plain
Message body	image_width=<image width (number of pixels)> image_height=<image height (number of pixels)> compression_type=JPEG image_quality=<image quality> video_input=<multiplex setting> frame_rate=<maximum frame rate>
Notes	When connection_id is specified, the stream information for the corresponding session is returned. When it is omitted, the default stream information is returned. video_input is always 0, if the model is anything but VB150. The range of values for image_quality differ depending on the model: VB-C500, VB-C60 and VB-C300: 0 to 4 (corresponding to values 1 to 5 in the settings page) The VB-C50i series and earlier models: 1 to 100

Example of Parameters and Responses

GET /-wvhttp-01-/GetVideoInfo HTTP/1.1

⇒

HTTP/1.1 200 OK

...

image_width=320

image_height=240

compression_type=JPEG

image_quality=2

video_input=0

frame_rate=30

4.3.5 GetCameraInfo

Function Overview

This function retrieves camera information.

Parameters

camera_id	The camera number (1 or higher). If 0 is specified, or if this is omitted, then the selected camera number will be used.
item	Specifies the information to be retrieved. Specify the item name (multiple specifications are possible). When all is specified or this is omitted, this is processed as "all specified". [Note] When VB-C60 item=all is specified, the reply does not include values of focus_value and rb_gain. When VB-C500 item=all is specified, the reply does not include values of rb_gain. Expressly specify values of focus_value or rb_gain or omit item parameter specification itself, if focus_value or rb_gain are necessary.

Responses

Content-Type	text/plain
Message body	camera_type=<camera type> camera_id=<camera number> camera_status=<state of operation> pan_current_value=<pan position> tilt_current_value=<tilt position> zoom_current_value=<zoom position> back_light=<backlight correction on or off> pan_left_end=<camera platform left side movement limit> pan_right_end=<camera platform right side movement limit> tilt_up_end=<camera platform top side movement limit> tilt_down_end=<camera platform bottom side movement limit> zoom_tele_end=<zoom telephoto side movement limit> zoom_wide_end=<zoom wide side movement limit> pan_left_limit=<camera platform left side control limit> pan_right_limit=<camera platform right side control limit> tilt_up_limit=<camera platform top side control limit> tilt_down_limit=<camera platform bottom side control limit> zoom_tele_limit=<zoom telephoto side control limit> zoom_wide_limit=<zoom wide side control limit> view_left_boundary=<visible range left boundary> view_right_boundary=<visible range right boundary> view_up_boundary=<visible range top boundary> view_down_boundary=<visible range bottom boundary> view_tele_boundary=<visible range telephoto boundary> view_wide_boundary=<visible range wide angle boundary> focus_mode=<focus mode> focus_value=<focus value> white_balance =<white balance mode> rb_gain =<RB gain value>

Notes	focus_value: can be retrieved only for VB-C300 and VB-C60 white_balance, rb_gain: can be retrieved only for VB-C300, VB-C60 and VB-C500 Note, however, that focus_value can only be retrieved when focus_mode=manual. rb_gain can only be retrieved when white_balance=manual. In any case other than those described above, these items will be ignored if specified as “item”. [Note] For VB-C60, the value of view_left_boundary to view_wide_boundary may be different from the value set using View restriction Tool etc. This is because correction of value is applied depending on the camera movement characteristics. For VB-C60, if changing the is setting in the setting page with the digital zoom on, the value of zoom telephoto side movement limit (zoom_tele_end) changes as follows. off -- zoom_tele_end=38 on1-- zoom_tele_end=46 on2—- zoom_tele_end=76 The value of zoom_current_value, zoom_tele_limit, view_tele_boundary may also change depending on the view restriction setting or the current zoom position.

Example of Parameters and Responses

GET /-wvhttp-01-/GetCameraInfo HTTP/1.1

⇒

HTTP/1.1 200 OK

…

camera_type=Canon VB-C500D

camera_id=1

camera_status=enabled

pan_current_value=0

tilt_current_value=0

zoom_current_value=152

back_light=OFF

pan_left_end=0
pan_right_end=0
tilt_up_end=0
tilt_down_end=0
zoom_tele_end=38
zoom_wide_end=152
pan_left_limit=0
pan_right_limit=0
tilt_up_limit=0
tilt_down_limit=0
zoom_tele_limit=38
zoom_wide_limit=152
view_left_boundary=0
view_right_boundary=0
view_up_boundary=0
view_down_boundary=0
view_tele_boundary=38
view_wide_boundary=152
focus_mode=none
white_balance=auto

4.3.6 GetCameraInfoEx

Function Overview

This function retrieves extended camera information.

Parameters

camera_id	The camera number (1 or higher). If 0 is specified, or if this is omitted, then the selected camera number will be used.
item	Specify item names, which you want to retrieve. If omitted or specifying 'item=all', it will be inpremented as all items are specified. List the items using 'item=…' for retrieving information of multiple items.
Notes	The specification with "item" is not supported (will be ignored) by VB-C60 and VB-C500.

Responses

Content-Type	text/plain
Message body	camera_id=<camera number> far_fixed_focus=<whether or not infinite focus is fixed> dome_focus=<whether or not dome is supported> one_shot_focus=<whether or not there is one-shot focus> shutter_ex=<whether or not there is a shutter speed specification> aperture_ex=<whether or not there is an aperture specification> gain_ex=<whether or not there is a gain specification> manual_ex=<whether or not there is manual exposure> night_mode=<whether or not there is night mode> digital_zoom=<whether or not there is digital zoom (0: no | 1: yes)> ir0=<whether or not there is internal IR lighting> iris_min=<minimum aperture value> iris_max=<maximum aperture value> iris_res=<aperture resolution> gain_min=<minimum gain value> gain_max=<maximum gain value> gain_res=<gain resolution> digital_zoom_boundary=<digital zoom boundary value> shutter_speed_1=<shutter speed 1> ... Whether or not a function exists: available: yes, unavailable: no.

Notes	This can only be used by VB150, the VB-C50i series, VB-C300, VB-C60 and VB-C500. The value of dome_focus is unavailable for VB-C60 and VB-C500. The following items cannot be retrieved for VB-C300: shutter_ex, aperture_ex, and gain_ex, ir0 The following items cannot be retrieved for VB150 or VB-C50i: aperture_ex, gain_ex, digital_zoom, and digital_zoom_boundary The configuration of shutter_speed also differs depending on the model (this includes the differences between NTSC and PAL as well).

Example of Parameters and Responses

GET /-wvhttp-01-/GetCameraInfoEx HTTP/1.1

⇒

HTTP/1.1 200 OK

…

camera_id=1

far_fixed_focus=unavailable

dome_focus=unavailable

one_shot_focus=unavailable

shutter_ex=available

aperture_ex=available

gain_ex=available

manual_ex=available

night_mode=available

digital_zoom=1

ir0=unavailable

iris_min=0

iris_max=0

iris_res=1

gain_min=0

gain_max=23

gain_res=1

digital_zoom_boundary=152

shutter_speed_1=1

shutter_speed_2=2

shutter_speed_3=4

shutter_speed_4=8

shutter_speed_5=15

shutter_speed_6=30

shutter_speed_7=60

shutter_speed_8=100

shutter_speed_9=120

shutter_speed_10=250

shutter_speed_11=500

shutter_speed_12=1000

shutter_speed_13=2000

shutter_speed_14=4000

shutter_speed_15=8000

4.3.7 GetCameraList

Function Overview

This function retrieves the camera list (the number of cameras and camera names).

Parameters

language	The language specification (english, japanese, and so on). VB-C60 and VB-C500 specify the abbreviations en and ja. When this is omitted, or an unknown language is specified, this is treated as no language specification and the ASCII name is returned.
character_set	The character set. VB-C60 and VB-C500 do not support this (ignore it). Although either ASCII or UNICODE can be specified for other models, unless the language is English, this will be treated as UNICODE. If this is omitted, then it will be treated as ASCII if the language is English, or as UNICODE otherwise.

Responses (With No Language Specification)

Content-Type	text/plain
Message body	language=english character_set=ascii default_camera=<number of the main camera (1 or higher)> number_of_cameras=<number of usable cameras (1 or higher)> camera_129=<name of camera 1 (ASCII)> ...

Responses (With a Language Specification)

Content-Type	text/plain; charset=utf-8
Message body	language=japanese character_set=utf-8 default_camera=<number of the main camera (1 or higher)> number_of_cameras=<number of usable cameras (1 or higher)> camera_129=<name of camera 1> ...
Notes	When language=Japanese is specified, the character set will differ depending on the model: VB-C60, VB-C500 – UTF-8 Any other model – UNICODE(UTF-16)

Example of Parameters and Responses

GET /-wvhttp-01-/GetCameraList?language=japanese HTTP/1.1

⇒

HTTP/1.1 200 OK

…

language=english

character_set=ascii

default_camera=1

number_of_cameras=1

camera_129=Camera

4.3.8 GetPresetList

Function Overview

This function retrieves the preset list (the number of presets, preset names, and the, camera control parameter).

Parameters

language	The language specification (english, japanese, and so on). VB-C60 and VB-C500 specify the abbreviations en and ja. When this is omitted, or an unknown language is specified, this is treated as no language specification and the ASCII name is returned.
character_set	The character set. VB-C60 and VB-C500 do not support this (ignore it). Although either ASCII or UNICODE can be specified for other models, unless the language is English, this will be treated as UNICODE. If this is omitted, then it will be treated as ASCII if the language is English, or as UNICODE otherwise.

Responses (With No Language Specification)

Content-Type	text/plain
Message body	language=english character_set=ascii number_of_camera_positions=<number of usable presets> position_1=<name of preset 1 (ASCII)> <camera control parameter for preset 1> ...

<table>
<tr><td>Notes</td><td>The preset's camera control parameter is comprised of the following items (the configuration differs depending on the model and settings):

<table><tr><td>camera_id</td><td>Camera number (1 or higher)</td></tr><tr><td>pan</td><td>Pan position (in 0.01 degree units)</td></tr><tr><td>tilt</td><td>Tilt position (in 0.01 degree units)</td></tr><tr><td>zoom</td><td>Zoom position (in 0.01 degree units)</td></tr><tr><td>back_light</td><td>Backlight correction (ON|OFF)</td></tr><tr><td>focus_mode</td><td>Focus mode (auto|manual|...)</td></tr><tr><td>focus_value</td><td>Focus position
(when focus_mode=manual)</td></tr></table>focus_mode and focus_value can only be retrieved from VB-C300 and VB-C60.

[Note]
VB-C60 has a capability of assigning a sequence number for preset. On the other hand, VB-C300 and older models are not capable of obtaining preset information using GetPresetList, if [Not shown in Viewers] is set to ON in Preset Setting Tool. Consequently, sometimes the preset numbers are not a sequence number, as shown below.
preset_1=…
preset_3=…
Although, VB-C60 preset information also cannot be obtained, if the [Not shown in Viewers] check box is ticked, the preset numbers is always a sequence number, as shown below.
preset_1=…
preset_2=…
Because of this, please understand that, the preset numbers of this command may not be the same as the preset numbers, indicated in Preset Setting Tool, or index numbers for ea01 ~ ea10.

[Note]
For VB-C500, number_of_camera_positions is fixed to 0.</td></tr>
</table>

Responses (With a Language Specification)

Content-Type	text/plain; charset=utf-8
Message body	language=japanese character_set=utf-8 number_of_camera_positions=<number of usable presets> position_1=<name of preset 1 > <camera control parameter for preset 1> ...
Notes	When language=Japanese, the character set will differ depending on the model: VB-C60, VB-C500 – UTF-8 Any other model – UNICODE(UTF-16) [Note] For VB-C500, number_of_camera_positions is fixed to 0.

Example of Parameters and Responses

GET /-wvhttp-01-/GetPresetList?language=japanese HTTP/1.1

⇒

HTTP/1.1 200 OK

…

language=japanese

character_set=utf-8

number_of_camera_positions=0

4.3.9 GetPanoramaList

Function Overview

This function retrieves the panorama image list.

Parameters

<table>
<tr><td>item</td><td>Specifies the information to be retrieved. The following values are specified (multiple specifications are possible):
<table><tr><td>camera_id</td><td>camera_id</td></tr><tr><td>panorama_info</td><td>pano_left to pano_height</td></tr><tr><td>image_info</td><td>image_width to image_size</td></tr><tr><td>date_and_time</td><td>year to time_zone</td></tr><tr><td>date_and_time_string</td><td>date_and_time</td></tr><tr><td>all</td><td>All (default)</td></tr></table></td></tr>
<tr><td>Notes</td><td>[Note] VB-C500 does not have this function.</td></tr>
</table>

Responses

Content-Type	text/plain
Message body	number_of_panorama_images=<number of panorama images> panorama_id=<panorama number (1 or higher)> camera_id=<camera number (1 or higher)> pano_left=<left boundary of the field of view (in 1/100 degree units)> pano_top=<top boundary of the field of view (in 1/100 degree units)> pano_width=<width of the field of view (in 1/100 degree units)> pano_height=<height of the field of view (in 1/100 degree units)> image_width=<image width (number of pixels)> image_height=<image height (number of pixels)> image_quality=<image quality (Q value)> image_size=<image size (in bytes)> date_and_time=<time stamp (local time)> year=<time stamp year (2000 or higher)> month=<time stamp month (1 to 12)> day_of_week=<time stamp day of the week (0 to 6)> day=<time stamp day of the month (1 to 31)> hour=<time stamp hour (0 to 23)> minute=<time stamp minute (0 to 59)> second=<time stamp second (0 to 59)> time_zone=<time zone (minutes)>
Notes	If a panorama image exists, then the panorama image is subject to caching. The response header does not include Cache-Control, etc., but includes Last-Modified instead. The user agent can access conditionally with If-Modified-Since, and if there is no update (modification), then a no update response (304 Not Modified) will be returned. [Note] VB-C500 returns number_of_panorama_images=0.

Example of Parameters and Responses

GET /-wvhttp-01-/GetPanoramaList HTTP/1.1

⇒

HTTP/1.1 200 OK

...

number_of_panorama_images=1

panorama_id=1

camera_id=1

pano_left=-19790

pano_top=4592

pano_width=39580

pano_height=15684

image_width=480

image_height=190

image_quality=50

image_size=10767

date_and_time=Mon, 31 Mar 2008 06:44:56 +0900

year=2008

month=3

day_of_week=1

day=31

hour=6

minute=44

second=56

time_zone=-540

4.3.10 GetPanoramaInfo

Function Overview

This function retrieves panorama image information.

Parameters

panorama_id	The panorama number (1 or higher). If 0 is specified, then this is interpreted as camera_id=0.
camera_id	The camera number (1 or higher). If 0 is specified, or if this is omitted, then the selected camera number is used. If the panorama number is specified at the same time, then this is ignored.
item	Specifies the information to be retrieved. The following values are specified (multiple specifications are possible): camera_id — camera_id panorama_info — pano_left to pano_height image_info — image_width to image_size date_and_time — year to time_zone date_and_time_string — date_and_time all — All (default)
Notes	[Note] VB-C500 does not have this function.

Responses

Content-Type	text/plain
Message body	panorama_id=<panorama number (1 or higher)> camera_id=<camera number (1 or higher)> pano_left=<left boundary of the field of view (in 1/100 degree units)> pano_top=<top boundary of the field of view (in 1/100 degree units)> pano_width=<width of the field of view (in 1/100 degree units)> pano_height=<height of the field of view (in 1/100 degree units)> image_width=<image width (number of pixels)> image_height=<image height (number of pixels)> image_quality=<image quality (Q value)> image_size=<image size (in bytes)> date_and_time=<time stamp (local time)> year=<time stamp year (2000 or higher)> month=<time stamp month (1 to 12)> day_of_week=<time stamp day of the week (0 to 6)> day=<time stamp day of the month (1 to 31)> hour=<time stamp hour (0 to 23)> minute=<time stamp minute (0 to 59)> second=<time stamp second (0 to 59)> time_zone=<time zone (minutes)>
Notes	If a panorama image exists, then the panorama image is subject to caching. The response header does not include Cache-Control, etc., but includes Last-Modified instead. The user agent can access conditionally with If-Modified-Since, and if there is no update (modification), then a no update response (304 Not Modified) will be returned. If no panorama image exists, then a 403 error will occur, regardless of whether or not there is a parameter specification. [Note] As VB-C500 does not have this function, HTTP 200, Livescope-Status 403 are returned, the same as when no panorama image exists.

Example of Parameters and Responses

GET /-wvhttp-01-/GetPanoramaInfo HTTP/1.1

⇒

HTTP/1.1 200 OK

...

panorama_id=1

camera_id=1

pano_left=-19790

pano_top=4592

pano_width=39580

pano_height=15684

image_width=480

image_height=190

image_quality=50

image_size=10767

date_and_time=Mon, 31 Mar 2008 06:44:56 +0900

year=2008

month=3

day_of_week=1

day=31

hour=6

minute=44

second=56

time_zone=-540

4.3.11 GetPanoramaImage

Function Overview

This function retrieves panorama image data. If there is no session specification, then this is limited to administrators.

Parameters

connection_id	The session identifier.
panorama_id	Panorama number (1 or higher). If 0 is specified, then this is interpreted as camera_id=0.
camera_id	Camera number (1 or higher). If 0 is specified, or if this is omitted, then the selected camera number is used. This is ignored if the panorama number is specified at the same time.
Notes	[Note] VB-C500 does not have this function.

Responses

Content-Type	image/jpeg
Message body	<panorama image data>
Notes	If a panorama image exists, then the panorama image is subject to caching. The response header does not include Cache-Control, etc., but includes Last-Modified instead. The user agent can access conditionally with If-Modified-Since, and if there is no update (modification), then a no update response (304 Not Modified) will be returned. If no panorama image exists, then an HTTP error will occur (404 Not Found). [Note] VB-C500 returns HTTP error (404 Not Found).

Example of Parameters and Responses

GET /-wvhttp-01-/GetPanoramaImage HTTP/1.1

⇒

HTTP/1.1 200 OK

...

{Panorama image data}

4.4 Event Retrieval Commands

4.4.1 GetNotice

Function Overview

This function waits for an event to occur, and then retrieves this event. When an event occurs, the event number is notified with the Livescope-Notice header field, and detailed event information is notified with the message body. If no event to be notified occurs within the prescribed time, then a 404 Operation Timeout error will occur. The timeout parameter can be used to specify the timeout time.

Parameters

connection_id (mandatory)	The session identifier.
notice	Event type. The following values may be specified. When specifying multiple event types, either list notice parameters, or list multiple values within a notice parameter value by delimiting them with ‘,’.

camera_server_event	11, 14, 21, 22, 23
camera_control	31, 32, 33, 34
camera_operation	41, 42, 43, 44
external_io_config	51
external_io_status	52
all	All (default)

timeout	This is the time limit for a response (in seconds). The upper and lower limit values are dependent on implementation.
Notes	option and seq|request_id were eliminated (are ignored). It is not possible to simultaneously execute multiple event retrieval commands in the same session (this will cause a 408 error). When using the notice parameter, it is recommended to specify the same item throughout the session. Even if the item is changed during a session, this will not result in an error, but a mismatch may result in the order of updating and the order of retrieval.

Responses (Event 11: Starting the Video Transmission Function)

Content-Type	text/plain
Extended header	Livescope-Notice: 11
Message body	video_capture_server connection_established
Factors and timing	When the session starts (once). This does not occur in sessions that do not have video transmission functions (4.1.1 OpenCameraServer etc),

Responses (Event 14: Starting the Camera Control Function)

Content-Type	text/plain
Extended header	Livescope-Notice: 14
Message body	camera_control_server connection_established
Factors and timing	When the session starts (once).

Responses (Event 21: Turning the Camera Power On)

Content-Type	text/plain
Extended header	Livescope-Notice: 21
Message body	camera_power_on
Factors and timing	When the camera part's power switches from off to on. This does not occur in integrated camera models where the camera part does not have a power off function (such as the VB-C50i, VB-C300, and VB-C60).

Responses (Event 22: Turning the Camera Power Off)

Content-Type	text/plain
Extended header	Livescope-Notice: 23
Message body	camera_power_off
Factors and timing	When the camera part's power switches from on to off. This does not occur in integrated camera models where the camera part does not have a power off function (such as the VB-C50i, VB-C300, and VB-C60).

Responses (Event 23: Ending the Session)

Content-Type	text/plain
Extended header	Livescope-Notice: 23
Message body	client_connection_closed
Factors and timing	When the session ends (once).

Responses (Event 31: Securing the Camera Control Right)

Content-Type	text/plain
Extended header	Livescope-Notice: 31
Message body	enabled_camera_control time_limit=<control privilege allocation time (in milliseconds)>
Factors and timing	When camera control privileges are secured. [Notes] The time_limit line does not exist for the VB-C300.

Responses (Event 32: Forfeiting the Camera Control Right)

Content-Type	text/plain
Extended header	Livescope-Notice: 32
Message body	disabled_camera_control
Factors and timing	When camera control privileges are forfeited, or the state of waiting for the control privilege is forcefully cancelled.

Responses (Event 33: Waiting to Secure the Camera Control Right)

Content-Type	text/plain
Extended header	Livescope-Notice: 33
Message body	waiting_camera_control wait_time=<control privilege allocation waiting time (in milliseconds)>
Factors and timing	When camera control privileges are waited for, or when the waiting time changes. This does not occur for the VB-C300, which does not have a camera control privilege waiting function.

Responses (Event 34: Refusing the Camera Control Right Request)

Content-Type	text/plain
Extended header	Livescope-Notice: 34
Message body	failed_to_get_camera_control
Factors and timing	When the camera control privileges request is refused.

Responses (Event 41: Camera Control)

Content-Type	text/plain
Extended header	Livescope-Notice: 41
Message body	camera_operated pan=<pan position> tilt=<tilt position> zoom=<zoom position> back_light=<backlight correction on or off> focus_mode=<focus mode> focus_value=<focus value>
Factors and timing	The client that used OperateCamera to control pan, tilt, or zoom and backlight correction.
Notes	Only VB-C300, VB-C60 and VB-C500 notify focus_mode. VB-C500 returns focus_mode=none. focus_value is returned only when focus_mode=manual. Only VB-C300 and VB-C60 notify focus_value.

Responses (Event 42: Camera Control)

Content-Type	text/plain
Extended header	Livescope-Notice: 42
Message body	camera_operated_by_another_client pan=<pan position> tilt=<tilt position> zoom=<zoom position> back_light=<backlight correction on or off> focus_mode=<focus mode> focus_value=<focus value>
Factors and timing	When the camera is controlled by another client, etc., when a control parameter is modified on the camera side, when the state of waiting for the camera control request is cancelled due to control privilege forfeiture, etc. [Note] When the camera is not controlled at all because the camera control request was cancelled for some reasons, event 42 is notified for previous models. But, for VB-C60 and VB-C500, no event is notified. (an event is notified for VB-C60 and VB-C500 when the camera is controlled somehow, even if it is not by camera control request.) This mainly occurs when the restriction of viewable range is applied. So, it is recommended to retrieve the information of viewable range using event 43 or GetCameraInfo command, then specify the camera control parameter not to exceed the range, before setting the restriction of viewable range to the camera.
Notes	Only VB-C300, VB-C60 and VB-C500 notify focus_mode. VB-C500 returns focus_mode=none. focus_value is returned only when focus_mode=manual. Only VB-C300 and VB-C60 notify focus_value.

Responses (Event 43: Starting the Camera Switch)

Content-Type	text/plain
Extended header	Livescope-Notice: 43
Message body	camera_selected Camera information (the same items as for GetCameraInfo)
Factors and timing	When the camera switch starts. [Note] Even if there is no camera switching function, such as VB-C300 and VB-C60, this can still occur due to a state change caused by modifying view restriction and other settings.

Responses (Event 44: Completing the Camera Switch)

Content-Type	text/plain
Extended header	Livescope-Notice: 44
Message body	camera_changed camera_id=<camera number after the switch>
Factors and timing	When the camera switch completes. [Note]This does not occur with models, such as VB-C300 and VB-C60, which do not have camera switching function.

Responses (Event 51: Changing the External Input/Output Settings)

Content-Type	text/plain
Extended header	Livescope-Notice: 51
Message body	The difference between external input/output setting information (the same items as for ExternalIOConfig)
Factors and timing	When the external input/output settings change. This does not occur if there is no corresponding setting function. [Note] To receive this event, the ExternalIOConfig command must be used to activate notification.

Responses (Event 52: Change in the External Input/Output State)

Content-Type	text/plain
Extended header	Livescope-Notice: 52
Message body	The difference between external input/output setting information (the same items as for ExternalIOConfig)
Factors and timing	When the external input/output state changes, and when a motion detection event occurs.. This does not occur if there is no external input/output terminal or motion detection function. [Note] To receive this event, the ExternalIOConfig command must be used to activate notification.

4.5 Camera Control Related Commands

4.5.1 GetPTZSpeedInfo

Function Overview

This function retrieves the pan, tilt, and zoom movement speed and range. The position specification speed is used in the position specification of OperateCamera, etc., and the operation specification speed is used in the operation specification of OperateCameraEx. For VB-C500, it retrieves zoom movement speed and range only because VB-C500 does not have pan and tilt control.

Parameters

connection_id (mandatory)	The session identifier.
camera_id	The camera number (1 or higher). If 0 is specified, or if this is omitted, then the selected camera number is used.

Responses

Content-Type	text/plain
Message body	camera_id=<camera number> point_p=<position specification's pan speed> point_p_min=<position specification's minimum pan speed> point_p_max=<position specification's maximum pan speed> direction_p=<operation specification's pan speed> direction_p_min=<operation specification's minimum pan speed> direction_p_max=<operation specification's maximum pan speed> point_t=<position specification's tilt speed> point_t_min=<position specification's minimum tilt speed> point_t_max=<position specification's maximum tilt speed> direction_t=<operation specification's tilt speed> direction_t_min=<operation specification's minimum tilt speed> direction_t_max=<operation specification's maximum tilt speed> point_z=<position specification's zoom speed> point_z_min=<position specification's minimum zoom speed> point_z_max=<position specification's maximum zoom speed> direction_z=<operation specification's zoom speed> direction_z_min=<operation specification's minimum zoom speed> direction_z_max=<operation specification's maximum zoom speed> allow_diagonal_move=<0|1>

Notes	The pan speed and tilt speed are calculated in 0.01 degree/second units, and the zoom speed is calculated in step values that depend on the device. allow_diagonal_move is set to 1 to indicate that both pan and tilt can be operated simultaneously, or 0 to indicate that simultaneous operation is not possible. [Note] VB-C500 returns the following message body. camera_id=<camera number> point_z=< position specification's zoom speed> point_z_min=<position specification's minimum zoom speed> point_z_max=<position specification's zoom speed> direction_z=<operation specification's zoom speed> direction_z_min=<operation specification's minimum zoom speed > direction_z_max=<operation specification's maximum zoom speed > allow_diagonal_move=<0|1>

Example of Parameters and Responses

GET /-wvhttp-01-/GetPTZSpeedInfo?connection_id=9BEA-A45A20C5 HTTP/1.1

⇒

HTTP/1.1 200 OK

…

camera_id=1

point_z=7

point_z_min=0

point_z_max=7

direction_z=7

direction_z_min=0

direction_z_max=7

allow_diagonal_move=1

4.5.2 SetPTZSpeed

Function Overview

This function specifies the movement speeds of the selected camera's pan, tilt, and zoom. The movement speeds are values specific to the session, and do not affect the operations of other sessions (or of sessionless commands). For VB-C500, it specifies the movement speed of the selected camera's zoom only, because VB-C500 does not have pan and tilt control.

Parameters

<table>
<tr><td>connection_id (mandatory)</td><td>The session identifier.</td></tr>
<tr><td>mode</td><td>Control mode. One of the following may be specified:
<table><tr><td>point</td><td>Position specification speed</td></tr><tr><td>direction</td><td>Operation specification speed</td></tr></table>
When this is omitted, it is processed as point.</td></tr>
<tr><td>p|pan</td><td>Pan speed. 0.01 degree/second units.

[Note]
The speed can be specified in 1degree/second units using 'p=' in VB-C300 and older models, however in VB-C60, values of 'p=' are also processed as values in 0.01 degree/second units.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>t|tilt</td><td>Tilt speed. 0.01 degree/second units.

[Note]
The speed can be specified in 1degree/second units using 't=' in VB-C300 and older models, however in VB-C60, values for 't=' are also processed as values in 0.01 degree/second units.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>z|zoom</td><td>Zoom speed. Step values depend on the specific device.</td></tr>
<tr><td>Notes</td><td>The range of values depends on the model.

[Note]
Some speed setting values might temporarily make camera's mechanical sound bigger.</td></tr>
</table>

Response (When Either p, t, or z Is Specified)

Content-Type	text/plain
Message body	<mode>_<specified p|t|z>=<actually set speed>

Responses (When Neither p, t, Nor z Is Specified)

Content-Type	text/plain
Message body	<mode>_p=<current pan speed> <mode>_t=<current tilt speed> <mode>_z=<current zoom speed>

Example of Parameters and Responses

GET /-wvhttp-01-/SetPTZSpeed?connection_id=9BEA-D699948A&mode=point&z=1 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

point_z=1

4.5.3 SelectCamera

Function Overview

This function switches the camera.

Parameters

connection_id (mandatory)	The session identifier.
camera_id	The number of the camera to be switched to (1 or higher).

Responses

Content-Type	text/plain
Message body	OK.
Notes	When the camera is switched, Event 43 and Event 44 occur. VB-C10, VB-C300, VB-C60 and VB-C500 only have one camera, and so there is no need to use this command.

Example of Parameters and Responses

GET /-wvhttp-01-/SelectCamera?connection_id=9BEA-69849C52&camera_id=1 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

OK.

4.5.4 OperateCamera

Function Overview

This function switches and controls the camera (pan, tilt, zoom, focus, and backlight correction). For VB-C500, only camera cotnrol is available (zoom, backlight compensation) because VB-C500 does not have pan, tilt and focus.

Parameters

connection_id (mandatory)	The session identifier.
camera_id	The number of the camera to be switched to (1 or higher). When the camera is switched, the following camera control parameters will be applied to the camera after the switch.
p|pan, t|tilt	The pan and tilt positions, specified by either “position” or “position@speed”. Positive position values are to the right/facing up, and negative values are to the left/facing down. The position and speed units are as shown below (the actual position and precision depend on the device). Position / Speed p, t: 1 degree units / 1 degree/second pan, tilt: 0.01 degree units / 0.01 degree/second When a d is affixed to the start of the position, this indicates a differential specification starting from the current position. If there is no speed specification, then the SetPTZSpeed?mode=point specification value is used. [Note] It is unavailable with VB-C500.

<table>
<tr><td>z|zoom</td><td>The zoom position, specified by either “position” or “position@speed”. The meanings of values are shown below (the actual position and precision depend on the device). The step values for the speeds of both z and zoom depend on the specific device.

<table><tr><td></td><td>Position</td></tr><tr><td>z</td><td>Zoom magnification ratio</td></tr><tr><td>zoom</td><td>Horizontal angle of view in 0.01 degree units</td></tr></table>
When a d is affixed to the start of the zoom position value, this indicates a differential specification starting from the current position (this specification method cannot be used for z).
If there is no speed specification, then the SetPTZSpeed?mode=point specification value is used.
[Note]
The operation result notified using GetNotice may be a little different from the specified position, because the correction by specifying camera’s movement is applied when operating VB-C60 or VB-C500 by position specification.</td></tr>
<tr><td>focus_mode</td><td>Focus mode. This can be specified for VB-C300 and VB-C60.
One of the following may be specified:
auto Auto focus
manual Manual focus
far_fix Fixed infinite focus
one_shot One-shot AF
dome Auto (dome support)

When one_shot is specified, after the device is focused at the current position, the mode reverts to manual focus.
The dome specification can only be used for VB-C300.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>focus_value</td><td>Focus value (only during manual focus).
The value is device-dependent, and differs based on the zoom position.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>b|back_light</td><td>Backlight correction. Specify either ON or OFF.</td></tr>
</table>

Responses

Content-Type	text/plain
Message body	OK.

Example of Parameters and Responses

GET /-wvhttp-01-/OperateCamera?connection_id=9BEA-69849C52&pan=9000 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

OK.

4.5.5 OperateCameraEx

Function Overview

This function controls the camera (pan, tilt, zoom, focus, shutter speed, white balance, backlight correction, and AE lock). One operation can be specified at a time, and multiple operations should not be specified (if there is no operation specification, then a 406 error will result). For VB-C500, only camera control is available (zoom, shutter speed, white balance, backlight compensation, AE lock), because VB-C500 does not have pan, tilt and focus.

Parameters

<table>
<tr><td>connection_id (mandatory)</td><td>The session identifier.</td></tr>
<tr><td>p|pan_tilt</td><td>Camera platform operation specification.
<table>
<tr><th></th><th>Pan</th><th>Tilt</th></tr>
<tr><td>stop</td><td>Stop</td><td>Stop</td></tr>
<tr><td>up</td><td>Stop</td><td>Move up</td></tr>
<tr><td>down</td><td>Stop</td><td>Move down</td></tr>
<tr><td>left</td><td>Move left</td><td>Stop</td></tr>
<tr><td>right</td><td>Move right</td><td>Stop</td></tr>
<tr><td>up_left</td><td>Move left</td><td>Move up</td></tr>
<tr><td>up_right</td><td>Move right</td><td>Move up</td></tr>
<tr><td>down_left</td><td>Move left</td><td>Move down</td></tr>
<tr><td>down_right</td><td>Move right</td><td>Move down</td></tr>
</table>
The specification value of SetPTZSpeed?mode=direction is used as the speed.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>z|zoom</td><td>Zoom operation specification.
<table>
<tr><td>stop</td><td>Stop</td></tr>
<tr><td>tele</td><td>Move to the telephoto side</td></tr>
<tr><td>wide</td><td>Move to the wide angle side</td></tr>
</table>
The specification value of SetPTZSpeed?mode=direction is used as the speed.</td></tr>
<tr><td>f|focus</td><td>Focus operation specification (only during manual focus).
<table>
<tr><td>stop</td><td>Stop</td></tr>
<tr><td>near</td><td>Move to near distance side</td></tr>
<tr><td>Far</td><td>Move to far distance side</td></tr>
</table>
[Note]
It is unavailable with VB-C500.</td></tr>
</table>

<table>
<tr><td>m|mode</td><td>Focus mode
<table><tr><td>auto</td><td>Auto focus</td></tr><tr><td>manual</td><td>Manual focus</td></tr><tr><td>far_fix</td><td>Fixed infinite focus</td></tr><tr><td>one_shot</td><td>One-shot AF</td></tr><tr><td>dome</td><td>Auto (dome support)</td></tr></table>
one_shot can only be used for VB-C300 and VB-C60.
When one_shot is specified, after the device is focused at the current position, the mode reverts to manual focus.

The dome specification can be used for models other than VB-C60.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>s|shutter_speed</td><td>Shutter speed specification. Specify either auto or a numerical value (the shutter speed’s reciprocal number).
<table><tr><td>auto</td><td>Automatic exposure (full auto)</td></tr><tr><td>Numerical value</td><td>Automatic exposure (giving priority to shutter speed)</td></tr></table></td></tr>
<tr><td>w|white_balance</td><td>White balance specification.
<table><tr><td>auto</td><td>Auto</td></tr><tr><td>lock</td><td>Locked</td></tr><tr><td>manual</td><td>Manual</td></tr><tr><td>fluorescent_l</td><td>Fluorescent (White cool fluorescent)</td></tr><tr><td>fluorescent_h</td><td>Fluorescent H (Daylight fluorescent)</td></tr><tr><td>fluorescnet_w</td><td>Fluorescent Warm white</td></tr><tr><td>sodium</td><td>Sodium light</td></tr><tr><td>halogen</td><td>Halogen light</td></tr><tr><td>mercury</td><td>Mercury light</td></tr><tr><td>one_shot</td><td>One-shot white balance</td></tr></table>
All items can be specified for VB-C60 and VB-C500.
Items other than fluorescnet_w can be specified for VB-C300.
Only auto and lock can be specified for other models.
When one_shot is specified, after white balance is set for the current position, it returns to manual white balance mode.</td></tr>
<tr><td>r|rb_gain</td><td>RB gain. Specified in RRRR-BBBB format. This can be used for VB-C300, VB-C60 and VB-C500.
This is only valid in manual white balance mode. In other modes, a 403 error will result.</td></tr>
</table>

<table>
<tr><td>b|brightness</td><td>AE brightness specification. Specify a number between 0 (dark) and 1023 (bright).
0 to 288: backlight correction off, 289 to 1023: backlight correction on.
The correspondence with the new command ae.brightness is as follows:<table><tr><td>b≧288</td><td>ae.brightness＝(b－288)/72</td></tr><tr><td>b＜288</td><td>ae.brightness＝(b－288)/48</td></tr></table></td></tr>
<tr><td>e|exposure</td><td>AE lock.<table><tr><td>auto</td><td>Automatic exposure (full auto)</td></tr><tr><td>lock</td><td>Locked</td></tr></table></td></tr>
<tr><td>Notes</td><td>White balance lock and AE lock are the same as manual white balance mode and manual exposure mode, respectively.</td></tr>
</table>

Responses

Content-Type	text/plain
Message body	camera_id=<camera number> <specified parameter name>=<specified parameter value>
Notes	Pan, tilt, zoom and focus positions are notified using event 42 when they stop. The timing is depending on models, but normally an event is generated along with a stop command (stop). When sending a moving command (pan, zoom), it is recommended to send a stop command to renew the stop position at the last.

Example of Parameters and Responses

GET /-wvhttp-01-/OperateCameraEx?connection_id=9BEA-69849C52&zoom=tele HTTP/1.1

⇒

HTTP/1.1 200 OK

...

camera_id=1

z=tele

4.5.6 OperateCameraOnScreen

Function Overview

This function controls the camera (pan and tilt). For VB-C500, it always returns error messages to the OperateCameraOnScreen command, because VB-C500 does not have pan and tilt control.

Parameters

<table>
<tr><td>connection_id (mandatory)</td><td>The session identifier.</td></tr>
<tr><td>p|pan, t|tilt</td><td>The pan and tilt position. This is a relative position, with (0, 0) indicating the center of the screen, (-1, -1) indicating the lower left corner of the screen, and (1, 1) indicating the upper right corner of the screen. p and t are in 1 units, and pan and tilt are in 0.01 units (the final destination of movement and precision are both device-dependent).

<table>
<tr><td>Example</td><td>Operation</td></tr>
<tr><td>p=-1&t=-1</td><td>Move halfway across the screen to the lower left</td></tr>
<tr><td>pan=100&tilt=100</td><td>Move halfway across the screen to the upper right</td></tr>
</table>

The SetPTZSpeed?mode=point specification value is used for the speed.</td></tr>
</table>

Responses

<table>
<tr><td>Content-Type</td><td>text/plain</td></tr>
<tr><td>Message body</td><td>OK.</td></tr>
<tr><td>Notes</td><td>Event 42 is notified, including the control client.
[Note]
VB-C500 returns HTTP 200 OK, Livescope-Status 401 Unknown operator to requests, in which a connection identifier is specified.
To requests, in which a connection identifier is not specified, it returns HTTP 200 OK, Livescope-Status 406 Parameter Missing.</td></tr>
</table>

Example of Parameters and Responses

GET /-wvhttp-01-/OperateCameraOnScreen?connection_id=9BEA-69849C52&p=100&t=100 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

OK.

4.5.7 Exposure

Function Overview

This function controls exposure.

Parameters

connection_id (mandatory)	The session identifier.
camera_id	Camera number (1 or higher). If 0 is specified, or if this is omitted, then the selected camera number is used.
s|shutter	auto or the shutter speed's reciprocal number.
i|iris	auto or the aperture value.
g|gain	auto or the AGC gain.
auto_slow_shutter	off or the auto slow shutter speed's reciprocal number. This can only be specified for VB-C60 and VB-C500.
Notes	The range of values depends on the model (GetCameraInfoEx can be used to retrieve this). Although the combinations of values also depend on the model, full auto (all auto) and full manual (all fixed values) are generally usable. [Note] Both flickerless AE and Shutter speed priority AE, which are exposure modes unique to VB-C60 and VB-C500, cannot be specified using this command. Use new command control.cgi, for these functions.

Responses

Content-Type	text/plain
Message body	camera_id=<camera number> iris=<auto|aperture value> shutter=< reciprocal number of auto|shutter speed> gain=<auto|AGC gain value> [Note] VB-C500 does not return iris.

Example of Parameters and Responses

GET /-wvhttp-01-/Exposure?connection_id=9BEA-FCC53719&s=auto&i=auto&g=auto HTTP/1.1

⇒

HTTP/1.1 200 OK

...

camera_id=1

shutter=auto

gain=auto

4.5.8 NightMode

Function Overview

This function retrieves and controls the night mode state. Only privileged users (administrator and privileged users) can use this command. Also, only cameras that support night mode can use this.

Parameters

camera_id	Camera number (1 or higher). If 0 is specified, or if this is omitted, then the selected camera number is used.
night_mode	Night mode. Specify either ON or OFF. This is valid when the operating mode (the response's auto_dn) is manual (otherwise, this is ignored).

Responses

Content-Type	text/plain
Message body	camera_id=<camera number> night_mode=<state of night mode (ON|OFF)> auto_dn=<night mode's control mode (manual|auto1|...)>
Notes	auto_dn can only be retrieved for VB-C300 ,VB-C60 and VB-C500.

Example of Parameters and Responses

GET /-wvhttp-01-/NightMode?night_mode=ON HTTP/1.1

⇒

HTTP/1.1 200 OK

...

camera_id=1

night_mode=ON

auto_dn=manual

4.5.9 CameraPosition / CameraControl

Function Overview

This function switches and controls the camera. CameraPosition is a high-priority command that can always be used, as long as it is not during the shooting of a panorama (note: this command is limited to administrators). CameraControl is a low-priority command that can only be used when camera control privileges are not secured. This command is for sessionless use only.

[Note] Pan, tilt and focus control are not available for VB-C500.

Parameters

<table>
<tr><td>camera_id</td><td>The number of the camera to be switched to (1 or higher). When the camera is switched, the following camera control parameters will be applied to the camera after the switch.</td></tr>
<tr><td>p|pan, t|tilt</td><td>The pan and tilt positions, specified by either “position” or “position@speed”. Positive position values are to the right/facing up, and negative values are to the left/facing down. The position and speed units are as shown below (the actual position and precision depend on the device).

<table>
<tr><td></td><td>Position</td><td>Speed</td></tr>
<tr><td>p, t</td><td>1 degree units</td><td>1 degree/second</td></tr>
<tr><td>pan, tilt</td><td>0.01 degree units</td><td>0.01 degree/second</td></tr>
</table>

When a D or d is affixed to the start of the position, this indicates a differential specification starting from the current position.
If there is no speed specification, then the maximum speed will be used. (The speed specification cannot be used for VB100, 101, or VB-C10.)
[Note]
It is unavailable with VB-C500.</td></tr>
</table>

<table>
<tr><td>z|zoom</td><td>The zoom position, specified by either “position” or “position@speed”. The meanings of values are shown below (the actual position and precision depend on the device). The step values for the speeds of both z and zoom depend on the specific device.
<table><tr><td></td><td>Position</td></tr><tr><td>z</td><td>Zoom magnification ratio</td></tr><tr><td>zoom</td><td>Horizontal angle of view in 0.01 degree units</td></tr></table>
When a D or d is affixed to the start of the position value, this indicates a differential specification starting from the current position.
If there is no speed specification, then the maximum speed will be used. (The speed specification cannot be used for VB100, 101, or VB-C10.)</td></tr>
<tr><td>focus_mode</td><td>Focus mode. This can be specified for VB-C300 and VB-C60. One of the following may be specified:
<table><tr><td>auto</td><td>Auto focus</td></tr><tr><td>manual</td><td>Manual focus</td></tr><tr><td>far_fix</td><td>Fixed infinite focus</td></tr><tr><td>one_shot</td><td>One-shot AF</td></tr><tr><td>dome</td><td>Auto (dome support)</td></tr></table>
When one_shot is specified, the mode reverts to manual focus mode after focusing is performed at the current position.
The dome specification can only be used for VB-C300.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>focus_value</td><td>Focus value (only during manual focus).
The value is device-dependent, and differs based on the zoom position.
[Note]
It is unavailable with VB-C500.</td></tr>
<tr><td>b|back_light</td><td>Backlight correction. Specify either ON or OFF.</td></tr>
</table>

Responses

Content-Type	text/plain
Message body	camera_type=<camera type> camera_id=<camera number> camera_status=<state of operation> pan_current_value=<current pan value> tilt_current_value=<current tilt value> zoom_current_value=<current zoom value> back_light=<backlight correction on or off> focus_mode=<focus mode> focus_value=<focus value>
Notes	focus_mode can only be used for VB-C300, VB-C60 and VB-C500. focus_value can only be used for VB-C300 and VB-C60. focus_value is only for when focus_mode=manual. [Note] The current PTZ position can be retrieved if sending the CameraControl,CameraPosition command without specifying any parameter. However, there are following differences between VB-C60/VB-C500 and older models. [VB-C500] VB-C500 returns fixed values, such as pan_current_value=0, tilt_current_value=0, focus_mode=none. [VB-C60] The current PTZ position can be retrieved while the camera is not in motion. While the camera is in motion, the PTZ position at the time the camera received the command (=the current position in the movement) can be retrieved. (for example, if sending a command while the pan position is moving from 0 to 17000, value between them can be retrieved, such as 5000,10000 etc.) [older models] The current PTZ position can be retrieved while the camera is not in motion. While the camera is in motion, if the camera's destination is specified, the PTZ position of destination can be retrieved. If the camera's destination is not specified (such as in camera operation using OperateCameraEx etc), the PTZ position before camera moves can be retrieved. (for example, if sending a command while the pan is moving from 0 to 17000, 0 or 17000 can be retrieved.)

Example of Parameters and Responses

GET /-wvhttp-01-/CameraControl?pan=1000 HTTP/1.1

⇒

HTTP/1.1 200 OK

…

camera_type=Canon VB-C500D

camera_id=1

camera_status=enabled

pan_current_value=0

tilt_current_value=0

zoom_current_value=152

back_light=OFF

focus_mode=none

4.5.10 ExternalIOCaption

Function Overview

This function retrieves the external input/output name.

Parameters

language	The language specification (english, japanese, and so on). VB-C60 and VB-C500 specify the abbreviations en and ja. When this is omitted, or an unknown language is specified, this is treated as no language specification and the ASCII name is returned.
character_set	The character set. VB-C60 and VB-C500 do not support this (ignore it). Although either ASCII or UNICODE can be specified for other models, unless the language is English, this will be treated as UNICODE. If this is omitted, then it will be treated as ASCII if the language is English, or as UNICODE otherwise.

Responses (With No Language Specification)

Content-Type	text/plain
Message body	language=english character_set=ascii number_of_input=<number of external input terminals (0 or higher)> number_of_output=<number of external output terminals (0 or higher)> i1=<name of external input terminal 1 (ASCII)> ... o1=<name of external output terminal 1 (ASCII)> ...
Notes	The numbers of i1... and o1... responses correspond to the numbers of external input/output terminals in the device.

Responses (With a Language Specification)

Content-Type	text/plain; charset=utf-8
Message body	language=japanese character_set=utf-8 number_of_input=<number of external input terminals (0 or higher)> number_of_output=<number of external output terminals (0 or higher)> i1=<name of external input terminal 1 (UTF-8)> ... o1=<name of external output terminal 1 (UTF-8)> ...
Notes	The numbers of i1... and o1... responses correspond to the numbers of external input/output terminals in the device. When language=Japanese is specified, the character set will differ depending on the model: VB-C60, VB-C500 – UTF-8 Any other model – UNICODE(UTF-16)

Example of Parameters and Responses

GET /-wvhttp-01-/ExternalIOCaption HTTP/1.1

⇒

HTTP/1.1 200 OK

...

language=english

character_set=ascii

number_of_input=2

number_of_output=2

i1=

i2=

o1=

o2=

4.5.11 ExternalIOConfig

Function Overview

This function queries whether or not there is external input/output terminal information and a motion detection function.

Parameters

connection_id	The session identifier.
Notes	If connection_id is specified, Event 51 is notified via GetNotice when settings are changed.

Responses

Content-Type	text/plain
Message body	io=<number of external input terminals (0 or higher)>/<number of external output terminals (0 or higher)> md=<whether or not a motion detection function exists (0: no|1: yes)> d1=<whether or not motion detection results are reversed (0: no|1: yes)> i1=<whether or not the state of external input terminal 1 is reversed (0: no|1: yes)> ... o1=<whether or not the output of external output terminal 1 can be controlled (0: no|1: yes)> ...
Notes	The numbers of i1... and o1... responses correspond to the numbers of external input/output terminals in the device.

Example of Parameters and Responses

GET /-wvhttp-01-/ExternalIOConfig HTTP/1.1

⇒

HTTP/1.1 200 OK

...

io=2/2

md=1

d1=0

i1=0

i2=0

o1=0

o2=0

4.5.12 ExternalIOStatus

Function Overview

This function queries the external input terminal state and the results of motion detection.

Parameters

connection_id (mandatory)	The session identifier.
imask	External input state no notification mask. Changes in the state of In1/In2 are specified with a series of 0 (notification) and 1 (no notification) values. VB-C60 and VB-C500 do not support this.
mmask	External input state no notification mask. Changes in the state of In1/In2 are specified with a series of 0 (notification) and 1 (no notification) values. Only VB150 and VB-C50i support this.
omask	External output state no notification mask. Changes in the state of Out1/Out2 are specified with a series of 0 (notification) and 1 (no notification) values. VB-C60 and VB-C500 do not support this.
Notes	If this command is executed, Event 52 is notified via GetNotice when the state changes.

Responses

Content-Type	text/plain
Message body	d1=<motion detection result (0: off|1: on)> i1=<state of external input terminal 1(0: off|1: on)> ... o1=<output of external output terminal 1 (0: off|1: on)> ...
Notes	The numbers of i1... and o1... responses correspond to the numbers of external input/output terminals in the device.

Example of Parameters and Responses

GET /-wvhttp-01-/ExternalIOStatus?connection_id=AC81-8BBDB6D8 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

d1=0

i1=0

i2=0

o1=0

o2=0

4.5.13 ExternalIO

Function Overview

This function controls the external output terminal. Only privileged users (administrators and privileged users) can use this command.

Parameters

<table>
<tr><td>o|output</td><td>External output control parameter. For instance, if there are two terminals (Out1 and Out2), they will be specified as follows (cases with three or more terminals are the same):
<table>
<tr><th></th><th>Out1 Control</th><th>Out2 Control</th></tr>
<tr><td>output=00</td><td>Off</td><td>Off</td></tr>
<tr><td>output=01</td><td>Off</td><td>On</td></tr>
<tr><td>output=0-</td><td>Off</td><td>Not controlled</td></tr>
<tr><td>output=10</td><td>On</td><td>Off</td></tr>
<tr><td>output=11</td><td>On</td><td>On</td></tr>
<tr><td>output=1-</td><td>On</td><td>Not controlled</td></tr>
<tr><td>output=-0</td><td>Not controlled</td><td>Off</td></tr>
<tr><td>output=-1</td><td>Not controlled</td><td>On</td></tr>
<tr><td>output=--</td><td>Not controlled</td><td>Not controlled</td></tr>
</table>
</td></tr>
</table>

Responses

<table>
<tr><td>Content-Type</td><td>text/plain</td></tr>
<tr><td>Message body</td><td>d1=<motion detection result(0|1)>
i1=<state of external input terminal 1 (0: off|1: on)>
...
o1=<state of external output terminal 1 (0: off|1: on)>
...</td></tr>
<tr><td>Notes</td><td>The numbers of i1... and o1... responses correspond to the numbers of external input/output terminals in the device.</td></tr>
</table>

Example of Parameters and Responses

GET /-wvhttp-01-/ExternalIO?o=01 HTTP/1.1

⇒

HTTP/1.1 200 OK

...

d1=0

i1=0

i2=0

o1=0

o2=1

A VB-C500 Information Retrieval Items

This appendix shows a list of information that can be retrieved by the VB-C500. The numbers <c>, <p>, <i>, <o>, and <m> in the table correspond to the following numbers (integer values). Attributes include C: control items (items that can be changed with control.cgi, etc.), P: client-specific items (items that can be changed without affecting the operation of other clients), and U: items with update notifications (items that notify with info.cgi when changed).

Number	Meaning	Range	Notes
<c>	Camera number	1	
<p>	Preset number	1 to 20	Only in cases where the preset setting is valid
<i>	External input terminal number	1 to 2	
<o>	External output terminal number	1 to 2	
<m>	Motion detection region number	1 to 4	Only in cases where the motion detection setting is valid

A.1 System Information

Item Name	Meaning	Attributes	Notes
s	Session identifier	- P -	*a
s.origin	Address and port of the camera server	- P -	*a, *b
s.duration	Remaining time in session	- P U	*c
s.priority	Session's priority level	C P U	
s.control	State of camera control privileges	C P U	*d
s.epoch	Start-up time	- - U	
s.hardware	Model name	- - -	
s.firmware	Firmware version	- - -	
s.protocol	Protocol version	- - -	

*a open.cgi command response only.

*b One of the following notations depending on the client type (IPv4 or IPv6), and whether or not there are NAT settings:

IPv6	[<IPv6 address>]:HTTP port	e.g. [3FFE:2A00:100:7031::1]:80
IPv4/no NAT setting	<IPv4 address>:HTTP port	e.g. 192.168.100.1:80
IPv4/with NAT setting	<NAT host>:<NAT port>	e.g. camera.jp:80

*c Numerical value: second units (with decimal part), 0: unlimited.

enabled[:<allocated time>]: securing, waiting[:<waiting time>]: waiting to secure, disabled: none.

*d Time is a numerical value: millisecond units, unlimited: unlimited.

A.2 Video Information

Item Name	Meaning	Attributes	Notes
v	Selected stream	C P U	*a
v.list	Stream list	- - U	*a
*a <jpg|mp4>:<screen width>x<screen height>:<image quality>:<frame rate>. (<image quality> is step values specific to the model. Integer 1 ~ 5 for VB-C60 and VB-C500. 5 represents the highest quality.)			

A.3 Camera Information

Item Name	Meaning	Attributes	Notes
c	Selected camera number	C - U	
c.count	Number of cameras	- - -	
c.<c>.type	Camera type	- - -	
c.<c>.status	State of operation	- - -	*a
c.<c>.name.asc	Camera name (ASCII)	- - U	
c.<c>.name.utf8	Camera name (UTF-8)	- - U	
c.<c>.name.lang	Camera name (UTF-8) setting language	- - U	*b
*a enabled: can be controlled, disabled: cannot be controlled.			
*b en: English, ja: Japanese			

Item Name	Meaning	Attributes	Notes
c.<c>.exp	Exposure mode	C - U	*c
c.<c>.exp.list	Exposure mode list	- - -	*c
c.<c>.ae.autoss	Auto slow shutter	C - U	*d,*e
c.<c>.ae.autoss.list	Auto slow shutter list	- - -	*d
c.<c>.ae.shutter	Shutter speed	C - U	*d,*f
c.<c>.ae.shutter.list	Shutter speed list	- - -	*d
c.<c>.ae.brightness	Backlight adjustment value	C - U	*g
c.<c>.ae.brightness.min	Backlight adjustment value's minimum value	- - -	
c.<c>.ae.brightness.max	Backlight adjustment value's maximum value	- - -	
c.<c>.ae.brightness.list	Backlight adjustment value list	- - -	
c.<c>.ae.photometry	Metering system	C - U	*g,*h
c.<c>.ae.photometry.list	Metering system list	- - -	*h
c.<c>.me.shutter	Shutter speed	C - U	*d,*i
c.<c>.me.shutter.list	Shutter speed list	- - -	
c.<c>.me.gain	Gain value	C - U	*i
c.<c>.me.gain.min	Gain value's minimum value	- - -	

c.<c>.me.gain.max	Gain value's maximum value	- - -	
c.<c>.dn	Infrared cutting filter insertion state	C - U	*j
c.<c>.dn.mode	Infrared cutting filter control mode	C - U	*k
c.<c>.dn.mode.list	Infrared cutting filter control mode list	- - -	*k
c.<c>.wb	White balance mode	C - U	*l
c.<c>.wb.list	White balance mode list	- - -	*l
c.<c>.wb.value	RB gain value	C - U	*m
c.<c>.nr	Noise reduction level	C - U	
c.<c>.nr.min	Noise reduction level minimum value	- - -	
c.<c>.nr.max	Noise reduction level maximum value	- - -	
c.<c>.ac	Aperture correction level	C - U	
c.<c>.ac.min	Aperture correction level minimum value	- - -	
c.<c>.ac.max	Aperture correction level maximum value	- - -	
c.<c>.shade	Shade correction	C - U	*j
c.<c>.shade.param	Shade correction parameter	C - U	
c.<c>.shade.param.min	Shade correction parameter minimum value	- - -	
c.<c>.shade.param.max	Shade correction parameter maximum value	- - -	

*c auto: auto, flickerfree: flicker-free, tv: shutter speed-priority, manual: manual.

*d shutter speed's reciprocal number.

*e c.<c>.exp = when auto only.

*f c.<c>.exp = when tv only.

*g c.<c>.exp = when not manual only.

*h center: center-weighted, average: average, spot: spot.

*i c.<c>.exp = when manual only.

*j on: on, off: off.

*k manual: manual, auto1: auto 1.

*l auto: auto, manual: manual, etc.

*m c.<c>.wb = when manual only.

Item Name	Meaning	Attributes	Notes
c.<c>.zoom	Zoom value	C - U	
c.<c>.zoom.d	Digital zoom boundary value (optical telephoto boundary)	- - -	
c.<c>.zoom.min	Zoom telephoto side control limit	- - U	
c.<c>.zoom.max	Zoom wide side control limit	- - U	
c.<c>.zoom.limit.min	Zoom telephoto side movement limit	- - -U	*o
c.<c>.zoom.limit.max	Zoom wide side movement limit	- - -	

c.<c>.zoom.speed.pos	Position-specified zoom speed	C P -	
c.<c>.zoom.speed.dir	Operation-specified zoom speed	C P -	
c.<c>.zoom.speed.min	Minimum zoom speed	- - -	
c.<c>.zoom.speed.max	Maximum zoom speed	- - -	

*o Valus for this item are not changed even when view restriction is applied. Instead, it changes according to settings for digital zoom.

[Memo: values in VB-C500]

digital zoom OFF: zoom.limit.min=156

digital zoom ON: zoom.limit.min=38

Item Name	Meaning	Attributes	Notes
c.<c>.panorama.count	Number of panorama images	- - -	*v

*v 0 fixed value

A.4 External Input/Output Information

Item Name	Meaning	Attributes	Notes
i.count	Number of external input terminals	- - -	
i.<i>	State of external input terminal<i>	- - U	*a
i.<i>.name.asc	External input terminal name (ASCII)	- - U	
i.<i>.name.utf8	External input terminal name (UTF-8)	- - U	
i.<i>.name.lang	External input terminal name (UTF-8) setting language	- - U	*b
o.count	Number of external output terminals	- - -	
o.<o>	State of external output terminal<i>	C - U	*a
o.<o>.name.asc	External output terminal name (ASCII)	- - U	
o.<o>.name.utf8	External output terminal name (UTF-8)	- - U	
o.<o>.name.lang	External output terminal name (UTF-8) setting language	- - U	*b
m.count	Number of motion detection regions	- - -	
m.<m>	State of motion detection region<i>	- - U	*a
m.<m>.name.asc	Motion detection region name (ASCII)	- - U	
m.<m>.name.utf8	Motion detection region name (UTF-8)	- - U	
m.<m>.name.lang	Motion detection region name (UTF-8) setting language	- - U	*b

*a 0: off, 1: on, -1: invalid (motion detection region state only).
*b en: English, ja: Japanese

A.5 Preset Information

Item Name	Meaning	Attributes	Notes
p.count	Number of presets	- - U	*c

*c 0 fixed value

B VB-C60 Information Retrieval Items

This appendix shows lists of information, which VB-C60 can retrieve. Lettes <c>, <p>, <i>, <o>, <m> in the following lists represent the number (integer value) mentioned below. The attributes include C: controllable item (it can be changed using control.cgi etc), P: client-specific (it does not affect other clients' operation even it is changed.), U: renewal notification (it is notified using info.cgi when any change occurs.).

number	meaning	range	notes
<c>	Camera number	1	
<p>	Preset number	1 to 20	Only in cases where the preset setting is valid
<i>	External input terminal number	1 to 2	
<o>	External output terminal number	1 to 2	
<m>	Motion detection area number	1 to 4	Only in case where the motion detectionsetting is valid

B.1 System Information

Item name	Meaning	Attributes	Notes
s	Session identifier	- P -	*a
s.origin	Address and port of the camera server	- P -	*b
s.duration	Remaining time in session	- P U	*c
s.priority	Session's priority level	C P U	
s.control	State of camera control privileges	C P U	*d
s.epoch	Start-up time	- - U	
s.hardware	Model name	- - -	
s.firmware	Firmware version	- - -	
s.protocol	Protocol version	- - -	

*a open.cgi command response only

*b one of the following notations depending on the client type (IPv4/IPv6), and whether or not there are NAT settings

IPv6	[<IPv6 address>]:HTTP port	e.g. [3FFE:2A00:100:7031::1]:80
IPv4/no NAT setting	<IPv4 address>:HTTP port	e.g. 192.168.100.1:80
IPv4/with NAT setting	<NAT host>:<NAT port>	e.g. camera.jp:80

*c Numerical value: second units (with decimal part), 0: unlimited

enabled[:<allocated time>]: securing, waiting[:<waiting time>]: waiting to secure, disabled: none,

*d Time - numerical value: millisecond units, unlimited: unlimited

B.2 Video Information

Item name	Meanings	Attributes	Notes
V	Selected stream	C P U	*a
v.list	Stream list	- - U	*a
*a <jpg|mp4>:<screen width>x<screen height>:<image quality>:<frame rate>. (<image quality> is step values specific to the model. Integer 1 ~ 5 for VB-C60. 5 represents thehighest quality.)			

B.3 Camera Information

Item name	Meanings	attributes	Notes
c	Selected camera number	C - U	
c.count	Number of cameras	- - -	
c.<c>.type	Camera type	- - -	
c.<c>.status	State of operation	- - -	*a
c.<c>.name.asc	Camera name (ASCII)	- - U	
c.<c>.name.utf8	Camera name (UTF-8)	- - U	
c.<c>.name.lang	Camera name (UTF-8) setting language	- - U	*b
*a Enabled: can be controlled, disabled: cannot be controlled			
*b En: English, ja: Japanese			

Item name	Meanings	attributes	Notes
c.<c>.exp	Exposure mode	C - U	*c
c.<c>.exp.list	Exposure mode list	- - -	*c
c.<c>.ae.autoss	Auto slow shutter	C - U	*d, *e
c.<c>.ae.autoss.list	Auto slow shutter list	- - -	*d
c.<c>.ae.shutter	Shutter speed	C - U	*d, *f
c.<c>.ae.shutter.list	Shutter speed list	- - -	*d
c.<c>.ae.brightness	Backlight adjustment value	C - U	*g
c.<c>.ae.brightness.min	Backlight adjustment value's minimum value	- - -	
c.<c>.ae.brightness.max	Backlight adjustment values's maximum value	- - -	
c.<c>.ae.brightness.list	Backlight adjustment value list	- - -	
c.<c>.ae.photometry	Metering system	C - U	*g, *h
c.<c>.ae.photometry.list	Metering system list	- - -	*h
c.<c>.me.shutter	Shutter speed list	C - U	*d, *i
c.<c>.me.shutter.list	Shutte speed list	- - -	
c.<c>.me.iris	Aperture value	C - U	*i
c.<c>.me.iris.min	Aperture value's minimum value	- - -	
c.<c>.me.iris.max	Aperture value's maximum value	- - -	
c.<c>.me.gain	Gain value	C - U	*i

c.<c>.me.gain.min	Gain value's minimum value	- - -	
c.<c>.me.gain.max	Gain value's maximum value	- - -	
c.<c>.dn	Infrared cutting filter insertion/removal state	C - U	*j
c.<c>.dn.mode	Infrared cutting filter control mode	C - U	*k
c.<c>.dn.mode.list	Infrared cutting filter control mode list	- - -	*k
c.<c>.wb	White balance mode	C - U	*l
c.<c>.wb.list	White balance mode list	- - -	*l
c.<c>.wb.value	RB gain value	C - U	*m
c.<c>.is	Image stabilization	C - U	*j
c.<c>.nr	Noise reduction level	C - U	
c.<c>.nr.min	Noise reducetion level minimum value	- - -	
c.<c>.nr.max	Noise reduction level maximum value	- - -	
c.<c>.ac	Aperture correction level	C - U	
c.<c>.ac.min	Aperture correction level minimum valur	- - -	
c.<c>.ac.max	Aperture correction level maximum valur	- - -	
c.<c>.shade	Shade correction	C - U	*j
c.<c>.shade.param	Shade correction parameter	C - U	
c.<c>.shade.param.min	Shade correction parameter minimum value	- - -	
c.<c>.shade.param.max	Shade correction parameter maximum value	- - -	

*c Auto: auto, flickerfree: flickerfree, tv: shutter speed priority, manual: manual

*d Shutter speed's reciprocal number

*e c.<c>.exp = when auto only.

*f c.<c>.exp = when tv only.

*g c.<c>.exp = when note manual only

*h center: center-weighted, average: average, spot: spot.

*i c.<c>.exp = when manual only.

*j on: on, off: off.

*k manual: manual, auto1: auto1.

*l Auto: auto, manual: manual, etc.

*m c.<c>.wb = when manual only.

Item Name	Meaning	attributes	Notes
c.<c>.focus	Focus mode	C - U	*m
c.<c>.focus.list	Focus mode list	- - -	*m
c.<c>.focus.value	Focus value	C - U	*n
c.<c>.zoom	Zoom value	C - U	
c.<c>.zoom.d	Digital zoom boundary value (optical telephoto boundary)	- - -	

c.<c>.zoom.min	Zoom telephoto side control limite	- - U	
c.<c>.zoom.max	Zoom wide side control limit	- - U	
c.<c>.zoom.limit.min	Zoom telephoto side movement limit	- - U	o*
c.<c>.zoom.limit.max	Zoom wide side movement limit	- - -	
c.<c>.zoom.speed.pos	Position-specified zoom speed	C P -	
c.<c>.zoom.speed.dir	Operation-specified zoom speed	C P -	
c.<c>.zoom.speed.min	Minimum zoom speed	- - -	
c.<c>.zoom.speed.max	Maximum zoom speed	- - -	

*m Auto: auto, infinity: fixed at infinity, manual: manual.

*n c.<c>.focus = when manual only.

*o values for this item are not changed even when restriction is applied. Instead, it changes according to settings for digital zoom and image stabilization.

[Note: values in VB-C60]

digital zoom OFF: zoom.limit.min=152

digital zoom ON, image stabilization OFF: zoom.limit.min=38

digital zoom ON, image stabilization On1: zoom.limit.min=46

digital zoom ON, image stabilization On2: zoom.limit.min=76

Item Name	Meaning	attributes	Notes
c.<c>.pan	Pan position	C - U	
c.<c>.pan.min	Camera platform left side control limit	- - U	*u
c.<c>.pan.max	Camera platform right side control limit	- - U	*u
c.<c>.pan.limit.min	Camera platform left side movement limit	- - -	
c.<c>.pan.limit.max	Camera platform right side movement limit	- - -	
c.<c>.pan.speed.pos	Position-specified pan speed	C P -	
c.<c>.pan.speed.dir	Operation-specified pan speed	C P -	
c.<c>.pan.speed.min	minimum pan speed	- - -	
c.<c>.pan.speed.max	maximum pan speed	- - -	
c.<c>.tilt	Tilt position	C - U	
c.<c>.tilt.min	Camera platform bottom side control limit	- - U	*u
c.<c>.tilt.max	Camera platform top side control limite	- - U	*u
c.<c>.tilt.limit.min	Camera platform bottom side movement limit	- - -	
c.<c>.tilt.limit.max	Camera platform top side movement limit	- - -	
c.<c>.tilt.speed.pos	Position-specified tilt speed	C P -	
c.<c>.tilt.speed.dir	Operation-specified tilt speed	C P -	
c.<c>.tilt.speed.min	Minimum tilt speed	- - -	
c.<c>.tilt.speed.max	Maximum tilt speed	- - -	
c.<c>.view	Visiblra range	C - U	p,u

c.<c>.view.restriction	Restriction on Visible range	C - U	*q

*p <left boundary>:<top boundary>:<width>:<height> (in 0.01 degrees unit).

*u It may be different from the value set using View Restriction Tool etc. This is because correction of value is applied due to camera operation's characteristics. The control is limited to the administrator.

*q

Item Name	Meaning	attributes	Notes
c.<c>.panorama.count	Number of panorama images	- - -	
c.<c>.panorama.1.view	Panorama iamge view field information	- - -	*r
c.<c>.panorama.1.image	Panorama image information	- - -	*s
c.<c>.panorama.1.timestamp	Panorama image time stamp	- - -	*t

*r <left boundary>:<top boundary>:<width>:<height> (in 0.01 degrees unit).

*s <width>x<height>:<image quality>:<size>.

*t <day of the ween>, <day> <monght> <year> <hour>:<minute>:<second> <time zone>.

B.4 External Input.Output Information

Item Name	Meaning	Attributes	Notes
i.count	Number of external input terminals	- - -	
i.<i>	External inpute terminal<i> status	- - U	*a
i.<i>.name.asc	External input terminalname (ASCII)	- - U	
i.<i>.name.utf8	External input terminalname (UTF-8)	- - U	
i.<i>.name.lang	External input terminal name (UTF-8) setting language	- - U	*b
o.count	Number of external output terminals	- - -	
o.<o>	External output terminal<i> status	C - U	*a
o.<o>.name.asc	External output terminalname (ASCII)	- - U	
o.<o>.name.utf8	External output terminalname (UTF-8)	- - U	
o.<o>.name.lang	External output terminal name (UTF-8) setting language	- - U	*b
m.count	Number of motion detection areas	- - -	
m.<m>	Motion detection area <i> status	- - U	*a
m.<m>.name.asc	Motion detection area name (ASCII)	- - U	
m.<m>.name.utf8	Motion detection area name (UTF-8)	- - U	
m.<m>.name.lang	Motion detection area name (UTF-8) setting language	- - U	*b

*a 0: off, 1: on, -1: invalid (motion detection region state only).

*b en: English, ja: Japanese

B.5 Preset Information

Item Name	Meaning	Attributes	Notes
p.count	Number of presets	- - U	
p.<p>.name.asc	Preset <p> name (ASCII)	- - U	
p.<p>.name.utf8	Preset <p> name (UTF-8)	- - U	
p.<p>.name.lang	Preset <p> name (UTF-8) setting language	- - U	*a
p.<p>.c	Preset <p> camera number	- - U	
p.<p>.pan	Preset <p> pan value	- - U	
p.<p>.tilt	Preset <p> tile value	- - U	
p.<p>.zoom	Preset <p> zoom value	- - U	
p.<p>.focus	Preset <p> focus value	- - U	*b
p.<p>.ae.brightness	Preset <p> backlight compensation value	- - U	

*a en: English, ja: Japanese

*b c.<c>.focus.list element for supported camera. Manual is manual:<focu value>.

C New Commands and Compatible Commands

C.1 Support for Each Type of Information

All types of information for the network camera have been redefined in a hierarchical manner for the new commands. Retrieval commands and item names were not always unified for compatible commands, and some items could not be retrieved. Although it is not possible to completely associate all new commands with compatible commands, the basic correspondence is as shown below:

New Command	Compatible Command	Item Name for Compatible Command
s	OpenCameraServer	connection_id
s.duration	GetSystemInfo	connection_time_limit
s.priority	Priority	priority
s.control	GetNotice	Event 31 to 34
s.epoch	GetSystemInfo	start_time
s.hardware	GetCameraServerInfo	modelNumber
	GetSystemInfo	version
s.firmware	GetCameraServerInfo	firmVersion
	GetSystemInfo	version
s.protocol	GetProtocolVersion	
v	GetVideoInfo	image_width
		image_height
		compression_type
		image_quality
		frame_rate
v.list	GetCameraServerInfo	image_size
		image_quality
c	GetCameraInfo	camera_id
c.count	GetCameraServerInfo	number_of_available_cameras
	GetCameraList	number_of_cameras
c.<c>.type	GetCameraInfo	camera_type
c.<c>.status	GetCameraInfo	camera_status
c.<c>.name.asc	GetCameraList	camera_129 ...
c.<c>.name.utf8	GetCameraList	camera_129 ...
c.<c>.name.lang	N/A	

c.<c>.exp	Exposure	
c.<c>.exp.list	GetCameraInfoEx	manual_ex
c.<c>.ae.autoss	GetCameraInfoEx	auto_slow_shutter_ex
c.<c>.ae.autoss.list	N/A	
c.<c>.ae.shutter	OperateCameraEx	shutter
c.<c>.ae.shutter.list	N/A	
c.<c>.ae.brightness	OperateCameraEx	brightness
	GetCameraInfo	back_light
c.<c>.ae.brightness.min	N/A	
c.<c>.ae.brightness.max	N/A	
c.<c>.ae.brightness.list	N/A	
c.<c>.ae.photometry	N/A	
c.<c>.ae.photometry.list	N/A	
c.<c>.me.shutter	Exposure	shutter
c.<c>.me.shutter.list	GetCameraInfoEx	shutter_speed_1 ...
c.<c>.me.iris	Exposure	iris
c.<c>.me.iris.min	GetCameraInfoEx	iris_min
c.<c>.me.iris.max	GetCameraInfoEx	iris_max
c.<c>.me.gain	Exposure	gain
c.<c>.me.gain.min	GetCameraInfoEx	gain_min
c.<c>.me.gain.max	GetCameraInfoEx	gain_max
c.<c>.dn	NightMode	night_mode
c.<c>.dn.list	N/A	
c.<c>.dn.mode	N/A	
c.<c>.dn.mode.list	N/A	
c.<c>.wb	GetCameraInfo	white_balance
c.<c>.wb.list	N/A	
c.<c>.wb.value	GetCameraInfo	rb_gain
c.<c>.is	N/A	
c.<c>.nr	NRLevel	nr_level
c.<c>.nr.min	N/A	
c.<c>.nr.max	N/A	
c.<c>.ac	N/A	
c.<c>.ac.min	N/A	
c.<c>.ac.max	N/A	
c.<c>.shade	N/A	

c.<c>.shade.param	N/A	
c.<c>.shade.param.min	N/A	
c.<c>.shade.param.max	N/A	
c.<c>.focus	GetCameraInfo	focus_mode
c.<c>.focus.value	GetCameraInfo	focus_value
c.<c>.focus.list	GetCameraInfoEx	far_fixed_focus
		dome_focus
		one_shot_focus
c.<c>.zoom	GetCameraInfo	zoom_current_value
c.<c>.zoom.d	GetCameraInfoEx	digital_zoom_boundary
c.<c>.zoom.min	GetCameraInfo	zoom_tele_limit
	GetCameraInfo	view_tele_boundary
c.<c>.zoom.max	GetCameraInfo	zoom_wide_limit
	GetCameraInfo	view_wide_boundary
c.<c>.zoom.limit.min	GetCameraInfo	zoom_tele_end
c.<c>.zoom.limit.max	GetCameraInfo	zoom_wide_end
c.<c>.zoom.speed.pos	GetPTZSpeedInfo	point_z
c.<c>.zoom.speed.dir	GetPTZSpeedInfo	direction_z
c.<c>.zoom.speed.min	GetPTZSpeedInfo	point_z_min / direction_z_min
c.<c>.zoom.speed.max	GetPTZSpeedInfo	point_z_max / direction_z_max
c.<c>.pan	GetCameraInfo	pan_current_vaue
c.<c>.pan.min	GetCameraInfo	pan_left_limit
c.<c>.pan.max	GetCameraInfo	pan_right_limit
c.<c>.pan.limit.min	GetCameraInfo	pan_left_end
c.<c>.pan.limit.max	GetCameraInfo	pan_right_end
c.<c>.pan.speed.pos	GetPTZSpeedInfo	point_p
c.<c>.pan.speed.dir	GetPTZSpeedInfo	direction_p
c.<c>.pan.speed.min	GetPTZSpeedInfo	point_p_min / direction_p_min
c.<c>.pan.speed.max	GetPTZSpeedInfo	point_p_max / direction_p_max
c.<c>.tilt	GetCameraInfo	tilt_current_vaue
c.<c>.tilt.min	GetCameraInfo	tilt_down_limit
c.<c>.tilt.max	GetCameraInfo	tilt_up_limit
c.<c>.tilt.limit.min	GetCameraInfo	tilt_down_end
c.<c>.tilt.limit.max	GetCameraInfo	tilt_up_end
c.<c>.tilt.speed.pos	GetPTZSpeedInfo	point_t
c.<c>.tilt.speed.dir	GetPTZSpeedInfo	direction_t

c.<c>.tilt.speed.min	GetPTZSpeedInfo	point_t_min / direction_t_min
c.<c>.tilt.speed.max	GetPTZSpeedInfo	point_t_max / direction_t_max
c.<c>.view	GetCameraInfo	view_left_boundary
		view_right_boundary
		view_up_boundary
		view_down_boundary
c.<c>.view.restriction	N/A	
c.<c>.panorama.count	GetPanoramaList	number_of_panorama_images
c.<c>.panorama.<c>.view	GetPanoramaInfo	pano_left
	GetPanoramaInfo	pano_top
	GetPanoramaInfo	pano_width
	GetPanoramaInfo	pano_height
c.<c>.panorama.<c>.image	GetPanoramaInfo	image_width
	GetPanoramaInfo	image_height
	GetPanoramaInfo	image_quality
	GetPanoramaInfo	image_size
c.<c>.panorama.<c>.timestamp	GetPanoramaInfo	date_and_time
i.count	ExternalIOConfig	number_of_input
i.<i>	ExternalIOStatus	i1 ...
i.<i>.name.asc	ExternalIOCaption	i1 ...
i.<i>.name.utf8	ExternalIOCaption	i1 ...
i.<i>.name.lang	N/A	
o.count	ExternalIOConfig	number_of_output
o.<o>	ExternalIOStatus	o1 ...
o.<o>.name.asc	ExternalIOCaption	o1 ...
o.<o>.name.utf8	ExternalIOCaption	o1 ...
o.<o>.name.lang	N/A	
m.count	ExternalIOConfig	md
m.<m>	ExternalIOStatus	d1
m.<m>.name.asc	N/A	
m.<m>.name.utf8	N/A	
m.<m>.name.lang	N/A	
p.count	GetPresetList	number_of_camera_positions
p.<p>.name.asc	GetPresetList	position_1 ...
p.<p>.name.utf8	GetPresetList	position_1 ...
p.<p>.name.lang	N/A	

p.<p>.c	GetPresetList	camera_id
p.<p>.pan	GetPresetList	pan
p.<p>.tilt	GetPresetList	tilt
p.<p>.zoom	GetPresetList	zoom
p.<p>.focus	GetPresetList	focus_mode
	GetPresetList	focus_value
p.<p>.ae.brightness	GetPresetList	back_light

D JPEG Header Specifications

This appendix mainly describes the Canon network camera's JPEG image header. The JPEG image header uses APP0 markers, and is a header that writes information within the JPEG area. [Note] This document indicates hexadecimal values by affixing an 'h' to the end of the number (for example: 12h).

D.1 JPEG Header Specifications

D.1.1 JPEG area map

As shown in Figure 1, the JPEG area starts with the SOI (Start of Image), and includes a JPEG image header, a reserved region, and the JPEG image data (encoded bit stream), ending with the EOI (End of Image). The JPEG image header area is the 64-byte area after the SOI's 2 bytes (the area within the dotted green rectangle).

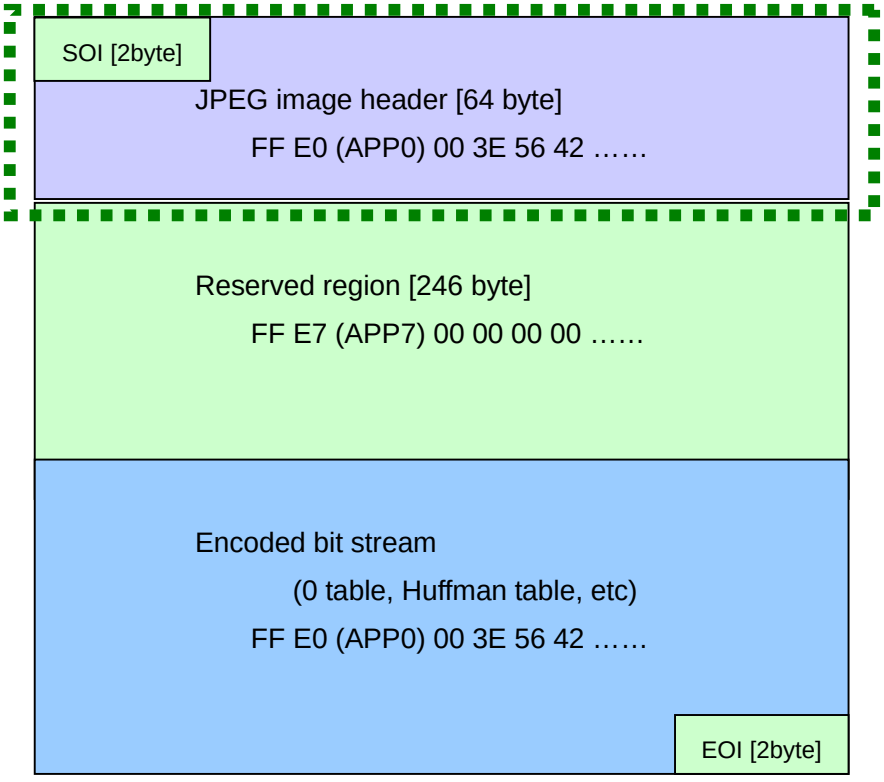

Figure 1

FF E0 : APP0 application marker

00 3E : APP0 area size (size of the area after the application marker's 2 bytes are subtracted = 62 bytes)

D.1.2 JPEG image header details

The following table shows the details of the information appended to the JPEG image header for Canon's network cameras as shown in Table 1 (other than the APP0 and APP0 area size).

Appended Info. (Shown in Figure 2)	Data Type	Details of Appended Information
Magic number (Magic)	U<2>	'V' and 'B' (fixed at 56 42h)
Trigger (Trg)	U<1>	Reason for shooting (fixed at 00h)
Camera (Cam)	U<1>	Camera number (fixed at 01h)
Pan (Pan)	U<2>	Pan angle during shooting (in 1/100 degree units)
Tilt (Tilt)	U<2>	Tilt angle during shooting (in 1/100 degree units)
Zoom (Zoom)	U<2>	Optical zoom angle during shooting (in 1/100 degree units)
Brightness (Exposure)	S<2>	Exposure setting during shooting (00h: invalid, 01h: normal, 02h: bright)
Shooting time (Time H)	U<4>	Shooting time (the number of seconds since 00:00:00 GMT, January 1st, 1970)
Time zone (Time zone)	S<2>	Offset from GMT (in minute units)
Image quality (Q)	U<1>	JPEG image quality information
Model (Mdl)	U<1>	Model information
External device input state (In port)	B[32]	State of external device input (B[0]: In1, B[1]: In2)
External device output state (Out port)	B[32]	State of external device output (B[0]: Out1)
File format (Fil)	U<1>	File format
Reserved (Res)	U<1>	For extended use (fixed at 00h)
Image width (Horizon)	U<2>	Number of pixels in the horizontal direction
Image height (Vertical)	U<2>	Number of pixels in the vertical direction
Shooting time decimal part (Time L)	U<2>	Shooting time (in millisecond units)
Reserved (Res) ()	U<4>	For extended use
MAC address (MAC address)	B[24]	Bottom 24 bits of the MAC address
Extended information (Ext)	B[136]	Extended information

Table 1

B[##] : ## is the number of bits
S<##> : Signed integer, ## is the number of bytes
U<##> : Unsigned integer, ## is the number of bytes

The bit order is such that the MSB is towards the front, and integers are shown as big endian.

Explanation of Each Item

Item Name	Explanation
Magic number (Magic)	This magic number indicates the application that created the APP0 marker. Canon's network cameras fix this at 'V' and 'B' (56 42h).
Trigger (Trg)	This number indicates the reason for shooting. 00h: Live video 01h: Video captured with external device input 1 as the trigger 02h: Video captured with external device input 2 as the trigger 21h: Video captured with the timer as the trigger 81h: Video captured with motion detection as the trigger This is always 00h for video retrieved with a WebView protocol video retrieval command (GetLiveImage, GetOneShot, GetStillImage, still.jpg, image.cgi, and video.cgi). 01h and higher are only used by models with functions for accumulating video within the camera. **[Note] VB-C300, VB-C60 and VB-C500 fix this at 00h.**
Camera (Cam)	Camera number a. Integrated camera model (VB-C10, the VB-C50i series, VB-C300, VB-C60 and VB-C500) 01h: Main camera unit 02h: External camera (only the VB-C50i series) b. Box type model (VB100, VB101, and VB150) 01h to 04h: Camera 1 to camera 4
Pan (Pan)	Pan angle during shooting A value is recorded in 1/100 degree units, with 180 degrees to the left as 0, 0 degrees to the front side as 18000, and 180 degrees to the right as 36000. For instance, although the left boundary of the panning for the VB-C60 is 170 degrees, the value of this item at this time is 03E8h (=(180-170) x 100 in hexadecimal notation). Also, in the case of cameras without a panning function (the VB-C50Fi, etc.), the invalid value 0000h is recorded. For VB-C500, fixed value 4650h(18000), which represents front (0 degree), is returned.
Tilt (Tilt)	Tilt angle during shooting A value is recorded in 1/100 degree units, with 180 degrees downward as 0, 0 degrees to the horizontal side as 18000, and 180 degrees upward as 36000. For instance, although the bottom boundary of the tilt for the VB-C60 is 25 degrees, the value of this item at this time is 3C8Ch (=(180-25) x 100 in hexadecimal notation). Also, in the case of cameras without a tilt function (the VB-C50Fi, etc.), the invalid value 0000h is recorded. For VB-C500, fixed value 4650h(18000), which represents front (0 degree), is returned.

Zoom (Zoom)	Optical zoom angle during shooting A value is recorded in 1/100 degree units to show the pan direction's view field angle. For instance, the VB-C60's optical telephoto boundary view field angle in the pan direction is 1.52 degrees, and so this item's value is 0098h (=1.52 x 100 in hexadecimal notation). Also, in the case of cameras without a zoom function (the VB-C50i's external camera, etc.), the invalid value 0000h is recorded. For VB-C500, fixed value 0098h, which represents optical telephoto end, is returned.
Brightness (Exposure)	Exposure setting during shooting 0000h: Invalid (Operation is impossible because the camera does not have a backlight correction/exposure correction function) 0001h: Normal (backlight correction/exposure correction is off) 0002h: Bright (backlight correction/exposure correction is on)
Shooting time (Time H)	Shooting time (the number of seconds since 00:00:00 GMT, January 1st, 1970) Put precisely, this is the time at which the JPEG image was generated inside the camera, rather than the time at which the image was sent by the camera to the network..
Time zone (Time zone)	Offset from GMT (in minute units)
Image quality (Q)	JPEG image quality information a. VB-C300, VB-C60, VB-C500 JPEG's Q table number 00h: low compression to 04h: high compression) b. The VB-C50i series, VB-C10, VB100, VB101, and VB150 JPEG's Q value 01h: low image quality (high compression) to 64h: high image quality (low compression)
Model (Mdl)	Model information VB-C500=0Ch, VB-C60=0Bh, VB-C300=0Ah, VB-C50FSi=09h, VB-C50Fi=08h, VB-C50iR=07h, VB-C50i=06h, VB150=05h, VB-C10R=04h, VB-C10=03h, VB101=02h, VB100=01h
External device input state (In port)	State of external device input (0: off, 1: on) B[0]: In1, B[1]:In2
External device output state (Out port)	State of external device output (0: off, 1: on) B[0]: Out1, B[1]:Out2, B[2]:Out3
File format (Fil)	File format. This will differ depending on the model and firmware version. VB-C500: 04h VB-C60: 04h VB-C300: 03h The VB-C50i series and VB150 (firmware version 1.1): 02h VB100, VB101, VB-C10, VB-C10R, and VB150 (firmware version 1.0): 01h
Image width (Horizon)	Number of pixels in the horizontal direction If VGA, this will be 0280h (=640 in hexadecimal notation)
Image height (Vertical)	Number of pixels in the vertical direction If VGA, this will be 01E0h (=480 in hexadecimal notation)

Shooting time decimal part (Time L)	Shooting time, millisecond part [Note] This item is only set to a value if the file format's value is 02h or 03h.
MAC address (MAC address)	MAC address's lower 24 bits [Note] This item is only set to a value if the file format's value is 02h or 03h.
Extended information	Extended information This item depends on the file format value. 01h: No value (all fixed at 00h) 02h: The event marker value is recorded in the first bit B[1] (the remainder are all 00h) The event marker records whether or not there is external device input or a motion detection event (0: no, 1: yes). This is only appended to video accumulated inside the camera, and is 0 in the case of live video. 03h: The digital zoom magnification factor value is recorded in the first byte U<1> (the remainder are all 00h) 00h: digital zoom OFF, 01h ~ 0ah: no setting, or 0bh to 28h: digital zoom magnification factor (in 1/10x units). 04h: The digital zoom magnification factor value is recorded in 0.1 units in the first bite U<1>. 00h: digital zoom OFF, 01h ~ 0ah: no setting, 0bh ~ 28h: digital zoom magnification factor (1/10x units). The shade correction value is recorded in the second byte U<1>. 00h: Shade correction OFF, 01h ~ 07h: Shade correction level The digital zoom magnification factor value is recorded in 0.01 units in the third and fourth bytes U<2>. 00h: digital zoom OFF, 01h ~ 12Ch: digital zoom magnification factor (1/100x units). (the remainderare all 00h)

JPEG Image Header Information Arrangement

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	APP 0		Size		Magic		Trg	Cam	Pan		Tilt		Zoom		Exposure	
00	FF	E0	00	3E	56	42	00	01	46	50	46	50	1B	58	00	01
	Time H				Time zone		Q	Mdl	In port				Out port			
10	48	00	00	00	02	1C	02	0B	00	00	00	00	00	00	00	00
	Fil	Res	Horizon		Vertical		Time L		Res				MAC address			Ext
20	03	00	01	40	00	F0	00	00	00	00	00	00	00	00	00	00
	Reserve															
30	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Figure 2

Red values indicate those which are fixed for the VB-C60. Black values show the following as an example:

Trigger: live video
Pan: 0°
Tilt: 0°
Zoom: 1.52°
Brightness: bright
Shooting time: 12:19 AM and 12.00 seconds on April 12th, 2008
Time zone: 9 hours (Japan)
Image quality: 3
External input state: No input
External output state: No output
Image width: 320
Image height: 240
Shooting time's decimal part: 00 milliseconds
MAC address=00 00 85 00 00 00h
Digital zoom: digital zoom off, shade correction OFF

E MPEG-4 Delivery Function Specifications

This appendix describes the VB-C60 and VB-C500's MPEG-4 delivery function.

E.1 MPEG-4 Data Format

The VB-C60 and VB-C500 handle MPEG-4 video data compliant with JISO/IEC 14496-2.[7] The only supported profile is the simple profile (b-frame is not handled).

E.2 MP4 Fragment Format

The VB-C60 and VB-C500 take the video stream described above and forms MP4 fragment format streams compliant with ISO/IEC 14496-12 and ISO/IEC 14496-14. In other words, it generates a moov header and a moof header, and links this with image frame data as long as the specified fragment length.

E.3 Image Parameters

The MPEG-4 video delivered by the VB-C60 and VB-C500 have the parameters shown in the following table:

Parameter	Value	Default value	Notes
Image size	640 x 480/ 320 x 240	320 x 240	There is only one size that can be used for simultaneous delivery. When there is a change, this is redelivered from the moov header.
Frame rate	30 / 15 / 10 fps	30	There is only one frame rate that can be used for simultaneous delivery. When there is a change, this is redelivered from the moov header.
Q value	1 to 5	3	There is only one Q value that can be used for simultaneous delivery.
i-frame interval	4, 8, 15	15	There is only one i-frame interval that can be used for simultaneous delivery.

A

[7]Encoding technology corresponds to H.263.

E.4 Notes

- ✓ The color and luminance range of MPEG-4 video, distributed by VB-C60 and VB-C500, is not 16 ~ 235, which is equivalent to ITU-R BT.601, but 8-bit full scale (1 ~ 254), which is equivalent to ITU-R BT.709. Hence, if the color conversion process to RGB upon displaying is not supported by 8-bit full scale, video may have obscurity in dark area or blown-out in brighter part. Since the MPEG-4 frame rate of video data delivered by the VB-C60 is not 30 fps, but rather 29.97 fps, the MPEG-4 timescale / duration = 30000 / 1001.
- ✓ The CBR (constant bit rate)/VBR (variable bit rate) function is not supported.
- ✓ MPEG-4 audio data compliant with ISO/IEC 14496-3 is not handled. Hint tracks compliant with ISO/IEC 14496-1 are also not handled. Therefore, the VB-C60 only delivers a stream with a single video track

F HTTP Uploading Specifications

The VB-C60 and VB-C500's HTTP uploading functions support the upload of both events and images. Once specified in the settings page, the HTTP server is accessed via HTTP with the specified arguments, and if the message details specify the attachment of images, video data can be uploaded.

The events that triggers uploading are set on the settings page, with "event".
The following three types of trigger events can be set:

- ✓ Motion detection
  This trigger issues an event if the image changes more than a certain set amount. It is also possible to issue an event while the change continues, or when the change stops. Use the VB management tool's motion detection setting tool to set parameters such as detection sensitivity and the time required to determine that a change has occurred.

- ✓ External device input
  This trigger issues an event when a sensor connected to the external device input terminal or another such sensor turns on. It is also possible to issue an event when the sensor turns off. The VB-C60 and VB-C500 can use both external device input 1 and input 2.

- ✓ Interval timer
  This trigger issues events at regular intervals. The following intervals may be specified. The timer starts from the point at which the setting item related to the interval timer is changed on the settings page.
  1 second, 3 seconds, 5 seconds, 10 seconds, 30 seconds
  1 minute, 3 minutes, 5 minutes, 10 minutes, 30 minutes
  1 hour, 3 hours, 6 hours, 12 hours, 24 hours

For details, refer to the VB-C60/VB-C500 user manual.

The destination setting items for uploading are shown below (refer to "upload" on the settings page).

- The uploading operation

Select either "Upload Disabled", "HTTP Upload", or "FTP Upload".

When "HTTP Upload" is selected, it will be possible to set the following items:

Message details	Select either "Notification Only with HTTP" or "Image attached Notification with HTTP".
URI	Specify the URI for HTTP access. Example: http://192.168.100.12:8080/cgi-bin/upload.cgi
User name:	User name.
Password:	Password. (If the specified URI requires user authentication, then specify the user name and password. Only basic authentication can be used.)
Proxy server:	Proxy server's host name or IP address.
Proxy port:	Proxy server's port number (Specify this when accessing the URI via an HTTP proxy server.)

Proxy user name: Proxy user name.
Proxy password: Proxy password.
(Specify the user name and password if the proxy server requires user authentication. Only basic authentication can be used.)

Parameter (query string): Specify the URI parameters to affix to the URI.
The specified parameters can be used as CGI query strings.
[Notes]
The URI parameters must specify an URI-encoded string (for details regarding URI encoding, refer to RFC2396 “Uniform Resource Identifiers (URI): Generic Syntax”).
Example: filename=img&sensorNo=1

Also note that parameters can use the following “% characters”:

%n	Reason for capture (number)	0 (Test) | 1 (Contact input 1) | 2 (Contact input 2) | 33 (Interval timer) | 130 (Motion detection [Area 1]) | 131 (Motion detection [Area 2]) | 132 (Motion detection [Area 3] | 133 (Motion detection [Area 4])
%N	Reason for capture (character string)	<External device input name (single-byte alphanumerics)> | <Motion detection area name 1/2/3/4] | NULL (Null character/interval timer test)
%X	Width of image	Number of pixels in horizontal direction
%Y	Height of image	Number of pixels in vertical direction
%C	Camera number	1
%D	Camera name	Setting for [Camera name (single-byte alphanumerics)]
%P	Pan position	-179.99 to 180.00 (VB-C500: fixed to 0)
%T	Tilt position	-179.99 to 180.00 (VB-C500: fixed to 0)
%Z	Zoom position	0.1 to 300.00 (VB-C500: 38 to 152)
%V	Camera server	VB-C60 (or VB-C500D)
%y	Year of capture time	2001 to 2031
%m	Month of capture time	1 to 12
%d	Day of capture time	1 to 31
%w	Day of week of capture time	0 to 6 (Sunday through Saturday)
%H	Hours of capture time	00 to 23
%M	Minutes of capture time	00 to 59
%S	Seconds of capture time	00 to 59
%s	Milliseconds of capture time	000 to 999
%z	Time zone of capture time	-1200 to +1300
%a	Weekday name of capture time	Sun | Mon | Tue | Wed | Thu | Fri | Sat
%b	Month name of capture time	Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec
%h	Host name	Host name or IP address

Messages Sent during Uploading

Uploads via HTTP are sent with GET or POST requests.

The “Notification” settings determine whether to use GET requests or POST requests.

a. When “Notification Only with HTTP” is selected

A message is set in the following format:

```
GET {URI’s setting value}?{parameter’s setting value} HTTP/1.1¥r¥n
        ...
User-Agent: Canon Network Camera VB/4.0¥r¥n
```

b. When “Image attached Notification with HTTP” is selected

A message is set in the following format:

```
POST {URI’s setting value}?{parameter’s setting value} HTTP/1.1
        ...
User-Agent: Canon Network Camera VB/4.0¥r¥n
Content-Type: image/jpeg¥r¥n
Content-Length: {JPEG image data length}¥r¥n
¥r¥n
{raw JPEG data}
```

[Notes]

◆ The method generally used to upload a file from the browser is as follows:
<input type="file" ...>
Note, however, that the method used to attach and upload VB-C60 and VB-C500 JPEG images is different.

◆ Notes regarding the main CGI creation language used are summarized below.

a. Perl CGI.pm package

- When a JPEG image is attached, the params() method cannot be used to retrieve URI parameters.
  Use the url_params() method instead.

- The JPEG image included in the POST request itself can be retrieved with param('POSTDATA').
  Example:

```
use CGI;
...
my $query = new CGI;

my $jpeg = $query->param('POSTDATA'); # retrieve the JPEG

open(JPG, ">", "sample.jpg") or die "error"; # Write to a file
binmode JPG;     # Specify binary mode for use under Windows
print JPG $jpg;
close(JPG);
```

b. Ruby’s CGI library

- When a JPEG image is attached, if CGI.new is used to generate a CGI object, the image data will be destroyed. Only use class methods, without generating CGI objects.

  For instance, it is possible to use the CGI.parse method to convert to a hash when acquiring the URI parameters, as shown below:

  Example:

```
require 'cgi'

params = CGI.parse(ENV['QUERY_STRING'])
```

  Read the JPEG image included in the POST request itself from standard input.

  Example:

```
$stdin.binmode              # Specify binary mode for use under Windows
jpeg = $stdin.read# Read from standard input
f = open("sample.jpg", "w")
f.binmode
f.write(data)
f.close
```

c. Python’s CGI module

- When a JPEG image is attached, if cgi.FieldStorage() is used to generate a FieldStorage object, the image data will be destroyed. Use functions such as parse_qs rather than generating a FieldStorage object.

  For instance, it is possible to use the parse_qs function to convert to a dictionary when acquiring URI parameters, as shown below:

  Example:

```
import os,cgi
params = cgi.parse_qs(os.environ['QUERY_STRING'])
```

- Read the JPEG image included in the POST request itself from standard input.

  Example:

```
import os,sys,cgi

jpeg = sys.stdin.read       # Read from standard input
f = open("sample.jpg", "w")
f.write(data)
f.close()
```

  *Process using binary mode as shown below in a Windows environment:

```
import os,sys

if sys.platform == "win32":
    import msvcrt
    msvcrt.setmode(sys.stdin.fileno(), os.O_BINARY)
```

```
jpeg = sys.stdin.read
f = open("sample.jpg", "wb")
f.write(data)
f.close()
```

G Summary of Differences among VB-C60/VB-C500 and Previous Models

Although the VB-C60 and VB-C500's WV-HTTP is basically upwardly compatible with VB-C300 and VB-C50i, the following changes have been made:

- The addition of a new command system
- The elimination of command limits on permanent connections
- Modified interpretations of a number of parameters
- Now ignores all undefined parameters
- Changed character encoding (changed to UTF-8)
- The ServerResponses header field was changed to VB/4.0
- The elimination of VideoMode, SessionMode, and GetStillImage commands

H VB-C300, VB-C60, VB-C500 Unsupported Commands

The VB-C300, VB-C60 and VB-C500 do not support the VideoMode, SessionMode, and GetStillImage commands. This appendix summarizes the specifications of these commands.

VideoMode

- Request

VideoMode connection_id=<connection identifier>
[mux=<multiplex parameter>]

<multiplex parameter>: This parameter specifies video input multiplexing. Either specify the camera with c1 to c4, or specify the bit sequence b4b3b2b1 to specify video transmission for each camera (when bi = 1, this transmits the video of camera i) using decimal notation. When this is omitted or 0 (c0), the default camera (the camera selected by the camera control system a) is used.

- Reply

Livescope-Status: 0
Content-Type: text/plain
mux=<multiplex parameter>

- Operation

This is the video stream multiplexing specification for when video input is multiplexed. Use the multiplexing parameter mux to specify the camera combination.

- Notes

This command is only supported by the VB150 in simultaneous mode. When the mux parameter is specified while the VB150 video input is in switching mode, a 402 Unknown parameter error results. Also, if none of the specified cameras can be used, a 403 Invalid Parameter Value error will result.

SessionMode

- Request

SessionMode connection_id=<connection identifier>
[mode=<session mode>]

<session mode>: Client end process specification using the SessionMode command Specify end process (0x8000), focus mode reset (0x4000), and exposure mode reset (0x2000) using OR and bits.

- Reply

Livescope-Status: 0
Content-Type: text/plain
mode=<session mode>

- Operation

Specifies postprocessing when the client disconnects (focus mode and exposure mode are returned to the server's setting value). When multiple clients execute this command, and when all of these clients disconnect, the details of the postprocessing are determined based on the specifications of the client that disconnects last.

- Notes

This command is available forVB150 and VB-C50i series.

GetStillImage

- Request

GetStillImage [camera_id=<camera number>]
[p|pan=<pan>]
[t|tilt=<tilt>]
[z|zoom=<zoom>]
[b|back_light=<backlight correction>]
[v|image_size=<video size>]
[q|quality=<video quality>]
[delay=<delay time>]
[timeout=<time out>]
[option|camera_control_option=<option>]

- Reply

Livescope-Status: 0
Livescope-Channel: <camera number>
Livescope-Frame-Number: 1
Content-Type: image/jpeg
<JPEG video data>

- Operation

This command retrieves a still image. It is possible to temporarily change the state of the video input system and the camera control system, cameras can be switched (camera_id) or controlled (p|pan, t|tilt, z|zoom, b|back_light), and the video size (v|image_size) and video quality (q|quality) can be specified. The execution of this

command is serialized based on camera control privileges. These camera control privileges are at a higher priority level than an ordinary client (priority level 3), and it is possible to forcefully take control privileges and quickly retrieve a still image. After the retrieval of the still image is complete, the state before the change is restored.

The delay parameter is used to specify the time to wait until the camera stabilizes, for when camera control causes exposure and focusing to be unstable. The time will vary depending on the photographic subject and the camera model, and when this is omitted, the settings page's "camera stabilization time" is used.

option|camera_control_option are the parameters that specify the operation when an error occurs during camera control privilege securement or camera control. It is possible to specify either quit_on_error or skip_on_error, to indicate either quitting or continuing, respectively. When this is omitted, operations proceed as if quit_on_error was specified.

The timeout parameter specifies the time limit for retrieval of the still image. Unlike GetLiveImage, since camera control and client serialization cause a delay, it is not possible to predict in advance how long it will take until the still image is retrieved. If it is necessary to ensure that still image retrieval process ends within a prescribed timeframe, it is possible to specify a time limit by using this parameter.

● Notes

This command can be used by the VB100, 101, 150, VB-C10, VB-C10R, and the VB-C50i series.

Livescope-Channel is only affixed by the VB150 and the VB-C50i series.

Undefined parameters are ignored. In simultaneous mode, the VB150 ignores the size specification (v|image_size) and video quality specification (q|quality).

I Command and User Access Restriction

Following is a list access restriction, which is required when executing each command of WV-HTTP protocol.

legend: ○: available
△: conditionally available
×: unavailable

1) Access restriction for new commands

Command	General user	Registered user (w/o privileged camera control)	Registered user (w/ privileged camera control)	Administrator
open.cgi	△(priority=0 only)	△(priority=0 only)	○(priority=1 or over canbe specified.)	○(priority=1 or over can be specified.)
close.cgi	○	○	○	○
claim.cgi	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
yield.cgi	○	○	○	○
session.cgi	△(priority=0 only)	△(priority=0 only)	○(priority=1 or over canbe specified.)	○(priority=1 or over canbe specified.)
image.cgi	△(Image Distribution privilege is required.)	△(Image Distribution privilege is required.)	○	○
video.cgi	△(Image Distribution privilege is required.)	△(Image Distribution privilege is required.)	△(Image Distribution privilege is required.)	△(Image Distribution privilege is required.)
info.cgi	○	○	○	○
panorama.cgi	○	○	○	○
control.cgi	△(Camera Control Privilege is required. Day/Night switching & External output controls are not available.)	△(Camera Control Privilege is required. Day/Night switching & External output controls are not available.)	○	○

2) Access restriction for compatible commands

Command	General user	Registered user (w/o privileged camera control)	Registered user (w/ privileged camera control)	Administrator
OpenCameraServer	△(priority=0 only)	△(priority=0 only)	○(priority=1 or over canbe specified.)	○(priority=1 or over canbe specified.)
CloseCameraServer	○	○	○	○
Priority	△(priority=0 only)	△(priority=0 only)	○(priority=1 or over canbe specified.)	○(priority=1 or over canbe specified.)
GetCameraControl	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
ReleaseCameraControl	○	○	○	○
GetOneShot	△(Image Distribution privilege is required.)	△(Image Distribution privilege is required.)	○	○
GetLiveImage	△(Image Distribution privilege is required.)	△(Image Distribution privilege is required.)	○	○
ChangeImageSize	△(Image Distribution privilege is required.)	△(Image Distribution privilege is required.)	○	○
GetProtocolVersion	○	○	○	○
GetCameraServerInfo	○	○	○	○
GetSystemInfo	○	○	○	○
GetVideoInfo	○	○	○	○
GetCameraInfo	○	○	○	○
GetCameraInfoEx	○	○	○	○
GetCameraList	○	○	○	○
GetPresetList	○	○	○	○
GetPanoramaList	○	○	○	○
GetPanoramaInfo	○	○	○	○
GetPanoramaImage	○	○	○	○
GetNotice	○	○	○	○
GetPTZSpeedInfo	○	○	○	○
SetPTZSpeed	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○

SelectCamera	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
OperateCamera	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
OperateCameraEx	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
OperateCameraOnScreen	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
Exposure	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
NightMode	×	×	○	○
CameraPosition	×	×	×	○
CameraControl	△(Camera Control Privilege is required.)	△(Camera Control Privilege is required.)	○	○
ExternalIOCaption	○	○	○	○
ExternalIOConfig	○	○	○	○
ExternalIOStatus	○	○	○	○
ExternalIO	×	×	○	○

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