Remote Camera
Settings Protocol Specifications

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1 Introduction

This document specifies the settings protocol, which is used for Canon remote cameras.

It is possible to use the settings protocol to view and update the settings items for Canon remote camera.

This document applies to the combinations of models and firmware versions listed below. As a general rule, the entire text of this document applies only to these combinations, unless otherwise specified.

Table 1-1 Combinations of Models and Firmware Versions to which This Document Applies

Model	Firmware Version
CR-N700	1.3.0
CR-N500	1.4.0
CR-N300	1.4.0
CR-N100	1.0.0
CR-X300	1.2.0

1.1 Use of this Document

This document is for developers of peripheral equipment and applications using the Canon remote cameras. Use of this document requires knowledge of application development.

1.2 Disclaimer

- This document is provided as is without any warranty of any kind. CANON has no responsibility or liability for any maintenance or support related to this document. The contents of the document may be changed without prior notice in the future.
- CANON will not bear any responsibility in the event of direct or indirect trouble caused by using the information in this document.
- CANON will not bear any responsibility for the programs created by using the information in this document.

1.3 Notation

The following notation and text formatting are used in this document.

"Courier New"	Indicates a code sample.
"Italic"	Indicates a parameter replaceable with an actual name or value.
"Verdana 0...50"	Indicates a parameter or setting value.
"<*Verdana*>"	Indicates a variable.
"**Note:**"	Indicates a special note or precaution.
"**!**"	Indicates an example of the occurrence of a phenomenon.
'*XXXXXX*'	Indicates a reference chapter or section and reference documents besides this document.

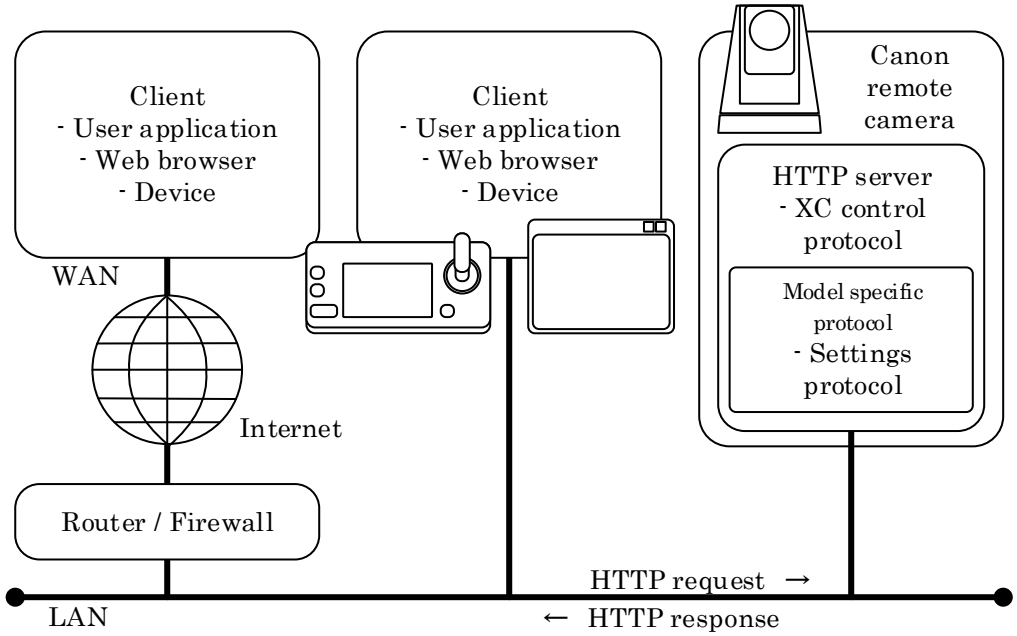
2 Terms

Terms	Description
802.1x Authentication	A method for authenticating users on LANs standardized by IEEE.
DDNS	An abbreviation of Dynamic Updates in the Domain Name System. **RFC2136** : https://www.rfc-editor.org/rfc/rfc2136
H.264 / H.265	The video encoding method standardized jointly by ITU-T and ISO/IEC. https://www.itu.int/rec/T-REC-H.264 https://www.itu.int/rec/T-REC-H.265
ISO 3166-1 alpha-2	This has been standardized by ISO as a country code using two Latin characters. https://www.iso.org/iso-3166-country-codes.html
ISO 639	An international standard for language codes that has been standardized by ISO. https://www.iso.org/iso-639-language-codes.html
JPEG	Digital video image compression method. Abbreviation of Joint Photographic Experts Group. Generally refers to the image data formed by using the JPEG compression method.
RTP	An abbreviation of Real-time Transport Protocol. **RFC1889** : https://www.rfc-editor.org/rfc/rfc1889 **RFC3550** : https://www.rfc-editor.org/rfc/rfc3550
RTCP	An abbreviation of Real-time Transport Control Protocol. **RFC3605** : https://www.rfc-editor.org/rfc/rfc3605
RTSP	An abbreviation of Real Time Streaming Protocol. **RFC2326** : https://www.rfc-editor.org/rfc/rfc2326

3 Protocol Overview

The settings protocol is one of the protocols that provides the function for viewing and updating the remote camera setting items.

The settings protocol is provided as an HTTP service of the remote camera.



4 Settings Protocol

4.1 Interface Specifications

The interface specifications of the settings protocol are described in the following order.

- System for transaction and session settings
- Structure of requests and responses
- Overview of protocol commands and syntax

4.1.1 Transactions and Sessions

The settings protocol specifies processes that should be executed in the following format. Each process that should be executed is called a “transaction”.

Syntax:

```
GET /admin/-set-?<transaction1>=<parameter1>
[&<transaction2>=<parameter2>…] HTTP/1.1
```

In the settings protocol, it is possible to read and write the various setting values for a combination of multiple transactions in a batch.

When executing a read or write for multiple setting values, if an error occurs during the process or a write from another client is executed at the same time, the integrity of the read values and the setting values on the camera may be lost.

In the settings protocol, the integrity of the setting values is ensured by grouping a series of transactions as a “session” and processing reads and writes in a batch.

Example:

```
GET /admin/-set-?ig00=1&ig01=0 HTTP/1.1
```

Note:

In the example, the two transactions that are writes of the specified settings “RTSP (ig00)” and “RTSP authentication method (ig01)” are grouped and published as one session.

4.1.1.1 System for Maintaining Session Integrity

Sessions operate based on the following procedure and system to maintain the integrity of a series of transactions.

- The client that starts the session is identified by its IP address. *1
- Parallel sessions are not allowed. If a session has been established already and then there is a request by another client (IP address) to start a session (OPEN), the new request is denied.
- If a setting value is changed (WRITE) before a session starts, the session starts implicitly.
- Updates (WRITE) by each transaction during a session are temporarily performed for the work area. They are reflected in the main settings when saving the session (SAVE).
- Integrity between the results of setting operations by each transaction is verified by automatically running a settings change verification (VERIFY) when saving (SAVE) a series of setting operations.
- The session closes when you finish saving (SAVE) a series of setting operations or when you finish discarding a series of setting operations (CLOSE).

It is possible to view setting values that have not been updated without starting a session. In addition, locking is not performed based on sessions in which setting is being performed.

Note:

*1 When there is an HTTP proxy between the remote camera and the client, the proxy IP address is recognized by the remote camera as the IP address of the client.

If the IP address is not fixed in the proxy settings, due to a multiplexed HTTP proxy for example, an unexpected (as a different client) lock may occur.

4.1.1.2 Transaction Type

The following transaction types are defined. Sessions are built by using transactions to view and update a series of setting values.

Table 4-1 Transaction Type

Transaction Type	Transaction Command	Description
Start session	OPEN	Intentionally starts a session. **Note:** It is possible to schedule a session before executing a WRITE.
View setting values	READ	Views setting values in the work area.
Change setting values	WRITE	Changes setting values in the work area. **Note:** If OPEN has not been executed, the session starts automatically.
Verify setting change details	VERIFY	Checks the integrity of a combination of setting values. **Note:** It is possible to intentionally execute a check before executing a SAVE.
Save setting change details	SAVE	Performs a VERIFY and saves setting values if there are no errors. **Note:** Automatically performs a REBOOT when items requiring a reboot are updated.
Discard session	CLOSE	Discards settings changes in the work area and closes the session. **Note:** This can also be executed by a client other than the session owner.
Reboot	REBOOT	Restarts the remote camera.
Restore initial settings	REVERT	Returns the setting values to the factory default settings, and restarts.

4.1.2 Request

In the settings protocol, setting values are viewed and updated using settings protocol parameters that show the transaction type. Settings protocol parameters are received by the HTTP server for the remote camera as parameters for an HTTP request.

- The settings protocol complies with HTTP/ 1.1, HTTP/2 and CGI/1.1.
- It is possible to use `GET` or `POST` as an HTTP method.
- The URI is made from settings protocol parameters that start with "`/admin/-set-`".
- Basic authentication or Digest authentication is required for system administrators.

Syntax:

```
GET /admin/-set-?<Name1>=<Value1>[&<Name2>=<Value2>…] HTTP/1.1
```

4.1.3 Response

The results from viewing and updating setting values in the settings protocol are sent as an HTTP response from the HTTP server for the remote camera.

The settings protocol response is made up of the HTTP status and five processing results.

- Status
- Server errors
- Parameter errors
- List of viewed setting values
- Reboot information

Syntax:

```
HTTP/1.1 200 OK
Pragma: no-cache
Cache-Control: no-cache
Accept-Ranges: none
Content-Type: text/plain; charset=utf-8          *1
Content-Length: <MessageBodyLengthValue>
Date: <TimeStamp>
Server: VB
<blank Line>
Status=<StatusCode>                              *2
[ServerError=<ErrorCode>[,<ErrorCode>]]          *3
[SettingError=<ErrorCode>[,<ErrorCode>]]         *4
[Typ<Name1>=<DataType1>]
[Val<Name1>=<Value1>]                            *5
reboot=[<NeedsReboot>]                           *6
END
```

Note:

*1 `Content-Type` is always "`text/plain; charset=utf-8`" and the end of the line is LF (line feed) with no CR (carriage return).

*2 For information about `Status`, see '*4.1.3.2 Status*'.

*3 The return of a `ServerError` is determined based on the value of `Status`. For details, see '*4.1.3.3 Server errors*'.

*4 The return of a `SettingError` is determined based on the value of `Status`. For details, see '*4.1.3.4 Parameter errors*'.

*5 URL encoding is performed on returned setting values.

*6 For information about `reboot`, see '*4.1.3.5 Reboot Information*'.

4.1.3.1 HTTP Status

The processing results for HTTP protocol levels are returned as the HTTP status.

The main return values and a description of these values are shown below.

Table 4-2 HTTP Status

HTTP Status	Description
200 OK	Request was processed normally.
304 Not Modified	Data is not modified.
400 Bad Request	Request is invalid.
401 Unauthorized	User authentication failed.
404 Not Found	Resource corresponding to requested URI does not exist.
411 Length Required	`Content-Length` is not specified.
500 Internal Server Error	Request denied due to internal processing error.
503 Service Unavailable	Request denied due to temporary overload.

4.1.3.2 Status

Status is a message body item that shows an error that has occurred in transaction processing when a request is processed at the HTTP protocol level.

When an error is reported in Status, the HTTP status is returned as "200 OK". The status return values and meanings are shown below.

Table 4-3 Status

Status	Description	
0 Success	Processed normally.	**Note:** Server errors and parameter errors are not returned.
1 Server Error	Server errors	**Note:** A server error value is returned.
2 Parameter Error	Parameter errors	**Note:** A parameter error value is returned.

4.1.3.3 Server errors

A server error is a message body item that is returned when an error occurs in command processing. If multiple errors occur, errors are listed using ',' separation.

The return values and meanings are shown below.

Table 4-4 Server Errors

Server errors	Description
4 : Unknown CGI parameter	An unknown CGI parameter was specified. *1
5 : Conflict CGI access	An OPEN, WRITE, or SAVE transaction was locked by a session on another client. *2
6 : Unknown Element	An unknown setting item was specified in a READ transaction. *3
7 : Can't allocate memory	Could not secure work memory. *2
9 : Subscript is over maximum	The subscript specified in the array-type setting variable for a WRITE or WRCHECK transaction exceeds the maximum number of arrays. *3/*4

Note:

*1 Errors in transaction type and session identifier values also result in this error.
Parameters are added to error messages using parentheses.

*2 In this case, all transactions are invalid, including READ.

*3 Operations for these setting items are ignored, but other setting items and transactions are processed. Even if "Show Setting Values" is specified in the error message setting (em), the inputted value for this item is not outputted for security reasons.

For information on the error message setting (em), see '*4.2.8 Error Message Settings (em)*.

*4 If you specify a value that exceeds the maximum integer (2147483647), it results in "4:Unknown CGI parameter".

4.1.3.4 Parameter errors

Parameter errors are message body items that show errors that have occurred when processing verification of setting change details for setting values specified in the settings protocol. If multiple errors occur, errors are listed using ‘,’ separation.

There are two types of parameter error: “single-item errors” and “combination errors”.

- In the process for verifying setting change details, errors detected in checks based on the data type are “single item errors”. *1
- In the process for verifying setting change details, errors detected in integrity checks for combined setting items are “combination errors”. *2

Note:

*1 When there is a single-item error, setting values in the work area are not updated and other transaction processes are not affected.

*2 When there is a combination error, the setting item is not necessarily restored when the error is detected because a check is performed for the updated setting value in the work area.

SAVE is not successful while there is a combination error because SAVE transactions implicitly execute a VERIFY.

The following shows the return value, message, and description.

Table 4-5 Parameter Errors

Parameter errors	Description
C000:read only	Single-item error: Constant error A change in value was specified for an item that cannot be changed
C001:not specified	Single-item error A null value was specified for a required setting item
C002:invalid format	Single-item error The value which does not match the data type of the setting item was specified.
C003:out of range	Single-item error The setting item has a range limit and the specified value is out of the range
C004:illegal value	Combination error *1 The value which does not match the format of the setting item was specified.
C005:illegal combination	Combination error An inconsistency was detected in the combination of setting items

Parameter errors	Description
C006:duplicate value	Combination error The same value was specified for more than one item that does not allow duplication
C007:inconsistent value	Combination error A setting value that contradicts another setting item was detected
C008:password unacceptable	Single-item error: Administrator password item *2 The administrator password and the confirmation input did not match
C009:system file not found	Combination error Did not find the required system file in the setting
C021:string too long	Single-item error: string setting item The specified string exceeds the upper limit
C022:illegal characters	Single-item error: string setting item The specified string contains a character that is not allowed *3
C023:string too short	Single-item error: string setting item The specified string falls below the lower limit
C024: invalid user name	Single-item error: An invalid user name was specified in the user name
C025: password strength is too weak	Single-item error: A weak password was specified
C201:too many list entries	Single-item error: list setting item The number of specified list setting items exceeds the upper limit
C601:too many user entries	Single-item error: user list item The number of specified user setting items exceeds the upper limit
C602:invalid user name is found	Single-item error: user list item An invalid user name was specified in the user setting item *4
C603:invalid password is found	Single-item error: user list item An invalid password was specified in the user setting item *5
C611:access from all hosts is prohibited	Single-item error: host list item The specified value does not allow access to all hosts
C612:too many access control entries	Single-item error: host list item The number of access control setting items exceeds the upper limit
C613:incorrect address is found	Single-item error: host list item An incorrect address was specified in the access control setting item
C616:duplicate entries are found	Single-item error: host list item Duplicate access control setting items were specified
C619:user name and password are duplicated	Single-item error: user list item Duplicate user name and password were specified in the user setting item

Note:

*1 This applies when there is a format error in the IP address value or subnet mask value, or the host portion of the IP address or default gateway is all 0 or all 1.

*2 Even if "Show Setting Values" is specified in the error message setting (em), the inputted value for this item is not outputted for security reasons.

For information on the error message setting (em), see '*4.2.8 Error Message Settings (em)*'.

*3 This applies when each string type contains a character that cannot be specified.

e.g. The DDNS host name (host type) contains a '*'.

*4 This applies when the user name (name type) of the uaccent type (name type = pass type) contains a character that cannot be specified.

e.g. The user name for the access control (name type) contains a '@'.

*5 This applies when the password (pass type) of the uaccent type (name type = pass type) contains a character or character code that cannot be specified.

e.g. The password (pass type) for access control contains a control code (such as CR(13)).

4.1.3.5 Reboot Information

Reboot information is a message body item that shows whether there has been a change to a setting item that requires a reboot in order to apply the value. It is appended immediately before the end string of the response, "END" to a SAVE or WRCHECK '*4.2.1.1.2 Check Setting Details (WRCHECK)*' request.

The reboot information values and their meanings are shown below.

Table 4-6 Reboot Information

Reboot information	Description
0	Setting items that require a reboot in order to apply the value have not been changed.
1	Setting items that require a reboot in order to apply the value have been changed.

Example: Reboot required

```
HTTP/1.1 200 OK
・・・
Status=0
reboot=1
END
```

4.1.4 Structure of the Settings Protocol

The settings protocol is made up of one command, and individual requests are expressed using parameters.

4.1.4.1 Syntax for the Settings Protocol

The settings protocol command is made up of the command name and parameters. The syntax requirements for specifying command names and parameters are shown below.

- The command name is in the format "`-set-`".
- Command names and parameters are separated using '?'.
- The parameter is in the format "*<Name>=<Value>*".
- When specifying multiple parameters, use the '&' separator in the URI query string. *1
- The parameter performs URL encoding. *2
- There are no limitations in the order of parameter specification. *3

Note:

*1 It is possible to also use the same separator as `GET` in the body of `POST` messages.

2 Alphanumeric characters (0-9, A-Z, a-z) and '' (asterisk), '-' (hyphen), '.' (period), '@' (at symbol), and '_' (underscores) are not converted.
A single-byte space is converted to a '+' (plus) and other characters are converted by the byte to '%' + hexadecimal double-digit notation.

*3 If the same parameter is specified multiple times, the last specified parameter is used, unless that parameter can be specified multiple times.

Example:

```
http://192.168.100.1/admin/-set-?ig00=1&pt=4&em=2
```

4.2 Command Specifications

The command specifications for the settings protocol are explained below.

4.2.1 Types of Transactions (pt)

The type of transaction to request is specified by the "pt" parameter. For the "transaction types" in '*4.1.1.2 Transaction Type*', the methods for specifying the actual command parameters are shown below.

- WRITE is not specified for this transaction type. Specify it using the "pa" transaction attribute.
- READ is not specified for this transaction type. Specify it using the "el" setting value view and the "tl" setting type view.

The transaction types specified with "pt" and their details are shown below.

Table 4-7 Transaction Type (pt)

Transaction Type	Pt	Transaction Command	Description
None	0	NONE	No action *1
Start session	1	OPEN	Starts a session.
Verify setting change details	2	CHECK	Checks the integrity of a partial combination of setting values. *2
Verify setting change details	3	VERIFY	Checks the integrity of a complete combination of setting values.
Save setting change details	4	SAVE	Saves the setting value (Executes an implicit VERIFY).
Discard session	5	CLOSE	Discards settings changes and closes the session.
Reboot	6	REBOOT	Reboot (Executes an implicit CLOSE)
Restore initial settings	7	REVERT	Recovers the factory default settings (Executes an implicit REBOOT).
Forced settings change	8	COMPL	Continuous execution of CLOSE + WRITE + SAVE
Check setting details	9	WRCHECK	Check WRITE parameter

Note:

*1 Can be specified in combination with READ. Does not need to be specified.

*2 The action is the same as VERIFY (complete check) for this model.

4.2.1.1 Commands

Syntax:

```
http://<ipaddress>/admin/-set-?pt=<Value>
```

The details of types that combine the actions of multiple transactions are shown below.

4.2.1.1.1 Forced Change of Settings Details (COMPL)

COMPL is a transaction that combines CLOSE, WRITE, and SAVE. CLOSE removes conflicts with other transactions, and executes a setting value change and save all at once.

- If COMPL is specified without specifying WRITE with the transaction attribute (pa) '*4.2.2 Transaction Attributes (pa)*', CLOSE and SAVE cannot be executed.
- If an error occurs in the VERIFY that is implicitly performed when a WRITE or SAVE is executed, the WRITE or SAVE is not completed, but a CLOSE is executed.
- If an error occurs in the VERIFY, SAVE is not completed, but the session that started with the WRITE remains ESTABLISHED. Note that the setting values updated in the work area are retained.

4.2.1.1.2 Check Setting Details (WRCHECK)

The WRCHECK transaction is a transaction that checks WRITE parameters. It performs WRITE-equivalent processes but does not change setting values.

It is possible to check whether there are any problems with change details if you perform this transaction before making the changes. It is possible to also retrieve the setting items and setting values for which an error message or error occurred by combining this with '*4.2.8 Error Message Settings (em)*'.

- The setting value is not changed, but WRITE-equivalent processes are performed. Therefore, if there is a conflict with another transaction, it is locked.

4.2.1.2 Protocol example

■ Normal

```
GET /admin/-set-?pt=4&ha03=20 *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
reboot=0
END
```

Note:

*1 This is an example of changing the setting item, "Maximum number of clients (ha03)", to 20 and saving it.

4.2.2 Transaction Attributes (pa)

Append the attribute parameter "pa" to the transaction type and controls the transaction behavior. The transaction attributes and their details are shown below.

Table 4-8 Transaction Attributes

Transaction Attribute	pa	Target Transaction	Description
Forced session start	h	OPEN, WRITE	Force starts when there are no changes to setting values
Restrict session start	p	WRITE, SAVE, CLOSE	Processing is not allowed while a session is not started
Maintain session	s	SAVE	Maintains the session even after the setting value has been saved

4.2.2.1 Commands

Syntax:

```
http://<ipaddress>/admin/-set-?pt=<Value>&pa=<Value1>[<Value2>…]
```

- For "pa", it is possible to specify multiple attributes at the same time.
  e.g. "pa=ps" Specifies the restrict session start 'p' and the maintain session 's'.
- Attribute values that are outside of the targets are ignored in the executed transaction.
- Even if you specify an attribute value that is undefined, it will be ignored and an error will not occur.

4.2.3 Session Identifier (id)

IP addresses are used to identify each client, but it is possible to also use the "id" session identifier to explicitly specify an IPv4 address.

4.2.3.1 Commands

Syntax:

```
http://<ipaddress>/admin/-set-?pt=<Value>&id=<ipaddress>
```

- Specify the setting value with an IP address in decimal notation.
- If you specify a value that cannot be interpreted as an IP address, such as "0.0.0.0" or "255.255.255.255", an error occurs and all transactions for that session are discarded.
- If you specify a session identifier, it is given priority over IP addresses detected in the IP layer when evaluating.
- Session identifiers are evaluated only in OPEN, WRITE, and SAVE transactions. They are ignored in other non-target transactions.

4.2.4 View Setting Value (el)

View setting value is the READ transaction which specifies the parameter "el".

4.2.4.1 Commands

Syntax:

```
http://<ipaddress>/admin/-set-?el=<Name1>[,<Name2>…]
```

- For information regarding the item name definitions for setting items, see '*4.4 Specifications for View/Setting Information Items*'.
- It is possible to omit the subscript specification for array-type setting items. In this case, it is assumed that all array elements have been specified.
- It is impossible to specify subscript for non-array-type setting items.
- It is possible to specify "el=*". In this case, it is assumed that all setting items have been specified.

4.2.4.2 Response

Syntax:

```
HTTP/1.1 200 OK
・・・
Val<Name1>=<Value1>
Val<Name2>=<Value2>
・・・
END
```

- The "Val" prefix, which shows a view of the setting value, is attached to the returned item name.

4.2.4.3 Protocol Example

■ Viewing the setting value

```
GET /admin/-set-?el=ha03,ha06            *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
Valha03=30
Valha06=0
END
```

Note:

*1 This is an example of retrieving the setting values for the “Maximum number of clients (ha03)” and “Maximum connection time (ha06)” setting items.

■ Viewing array items

```
GET /admin/-set-?el=ip10                    *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
Valip10-0=192.168.100.1                     *2
Valip10-1=192.168.100.2
Valip10-2=192.168.100.3
Valip10-3=192.168.100.4
Valip10-4=192.168.100.5
Valip10-5=192.168.100.6
Valip10-6=192.168.100.7
Valip10-7=192.168.100.8
Valip10-8=192.168.100.9
Valip10-9=192.168.100.10
Valip10-10=192.168.100.11
Valip10-11=192.168.100.12
Valip10-12=192.168.100.13
Valip10-13=192.168.100.14
Valip10-14=192.168.100.15
Valip10-15=192.168.100.16
Valip10-16=192.168.100.17
Valip10-17=192.168.100.18
Valip10-18=192.168.100.19
Valip10-19=192.168.100.20
END
```

Note:

*1 This is an example of acquiring the setting item "Host access-restricted network address (ip10)". The network address is a reference example.

*2 Since the setting item “Host access -restricted network address (ip10)” is an array-type setting item, all array values reply in “`el=ip10`”.

To retrieve individual values, you need to specify an array element subscript (an integer of 0 or more) at the end, such as “`el=ip10-2`”.

For information about array types, see ‘*4.3 Data Type Specifications*’.

■ Viewing the elements of array items

```
GET /admin/-set-?el=ip10-2                *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
Valip10-2=192.168.100.3
END
```

Note:

*1 This is an example of acquiring the third network address (subscript: 2) of setting item "Host access -restricted network address (ip10)"

4.2.5 View Setting Type (tl)

View setting type is the READ transaction for which the "tl" parameter is specified.

4.2.5.1 Commands

Syntax:

```
http://<ipaddress>/admin/-set-?tl=<Name1>[,<Name2>…]
```

- "tl" is used in the same way as view setting value "el".

4.2.5.2 Response

Syntax:

```
HTTP/1.1 200 OK
・・・
Typ<Name1>=<DataType1>
Typ<Name2>=<DataType2>
・・・
END
```

- The "Typ" prefix, which shows a view of the setting type, is attached to the returned item name.
- For information on returned data types, see '*4.3 Data Type Specifications*'.
- For information regarding the item type definitions for setting items, see '*4.4 Specifications for View/Setting Information Items*'.

4.2.5.3 Protocol Example

■ Viewing the setting type

```
GET /admin/-set-?tl=ha03,ha06            *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
Typha03=int%280%2C30%29                  *2
Typha06=int%280%2C65535%29               *3
END
```

Note:

*1 This is an example of retrieving the setting types for the "Maximum number of clients (ha03)" and "Maximum connection time (ha06)" setting items.

*2 "int%280%2C30%29" is the URL encoding result for "int(0,30)".

*3 "int%280%2C65535%29" is the URL encoding result for "int(0,65535)".

4.2.6 Language Setting (lg)

The encoding schema for multibyte strings (unicode type) used in settings protocol requests and responses is UTF-8. This language setting is specified using "lg" and two ISO 639 letters. It is possible to use "lg" to specify the language of unicode type (*1) setting items. The language setting values are shown below.

Table 4-9 Language Settings

Language Setting Value lg	Description
en	English (default)
ja	Japanese

Note:

*1 As the unicode-type setting item, there is "Camera name (db02)". For information on unicode types, see '*4.3 Data Type Specifications*'.

4.2.6.1 Commands

Syntax:

```
http://<ipaddress>/admin/-set-?lg=<Language>&<Name1>=<Value1>…
```

- Language setting values are not case-sensitive.
- If the language setting is omitted or an invalid setting value is entered, the language setting will be interpreted as being the default setting of English.
- The language setting for a string is not checked. If you set English and specify a string in another language such as Japanese, it will not result in an error.
- If you execute a READ for a setting item using a language setting that is different from the WRITE language setting, the resulting READ value is a null value.
- The HTTP `Accept-Language` header field is ignored.

4.2.7 Changing Setting Values

WRITE does not require a specification to show the transaction type. It directly specifies a setting item for "*<Name>*" in the format "*<Name>=<Value>*".

4.2.7.1 Commands

The syntax for specifying a setting item is a simple-type (non-array type) to point to one value, and an array type to point to an array element.

■ Simple type

A simple-type (non-array type) setting item that points to one value is specified with "*<Name>*".

Syntax:

```
http://<ipaddress>/admin/-set-?<Name1>=<Value1>[&<Name2>=<Value2>…]
```

Example:

```
http://<ipaddress>/admin/-set-?ca01=192.168.100.1
```

■ Array type

An array-type setting item that points to an array element is specified with "*<Name>-<Index>*".

Syntax:

```
http://<ipaddress>/admin/-set-?<Name1>-<Index1>=<Value1>
[&<Name1>-<Index2>=<Value2>…]
```

Example:

```
http://<ipaddress>/admin/-set-?pt=4&db02-0=Camera
```

- For information regarding the item name definitions for setting items, see '*4.4 Specifications for View/Setting Information Items*'.
- It is impossible to omit the subscript specification for array-type setting items.
- It is impossible to specify subscript for non-array-type setting items.
- If the setting value "*<Value>*" is a numerical type, the leading whitespace is ignored.
  e.g. "ha03=␣10" is the same as "ha03=10".
- If the setting value "*<Value>*" is a numerical type, a trailing whitespace is treated as a format error and "C002:invalid format" is returned.
  e.g. "ha03=10␣" is a format error for a numerical value.
- If the setting value "<Value>" is not a numerical type, leading and trailing whitespaces are treated as a value.
  e.g. "db02-0=camera", "db02-0=␣camera", and "db02-0=camera␣" are different values.

4.2.7.2 Protocol Example

■ Setting simple types

```
GET /admin/-set-?em=2&pt=4&ha03=10                    *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
reboot=0
END
```

Note:

*1 This is an example of setting the "Maximum number of clients (ha03)" setting item to 10.

■ Setting an array-type element

```
GET /admin/-set-?em=2&pt=4&ip10-3=192.168.100.30    *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
reboot=0
END
```

Note:

*1 This is an example of setting the network address "192.168.100.30" to the 4th (subscript: 3) of setting item "Host access -restricted network address (ip10)".

■ Setting a multi-byte character for a simple-type

```
GET /admin/-set-?em=2&pt=4&db02-0=%E3%82%AB%E3%83%A1%E3%83%A9  *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=0
reboot=0
END
```

Note:

*1 This is an example of setting "Camera" for the "Camera name (multibyte characters) (db02-0)" setting item.

4.2.8 Error Message Settings (em)

These settings specify the output level for error messages that show transaction processing results and the details of errors that have occurred. In the error message setting, specify the "em" parameter.

The error message setting values are shown below.

Table 4-10 Error Message Settings

Error Message Setting Value em	Description
0	No message displayed (default value)
1	Message displayed (No setting item name displayed)
2	Message displayed (Setting item name and setting value are displayed)
3	Error number displayed (Setting item name displayed)

4.2.8.1 Commands

Syntax:

```
http://<ipaddress>/admin/-set-?em=<Value>
```

4.2.8.2 Response

Syntax: [em=0] No message displayed

```
HTTP/1.1 200 OK
・・・
Status=<TransactionStatus>
[ServerError=<ErrorCode>[,<ErrorCode>]]
[SettingError=<ErrorCode>[,<ErrorCode>]]
・・・
END
```

Syntax: [em=1] Message displayed (No setting item name displayed)

```
HTTP/1.1 200 OK
・・・
Status=<TransactionStatus>
[ServerError=<ErrorCode>:<ErrorMessage>[,<ErrorCode>:<ErrorMessage>]]
[SettingError=<ErrorCode>:<ErrorMessage>[,<ErrorCode>:<ErrorMessage>]]
・・・
END
```

Syntax: [em=2] Message displayed (Setting item name displayed)

```
HTTP/1.1 200 OK
・・・
Status=<TransactionStatus>
[ServerError=<ErrorCode>:<ErrorMessage>(<Name>=<Value>)[,<ErrorCod
e>:<ErrorMessage>(<Name>=<Value>)]]
[SettingError=<ErrorCode>:<ErrorMessage>(<Name>=<Value>)[,<ErrorCo
de>:<ErrorMessage>(<Name>=<Value>)]]
・・・
END
```

4.2.8.3 Protocol example

■ **[em=0]** No message displayed

```
GET /admin/-set-?em=0&pt=4&ha03=100                    *1


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=2
SettingError=C003
reboot=0
END
```

Note:

*1 This is an example of setting the "Maximum number of clients (ha03)" setting item to 100.

■ **[em=1]** Message displayed (No setting item name displayed)

```
GET /admin/-set-?em=1&pt=4&ha03=100


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=2
SettingError=C003%3Aout+of+range                    *1
reboot=0
END
```

Note:

*1 "C003%3Aout+of+range" is the URL encoding result for "C003: out of range".

■ **[em=2]** Message displayed (Setting item name displayed)

```
GET /admin/-set-?em=2&pt=4&ha03=100


HTTP/1.1 200 OK
Content-Type: text/plain; charset=utf-8
・・・
Server: VB

Status=2
SettingError=C003%3Aout+of+range%28ha03%3D100%29     *1
reboot=0
END
```

Note:

*1 "%28ha03%3D100%29" is the URL encoding result for "(ha03=100)".

4.3 Data Type Specifications

The value formats and ranges for each setting item are specified for each setting value that is handled by the settings protocol. When changing settings, the values are checked based on the rules for that item. The settings protocol data types and data type notation specifications are explained below.

■ Numerical value types:

There are 'int' decimal types and 'fixed' fixed-point types. The minimum value and maximum value sets (min, max) are added to the type name and shown as int(-5, 5) or fixed(0.00, 10.00).

The maximum value for int and uint are shown as '-'.

Table 4-11 Data Type Specification - Integer Type

Type	Description
int	Signed decimal integer type, maximum value 2147483647 e.g. int(-65536, 65535) int(10, -)
uint	Unsigned decimal integer type, maximum value 4294967295 e.g. uint(0, 256) uint(256, -)
fixed	Signed decimal fixed point number type e.g. fixed(-270.00, 270.00)
boolean	Logical **Note:** Same as int(0, 1)

■ Bit type:

'hex' specifically states the maximum number of bytes. For example, it is shown as hex[4]. It is possible to set a bit string with less than the maximum number of bytes.

Table 4-12 Data Type Specification - Bit Type

Type	Description
hex	Hexadecimal. Setting values can be omitted by the byte. e.g. hex[24]: 24Byte

■ **Obfuscated password type:**

Hexadecimal string corresponding to bit string with obfuscated password. A combination of the minimum and maximum character lengths (min,max) after obfuscation cancellation is added to the type name as the character length range specification and is expressed as hpass[36](8,32).

Table 4-13 Data Type Specification - Obfuscated Password Type

Type	Description
hpass	Obfuscated password type e.g. hpass[36](8,32)

■ **Camera control parameter type:**

Types include 'coord', which is used in the pan/tilt range and the shooting range for the visibility range, and 'scope', which is used in the zoom range.

Table 4-14 Data Type Specification - Camera Control Parameter Type

Type	Description
coord	Coordinates **Note:** Same as fixed(-179.99, 180.00)
scope	Hexadecimal (Setting values can be omitted by the byte) **Note:** Same as fixed(0.01, 300.00)

■ **Video transfer parameter type:**

As the data type representing the video resolution range, there is vscale. The element is represented by adding a pair of minimum value, min, and maximum value, max (min, max) using "x". The combined format is represented by "width" x "height", where "width" represents the width of the video while "height" represents the height of the video.

Table 4-15 Data Type Specification - Video Transfer Parameter Type

Type	Description
vscale	Resolution type **Note:** vscale(640x360, 3840x2180)

■ **Character string type:**

The type name is defined according to the application, and the character set for each type is different. They are all single-byte characters, the maximum length is explicitly shown, and they are expressed as pass[15], mail[63] (multi-line strings are [line length x number of lines]).

Table 4-16 Data Type Specification - Character String Type

Type	Description
name	Name **Note:** Range (alphanumeric character, '-', and '_')
pass	Password **Note:** Range (0x20 to 0x7E) The character length specified range may be added and expressed as pass[31](8,31).
host	Host name **Note:** Range (alphanumeric character, '-', '_', '.', and ':')
mail	E-mail address **Note:** Range (alphanumeric character, '-', '_', '.', ':' and '@')
atext	Sentence **Note:** Range (0x20 to 0x7E, ¥t, ¥r, and ¥n)
uri	URI type **Note:** Range (0x21 to 0x7E)
const	Constant **Note:** A return-specific item type that cannot be changed
uname	User name **Note:** Range (alphanumeric character, '-' and '_' (except first character))

■ **Name type:**

Used for applications such as the camera name and preset names. The character set for each is different and type names are defined for each character set.

Table 4-17 Data Type Specification - Name Type

Type	Description
ascii	ASCII **Note:** Range (0x20 to 0x7E) Except for ' " ' (double quotation marks)
char	CHARACTER **Note:** Range (0x20 to 0x7E)
unicode	UNICODE **Note:** Multibyte strings with UTF-8 encoding
nchar	NCHARACTER type **Note:** Range (0x20 to 0x7E) Except for ',' (comma)

Example: Camera name (multibyte characters) (db02-0) unicode

```
GET /admin/-set-?db02-0=%E3%82%AB%E3%83%A1%E3%83%A9 HTTP/1.1
```

■ **Date and time type:**

date is used to set the expiration period of SSL and the date. time is used to set the time.

Table 4-18 Data Type Specification - Date Time Type

Type	Description
date	Date type "yyyymmdd" notation **Note:** Range (20010101 to 20311231)
time	Time type "hhmmss" notation **Note:** Range (000000 to 235959)

■ **Network address type:**

Used to set network IP addresses. It is possible to specify both IPv4/v6 but setting items are prepared individually.

Table 4-19 Data Type Specification - Network Address Type

Type	Description
inaddr	IPv4 address type "xxx.xxx.xxx.xxx" decimal notation **Note:** It is impossible to specify 0.0.0.0 or 255.255.255.255.
inaddr6	IPv6 address type "xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx" hexadecimal notation **Note:** It is possible to omit a sequence of zeros. For example, fd00::1.
inaddrx	IPv4 / IPv6 address shared type **Note:** The notation is based on inaddr and inaddr6.
mcaddrx	IPv4 / IPv6 address shared type **Note:** The notation is based on inaddr and inaddr6.

■ **Local port type:**

Local port number. It is the same as int(1,65535). However, it has a unique value in the server, and multiple local port type setting values cannot have the same value.

Table 4-20 Data Type Specification - Local Port Type

Type	Description
lport	Local port
hport	HTTP port **Note:** It is possible to only specify 80 or 1024 to 65535.
hsport	HTTPS port **Note:** It is possible to only specify 443 or 1024 to 65535.
rport	RTSP port **Note:** It is possible to only specify 554 or 1024 to 65535.
mcport	RTSP Multicast port **Note:** It is possible to only specify even numbers in the range of 1024 to 65535.
amcport	Audio Multicast port **Note:** It is possible to only specify 1024 to 65530.

■ **User account type:**

Management list element type for registered users.

Expressed in the format "username" or "username=<*password*>" ("username" is a name type and "<*password*>" is a pass type). Specify the "<*password*>" portion as a numeric string in ASCII character encoding, showing the name characters as three-digit decimals. It is impossible to view the set password.

Table 4-21 Data Type Specification - User Account Type

Type	Description
uaccent	User account type e.g. "username=112097115115119111114100" "password"
obuaccent	User account type "username" is a name type and "password" is an hpass type. Set an obfuscated password for "password".

■ **Record type:**

This is a general composite data type that uses a ":" separated format to combine multiple elements. The element type can be used to combine different types, such as "date:time" or "coordinate vertex aggregation" in other defined elementary data types. It is impossible to omit elements.

Table 4-22 Data Type Specification - Record Type

Type	Description
record( )	Record e.g. record(date, time) Date:time ("20130930:144820")

Example: Date and time (bc20) record(date, time)

```
GET /admin/-set-?bc20=20140123%3A150333 HTTP/1.1
```

■ List type:

This is a general composite data type that uses a ',' separated CSV format to combine multiple elements. The element type can be used as a variable length list for the same type, in an elementary data type or record type. The maximum number of items is added to the type and expressed as uaccent <15>. Element duplication and order are not defined in the type.

Table 4-23 Data Type Specification - List Type

Type	Description
< >	List e.g. uaccent<15> User (+ password) List

Example: Domain name (ib23) host[63] <6>

```
GET /admin/-set-?pt=4&ib23=domain1%2Cdomain2 HTTP/1.1
```

Note:

"domain1%2Cdomain2" is the URL encoding result for "domain1,domain2".

■ Array type:

Array types with multiple elements are shown as a number of array elements rather than expressed as a data type. Access to array-type items is specified by appending the "-N" subscript to the information item name. Note that some information items only have one element.

Table 4-24 Data Type Specification - Array Type

Type	Description
Number of array items	Array type e.g. ip10-0=192.168.100.1 Host access -restricted network address

4.4 Specifications for View/Setting Information Items

Information items that can be viewed/set in READ/WRITE transactions of the settings protocol specifications are explained by function.

Notation item List of attributes:

Each information item has different behaviors depending on the role, such as items that can only be viewed, items that can be viewed and updated, and items that require a reboot to apply the updated value.

These behaviors are called attributes. They are shown as abbreviations of the attribute value, as shown in Table 4-25 Attribute Information.

Table 4-25 View/Setting Items - Attribute Information

Attribute	Attribute Value	Description
Can be referenced	R	Shows items that can be read by READ transactions
Can be set	W	Shows items that can be written by WRITE transactions
Automatic reboot when set	B	Shows items that automatically reboot at the time of a SAVE transaction
Requires a reboot to apply the setting	b	Shows items that require an explicit REBOOT after a SAVE to apply the values
A null value can be set	O	Shows items that can take a null value in a WRITE transaction
Values are retained even when resetting to the factory default settings	P	Shows items that retain the values prior to a REVERT when a REVERT is performed
Not possible/not required	-	Shows that each attribute behavior is not possible, or does not need to be considered

A legend of the table for setting information item specifications is shown below.

Legend for the table of setting items

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
xx00	int(0,3)		0	RWB--	Non-array-type integers with a range of 0 to 3	
yy01	name	20		RW-OP	Array-type string **Note:** xxxxxxxxxxxxxxx	

Type: Shows the item data type.

Array: Shows the number of elements if the item is an array.

If this is blank, it indicates that the item is not an array.

Initial value: Shows the initial value for the item. If this is blank, it indicates that there is no initial value.

Attributes: The attribute is expressed in 5 digits. Each digit has the following meaning. It shows how the item behaves.

- First digit: Whether the setting can be viewed
- Second digit: Whether the setting can be changed
- Third digit: Whether a reboot is required and whether the device reboots automatically
- Fourth digit: Whether a null value can be specified
- Fifth digit: Status of values that the specified value retains after the device is restored to factory defaults

Description: Shows a description of item value ranges, restrictions, etc.

Model Specific Information: Shows the differences between models that are new functions or significantly added functions.

The description policy of this chapter is as follows.

- Cover all specifications of supported products.

  e.g. For items that are in an exclusive relationship in terms of function selection, both are described in this chapter.

- For values, ranges, and selection options, the minimum and maximum values within all supported products are described. However, the models within those ranges may not exist.

  e.g. When the models within the type range exist

Specifications of Model A *1

Item	Type	Array	Initial Value	Attributes	Description
xx00	int (0,2) ↑		0	RWB--	Non-array-type integers with a range of 0 to 2

Specifications of Model B *1

Item	Type	Array	Initial Value	Attributes	Description
xx00	int (0,1) ↑		0	RWB--	Non-array-type integers with a range of 0 to 1

Description in this chapter

Item	Type	Array	Initial Value	Attributes	Description
xx00	int (0,2)		0	RWB--	Non-array-type integers with a range of 0 to 2

e.g. When the models within the type range do not exist

Specifications of Model A *1

Item	Type	Array	Initial Value	Attributes	Description
yy01	int (0,1) ↑		1	RWB--	Non-array-type integers with a range of 0 to 1

Specifications of Model B *1

Item	Type	Array	Initial Value	Attributes	Description
yy01	int (1,2) ↑		1	RWB--	Non-array-type integers with a range of 1 to 2

Description in this chapter

Item	Type	Array	Initial Value	Attributes	Description
yy01	int (0,2)		1	RWB--	Non-array-type integers with a range of 0 to 2

Note:

*1 The listed items do not exist in the actual specifications.

4.4.1 System Information

Table 4-26 View/Setting Items - System Information

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
aa00	uname [15] (5,15)			RW--P	Name of system administrator	
aa01	pass [32] (8,32)			-W--P	Administration password *1 **Note:** For null values, the value is not changed	
aa02	pass [32] (8,32)			-W--P	Administration password (for confirmation) *1 **Note:** Specify the same value as aa01	
aa11	hpass [36] (8,32)			-W-OP	Administration password (obfuscation) *2 **Note:** Save the password with an obfuscated aa01 value	
bb00	const		admin	R----	URL for the settings page	

Note:

*1 The administration password (aa01) and administration password (for confirmation) (aa02) must be updated with a single WRITE. Values are only updated for the same string. Null values are not updated.

*2 In case the obfuscated password information is necessary, contact the sales company or distributors from which the product was purchased.

4.4.2 Device Attribute Information

Table 4-27 View/Setting Items - Device Attribute Information

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ra00	const		CR-xxxxx	R----	Model Name	
ra01	const		Ver. x.x.x	R----	Firmware version *1	
ra02	const		(Unit specific)	R----	MAC address *2	
ra09	const		1	R----	Number of video input channels	
ra10	const		3840x2160	R----	Maximum image size	
ra11	const		en,ja,zh *3	R----	Supports multiple languages	
ra12	const		Xxxxx	R----	Serial number *2	
ra13	const		Xxxxx	R----	Build number *1	
ra17	const		3	R----	Maximum number of streams	
ra19	const		(Unit specific)	R----	MAC address (wireless LAN) *2	Not used for CR-X300/CR-N100
ra20	const		1	R----	Maximum number of JPEG streams	
ra21	const		2	R----	Maximum number of H.264/ AVC streams	
ra22	const		1	R----	Maximum number of H.265/ HEVC streams	

Note:

*1 The firmware version and build number values depend on the firmware version installed at the time that the values are retrieved.

*2 The MAC address and serial number values depend on the individual camera.

*3 zh(Chinese) is CR-N700 only.

4.4.3 Clocks and Time Zones

Table 4-28 View/Setting Items - Clocks and Time Zones

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
bc00	fixed (-12.00, 14.00)		9	RW--P	Time zone (difference from GMT)	
	int				Procedure for setting the clock	

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
bc01	(0,1)		0	RW--P	**Note:** 0: Specify the time based on bc20 1: NTP server *1	
bc10	host [63]			RW-OP	IP address of the NTP server **Note:** This can only be specified when the procedure for setting the clock (bc01) is NTP server (1). This is ignored for null values.	
bc11	int (0,3)		0	RW--P	Procedure for using DHCP *2 **Note:** 0: Do not use 1: Use DHCP 2: Use DHCPv6 3: Use both DHCP / DHCPv6	
bc12	const	2		R--O-	The NTP address reported from the DHCP server **Note:** Bc12-0: DHCP address Bc12-1: DHCPv6 address	
bc13	int (5,1440)		5	RW--P	NTP sync interval	
bc14	record (date, time)		2	R--O-	NTP last sync time	
bc20	record (date, time)			RW--P	Date and time **Note:** Valid if the procedure for setting the clock (bc01) is "specify the time based on bc20" (0). Ignored if any other value. *3	
bc30	boolean		0	RW--P	Daylight Saving Time **Note:** 0: Do not use 1: Use	
bc32	const		JST-9	R---P	Manual time zone	
bc34	ascii[63]		Asia/ Tokyo	RW--P	City name (zoneinfo) *4	

Note:

*1 When specifying "NTP server" (1), IP address of the NTP server (bc10) also need to be specified.

*2 When specifying either "Use DHCPv6" (2) or "Use DHCP/DHCPv6" (3), specify "Use" (1) for the following two items in '*4.4.4 Networks*':

Use IPv6 (ca20)

Use DHCPv6 (ca46)

*3 Specify in the format yyyymmdd:HHMMSS (four digits for the year, and two digits for the month, day, hour, minute, and second).

*4 For the description method, see the database of '*IANA*'.

4.4.4 Networks

When using the settings protocol to specify an IPv4/IPv6 address, note that it will no longer be possible to access the camera if you set an invalid address.

Table 4-29 View/Setting Items - Networks

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ca01	int (0,1)		1	RWB-P	IPv4 address setting method **Note:** 0: Manual setting *1 1: Automatic setting (DHCP)	
ca02	inaddr		192.168. 100.1	RWB-P	IPv4 address	
ca03	inaddr		255.255. 255.0	RWB-P	Subnet mask	
ca11	int (1,3)		1	R----	LAN interface **Note:** 1: Auto 2: Full duplex 3: Half duplex	
ca20	boolean		1	RWB-P	Use IPv6 *2 **Note:** 0: Do not use 1: Use	
ca22	const	6	(Unit specific)	R--O-	IPv6 address (auto set) *3	
ca23	boolean		1	RWB-P	Auto set (router advertisement) **Note:** 0: Disable 1: Enable	
ca24	inaddr6			RWBOP	IPv6 address (manual setting)	
ca25	int (16128)		64	RWB-P	Prefix length	
ca26	const	6	(Unit specific)	R--O-	Prefix length (auto set) *4	
ca30	const		(Unit specific)	R--O-	IPv4 address (AutoIP)	
ca31	const		(Unit specific)	R--O-	IPv4 Address (DHCP)	
ca32	const		(Unit specific)	R--O-	Net mask **Note:** Value reported from the DHCP server	
ca33	const		(Unit specific)	R--O-	Gateway **Note:** Value reported from the DHCP server	

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ca34	boolean		1	RW--P	Use AutoIP **Note:** 0: Do not use 1: Use	
ca40	const		(Unit specific)	R--O-	IPv6 address (link-local)	
ca41	const	5	(Unit specific)	R--O-	IPv6 address (router advertisement)	
ca42	const	5	(Unit specific)	R--O-	IPv6 address (DHCPv6)	
ca43	const		(Unit specific)	R--O-	Prefix length (link-local)	
ca44	const	5	(Unit specific)	R--O-	Prefix length (router advertisement)	
ca45	const	5	(Unit specific)	R--O-	Prefix length (DHCPv6)	
ca46	boolean		1	RWB-P	Use DHCPv6 **Note:** 0: Do not use 1: Use	
ca50	boolean		1	RW--P	Use mDNS	
cc01	inaddr			RW-OP	IPv4 default gateway address *5	
cc02	inaddr6			RW-OP	IPv6 default gateway address *6	
cf00	int (576,1500)		1500	RWB-P	Maximum packet size *2	
cf01	Int (576,1500)		1500	RWB-P	Maximum packet size (wireless LAN) *2	Not used for CR-X300/CR-N100
ch00	int (0,1)		0	RW--P	Use wireless LAN **Note:** 0: Do not use 1: Use	Not used for CR-X300/CR-N100
ch02	inaddr		192.168.101.1	RWB-P	IPv4 address (wireless LAN)	Not used for CR-X300/CR-N100
ch03	inaddr		255.255.255.0	RWB-P	Net mask (wireless LAN)	Not used for CR-X300/CR-N100
ch04	int (1,11)		1	RW---	Channel setting (wireless LAN)	Not used for CR-X300/CR-N100
ch70	char [32]	1		RW-OP	SSID *7	Not used for CR-X300/CR-N100

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ch71	pass [63] (8,63)	1		-W--P	Encryption key *7 **Note:** For null values, the value is not changed	Not used for CR-X300/CR-N100
ch81	hpass [67] (8,63)	1		-W--P	Encryption key (obfuscation) *7/*8 **Note:** Save the key with an obfuscated ch71 value.	Not used for CR-X300/CR-N100

Note:

*1 For specifiying both "Manual setting" (0) and "Register" (1) to "Register the host name to the DDNS" (ib20) in '*4.4.4.1 DNS/DDNS*', it is also necessary to set Name server address 1 (ib00).

*2 For specifying "Use" (1) for Use IPv6 (ca20), set the maximum packet size (cf00) to 1280 or higher.

*3 The IPv6 address that is currently operating is set.
If an IPv6 address has not been assigned, the value is null.

*4 The prefix length of the IPv6 address that is currently operating is set.
If an IPv6 address has not been assigned, the value is null.

*5 It is necessary to specify a value that is different from the IPv4 address (ca02).

*6 It is necessary to specify a value that is different from the IPv6 address (ca40).

*7 SSID (ch70) and the encryption key (ch71) or encryption key (obfuscated) (ch81) must be changed simultaneously.

*8 In case the obfuscated password information is necessary, contact the sales company or distributors from which the product was purchased.

4.4.4.1 DNS/DDNS

Table 4-30 View/Setting Items - DNS/DDNS

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ib00	inaddrx			RW-OP	Name server address 1 *1	
ib01	inaddrx			RW-OP	Name server address 2	
ib10	host [63]			RW-OP	Host name *1	

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ib21	int (0,3)		0	RW--P	Retrieve the DNS setting from DHCP *2 **Note:** 0: Do not use 1: Use DHCP 2: Use DHCPv6 3: Use DHCP / DHCPv6	
ib22	const	2		R--O-	The DNS address reported from the DHCP server **Note:** ib22-0 is for DHCP. Ib22-1 is forDHCPv6.	
ib23	host [63] <6>			RW-OP	Domain name	

Note:

*1 When setting "Register" (1) for Register the host name to the DDNS (ib20), it is necessary to set any of the following:

Name server address 1 (ib00)

Host name (ib10)

However, if the IPv4 address setting method (ca01) in '*4.4.4 Networks*' is "Automatic setting (DHCP)" (1), the value for Name server address 1 (ib00) is not checked.

*2 When specifying "DHCP is used" (1) for Retrieve the DNS setting from DHCP (ib21), "Automatic setting (DHCP)" (1) needs to be set for IPv4 address setting method (ca01) in '*4.4.4 Networks*'.

4.4.5 Camera

4.4.5.1 Camera Settings

Table 4-31 View/Setting Items - Camera Settings

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
da00	const		0	R----	Main camera (built-in camera) **Note:** 0: Built-in camera	
da05	int (1,2)		2	RW---	Image flip **Note:** 1: Enable 2: Disable	

4.4.5.2 Camera Control

Table 4-32 View/Setting Items - Camera Control

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
db00	const	1	1	R----	Use camera	
db02	unicode [15]	1	Camera	RW-O-	Camera name (multibyte characters)	
db07	const	1	1	R----	Camera control port	
db09	boolean	1	1	RW---	Tally lamp control **Note:** 0: Do not use 1: Use	
db10	int (0,2)	1	1	RW---	Brightness of tally lamp **Note:** 0: Low 1: Medium 2: High	
db20	boolean	1	0	RW---	Apply the restriction to visibility range **Note:** 0: Do not apply 1: Apply	
db21	coord	1		RW-O-	Visibility range: Top edge *1	
db22	coord	1		RW-O-	Visibility range: Bottom edge *1	
db23	coord	1		RW-O-	Visibility range: Left edge *1	
db24	coord	1		RW-O-	Visibility range: Right edge *1	
db25	scope	1		RW-O-	Visibility range: Telephoto *1	
db26	scope	1		RW-O-	Visibility range: Wide angle *1	
db30	boolean	1	0	RW---	Use the extension digital zoom **Note:** 0: Do not use 1: Use	

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
db31	int (4,20)	1	5	RW---	Maximum digital zoom ratio	
db32	boolean	1	0	RW---	Use digital zoom **Note:** 0: Do not use 1: Use	
db35	boolean	0	1	RW---	Use auto flip **Note:** 0: Do not use 1: Use	CR-X300 only
db90	boolean	1	1	RW---	Fan operation **Note:** 0: Auto mode 1: Always on mode	
db97	boolean	0	0	RW---	Output still image during preset execution **Note:** 0: Do not Output 1: Output	Not used for CR-N100

Note:

*1 Specify the combination of values for each item so that they have the following relationship.

Top edge of visible range (db21) > Bottom edge of visible range (db22)

Left edge of visible range (db23) < Right edge of visible range (db24)

Visible range Telephoto (db25) ≦ Visible range Wide angle (db26)

If one value is null, the condition above is ignored.

4.4.6 Video

4.4.6.1 Capture Video

Table 4-33 View/Setting Items - Capture Video

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
dc01	const	3	0	R----	Video type **Note:** 0: Normal 1: Digital PTZ	
dc02	int (0,2) *1	3	*2	RW---	Video codec **Note:** 0: JPEG 1 : H.264/AVC 2 : H.265/HEVC	
dc06	int (1,8) *3	3	*4	RW---	Frame rate **Note:** 1 to 8: Frame rate Small to Large *6	
dc07	int (0,10)	3	10	RW---	I Frame Interval **Note:** 0: I Frame for all 1 to 10: Value × 1/10 sec.	
dc08	int (0,1)	3	1	RW---	Bit Rate Control **Note:** 0: CBR 1: VBR	
dc09	int (1000,80000)	3	*7	RW---	Target bit rate	
dc22	vscale (640x360,3840x2160)	3	*8	RW---	Video size (width x height) **Note:** The possible combinations are as follows: 640x360 1280x720 1920x1080 3840x2160	
dp01	vscale(1920x1080, 3840x2160)		3840x2160	RWB--	Maximum resolution **Note:** 1920x1080 3840x2160	CR-N700 only
dp10	int (2398,5994)		5994	RWB--	Frame frequency (Hz) *5 **Note:** Specify a 100-fold value of the frequency. 2398 : 23.98Hz 2500 : 25.00Hz 2997 : 29.97Hz 5000 : 50.00Hz 5994 : 59.94Hz	

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
dp20	int (0,4)	*9	1	RW---	HDMI/SDI output signal format **Note:** 0: 720p 1: 1080p 2: 1080i 3: 2160p 4: 720x480i(NTSC), 720x576i(PAL)	4 can be selected only for CR-N700
dp21	int (0,1)	*9	0	RW---	3G-SDI mapping **Note:** 0 : Level A 1 : Level B	Not used for CR-N100
dp30	int (0,1)		0	RW---	Select the priority HDMI/SDI output destination *5 **Note:** 0 : HDMI 1 : SDI	CR-X300 only
dp40	int (0,2)		0	RWB-- *10	Select the color bars type **Note:** 0 : SMPTE 1 : EBU 2 : ARIB	CR-X300 / N700 only
dp41	int (0,3)	2	0	RW---	Color bars test tone **Note:** 0 : OFF 1 : -12dB 2 : -18dB 3 : -20dB	CR-N700 only
dp50	int (0,1)	2	1	RW---	Crop output resolution setting **Note:** 0 : HD 1 : FullHD dp50-0 Crop1 dp50-1 Crop2	CR-N700 only

Note:

The array elements in dc01 through dc02, dc06 through dc09, and dc22 correspond to the main stream and the sub streams 1 to 2.

*1 The type varies depending on the array.

dc02-0 : int(1,2)

dc02-1 : int(1,1)

dc02-2 : int(0,0)

*2 The initial value varies depending on the array.

dc02-0 : 1

dc02-1 : 1

dc02-2 : 0

*3 The type varies depending on the array.

dc06-0 : int(1,8)

dc06-1 : int(1,6)

dc06-2 : int(1,8)

*4 The initial value varies depending on the array.

dc06-0 : 7

dc06-1 : 6

dc06-2 : 5

*5 Selectable only when dp20 = 3

*6 For the frame rate (dc06), an available value is determined by the frame frequency (dp10).

Setting values for main stream (dc06-0) and sub stream 2 (dc06-2).

Frame frequency (Hz)			59.94	29.97	23.98	50	25
dp10			0	1	2	3	4
Frame rate (fps)	dc06	1	5.00	5.00	5.99	5	5
		2	5.00	5.00	5.99	5	5
		3	5.00	5.00	5.99	5	5
		4	5.00	5.00	5.99	5	5
		5	14.99	14.99	11.99	12.5	12.5
		6	29.97	29.97	23.98	25	25
		7	59.94	29.97	23.98	50	25
		8	59.94	29.97	23.98	50	25

Setting values for sub stream 1 (dc06-1)

Frame frequency (Hz)			59.94	29.97	23.98	50	25
dp10			0	1	2	3	4
Frame rate (fps)	dc06	1	5.00	5.00	5.99	5	5
		2	5.00	5.00	5.99	5	5
		3	5.00	5.00	5.99	5	5
		4	5.00	5.00	5.99	5	5
		5	14.99	14.99	11.99	12.5	12.5
		6	29.97	29.97	23.98	25	25

*7 The initial value varies depending on the array.

dc09-0 : 20000

dc09-1 : 6000

dc09-2 : 1000

*8 The initial value varies depending on the array.

dc22-0 : 1920x1080

dc22-1 : 640x360

dc22-2 : 1280x720

*9 Only CR-N700 has a capacity of 2.

*10 Only CR-N700 has the attribute RW---.

4.4.7 Servers

4.4.7.1 Camera Server

Table 4-34 View/Setting Items - Camera Server

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ha03	int (0,15)		15	RW---	Maximum number of clients *1	
ha05	fixed (0.1,60.0)		15.0	RW---	Maximum frame rate	
ha06	int (0,65535)		0	RW---	Maximum connection time	
ha07	int (1,3600)		20	RW---	Camera control time	

Note:

*1 The maximum number of clients represents the total number of video stream connections with "XC Control Protocol". Note, however, that it is different from the number of clients related to video transmission in other communications, such as RTP/RTSP, standard communication, NDI|HX, and RTMP.

4.4.7.2 Audio Server

Table 4-35 View/Setting Items - Audio Server

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
hb01	int (1100)		50	RW---	Input volume	
hb08	boolean		0	RW---	Attenuator **Note:** 0: Disable 1: Enable	
hb30	int (0,5)		0	RW---	Audio input connection method **Note:** 0: MIC terminal/LINE 1: MIC terminal/MIC 2: MIC terminal/MIC (MIC power-ON) 3: INPUT terminal/LINE 4: INPUT terminal/MIC 5: INPUT terminal/MIC+48V	For CR-N300/N100, the range of int (0,2) is effective. For CR-X300, data type is const, initial value is 2, attributes are "R----".

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
hb40	boolean		1	RW---	Use of audio input **Note:** 0: Do not use 1: Use	For CR-X300, the initial value is 0.
hb43	int (64,192)		128	RW---	Sound bit rate (kbps)	

4.4.7.3 HTTP Server

Table 4-36 View/Setting Items - HTTP Server

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ia00	hport		80	RW--P	HTTP port number *1 **Note:** It is possible to only specify 80 or in the range of 1024 to 65535.	
ia05	hsport		443	RW--P	HTTPS port number *1 **Note:** It is possible to only specify 443 or in the range of 1024 to 65535.	
ia06	int (0,1)		1	RWB--	Authentication method **Note:** 0: Basic authentication 1: Digest authentication	

Note:

*1 Specify a port other than HTTP port number (ia00), HTTPS port number (ia05), or RTSP port (ig02) in "*4.4.7.4 RTP/RTSP*".

4.4.7.4 RTP/RTSP

Table 4-37 View/Setting Items - RTP/RTSP

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ig00	boolean		1	RW---	RTSP **Note:** 0: Do not use 1: Use	For CR-N700, the initial value is 0
ig01	int (0,2)		0	RW---	RTSP authentication method **Note:** 0: Digest authentication 1: Basic authentication 2: No authentication	
ig02	rport		554	RW---	RTSP port number **Note:** 554 or 1024 to 65535	
ig12	mcaddrx	3	0.0.0.0	RW---	Multicast address **Note:** For video	
ig13	mcport	3	0	RW---	Multicast port number **Note:** For video 0 or 1024 to 65534 (even numbers)	
ig14	int (0,255)	3	1	RW---	RW--- Multicast TTL (TimeToLive: Valid period) *1 **Note:** For video 0 to 255	
ig20	boolean	3	1	RW---	Audio transmission **Note:** 0: Do not use 1: Use	For CR-X300, the initial value is 0.
ig21	mcaddrx	1	0.0.0.0	RW---	Multicast address *2 **Note:** For audio	
ig22	amcport	1	0	RW---	Multicast port number *2 **Note:** For audio 0 or 1024 to 65530 (even numbers)	
ig23	int (0,255)	1	1	RW---	RW--- Multicast TTL (TimeToLive: Valid period) *1/*2 **Note:** For audio 0 to 255	
ig24	const	1	2	R----	Audio Compression Method **Note:** 1: G.711 2 : AAC-LC	

Note:

The array elements in ig12 through ig14, and ig20 correspond to the main stream and the sub streams 1 to 2.

*1 This specification is ignored when using IPv6.

*2 This specification is ignored except when Audio transmission (ig20) is set to “Enable” (1).

4.4.8 Communication

4.4.8.1 Standard Communication

Table 4-38 View/Setting Items - Standard Communication

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
hc00	boolean		1	RW---	Use of standard serial communication **Note:** 0: Do not use 1: Use	For CR-X300, data type is const, attribute is "R----".
hc01	int (0,7)		0	RW-O-	Serial device address **Note:** 0: Auto 1 to 7: Set manually	
hc10	boolean		1	RW---	Use of standard communication **Note:** 0: Do not use 1: Use	
hc11	int (0,1)		0	RW---	Command response method **Note:** 0: Use the standard IP communication command response port 1: Use the source port number	
hc13	boolean		1	RW---	Inquiry about camera IP settings **Note:** 0: Do not allow 1: Allow	
hc14	boolean		0	RW---	Network configuration for camera IP setting **Note:** 0: Do not allow 1: Allow	

4.4.8.2 NDI|HX

Table 4-39 View/Setting Items - NDI/HX

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ih00	boolean		0	RW---	Use of NDI|HX **Note:** 0: Do not use 1: Use	
ih01	boolean		0	RW---	Use of Discovery Server **Note:** 0: Do not use 1: Use	
ih02	inaddr			RW-O-	Discovery Server address	
ih03	boolean		0	RW---	Use of group setting **Note:** 0: Do not use 1: Use	

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ih04	nchar [16] <10>		public	RW---	Group name	
ih10	boolean		0	RW---	Use of multicast **Note:** 0: Do not use 1: Use	
ih14	int (1,255)		1	RW---	RW--- (TimeToLive Expiration)	
ih20	boolean		1	RW---	Audio transmission **Note:** 0: Do not use 1: Use	For CR-X300, the initial value is 0.

4.4.8.3 RTMP

Table 4-40 View/Setting Items - RTMP

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ii00	boolean		0	RW---	Use of RTMP **Note:** 0: Do not use 1: Use	
ii10	int (1,2)		1	RW---	Use of video stream **Note:** 1: Main stream 2: Sub stream 1	
ii11	int (0,1)		0	RW---	Use of audio stream **Note:** 0: Do not use 1: Use	
ii20	uri[256]			RW-O-	RTMP URL	
ii21	uri[256]			RW-O-	RTMP stream key	

4.4.8.4 SRT

Table 4-41 View/Setting Items -SRT

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ij00	boolean		0	RW---	Use of SRT **Note:** 0: Do not use 1: Use	
ij10	boolean		1	RW---	Use of audio stream **Note:** 0: Do not use 1: Use	For CR-X300, the initial value is 0.
ij20	int (0,1)		1	RW---	Connection mode **Note:** 0: caller 1: listeners	
ij21	host [255]			RW-O-	Destination IP address **Note:** Used when in caller mode (required)	For CR-N100, the type is "inaddrx".
ij22	int (1024,65535)		1	RW-O-	Destination port number **Note:** Used when in caller mode (required)	
ij23	sport		5100	RW---	Standby port number **Note:** Used in listener mode (required)	
ij24	int (1,255)		64	RW---	TTL	
ij25	int (20,8000)		250	RW---	Latency **Note:** The unit is [ms]	
ij26	char[64]			RW-O-	Stream ID	
ij27	int (0,3)		0	RW---	Encryption method **Note:** 0: Off 1: AES-128 2: AES-192 3: AES-256	
ij28	pass [79] (10,79)			-W-O-	Passphrase **Note:** 10 to 79 characters	
ij29	boolean	0	0	RW---	Use of ABR **Note:** 0: Do not use 1: Use	Not used for CR-N100

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ij38	hpass [84] (10,79)			-W-O-	Passphrase (Obfuscation) **Note:** save the obfuscated ij28 value	

4.4.8.5 FreeD

Table 4-42 View/Setting Items -FreeD

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ik00	boolean		0	RW---	Use of FreeD **Note:** 0: Do not use 1: Use	Not used for CR-N100
ik01	int (16,1000)			RW-O-	Output cycle **Note:** The unit is [ms]	Not used for CR-N100
ik02	boolean		1	RW---	FreeD auto flip linkage **Note:** 0: During auto flip image flip, 0-degrees is stored in the roll angle. 1: During auto flip image flip, 180-degrees is stored in the roll angle.	CR-X300 only
ik11	inaddr	4		RW-O-	FreeD client IP address	Not used for CR-N100
ik12	int (1024,65535)	4	40000	RW---	FreeD client port number	Not used for CR-N100
ik13	int (0,1)	4	0	RW---	Message type **Note:** 0: D1 1: A2	Not used for CR-N100
ik20	int (0,255)		255	RW---	camera ID	Not used for CR-N100
ik21	boolean		0	RW---	Use of XYZ Offset **Note:** 0: Do not use 1: Use	Not used for CR-N100
ik22	fixed (-131072.0,131071.9)		0	RW---	X-value	Not used for CR-N100
ik23	fixed(-131072.0,131071.9)		0	RW---	Y-value	Not used for CR-N100

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ik24	fixed(-131072.0,131071.9)		0	RW---	Z-value	Not used for CR-N100

4.4.8.6 Serial Port

Table 4-43 View/Setting Items - Serial Ports

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
rc10	boolean		1	RW---	Use of serial port **Note:** 0: Do not use 1: Use	For CR-X300, int(0,2)*1, initial value is 2, attribute is "RWB--".
rc11	const		3	R----	Serial port connection type **Note:** 1: RS485 2: RS485_4 3: RS422 4: RS232C	
rc12	int (9600, 38400)		9600	RW---	Baud rate setting (bps)	
rc13	const		8	R----	Data length (bit) **Note:** 7 : 7 bit 8 : 8 bit	
rc14	const		1	R----	Start bit (bit) **Note:** 1 : 1 bit	
rc15	const		1	R----	Stop bit (bit) **Note:** 1 : 1 bit 2 : 2 bit	
rc16	const		0	R----	Parity **Note:** 0 : None 1 : Odd 2 : Even	

Note:

*1 Options are followings:

0 : Not used

1 : Standard Communication (Serial)

2 : NU

4.4.8.7 Infrared Remote Controller

Table 4-44 View/Setting Items - Infrared Remote Controller

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
rd00	boolean		1	RW---	Use of infrared remote controller **Note:** 0: Do not use 1: Use	Not used for CR-X300

4.4.8.8 GenLock

Table 4-45 View/Setting Items - GenLock

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
re00	int(0,2) *1	*2	0	RW---	Use of GenLock Input / HD Sync Output **Note:** 0: Do not use 1: Use of GenLock Input 2: Use of HD Sync Output *1	Not used for CR-N300/N100
re01	int (-1023, 1023)		0	RW---	GenLock adjustment **Note:** 10 ms units	Not used for CR-N300/N100
re10	boolean		0	RW---	SYNC scan mode **Note:** 0: P 1: PsF	CR-N700 only

Note:

*1 The type is boolean and 2 cannot be selected on CR-N500, CR-X300.

*2 The array is 1 for CR-N700.

4.4.8.9 Timecode

Table 4-46 View/Setting Items -Timecode

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
rf00	boolean		0	RW---	Timecode terminal setting **Note:** 0 : INPUT 1 : OUTPUT	CR-N700 only

4.4.8.10 Infrared remote control

Table 4-41 View/Setting Items – External Device

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
sp00	const	0	0	R----	Enable external device input event **Note:** 0 : Disable 1 : Enable	CR-X300 only
sp01	const	1	0	R----	Preset (External device input) **Note:** 0: Do not specify 1: Home position 2 to 65: Preset number	CR-X300 only
sp30	const	1	0	R----	Operation during an active event **Note:** 0 : Disable 1 : Enable	CR-X300 only
sp31	const	1	0	R----	Operation during an inactive event **Note:** 0 : Disable 1 : Enable	CR-X300 only
sp80	const	1	0	R----	Reverse the input on/off **Note:** 0: Not reverse 1: Reverse	CR-X300 only
sp92	const	1	0	R----	External device output during an active event **Note:** 0: Disable 1: External device output on 2: External device output off	CR-X300 only
sp93	const	1	0	R----	External device output during an inactive event **Note:** 0: Disable 1: External device output on 2: External device output off	CR-X300 only
sp96	const	1	0	R----	Day/Night camera control when active **Note:** 0: Disable 1: Transit to Day mode 2: Transit to Night mode	CR-X300 only

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
sp97	const	1	0	R----	Day/Night camera control when inactive **Note:** 0: Disable 1: Transit to Day mode 2: Transit to Night mode	CR-X300 only
sq00	const	1	1	R----	Output type **Note:** 0: Pulse 1: Continuous	CR-X300 only
sq01	const	1	1	R----	Pulse hold time (sec)	CR-X300 only
sq80	boolean	1	0	RW---	AUX output operation mode **Note:** 0: Normally open 1: Normally closed	CR-X300 only

4.4.9 Security

4.4.9.1 User Access Control

Table 4-48 View/Setting Items - User Access Control

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
gb00	uaccent <15>			RW-O-	User (+ password) List *1	
gb10	obuaccent <15>			RW-O-	User (+password) List (password obfuscation) *3 **Note:** Save the password with an obfuscated gb00 value	
gb50	int (0,2)		2	RW---	Set camera permissions for registered users *2 **Note:** 0: No access privileges 1: Video transmission only 2: General camera control + video transmission	
gb51	int (0,2)		2	RW---	Set camera permissions for general users *2 **Note:** 0: No access privileges 1: Video transmission only 2: General camera control + video transmission	

Note:

*1 Register and delete users and change passwords in a batch. The information contained in the list is used in the final registration. User names cannot be duplicated.
Specify the password portion as a character code string (a numeric string in which each character is represented by three decimal digits). This is required when registering a new user and changing the password for a registered user.
It is not necessary to specify the password portion, if the password of a registered user is not to be changed.
To register a new user, specify the user name and password as a set.

*2 For registered users, specify higher camera permissions than general users.

*3 In case the obfuscated password information is necessary, contact the sales company or distributors from which the product was purchased.

4.4.9.2 Host Access Restrictions

Table 4-49 View/Setting Items - Host Access Restrictions

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ip00	boolean		0	RW--P	Apply host access restrictions **Note:** 0: Do not apply 1: Apply	
ip01	boolean		0	RW--P	Apply host access restrictions **Note:** 0: Do not apply 1: Apply	
ip02	int (0,1)		0	RW--P	Default policy **Note:** 0: Allow access 1: Prohibit access	
ip03	int (0,1)		0	RW--P	Default policy **Note:** 0: Allow access 1: Prohibit access	
ip10	inaddr	20		RW-OP	Network address	
ip11	int (1,32)	20	32	RW--P	Net mask	
ip12	int (0,1)	20	0	RW--P	IPv4 policy **Note:** 0: Allow 1: Prohibit	
ip20	inaddr6	20		RW-OP	Prefix	
ip21	int (16,128)	20	128	RW--P	Prefix length	
ip22	int (0,1)	20	0	RW--P	IPv6 policy **Note:** 0: Allow 1: Prohibit	

4.4.9.3 SSL

Table 4-50 View/Setting Items - SSL

Item	Type	Array	Initial Value	Attributes	Description	Model Specific Information
ss00	int (0,2)		0	RW--P	SSL communication *1 **Note:** 0 : HTTP 1 : HTTP / HTTPS 2 : HTTPS	
ss10	char [2]			RW-OP	Country name (c) *2	
ss11	char [128]			RW-OP	State/Province name (ST)	
ss12	char [128]			RW-OP	Locality name (L)	
ss13	char [64]			RW-OP	Organization name (O)	
ss14	char [64]			RW-OP	Organizational unit name (OU)	
ss15	char [64]			RW-OP	Common name (CN)	
ss16	date			RW-OP	Validity period start date *3	
ss17	date			RW-OP	Validity period end date *3	

Note:

*1 If SSL communication (ss00) is "HTTP/HTTPS" (1) or "HTTPS" (2), certificates must already be installed.

*2 The country code is specified in the ISO 3166-1 alpha-2 two uppercase Roman characters.

e.g.

Japan : JP

United States : US

Great Britain : GB

*3 Specify so that Validity period start date (ss16) ≦ Validity period end date (ss17).
When specifying Validity period start date (ss16) and Validity period end date (ss17), always set a value for both.

Appendix

A Settings for RTP/RTSP Video Transmission

This appendix explains the procedure for starting video transmission using RTP/RTSP.

The procedure assumes that IP address settings are completed and it is possible to access the front page of the camera. For details about how to access the front page, refer to “Settings Guide”.

When authentication is requested in each process, authentication is performed using the user name and password of the administrator or registered user, and the description in the procedure is omitted.

In this appendix, all IP addresses are described as “192.168.100.1”.

When implementing, replace the IP address to suit your environment.

In addition, there is no particular specification regarding a media player that is compatible with RTSP based on the assumption that a media player is available and ready to operate.

A.1 Settings Parameters Relating to RTP/RTSP Video Transmission

For the settings parameters for RTP/RTSP, see the settings information items below.

- Setting items for RTP/RTSP ‘4.4.7.4 RTP/RTSP’

A.2 Initial Settings Values and Starting Video Transmission

Table A-1 Initial Settings Values

Stream	Video codec	Video size	Target bit rate	Frame rate	I Frame Interval
Main stream	H.264	1920x1080	20Mbps	59.94fps	1 sec
Sub stream 1	H.264	640x360	6Mbps	29.97fps	1 sec
Sub stream 2	JPEG	1280x720	1Mbps	15fps	-

Note:

The default values of the video size, target bit rate, and frame rate vary depending on the model.

Start up a media player supporting RTSP and open the URL below.

```
rtsp://192.168.100.1:554/rtpstream/config(1|2|3)        *1/*2/*3
```

The main stream corresponds to config1, and the sub streams correspond to config2 to 3.

For the transmission protocol, follow the media player settings.

Note:

*1 The RTSP port number specified with the URL is the same value as ig02 (RTSP port number).

*2 The HTTP port number specified with the URL is the same value as ia00 (HTTP port number).

*3 The HTTPS port number specified with the URL is the same value as ia05 (HTTPS port number).

A.3 Commands to Use Keep-alive

When transmitting video, the default session time is 60 seconds. To keep a session, you need to perform a Keep-alive.

It is possible to use the following commands in a streaming Keep-alive.

Table A-2 Commands for Keep-alive

Protocol	Commands
RTSP	any RTSP method
RTSP	SET_PARAMETER (Recommended)
RTCP	Receiver Reports

(End)