# VC-C4

**COMMUNICATION CAMERA**

## PROGRAMMER'S MANUAL

**Contents**

## 1. Getting Started

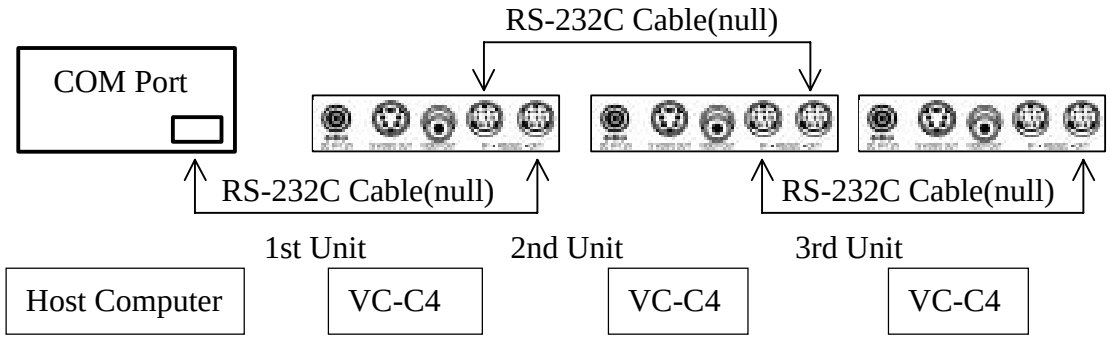
This manual describes Commands which control Communication Camera VC-C4 through RS-232C Interface. Before reading this manual, It is recommended to read Operation Manual of VC-C4.

CAUTION:

VC-C4/VC-C4R Pan/Tilt operational durability is guaranteed for 100K cycles.
In case of the continuous operation by the program such as Auto Pan Tilt System, & etc.,
it is important not to overdrive the said value(100K)

## 2. Connection with your Computer

### 2.1 Connection

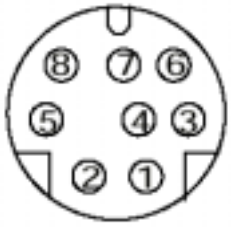



- Connect RS-232C Connector of VC-C4 with COM Port of your computer by RS-232C null cable.
- In case of the operation for multiple VC-C4, connect between IN and OUT of VC-C4, using RS-232C null cable.
- VC-C4 has capability to connect maximum 9 units.
- When Command Cascade ON is issued in multiple VC-C4 usage, the device number of each VC-C4 is set as 1,2,3,,,, from Host Computer side.
- In case of single use of VC-C4, the connection from the second VC-C4 on, is not required.

### 2.2 Connector & Pin Assignment

| Pin Num. | IN/OUT | Signal |
|---|---|---|
| 1 | OUT PUT | RTS |
| 2 | IN PUT | CTS |
| 3 | OUT PUT | TXD |
| 4 | | GND |
| 5 | IN PUT | RXD |
| 6 | | |
| 7 | | NC |
| 8 | | NC |

Model : TCS7282-01-21 (female)
Manufacture : HOSIDON




RS-232C Pin Assignment

## 3. Communication Format

### 3.1 Signal Format

| | |
|---|---|
| RS-232C Conformity | Connector & Pin assignment of connector are referred to 2.2 |
| Transmission Mode | : Half Duplex (Full Duplex for Notification) |
| Transfer Speed | : 4800,9600,14400,19200bps. (selected through Menu window) |
| Data Bit | : 8 bit |
| Parity | : None |
| Stop Bit | : 1 bit or 2 bit (selected through Menu window) |
| Handshake | : RTS/CTS Control |
| Others | : One Acknowledge per Command |

RS-232C level Definitions

| | |
|---|---|
| ON | : +5V ~ +15V |
| OFF | : -5V ~ -15V |

### 3.2 Understanding

The followings are described based on the signal from the computer terminal(RS-232C).

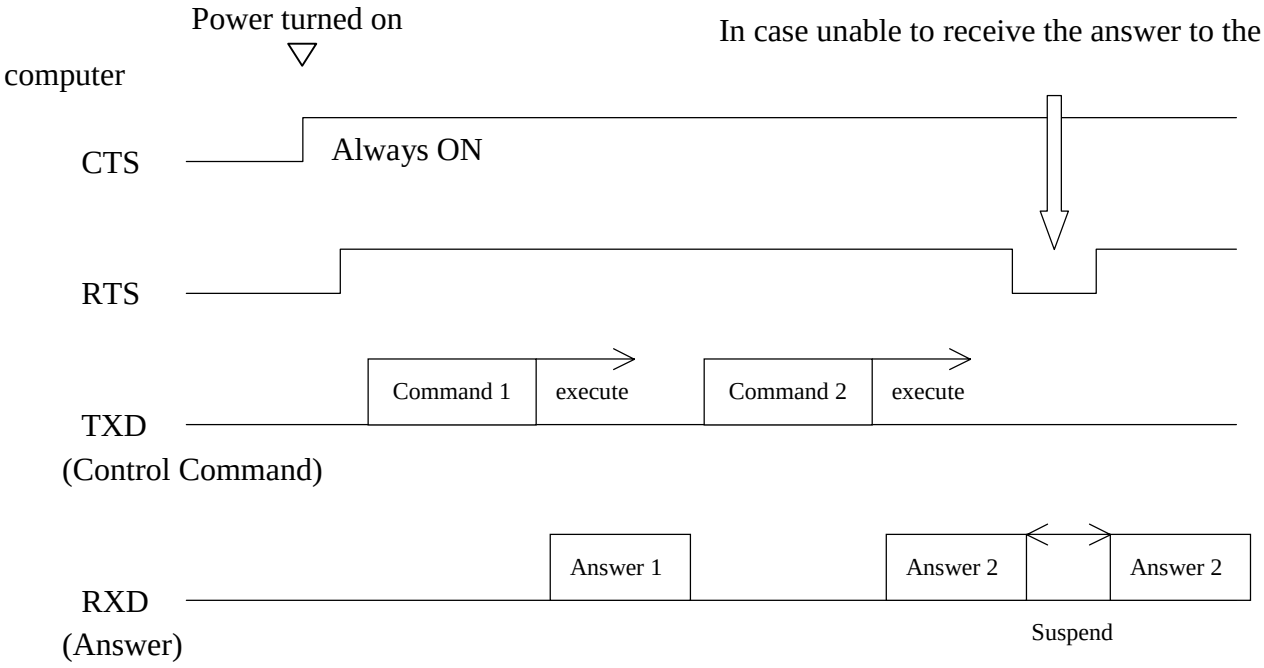
- The flow is controlled by RTS/CTS terminal control.
- When the VC-C4 is ready to receive control commands, the CTS line of the computer is ON. And as long as VC-C4 is turned on, the CTS line is always ON because VC-C4 is ready to receive the control commands.
- In case of starting the communication from the computer, the RTS line of computer must be ON
- After receiving the answer corresponding to the control command, the next control commands will be ready to transmit.
- Before transmitting the answer corresponding to the control command, VC-C4 cancels the received code, in case of receiving the next control commands.
- In case of not receiving the answer to the computer, the RTS line of the computer must be OFF.

  In this case, VC-C4 will suspend to issue the answer. If VC-C4 , however, suspends more than one second, the issue of the answer will be forced to stopped and VC-C4 returns to the receiving status.
- In case of using the Notification functions, the communication format must correspond to Full Duplex. There are some case for VC-C4 to issue the notification data, while the computer issues the commands.
- The standard waiting time of the answer is 300ms. If VC-C4 does not return the answer more than 300ms, there must be some errors.
- Note that VC-C4 is unable to execute remote control and communication control at a one time.
- After turn on, VC-C4 is under the condition of remote control. If the communication control is required, **Host Control Mode** Command or **Cascade ON Command** must be issued. Note that the VC-C4 can not shift the remote control status to the communication control mode during menu processing.

### 3.3 Communication Timing Diagram

**Example 1: Basic communication**

**Computer Side:**



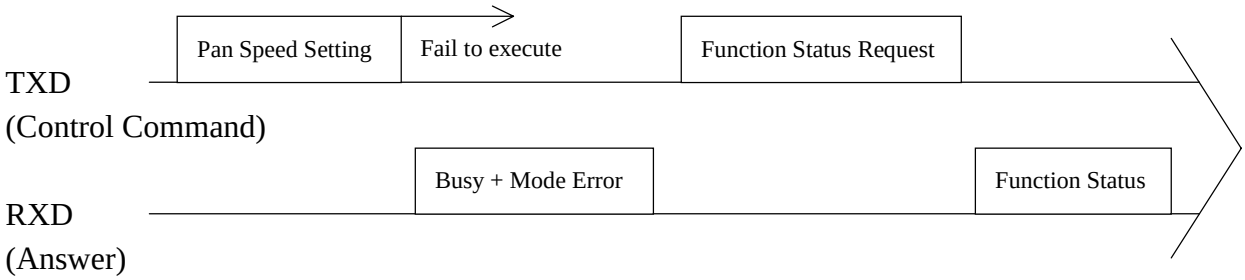

**Example 2: Unable to execute the commands due to error**

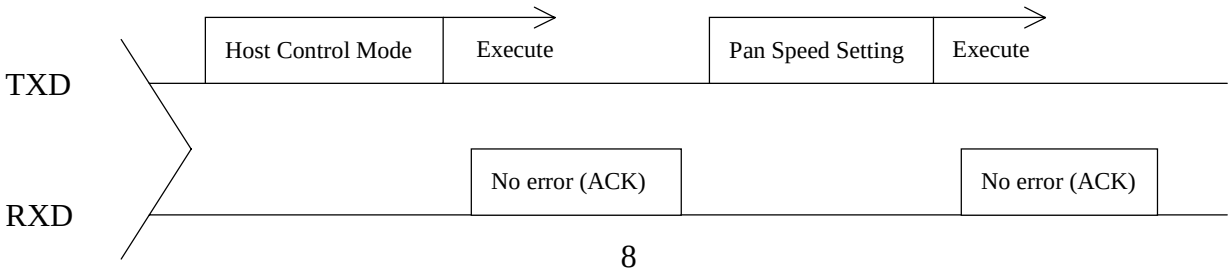
The details are referring to **11.1 Pan Speed setting** Command.

The followings shows the case which causes the error by **Pan Speed Setting** Command, when the Communication Mode isn't Host mode. **Pan Speed Setting** Commands will cause the error mode under the condition that the Communication Mode is not Host Mode.

After the error generated by **Pan Speed Setting** Command, the **Function Status Request** Command is issued and confirms that the error source isn't Host Mode, then the **Host Control** Command is issued and **Pan Speed Setting** Command is again executed.

**The Computer side**



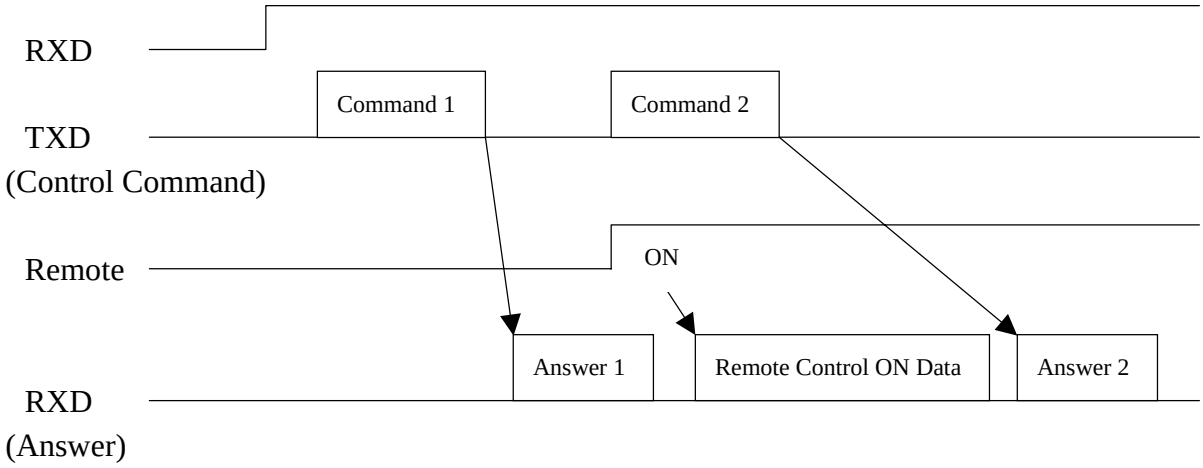



**Example 3: The case using Remote Control Through Function**

The details are referring to 8. Remote Control Through Function

As shown below, there are some case that the Commands and Remote Control Through Data are generated at the same time, while Remote Control Through Function turns on the RTS line of computer. In this case, the software of computer must correspond to Full Duplex.

**Computer Side:**

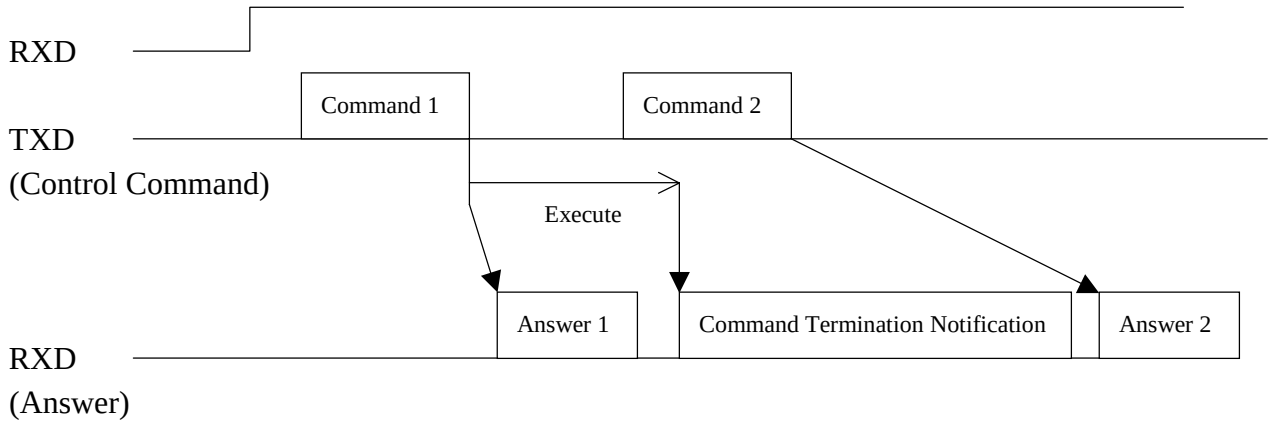



**Example 4: The case using the function of Command Termination Notification**

The details are referring to 6. Function of Command Termination Notification.

As shown below, there are some case that the Commands and Remote Control Through Data are generated at the same time, while the function of Command Termination Notification turns on the RTS line of computer. In this case, the software of computer must correspond to Full Duplex.

**Computer Side**



## 4. Control Command Format

This format is to transmit from the computer to VC-C4.

| Header | Device Num | Command | Parameter | End mark |
|---|---|---|---|---|

Header : 1 byte FFh
Device Num : 2 byte 3030h~3039h (Device Num in cascade connection)
Command : 2 byte (refer to 11.Pedestal Control Command ~ 13.System Control Command)
Parameter : Variable length If not specified, Parameter manifests Hexadecimal, transmits its ASCII code.
End mark : 1 byte EFh

Just after Power on, Device Num is 3030 and each Device Num is determined by Cascade ON Control Command.
The Control Command(Global Command) of Device Num 3030 became valid to all VC-C4 connected in Cascade ON status.

## 5. Answer Format

### 5.1 Answer Format

This answer format corresponds to the Control Command transmitted from the computer to VC-C4.

| Header | Device Num | Error Code | Status | End mark |
|---|---|---|---|---|

Header : 1 byte FEh
Device Num : 2 byte 3030h~3039h (Device Num in cascade connection)
Error Code : 2 byte manifested error flag In Hexadecimal and return it's ASCII code.
Status : Variable length If not specified, Status manifests Hexadecimal, transmits its ASCII code.
End mark : 1 byte EFh

Under the condition in Cascade connection ON, the answer corresponding to Control Command
of Device Num 3030, is returned only to the last device connected in Cascade.

### 5.2 Error Code

Error Code manifests error flag in Hexadecimal and returns it’s ASCII code. If not exists error, All bits of error flags are cleared and becomes zero

- The bit assignment of error flag.

| b7(MSB) | b6 | b5 | b4 | b3 | b2 | b1 | b0(LSB) |
|---|---|---|---|---|---|---|---|
| Mode error | Parameter error | Command error | Busy | System reservation | System reservation | System reservation | System error |

1st byte b7: Mode Error In case of wrong mode
b6: Parameter Error In case of receiving wrong parameter
b5: Command Error In case of receiving wrong command

| | |
|---|---|
| b4: Busy | In case of unable to execute by error |

| | | |
|---|---|---|
| 2nd byte | b3: System reservation | Always Zero |
| | b2: System Reservation | Always zero |
| | b1: System Reservation | Always Zero |
| | b0: System Error | In case of the fatal error to the system |

The details of Error Flags are described as below.

| | |
|---|---|
| Busy | : VC-C4 is unable to execute the commands in process to execute the former Command.<br>: In case of generating Command error, Parameter error, Mode error or System error. |
| Command Error | : In case of receiving the wrong commands(not prepared commands) |
| Parameter Error | : In case of over value of parameter or wrong parameter length. |
| Mode Error | : In case of receiving the command unable to execute under VC-C4 during the receiving Status. |
| System Error | : In case that the fatal accidents occur for some reason. |

**CAUTION**

- If the Device Num. is wrong, its control command code will be ignored.
- By **Operation Status Request**, the cause of error can be found.
- The error check will be executed by the following priority order.
  (1) Mode Error
  (2) Command Error
  (3) Parameter Error, Busy
  VC-C4 sets the error flag corresponding to any, after the detection of error, and returns the answer, then multiple error flags can't be set. Busy, however, is exceptional and set, whenever any of Command error, Parameter error, Mode error or System error occurs.

Example: Wrong command to be transmitted.

| 1st byte | | | | 2nd byte | | | |
|---|---|---|---|---|---|---|---|
| b7 = 0, | b6 = 0, | b5 = 1, | b4 = 1 | b3 = 0, | b2 = 0, | b1 = 0, | b0 = 0 |
| 3h → 33h | | | | 0h → 30h | | | |

(Hexadecimal Indication → ASCII code conversion)

Note: When the Command errors occur and unable to execute, Busy flag and command error flag will be set at the 1.

### 5.3 Status

In case of having received Status Request Command, this status adds status value to the answer. The details of Operation Status Command and status value are described later.
(Refer to System **13. Control Command**)

The **Operation Status Request** will accept the command, if not Host Control Mode

## 6. Function of the Command Termination Notification

### 6.1 Function In General

Among the control commands of VC-C4, the executive format type 2 has the function of the termination notification at the time terminated to executed.(the details of executive format refers to 9.Command Classification). The Termination Notification to be admitted or forbidden will be executed by the ON/OFF command of the termination notification.

Note 1: After just turn on, the function of Command Termination Notification is set under the condition of forbidden status.

Note 2: In case of using this function, the software of computer must correspond to Full Duplex, in order to be able to receive the termination notification data, even if the computer issues the commands.

Note 3: The RTS line must be always ON, in order not to forbid the transmission of Notification Data during the flow control.

Note 4: The details of the communication timing are referring to 3.3 Communication Timing

### 6.2 Format of Command Termination Notification

Before the time to terminate the execution, the data format from VC-C4 to the computer is configured as shown below.

| Header | Device Num | Notification Code | End mark |
|---|---|---|---|

Header : 1 byte FAh
Device Num : 2 byte 3030h~3039h (Device Num in cascade connection)
Command : 2 byte Command at the time of the operation terminated.
Parameter : Variable length Parameter at the time of the operation terminated.
End mark : 1 byte EFh

Under the status of Cascade ON, The Command Termination Notification will be returned from each device, corresponding to the control command of Device Num.3030.(Device Num. 3031~3039)

## 7. Cascade Global Notification

### 7.1 In General

In case of using VC-C4 connected In Cascade, the global commands(Device Num 3030h) can execute the identical operation to all VC-C4 connected in Cascade. But the only last device will return the answer to the computer. In case of the Cascade Notification function admitted and Global Command issued, the only error information integrated among the answer information of VC-C4 is notified to the computer.

Note 1: After just turn on, the function of Command Termination Notification is of setting the forbidden Status.

Note 2: In case of using this function, the software of computer must correspond to Full Duplex, in order to be able to receive the termination notification data, even if the computer issues the commands.

Note 3: The RTS line must be always ON, in order not to forbid the transmission of Notification Data during the flow control.

Note 4: The details of the communication timing are referring to **3.3 Communication Timing**

## 7.2 Format of Cascade Global Notification Data

Before the time to terminate the execution, the data format from VC-C4 to the computer is configured as shown below.

| Header | Device Num | Notification Code | End mark |
|---|---|---|---|

Header : 1 byte F8h
Device Num : 2 byte 3031h~3039h (Last device Num connected In Cascade)
Notification Code : 4 byte Present information of VC-C4 connected
End mark : 1 byte EFh

## 7.3 Notification Code

The error information of VC-C4 connected in Cascade indicates in Hexadecimal, returns its ASCII code. If the error does not exists, all bits of Notification flags will be cleared and become zero.

• Bit Assignment of Error Flags.

| b15(MSB) | b14 | b13 | b12 | b11 | b10 | b9 | b8 |
|---|---|---|---|---|---|---|---|
| System Resv.(0) | System Resv.(0) | System Resv.(0) | System Resv.(0) | System Resv.(0) | System Resv.(0) | System Resv.(0) | Cascade 9th |

| b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0(LSB) |
|---|---|---|---|---|---|---|---|
| Cascade 6th | Cascade 7th | Cascade 6th | Cascade 5th | Cascade 4th | Cascade 3rd | Cascade 2nd | Cascade 1st |

Example: 6 units are connected in Cascade, and the errors occur in 1st unit and 5th unit.

1st byte
b7 = 0, b6 = 0, b5 = 0, b4 = 0
0h → 30h

2nd byte
b3 = 0, b2 = 0, b1 = 0, b0 = 0
0h → 30h

3rd byte
b7 = 0, b6 = 0, b5 = 0, b4 = 1
1h → 31h

4th byte
b3 = 0, b2 = 0, b0 = 0, b0 = 1
1h → 31h

(Hexadecimal Indication → ASCII code conversion)

Example of Notification data

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Notification Code | | | | End mark |
| F8h | 30h | 36h | 30h | 30h | 31h | 31h | EFh |

## 8. Function of Remote Control

### 8.1 In general

The ON/OFF status of remote control can be monitored by the Computer.
By Remote Control Through Command ON, VC-C4 is In the status of Through Mode and Notify the status of ON/OFF to the Computer
In case of Remote Control ON by Host Control, VC-C4 transmits the status corresponding to the key pushed, even though VC-C4 receives Remote Control Code

Note 1: After just turn on, the function of remote Control is of setting the Status OFF.
Note 2: In case of using this function, the software of computer must correspond to Full Duplex, in order to be able to receive the remote control through data, even if the computer issues the commands.
Note 3: The RTS line must be always ON, in order not to forbid the remote control through Data during the flow control.
Note 4: The details of the communication timing are referring to **3.3 Communication Timing**

### 8.2 Data Format of Remote Controller Through

At the time to receive remote controller data, the data format from VC-C4 to the computer is configured as shown below.

| Header | Device Num | Status | End mark |
|---|---|---|---|

Header : 1 byte FDh Remote Button ON (Pushed)
FCh Remote Button OFF (Released)
Device Num : 2 byte 3030h~3039h (Device Num in Cascade connection)
Status : 2 byte Remote Control Code indicates Hexadecimal, returns its ASCII code.
(refer to **8.3. Remote control code table**)
End mark : 1 byte EFh

Each device return the data of remote control in the status of Cascade connection (3031 3039)

Example: Remote Control Button [1] ON

| d0 | d1 | d2 | d3 | d4 | d7 |
|---|---|---|---|---|---|
| Header | Device Num | | Remote control Code | | End mark |
| FDh | 30h | 3Xh | 30h | 31h | EFh |

Example: Remote Control Button [1] OFF

| d0 | d1 | d2 | d3 | d4 | d7 |
|---|---|---|---|---|---|
| Header | Device Num | | Remote control Code | | End mark |
| FCh | 30h | 3Xh | 30h | 31h | EFh |

### 8.3 Table of Remote Control code

At the Remote Control Through Mode, the code corresponding to the key transmitted by VC-C4, is described below.

| Command of remote control (Remote Key) | Code | Status Value |
|---|---|---|
| MF | 00h | 30 30h |
| 1 | 01h | 30 31h |
| 2 | 02h | 30 32h |
| 3 | 03h | 30 33h |
| 4 | 04h | 30 34h |
| 5 | 05h | 30 35h |
| 6 | 06h | 30 36h |
| AF | 07h | 30 37h |
| NEAR | 08h | 30 38h |
| FAR | 09h | 30 39h |
| WIDE | 0Ah | 30 41h |
| TELE | 0Bh | 30 42h |
| UP | 0Ch | 30 43h |
| DOWN | 0Dh | 30 44h |
| LEFT | 0Eh | 30 45h |
| RIGHT | 0Fh | 30 46h |
| HOME | 10h | 31 30h |
| ID | 11h | 31 31h |
| BRIGHT- | 12h | 31 32h |
| ON SCREEN | 13h | 31 33h |
| CAMERA | 14h | 31 34h |
| SET/OK | 15h | 31 35h |
| CANCEL | 16h | 31 36h |
| * | 17h | 31 37h |
| # | 18h | 31 38h |
| BRIGHT+ | 19h | 31 39h |
| Fn | 1Ah | 31 41h |
| MENU | 1Bh | 31 42h |
| 7 | 1Ch | 31 43h |
| 8 | 1Dh | 31 44h |
| 9 | 1Eh | 31 45h |
| 0 | 1Fh | 31 46h |

## 9. Classification of Command

### 9.1 Classification by Operation

VC-C4 consists of Pedestal and Camera sections, and Command consists of Pedestal Control, Camera Control and System Control. This manual describes according to this classification.

(1) Pedestal Control

This control is to set each parameter, to inquire and to indicate operation for Pedestal.
Pan Speed Setting, Pan Speed Request, Pan Angle Request, etc. are counted among this classification. See the Table 10.1 Pedestal Commands, and 11. Pedestal Control Commands.

(2) Camera Control

This control is to set each parameter, to inquire and to indicate operation for Camera.
Zoom Position Request, Parameter Setting, etc.. are counted among this classification.
See the Table 10.2 Camera Control Command and 12. Details for Camera Control Commands.

(3) System Control

This control is to control the operation by Remote Control, to control LED Display, Operation
of Both Camera and Pedestal, to inquire the Inside status and etc.
Remote ON/OFF, LED forced control, Preset setting, Status Request of Operation are counted
among this classification.
See the Table 10.3 System Control Command and 13. Details for System Control Commands.

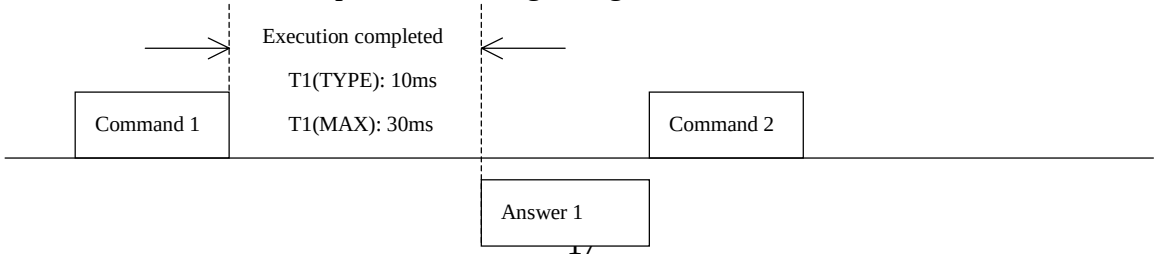
### 9.2 Classification by Executive Format

Each command classify as one of Synchronous Execution (type 1) and other of Non-Synchronous
Execution (type 2)

(1) Synchronous Execution (type 1)

This command executes immediately at the time of Command receipt, and complete the execution at the time of the answer completed.
The command among this classification enable to accept the next command at the moment of Answer transmission. This classified commands describe as type 1 in 11. Detail of Pedestal Control ~ 13. Camera Control Commands, or System Control Commands.

Timing diagram describes below.
The answering time after receipt of the command code is 10 ms in Standard, and 30 ms Max.
And the execution completes at the beginning of transmission



(2) Non-Synchronous Execution A (type 2)

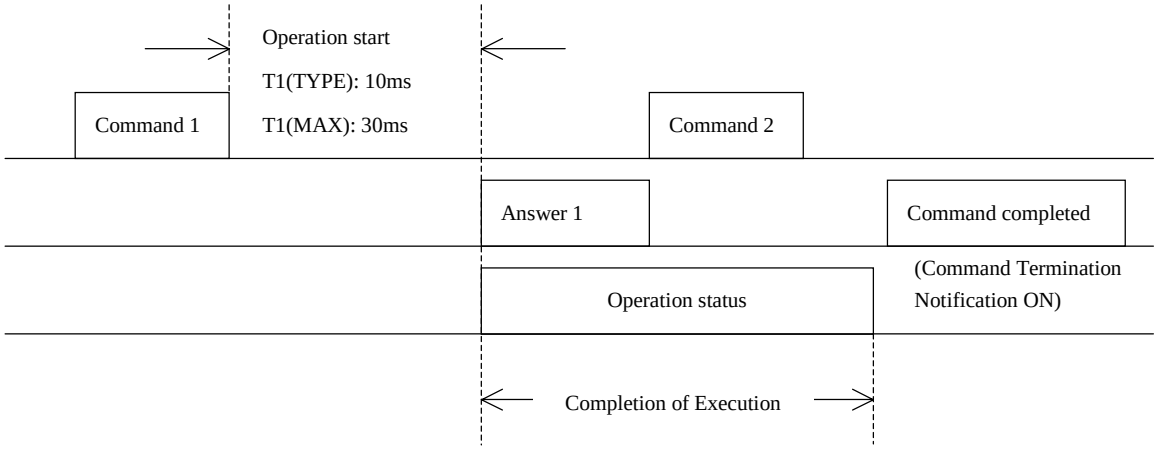
On receipt of the command code, this command transmits the command without waiting of the completion to execute. The completion of operation can be found by the status of flag among the operation status, or by the Termination Notification of Command Termination Notification.

The commands classified in this, describe in 11. Details for Pedestal Control Command ~ 13. System Control Command as type 2.

Timing diagram of the operation describes below.

The answering time after receipt of the command code, is 10 ms Standard, 30 ms Max

The time between start and stop, is depend on the class of commands and condition to be executed




**NOTE**

The time shown above indicates the case of single VC-C4 to be connected with the Host computer.

In case of multiple connection in Cascade, the time delay (30 ms Max.) will occur according

to the number of VC-C4

# 10. Control Command Table

## 10.1 Pedestal Control Command Table

| Function | Meaning | Command | Parameter | Status | Ref |
|---|---|---|---|---|---|
| Pan Speed Assignment | To set running speed for Pan | 0050h | 008h~320h | None | P 20 |
| Tilt Speed Assignment | To set running speed for Tilt | 0051h | 008h~26Eh | None | P 21 |
| Pan Speed Request | To return present running speed for Pan | 0052h | 0h | 008h~320h | P 22 |
| Tilt Speed Request | To return present running speed for Tilt | 0052h | 1h | 008h~26Eh | P 23 |
| Pan Tilt Stop | To stop running of Pan/Tilt | 0053h | 0h | None | P 24 |
| Pan Right Start | To start Pan running to right | 0053h | 1h | None | P 25 |
| Pan Left Start | To start Pan running to left | 0053h | 2h | None | P 26 |
| Tilt Up Start | To start Tilt running to up | 0053h | 3h | None | P 27 |
| Tilt Down Start | To start Tilt running to down | 0053h | 4h | None | P 28 |
| Home Position | To move Home position | 0057h | None | None | P 29 |
| Pedestal Initialize 1 | After Initialization, to move home position | 0058h | 0h | None | P 30 |
| Pedestal Initialize 2 | After Initialized, to move the origin position | 0058h | 1h | None | P 31 |
| Pan Slowest Speed Request | To return the slowest speed of Pan | 0059h | 0h | 008h | P 32 |
| Pan Fastest Speed Request | To return the fastest speed of Pan | 0059h | 1h | 320h | P 33 |
| Tilt Slowest Speed request | To return the slowest speed for Tilt | 0059h | 2h | 008h | P 34 |
| Tilt Fastest Speed request | To return the fastest speed for Tilt | 0059h | 3h | 26Eh | P 35 |
| Pan Angle Pulse Ratio Request | To return coefficient of Pan angle conversion | 005Bh | 0h | 2BF2h | P 36 |
| Tilt Angle Pulse Ratio Request | To return coefficient of Tilt angle conversion | 005Bh | 1h | 2BF2h | P 37 |
| Pan Minimum Angle Request | To return minimum angle of Pan | 005Ch | 0h | 7C87h (7A19h) | P 38 |
| Pan Maximum Angle Request | To return maximum angle of Pan | 005Ch | 1h | 8379h (85F7h) | P 39 |
| Tilt Minimum Angle Request | To return minimum angle of Tilt | 005Ch | 2h | 7EF5h (7CF0h) | P 40 |
| Tilt Maximum Angle Request | To return maximum angle of Tilt | 005Ch | 3h | 8320h (8059h) | P 41 |
| Pan/Tilt Stop | To stop Pan/tilt running | 0060h | 00h | None | P 42 |
| Pan/Tilt Start Stop | To start and stop Pan/tilt running | 0060h | 01h~22h | None | P 43 |
| Pan/Tilt Angle Assignment | To move assign position of Pan/Tilt | 0062h | XXXX, YYYYh | None | P 45 |
| Pan/Tilt Angle Request | To return present position of Pan/Tilt | 0063h | None | XXXX, YYYYh | P 47 |
| Pan Movable Range Assignment | To assign movable limit for Pan | 0064h | 0h, PMIN, PMAX | None | P 49 |
| Tilt Movable Range Assignment | To assign movable limit for Tilt | 0064h | 1h, TMIN, TMAX | None | P 51 |
| Pan Movable Range Request | To return present position of Pan | 0065h | 0h | PMIN, PMAX | P 53 |
| Tilt Movable Range Request | To return present position of Tilt | 0065h | 1h | TMIN, TMAX | P 54 |

Note: XXXX, YYYY means Pan angel, Tilt angle In Hexadecimal

PMIN, PMAX means Pan min. movable range, max. movable range in Hexadecimal

TMIN, TMAX means Tilt mini. movable range, max. movable range in Hexadecimal

The value inside ( ) means status value in the inverse mount type

## 10.2 Camera Control Command Table

| Function | Meaning | Command | Parameter | Status | Ref |
|---|---|---|---|---|---|
| Camera OFF | To turn OFF power for Camera section | 00A0h | 0h | None | P 55 |
| Camera ON | To turn ON power for Camera section | 00A0h | 1h | None | P 56 |
| Focus Auto | To change mode of focus to AF | 00A1h | 0h | None | P 57 |
| Focus Manual | To stop and change of focus to Manual | 00A1h | 1h | None | P 58 |
| Focus Near | To move to near focus | 00A1h | 2h | None | P 59 |
| Focus Far | To move to far focus | 00A1h | 3h | None | P 60 |
| Focus Position Assignment | To move to focus position assigned | 00B0h | XXXXh *1 | None | P 61 |
| Focus Position Request | To return present focus position | 00B1h | 0h | XXXXh *1 | P 62 |
| One Push AF | After adjustment of focus, change to AF | 00B1h | 1h | None | P 63 |
| Focus Range Request | To return movable range of focus | 00B1h | 2h | XXXXXXXXh *2 | P 64 |
| Zoom Stop | To stop zoom operation | 00A2h | 0h | None | P 65 |
| Zoom Wide | To zooming to wide | 00A2h | 1h | None | P 66 |
| Zoom Tele | To zooming to tele | 00A2h | 2h | None | P 67 |
| Zoom Hi Wide | To zooming to wide high speed | 00A2h | 3h | None | P 68 |
| Zoom Hi Tele | To zooming to tele high speed | 00A2h | 4h | None | P 69 |
| Zoom Position 1 Assignment | To move to zoom position assigned | 00A3h | 00h~80h | None | P 70 |
| Zoom Position 1 Request | To return present zoom position | 00A4h | None | 00h~80h | P 71 |
| Zoom Position 2 Assignment | To move to zoom position assigned | 00B3h | 0000h~Max | | P 72 |
| Zoom Position 2 Request | To return present zoom position | 00B4h | 0h | 0000h~Min | P 73 |
| Zoom Speed Assignment | To assign running speed of zoom | 00B4h | “31h”, 0h~7h | None | P 74 |
| Zoom Speed Request | To return present running speed | 00B4h | 2h | 0h~7h | P 75 |
| Zoom Maximum Request | To return maximum movable position | 00B4h | 3h | XXXXh *3 | P 76 |
| Backlight Compensation OFF | To eliminate compensation of backlight | 00A5h | 0h | None | P 77 |
| Backlight Compensation ON | To compensate backlight | 00A5h | 1h | None | P 78 |
| Exposure Auto | To control exposure automatically | 00A5h | 2h | None | P 79 |
| Exposure Manual | To control exposure manually | 00A5h | 3h | None | P 80 |
| AE Lock OFF | To cancel AE lock ON | 00A5h | 40h | None | P 81 |
| AE Lock ON | To lock the exposure of AE mode | 00A5h | 41h | None | P 82 |
| Shutter Speed Program | To change shutter speed to program mode | 00A8h | 0h | None | P 83 |
| Shutter Speed 1/60 (PAL: 1/50) | To change shutter speed to 1/60 (PAL: 1/50) | 00A8h | 1h | None | P 84 |
| Shutter Speed1/100 (PAL: 1/120) | To change shutter speed to 1/12 (0PAL: 1/100) | 00A8h | 2h | None | P 85 |
| Shutter Speed Assignment | To assign shutter speed | 00A5h | “35h”, 00h~19h | None | P 86 |
| Shutter Speed Request | To return present shutter speed | 00A5h | 6h | 00h~19h | P 87 |
| AGC Gain Assignment | To assign AGC Gain | 00A5h | “37h”, 00h~FFh | None | P 89 |
| AGC Gain Request | To return present AGC gain | 00A5h | 8h | 00h~FFh | P 80 |
| Iris Assignment | To assign iris | 00A5h | “39h”, 02h~10h | None | P 91 |
| Iris Request | To return iris value | 00A5h | “3Ah” | 00h~11h | P 92 |
| AE Target Value Assignment | To assign target value of AE brightness | 00A5h | “3Bh”, 10h~FFh | None | P 94 |
| AE Target Value Request | To return target value of AE brightness | 00A5h | “3Ch” | 10h~FFh | P 95 |
| Auto White Balance Normal | To adjust white balance automatically | 00A7h | 0h | None | P 96 |
| Auto White Balance Lock | To stop white balance control | 00A7h | 1h | None | P 97 |
| White Balance Manual Mode | To set white balance manually | 00A7h | 2h | None | P 98 |
| White Balance Value Assignment | To assign white balance manually | 00A7h | “34h”, 00h~FFh | None | P 99 |
| White Balance Value Request | To return present white balance manually | 00A7h | 5h | 00h~FFh | P 100 |
| Fade Normal | To fade out normal image slowly | 00A9h | 0h | None | P 101 |
| Fade White | To fade in white image slowly | 00A9h | 1h | None | P 102 |
| Fade Hi Speed White | To change to white image high speed | 00A9h | 2h | None | P 103 |
| Fade Hi Speed Black | To change to black image high speed | 00A9h | 3h | None | P 104 |
| Camera Reset | To reset Camera section | 00AAh | None | None | P 105 |
| Zoom Ratio request | To return zoom ratio of camera | 00ABh | None | 10h | P 106 |
| Pixel Size Request | To return CCD pixel size | 00ACh | None | 14h | P 107 |
| Product Version Request | To return version value of camera section | 00BEh | 0h | 00h~FFh | P 108 |
| EEPROM Version Request | to return version of camera EEPROM | 00BEh | 1h | 00h~FFh | P 109 |

*1 4 figures Hexadecimal value within the request of focus limit

*2 The focus range changes according to the zoom position. The value indicates Max/Min 4 figures in Hexadecimal

*3 The zoom value is to set individually inherent value within 0000h~FFFFh

## 10.3 System control Command Table

| Function | Meaning | Command | Parameter | Status | Ref |
|---|---|---|---|---|---|
| Remote Control ON | To available remote controller | 0080h | 0h | None | P110 |
| Remote Control OFF | To inhibited remote controller | 0080h | 1h | None | P111 |
| Operation Status Request | To return information of operate status | 0086h | None | 3 byte | P112 |
| Extended Operation Status Request | To return extended information of operate status | 0086h | 0h | 5 byte | P113 |
| Product Name Request | To return product name | 0087h | None | "VC-C4" | P115 |
| ROM Version Request | To return ROM version of VC-C4 | 0088h | None | "V5-16" | P116 |
| Preset Set | To memory preset position | 0089h | 1h~9h | None | P117 |
| Preset Move | To move preset position | 008Ah | 1h~9h | None | P118 |
| Preset Status Request | To request preset status | 008Bh | None | 2 byte | P120 |
| Extended Preset Status Request | To request extended preset status | 008Bh | 0h | 3 byte | P121 |
| Remote Controller Through Setting | To set ON/OFF of remote controller through | 008Dh | 0h~1h | None | P123 |
| LED Normal Display | To set normal display of LED | 008Eh | 0h | None | P124 |
| LED Forced Control | To set forced ON/OFF of LED | 008Eh | 1h~4h | None | P125 |
| Cascade OFF | To release cascade connection OFF | 008Fh | 0h | None | P126 |
| Cascade ON | To connect cascade connection ON | 008Fh | 1h | None | P127 |
| Host Control Mode | To control by host computer | 0090h | 0h | None | P128 |
| Local Control Mode | To control by remote controller | 0090h | 1h | None | P129 |
| Screen Control | To set screen display of date, time, characters | 0091h | 00h~09h | None | P130 |
| Display Character Data Assignment | To assign character data of display | 0091h | 1h XX,Y,DD | None | P132 |
| Display Character Data Request | To request character data of display | 0091h | 2h XX,Y | 2 byte | P134 |
| Display Date Setting | To set display date (yy/mm/dd) | 0091h | 3h YY,MM,DD | None | P136 |
| Display Date Request | To request display date (yy/mm/dd) | 0091h | 4h | YY,MM,DD | P137 |
| Display Time Setting | To set display time (hh/mm/ss) | 0091h | 5h,HH,MM,SS | None | P138 |
| Display Time Request | To request display time (hh/mm/ss) | 0091h | 6h | HH,MM,SS | P139 |
| Turning On Time Request | To request total accumulated turn on time | 0092h | 0h~1h | 0000h~FFFFh | P140 |
| Default Setting | To initialize in status of factory setting | 0093h | None | None | P141 |
| Command Termination Notification Setting | To set termination notification on/off | 0094h | 0h~1h | None | P142 |
| Global Notification Setting | To set global notification on/off | 0095h | 0h~1h | None | P143 |
| Pedestal Model Request | To return pedestal model (normal/inverse) | 009Ah | 0h | 0h~1h | P144 |
| Camera Model Request | To return camera model (NTSC/PAL) | 009Ah | 1h | 0h~1h | P145 |

*1 XX, Y, DD indicate X address, Y address, ,Character Data of Display in Hexadecimal

*2 YY, MM, DD indicate Year, Month, Day in Hexadecimal

*3 HH, MM, SS indicate Hour, Minute, Second in Hexadecimal

## 11. Detail of Pedestal Control Command

### 11.1 Pan Speed Assignment

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To set running speed of Pan direction | |
| Command | 0050h | |
| Parameter | Length | 3 byte |
| | Range | 8~800PPS (008h~320h) |
| | Default Value | 800PPS (320h) |
| Status | None | |
| Reference | •1LSB of parameter value is equal to 0.1125 degree/s<br>•The running time of Pan can calculate as under<br>$\frac{\text{(Pan position after run) - (Pan position before run)}}{\text{(Pan Running Speed)}}$<br>(refer to **11.27**, **11.29** concerning Pan position of pedestal)<br>Example set Pan Running Speed 800. In this case, the running time is approx. 2 seconds from+800 position to -800 position of pedestal.<br>$\frac{\text{800\{position +90degree\} - (-800)\{position -90degree\}}}{\text{800\{Pan Running Speed\}}}$<br>•The command unable to set speed, is **Home Position**, **Pedestal Initialize 1** and **Pedestal Initialize 2**, total 3 commands<br>Pan running speed can modify by this command during even running Pan. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | End mark |
| FFh | 30h | 3Xh | 00h | 50h | p0 | p1 | p2 | EFh |

⇓

| The running speed indicates in 3 figures Hexadecimal, and its ASCII code treats as parameter. | | | | | |
|---|---|---|---|---|---|
| example: | | | | p0 | p1 |
| p2 | | | | | |
| | 150 | ⇒ | 096h | ⇒ 30h | 39h |
| 36h | | | | | |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FFh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error : | 00000000B | ⇒ | 00h | ⇒ | 30h | 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h | 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h | 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h | 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Preset Move** Command. *1 |
| Parameter Error | •Assigned parameter comes out less than minimum value.<br>•Assigned parameter comes out more than maximum value. |

| | |
|---|---|
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

*1: Not applicable ROM Version V5-16 or newer

## 11.2 Tilt Speed Assignment

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To set the running speed of Tilt direction | |
| Command | 0051h | |
| Parameter | Length | 3 byte |
| | Range | 8~6222PPS (008h~26Eh) |
| | Default Value | 622PPS (26Eh) |
| Status | None | |
| Reference | •1LSB of parameter value is equal to 0.1125 degree/s<br>•The running time of Tile can calculate as under<br>$\frac{\text{(Tilt position after run) - (Tilt position before run)}}{\text{(Tilt Running Speed)}}$<br>(refer to **11.28**, **11.30** concerning Tilt position of pedestal)<br>Example set Tilt Running Speed 600. In this case, the running time is approx. 0.9 seconds from +267 position to -267 position of pedestal.<br>$\frac{\text{267\{position +30degree\} - (-267)\{position -30degree\}}}{\text{600\{Tilt Running Speed\}}}$<br>•The command unable to set speed, is **Home Position**, **Pedestal Initialize 1** and **Pedestal Initialize 2**, total 3 commands<br>•Tilt running speed can modify by this command during even Tilt running. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | End mark |
| FFh | 30h | 3Xh | 00h | 51h | p0 | p1 | p2 | EFh |

⇓

| The running speed indicates in 3 figures Hexadecimal, and its ASCII code treats as parameter. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| example: | | | | | | | | | p0 |
| p1 | p2 | | | | | | | | |
| | | 350 | ⇒ | | 15Eh | ⇒ | | 31h | |
| 35h | 45h | | | | | | | | |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FFh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error : | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Preset Move** Command. *1 |
| Parameter Error | •Assigned parameter comes out less than minimum value.<br>•Assigned parameter comes out more than maximum value. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

*1: Not applicable ROM Version V5-16 or newer

## 11.3 Pan Speed Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To request the running speed of Pan direction | |
| Command | 0052h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 3 byte |
| | Range | 8~800 (008h~320h) |
| Reference | •1 LSB of Status value is equal to 0.1125 degree/s | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 52h | 30h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | EFh |

⇓

| |
|---|
| The running speed indicates in 3 figures Hexadecimal, and its ASCII code treats as status. |
| example: s0<br>s1 s2<br>150 ⇒ 096h ⇒ 30h<br>39h 36h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
| Example e0<br>e1<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.4 Tilt Speed Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To request the running speed of Tilt direction | |
| Command | 0052h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | Length | 3 byte |
| | Range | 8~622 (008h~26Eh) |
| Reference | •1 LSB of Status value is equal to 0.1125 degree/s | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 52h | 31h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | EFh |

⇓

| The running speed indicates in 3 figures Hexadecimal, and its ASCII code treats as status. |
|---|
| example: s0<br>s1 s2<br>350 ⇒ 15Eh ⇒ 31h<br>35h 45h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example : e0<br>e1<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.5 Pan Tilt Stop

Pedestal control Command Type 1

| | | |
|---|---|---|
| Function | To stop the running of Pan/Tilt | |
| Command | 0053h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •To stop the running of Pan/Tilt except the running by **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands.<br>•By issuing this command, the **Panning flag** and **Tilting flag** to clear.<br>•By issuing this command, the Command Termination Notification flag to clear | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 53h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| EFh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.6 Pan Right Start

Pedestal Control Command Type 2

| | | |
|---|---|---|
| Function | To start Pan running to the Right | |
| Command | 0053h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •Until **Pan Tilt Stop** Command issues, or right limit position, continue to run.<br>•The running speed is able to set by **Pan Speed Assignment** Command.<br>•By issuing this Command, 1 is set in **Panning flag** among the Operating Status<br>The setting flag will be done, just before running pedestal. When Pedestal reaches to the right limit, Pan running will stop and clear **Panning flag** and1 of **Pan Limit Position flag** will be set.<br>Note: After power ON, at the moment of receipt of this command without executing Pedestal Initialize 1 or Pedestal Initialize 2, returns Mode error and executes Pedestal Initialize 2, | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 53h | 31h | EFh |

● Answer Format

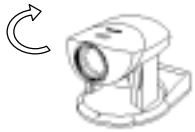
| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| EFh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Pan running by Pedestal Control Command. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •After Power ON, Not executed Pedestal Initialize<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |



Normal Mounting: Right direction

Inverse Mounting: Right direction

## 11.7 Pan Left Start

Pedestal Control Command Type 2

| | | |
|---|---|---|
| Function | To start Pan running to the Left | |
| Command | 0053h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | None | |
| Reference | •Until Pan/Tilt Stop Command issues, or reaches to the left limit, continue to run.<br>•The running speed is able to set by Pan Speed Assignment Command.<br>•By issuing this command, 1 is set in Pan running flag among the running status.<br>The setting flag will be done, just before running pedestal. When Pedestal reaches to the left limit, Pan running will stop and clear Pan running flag and 1 of Pan Limit Position will be set.<br>Note: After power ON, at the moment of receipt of this command without executing pedestal Initialize 1 or Pedestal Initialize 2, returns Mode error and executes Pedestal Initialize 2, | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 53h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| EFh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Pan running by Pedestal Control Command. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •After turn ON, Pedestal Initialize has never been done.<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

Normal Mounting: Left direction

Inverse Mounting: Left direction

## 11.8 Tilt Up Start

Pedestal Control Command Type 2

| | | |
|---|---|---|
| Function | To start Tilt running to the Up | |
| Command | 0053h | |
| Parameter | Length | 1 byte |
| | Value | 3h |
| Status | None | |
| Reference | •Until Pan/Tilt Stop Command issues, or reaches to the upper limit, continue to run.<br>•The running speed is able to set by Tilt Speed Assignment Command.<br>•By issuing this command, 1 is set in Tilt running flag among the running status.<br>•The setting flag will be done, just before running pedestal. When Pedestal reaches to the upper limit, Tilt running will stop and clear Tilt running flag and 1 of Tilt Limit Position will be set.<br>Note: After power ON, at the moment of receipt of this command without executing pedestal Initialize 1 or Pedestal Initialize 2, returns Mode error and executes Pedestal Initialize 2, | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 53h | 33h | EFh |

● Answer Format

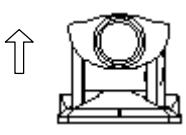
| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| EFh | 30h | 3Xh | e0 | e1 | EFh |

⇓

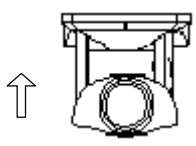
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Tilt running by Pedestal Control Command. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •After turn ON, Pedestal Initialize has never been done.<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |



Normal Mounting: Up direction



Inverse Mounting: Up direction

## 11.9 Tilt Down Start

Pedestal Control Command Type 2

| | | |
|---|---|---|
| Function | To start Tilt running to the Down | |
| Command | 0053h | |
| Parameter | Length | 1 byte |
| | Value | 4h |
| Status | None | |
| Reference | •Until Pan/Tilt Stop Command issues, or reaches to the lower limit, continue to run.<br>•The running speed is able to set by Tilt Speed Assignment Command.<br>•By issuing this command, 1 is set in Tilt running flag among the running status.<br>The setting flag will be done, just before running pedestal. When Pedestal reaches to the low limit, Tilt running will stop and clear Tilt running flag and 1 of Tilt Limit Position will be set.<br>Note: After power ON, at the moment of receipt of this command without executing pedestal Initialize 1 or Pedestal Initialize 2, returns Mode error and executes Pedestal Initialize 2, | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 53h | 33h | EFh |

● Answer Format

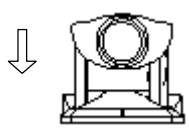
| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| EFh | 30h | 3Xh | e0 | e1 | EFh |

⇓

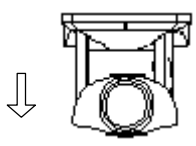
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Tilt running by Pedestal Control Command. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •After turn ON, Pedestal Initialize has never been done.<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |



Normal Mounting: Down direction



Inverse mounting: Down direction

## 11.10 Home Position

Pedestal Control Command Type 2

| | |
|---|---|
| Function | To move Home position(front) |
| Command | 0057h |
| Parameter | None |
| Status | None |
| Reference | •Home Position(Front) is originally set at the following position.<br>Angle of Pan direction(position) 0 (8000h)<br>Angle of Tilt direction(position) 0 (8000h)<br>•Regardless of the running speed setting of Pan/Tilt direction, Pan/Tilter will return to home position with the fastest speed.<br>•After power ON, at the moment of receipt of this command without executing pedestal Initialize 1 or Pedestal Initialize 2, returns Mode error and execute Pedestal Initialize 1.<br>In process of Home position running, Pan/Tilt stop command is effective.<br>By issuing this command, Pan & Tilt run simultaneously and flags of Pan & Tilt running among of running status, come out 1. When Pan running stops flag of Tilt running comes out 0, then Tilt will stop and the flag of Tilt comes<br>out zero.<br>Note:<br>In case that Pan 6 Tilt are in Home position, Pan & Tilt do not run. |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | 57h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓d

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error : | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Pan/Tilt running by Pedestal Control Command. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 11.11 Pedestal Initialize 1

Pedestal Control Command Type 2

| | | |
|---|---|---|
| Function | After initialize pedestal, to run to Home position. | |
| Command | 0058h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •After initialization, run to Home Position.<br>•Home Position(Front) is originally set at the following position.<br>Angle of Pan direction(position) 0(8000h)<br>Angle of Tilt direction(position) 0(8000h)<br>•By issuing this command, at first to centralize with high speed, then approach to the right central position with low speed and determine the central position. This central position will be Home Position.<br>The flag of Pan & Tilt running during Pan & Tilt running come out 1 and when every operation stops, it comes out zero. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 58h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing Pan running by Pedestal Control Command.<br>•In case of executing Tilt running by Pedestal Control Command.<br>•In case of executing **Preset Move** Command. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.12 Pedestal Initialize 2

Pedestal Control Command Type 2

| | | |
|---|---|---|
| Function | After initialize pedestal, to run to original position. | |
| Command | 0058h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •After initialization, runs to former position.<br>•By issuing this command, at first to centralize in Pan with high speed, then approaches to Pan central position with low speed and determine Pan central position and secondly to try to centralizes in Tilt with high speed, then approach to Tilt central position with low speed and determines Pan & Tilt central position. This Pan & Tilt central position will be Home Position and returns to the position, when this command issued.<br>The flag of Pan & Tilt running during Pan & Tilt running comes out 1 and when every operation stops, it comes out zero. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 58h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing Pan running by Pedestal Control Command.<br>•In case of executing Tilt running by Pedestal Control Command.<br>•In case of executing **Preset Move** Command. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 11.13 Pan Slowest Speed Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the slowest running speed in Pan direction. | |
| Command | 0059h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | Length | 3 byte |
| | Value | 8(008h) |
| Reference | •To return the slowest speed enable to set the running speed of Pan direction.<br>•The status value 8 is equal to approx. 0.9 degree/s. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 59h | 30h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 30h | 30h | 38h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.14 Pan Fastest Speed Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the fastest running speed in Pan direction. | |
| Command | 0059h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | Length | 3 byte |
| | Value | 800(320h) |
| Reference | •To return the fastest speed enable to set the running speed of Pan direction.<br>•The status value 800 is equal to approx. 90 degrees/s. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 59h | 31h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 33h | 32h | 30h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.15 Tilt Slowest Speed Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the slowest running speed in Tilt direction. | |
| Command | 0059h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | Length | 3 byte |
| | Value | 8(008h) |
| Reference | •To return the slowest speed enable to set the running speed of Tilt direction.<br>•The status value 8 is equal to approx. 0.9 degree/s. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 59h | 32h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 30h | 30h | 38h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.16 Tilt Fastest Speed Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the fastest running speed in Tilt direction. | |
| Command | 0059h | |
| Parameter | Length | 1 byte |
| | Value | 3h |
| Status | Length | 3 byte |
| | Value | 622 (26Eh) |
| Reference | •To return the fastest speed enable to set the running speed of Tilt direction.<br>•The status value 622 is equal to approx. 70 degrees/s. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 59h | 33h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 32h | 36h | 45h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters.. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.17 Pan Angle Pulse Ratio Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the coefficient to convert parameter value using Pan angle(position) and Pan speed commands to angle unit. | |
| Command | 005Bh | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 4 byte |
| | Value | 11250 (2BF2h) |
| Reference | •To return integral value multiplied 100000 to the conversion coefficient of true Pan angle. In case of angle conversion, divide it by 10000<br>Example below,<br>Status value /100000 = 11250 /100000 = 0.1125<br>The parameter of Pan Assignment Command can be converted as under.<br>Pan speed = 800PPS = 800 × 0.1125 = 90 degrees/s | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 5Bh | 30h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 32h | 42h | 46h | 32h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.18 Tilt Angle Pulse Ratio Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the coefficient to convert parameter value using Tilt angle(position) and Tilt speed commands to angle unit. | |
| Command | 005Bh | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | Length | 4 byte |
| | Value | 11250 (2BF2h) |
| Reference | •To return integral value multiplied 100000 to the conversion coefficient of true Tilt angle. In case of angle conversion, divide it by 10000.<br>Example below,<br>Status value /100000 = 11250 /100000 = 0.1125<br>The parameter of Tilt Assignment Command can be converted as under.<br>Tilt speed = 622 PPS = 622 × 0.1125 = 70 degrees/s | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 5Bh | 31h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 32h | 42h | 46h | 32h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 11.19 Pan Minimum Angle Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the minimum value(left) value in Pan direction. | |
| Command | 005Ch | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 4 byte |
| | Value | Normal Mounting: -889 (7C87h) |
| | | Inverse Mounting: -1511 (7A19h) |
| Reference | •Status Value (-889) in normal mounting is the position rotated approx. 100degree to left as zero degree for front.<br>•Status Value (-1511) in inverse mounting is the position rotated approx. 170degrees to left as zero degree for front. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 5Ch | 33h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 37h | 43h | 38h | 37h | EFh |

or

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 37h | 41h | 31h | 39h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in Hexadecimal 2 figures 2 figures and returns ASII value |
|---|
| Example e0<br>e1<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.20 Pan Maximum Angle Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the maximum Angle(right) value in Pan direction. | |
| Command | 005Ch | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | Length | 4 byte |
| | Value | Normal Mounting: +889 (8379h) |
| | | Inverse Mounting: +1511 (85F7h) |
| Reference | •Status Value (+889) in normal mounting is the position rotated approx. 100degree to right as zero degree for front.<br>•Status Value (+1511) in inverse mounting is the position rotated approx. 170degreess to right as zero degree for front. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 5Ch | 31h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 38h | 33h | 37h | 39h | EFh |

or

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 38h | 35h | 46h | 37h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.21 Tilt Minimum Angle Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the minimum value(down) value in Tilt direction. | |
| Command | 005Ch | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | Length | 4 byte |
| | Value | Normal Mounting: -267 (7EF5h) |
| | | Inverse Mounting: -800 (7CE0h) |
| Reference | •Status Value(-267) in normal mounting is the position rotated approx. 30degree to down as zero degree for horizontal.<br>•Status Value(-800) in inverse mounting is the position rotated approx. 90degrees to down as zero degree for horizontal. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 5Ch | 32h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 37h | 45h | 46h | 35h | EFh |

or

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 37h | 43h | 45h | 30h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.22 Tilt Maximum Angle Request

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To return the maximum value(up) value in Tilt direction. | |
| Command | 005Ch | |
| Parameter | Length | 1 byte |
| | Value | 3h |
| Status | Length | 4 byte |
| | Value | Normal Mounting: +800(8320h) |
| | | Inverse Mounting: +89(8059h) |
| Reference | •Status Value(+800) in normal mounting is the position rotated approx 90degrees to upper as zero degree for horizontal.<br>•Status Value(+89) in inverse mounting is the position rotated approx 10degrees to upper as zero degree for horizontal. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 5Ch | 33h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 38h | 33h | 32h | 30h | EFh |

or

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | 38h | 30h | 35h | 39h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.23 Pan/Tilt Stop

Pedestal Control Command Type 1

| | | |
|---|---|---|
| Function | To stop motion of Pan & Tilt. | |
| Command | 0060h | |
| Parameter | Length | 2 byte |
| | Value | 00h |
| Status | None | |
| Reference | •To stop the motion of Pan/Tilt excluding the motion by Pedestal Initialize 1 & Pedestal Initialize 2.<br>•By issuing this command, flag in Pan/Tilt motion among of the executing status comes out zero.<br>•By issuing this command, the requested flag of Command Termination Notification to Pan/Tilt motion comes out zero.. | |

● The format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | device num | | Command | | Parameter | | End mark |
| FFh | 30h | 3Xh | 00h | 60h | 30h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| •Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands. |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 11.24 Pan/Tilt Start Stop

Pedestal Control Command type 2

| | | |
|---|---|---|
| Function | To start or stop the motion of Pan/Tilt. | |
| Command | 0060h | |
| Parameter | Length | 2 byte |
| | First Value | 0h~2h |
| | Second Value | 0h~2h |
| Status | None | |
| Reference | •First parameter assigns Pan motion, and second parameter assigns Tilt motion<br>Depend on the combination of first and second parameter,<br>the following nine(9) kind of motion can be assigned.<br><br>first parameter Second Parameter Pan/Tilt Motion<br>0h 0h : Pan Stop, Tilt Stop<br>0h 1h : Pan Stop, Tilt up Start<br>0h 2h : Pan Stop, Tilt Down Start<br>1h 0h : Pan Right Start, Tilt Stop<br>1h 1h : Pan Right Start, Tilt Up Start<br>1h 2h : Pan Right Start, Tilt Down Start<br>2h 0h : Pan Left Start, Tilt Stop<br>2h 1h : Pan Left Start, Tilt Up Start<br>2h 2h : Pan Left Start, Tilt Down Start<br><br>•The stop motion of Pan(0h) is different from the one of Tilt(0)<br>See **11.23 Pan/Tilt Stop**<br><br>•In case of changing motion status of Pan/Tilt by this command, not necessary to issue Pan/tilt Stop command. For example, the status in Pan right start and Tilt up start can be changed to the status in Pan left start and Tilt down start.<br>•Pan/Tilt speed assignment command is able to set Pan/Tilt running speed.<br>•By issuing this command, Pan/Tilt will be simultaneously in action, and flag of Pan/Tilt in action, is to set 1. When Pan motion stops, flag of Pan in action<br>clears it zero and When Tilt motion stops, flag of Tilt in action clear it zero.<br>Note:<br>After power on, in case of receipt of this command without executing Pedestal Initialize 1 and Pedestal Initialize 2, Mode error is returned and Pedestal Initialize 2 will be executed. | |

● Format of Control Code (Example Pan Right Start, Tilt Dow Start)

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | End mark |
| FFh | 30h | 3Xh | 00h | 60h | 31h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

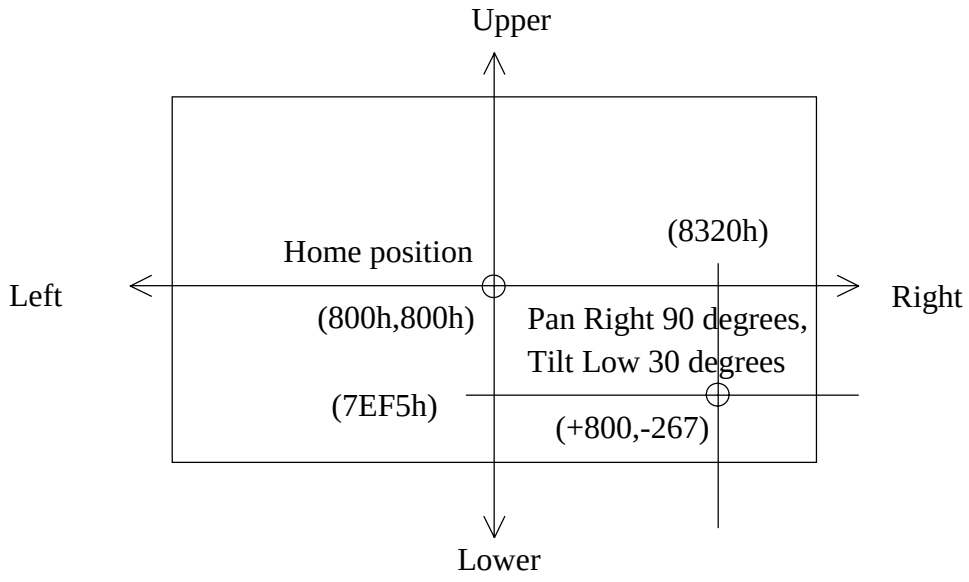
● Condition of Error flag to be set

| | |
|---|---|
| Busy | In case of executing **Home Position**, **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Pan/Tilt running by Pedestal Control Command |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •After Power ON, Not executed Pedestal Initialize<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.25 Pan/Tilt Angle Assignment

Pedestal Control Command type 2

| | | |
|---|---|---|
| Function | To assign Angle(position) in Pan/Tilt direction | |
| Command | 0062h | |
| Parameter | Length | 8 byte |
| | Range | within range of Pan and Tilt Movable Range |
| | Default Range (normal mounting) | Pan : -889~ +889 (7C87h~8379h) |
| | | Tilt : -267~ +267 (7EF5h~810Bh) |
| | Default Range (inverse mounting) | Pan : -1511~ +1511 (7A19h~85E7h) |
| | | Tilt : -800~ +89 (7CE0h~8059h) |
| status | None | |
| Reference | •Parameter Value (1LSB) of both Pan/Tilt is equal to approx.0.1125 by converting to angle ( see 11.17 and 11.18)<br>•Parameter section (8 byte) splits p0~p3 as angle (position) section, and p4~p7 as Tilt (position) section.<br>•The range of each parameter is effective within the range set by Pan Movable Range Assignment (11.27) and Tilt Movable Range Assignment (11.28)<br>•The right direction of Pan Angle (position) is positive at the Home position and the left one is passive. The upper direction of Tilt Angle (position) is positive at the Home position and the lower one is passive.<br>•Assign each parameter with the angle (position) at Home position. (Home position is 8000h)<br>•Assigned sample of Pan/tilt Angle(position) as below<br>Pan right 90 degrees ⇒ +90/0.1125 ⇒ +800 ⇒ +320h<br>⇒ 8000h+320h = 8320h<br>Tilt lower 30 degrees ⇒ -30/0.1125 ⇒ -267 ⇒ -10Bh<br>⇒ 8000h-10Bh = 7EF5h<br><br>•Pan/Tilt stop Command can stop motion by force. The running speed can be set by Pan/Tilt Speed Assignment command.<br>•By issuing this command, Pan/tilt will be in action simultaneously and Pan and Tilt flag in action among the running status, set 1 and when Pan/Tilt motion stop, Pan/Tilt flags in action clear to zero.<br><br>Note : After power ON, in case of receipt of this command without executing **Pedestal Initialize 1 & 2**, return Mode Error and execute **Pedestal Initialize2** | |



● Format of Control Command

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Command | |
| FFh | 30h | 3Xh | 00h | 62h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 | d13 |
|---|---|---|---|---|---|---|---|---|
| Pan Angle Parameter | | | | Tilt Angle Parameter | | | | End mark |
| p0 | p1 | p2 | p3 | p4 | p5 | p6 | p7 | EFh |

⇓

| Running speed indicates Hexadecimal 8 figures and returns ASCII as parameter value | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example | Pan right 90 degrees | | | Tilt lower 30 degrees | | | |
| | Pan | | | p0 | p1 | p2 | p3 |
| | +800 | ⇒ | 8320h | ⇒ | 38h | 33h | 32h | 30h |
| | Tilt | | | | p4 | p5 | p6 | p7 |
| | -267 | ⇒ | 7EF5h | ⇒ | 37h | 45h | 46h | 35h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Home Position**, **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•In case of Panning by Pedestal Control Command<br>•In case of Tilting by Pedestal Control Command |
| Parameter Error | •Assign illegal parameters.<br>•In case that Pan/Tilt angle(position) is out-of-range Pan/Tilt Movable Range |
| Mode Error | •After Power ON, Not executed Pedestal Initialize<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.26 Pan/Tilt Angle Request

Pedestal Control Command type 1

| | | |
|---|---|---|
| Function | To request Angle(position) in Pan/Tilt direction | |
| Command | 0063h | |
| Parameter | None | |
| Status | Length | 8 byte |
| | Range | within range of Pan and Tilt Movable Range |
| Reference | •Parameter Value (1LSB) of both Pan/Tilt is equal to approx.0.1125 by converting to angle ( see **11.17 and 11.18**)<br>•Parameter section (8 byte) splits s0~s3 as angle (position) section, and s4~s7 as Tilt (position) section.<br>•The value of each status is indicated as angle at Home position(8000h).<br>•This command returns the angle(position), at the moment of receipt of Command even through Pan/Tilt is in action except executing Pedestal Initialize 1 & 2<br><br>Note : After power ON, in case of receipt of this command without executing **Pedestal Initialize 1 & 2**, return Mode Error and execute **Pedestal Initialize2** (applicable Version V5-16 or newer) | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | 63h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Error Code | |
| EFh | 30h | 3Xh | 30h | 30h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 | d13 |
|---|---|---|---|---|---|---|---|---|
| Pan Angel Status | | | | Tilt Angle Status | | | | End mark |
| s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | EFh |

⇓

The present position indicates in Hexadecimal 8 figures and its ASCII is as parameter value

Example Pan right 90 degrees Tilt lower 30 degrees

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pan | | | | s0 | s1 | s2 | s3 |
| +800 | ⇒ | 8320h | ⇒ | 38h | 33h | 32h | 30h |
| Tilt | | | | s4 | s5 | s6 | s7 |
| -267 | ⇒ | 7EF5h | ⇒ | 37h | 45h | 46h | 35h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands |
| Mode Error | •After Power ON, Not executed Pedestal Initialize *1<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

*1: Applicable ROM Version V5-16 or newer

## 11.27 Pan Movable Range Assignment

Pedestal Control Command type 1

| | | |
|---|---|---|
| Function | To assign movable range in Pan direction | |
| Command | 0064h | |
| Parameter | Length | 9 byte |
| | Range | Normal Mounting : -889~+889(7C87h~8379h) |
| | | Inverse Mounting : -1511~+1511(7A19h~85E7h) |
| Status | None | |
| Reference | •Maximum & Minimum(position) movable angle can be set, when Pan Motion Setting is executing.<br>•To set Pan Maximum & Minimum Angle(position) which can be set by Pan/Tilt Angle Assignment Command.<br>•Parameter Value(1LSB) of Pan is equal to approx.0.1125 by converting to angle( see 11.17)<br>•Minimum parameter value can be obtained by Pan Maximum Angle request(11.20) and Pan minimum Angle Request(11.19).<br>•Parameter section(9byte) splits minimum angle(position) as p1~p4 and maximum angle (position) as p5~p8.<br>•Minimum & Maximum Pan Parameter Value is to set at angle of Home position(8000h) See 11.25 Pan/tilt Angle Assignment<br>•Not necessary to include Home position between Minimum and maximum Angle(position). But Minimum angle value must set equal or less value of maximum value.<br>•When Pedestal Initialize 1 command executes, move to home position, even though out of range.<br>•In case that Pan position is out of range before executing Pedestal Initialize 2 command, it return to minimum or maximum position within motion range by the return motion. | |

● Format of Control Code

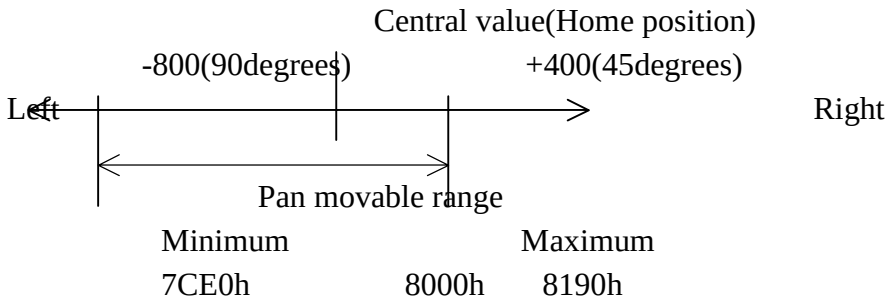
| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| header | Device Num | | Command | |
| FFh | 30h | 3Xh | 00h | 64h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 | d13 | d14 |
|---|---|---|---|---|---|---|---|---|---|
| Fixed | Minimum Angle Parameter | | | | Maximum Angle parameter | | | | End mark |
| 30h | p1 | p2 | p3 | p4 | p5 | p6 | p7 | p8 | EFh |

⇓

| Running speed indicates in Hexadecimal 8 figures and returns ASCII as parameter value | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example Min Value(left) 90 degrees, Max Value(right) 45 degrees | | | | | | | |
| Left | | | | p1 | p2 | p3 | p4 |
| -800 | ⇒ | 7CE0h | ⇒ | 37h | 43h | 45h | 30h |
| Right | | | | p4 | p5 | p6 | p7 |
| +400 | ⇒ | 8190h | ⇒ | 38h | 31h | 39h | 30h |

Example: Minimum (Left) 90 degrees, Maximum(Right) 45 degrees



● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of No Error: •00000000B ⇒ 00h ⇒ 30h 30h<br>■ In case of Busy : 00010000B ⇒ 10h ⇒ 31h 30h<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | In case of executing **Home Position**, **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Pan/Tilt running by Pedestal Control Command |
| Parameter Error | •In case of assigned parameter over value to the Max. & Min Parameter Range<br>•In case of assigned Minimum value over Maximum value. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.28 Tilt Movable Range Assignment

Pedestal Control Command type 1

| | | |
|---|---|---|
| Function | To assign movable range in Tilt direction | |
| Command | 0064h | |
| Parameter | Length | 9 byte |
| | Range | Normal Mounting :-267~+800(7EF5h~8320h) |
| | | Inverse Mounting :-800~+89(7CE0h~8059h) |
| status | None | |
| Reference | •Maximum & Minimum(position) movable angle can be set, when Tilt motion command is set by Tilt right and left start Tilt motion setting command and etc. and set Tilt Maximum & Minimum Angle(position) which can be set by Pan/Tilt Angle Assignment Command.<br>•Parameter Value(1LSB) of Pan is equal to approx.0.1125 by converting to angle( see 11.18)<br>•Minimum parameter value can be obtained by Tilt Minimum Angle request command (11.21) and maximum value can be obtained by Tilt maximum Angle Request(11.22).<br>•Parameter section(9byte) splits fixed value as p0, minimum angle(position) as p1~p4 and maximum angle (position) as p5~p8.<br>•Minimum & Maximum Tilt Parameter Value is to set at angle of Home position(8000h) See 11.25 Pan/tilt Angle Assignment<br>•Not necessary to include Home position between Minimum and maximum Angle(position). But Minimum angle value must set equal or less value of maximum value.<br>•When Pedestal Initialize 1 command executes, moves to home position, even though out of range.<br>•In case that Pan position is out of range before executing Pedestal Initialize 2 command, it returns to minimum or maximum position within motion range by the return motion. | |

● Format of Control Code

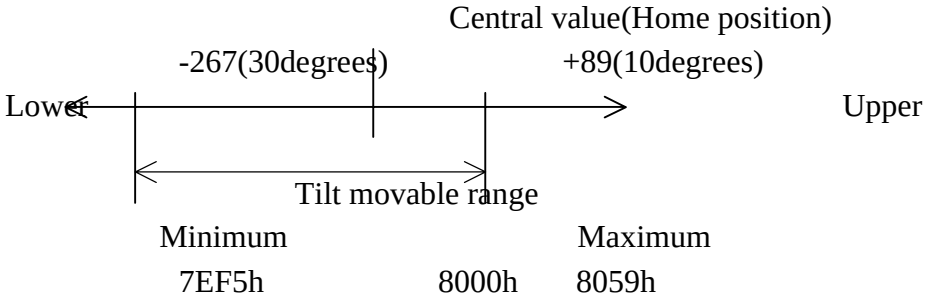
| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| header | Device Num | | Command | |
| FFh | 30h | 3Xh | 00h | 64h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 | d13 | d14 |
|---|---|---|---|---|---|---|---|---|---|
| Fixed | Minimum Angle Parameter | | | | Maximum Angle parameter | | | | End mark |
| 31h | p1 | p2 | p3 | p4 | p5 | p6 | p7 | p8 | EFh |

⇓

| Running speed indicates in Hexadecimal 8 figures and returns ASCII as parameter value | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example Min Value(lower) 30 degrees, Max Value(upper) 10 degrees | | | | | | | |
| Lower | | | | p1 | p2 | p3 | p4 |
| -267 | ⇒ | 7EF5h | ⇒ | 37h | 45h | 46h | 35h |
| Upper | | | | p5 | p6 | p7 | p8 |
| +89 | ⇒ | 8059h | ⇒ | 38h | 30h | 35h | 39h |

Example: Minimum (Lower) 30 degrees, Maximum(Upper) 10 degrees



● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | In case of executing **Home Position**, **Pedestal Initialize 1** and **Pedestal Initialize 2** Commands<br>•In case of executing **Pan/Tilt Angle Assignment** and **Preset Move** Commands<br>•Executing Pan/Tilt running by Pedestal Control Command |
| Parameter Error | •In case of assigned parameter over value to the Max. & Min. Parameter Range<br>•In case of assigned Minimum value over Maximum value. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.29 Pan Movable Range Request

Pedestal Control Command type 1

| | | |
|---|---|---|
| Function | To request movable range in Pan direction | |
| Command | 0065h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 1 byte |
| | Range | Normal Mounting : -889 ~ +889 (7C87h~8379h) |
| | | Inverse Mounting : -1511 ~ +1511 (7A19h~85E7h) |
| Reference | •Parameter Value(1LSB) of Pan is equal to approx.0.1125 by converting to angle( see 11.17)<br>•Parameter section(8byte) splits minimum angle(position) as s0~s3 and maximum angle (position) as s4~s7.<br>•Minimum & Maximum Parameter Value is to set at angle of Home position(8000h) See 11.27 Pan Movable Range Assignment | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 65h | 30h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Error Code | |
| FEh | 30h | 3Xh | 30h | 30h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 | d13 |
|---|---|---|---|---|---|---|---|---|
| Minimum Angle Status | | | | Maximum Angle Status | | | | End mark |
| s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | EFh |

⇓

| Running speed indicates in Hexadecimal 8 figures and returns ASCII as parameter value | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example Min Value(lower) 30 degrees, Max Value(upper) 10 degrees | | | | | | | |
| Lower | | | | s1 | s2 | s3 | s4 |
| -889 | ⇒ | 7C87 | ⇒ | 37h | 43h | 38h | 37h |
| Upper | | | | s5 | s6 | s7 | s8 |
| +267 | ⇒ | 810Bh | ⇒ | 38h | 31h | 30h | 42h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates Hexadecimal 2 figures and returns ASII value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 11.30 Tilt Movable Range Request

Pedestal Control Command type 1

| | | |
|---|---|---|
| Function | To request movable range in Tilt direction | |
| Command | 0065h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | Length | 8 byte |
| | Range | Normal Mounting : -267 ~ +800 (7EF5h~8320h) |
| | | Inverse Mounting : -800 ~ +89 (7CE0h~8059h) |
| Reference | •Parameter Value(1LSB) of Tilt is equal to approx.0.1125 by converting to angle( see 11.18)<br>•Parameter section(8byte) splits minimum angle(position) as s0~s3 and maximum angle (position) as s4~s7.<br>•Minimum & Maximum Parameter Value is to set at angle of Home position(8000h) See 11.28 Tilt Movable Range Assignment | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 65h | 31h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Error Code | |
| FEh | 30h | 3Xh | 30h | 30h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 | d13 |
|---|---|---|---|---|---|---|---|---|
| Minimum Angle Status | | | | Maximum Angle Status | | | | End mark |
| s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | EFh |

⇓

| Running speed indicates in Hexadecimal 8 figures and returns ASCII as parameter value | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example Min Value(lower) 30 degrees, Max Value(upper) 10 degrees | | | | | | | |
| Lower | | | | s1 | s2 | s3 | s4 |
| -267 | ⇒ | 7EF5h | ⇒ | 37h | 45h | 46h | 35h |
| Upper | | | | s4 | s5 | s6 | s7 |
| +89 | ⇒ | 8059h | ⇒ | 38h | 30h | 35h | 39h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12. Details of Camera Control Command

### 12.1 Camera OFF

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To stop operation of Camera and Pedestal, and Camera Section Power OFF. | |
| Command | 00A0h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •To power Camera section OFF(Picture signal of camera comes out OFF)<br>•If this command issues, this command is waiting status until Initialize operation finish, when Pedestal 1 & 2 are in process.<br>(Pan/Tilt motion operation besides the above, will be forced to stop.<br>•During this process of camera OFF by this command, Busy error will occur, when Camera ON or Camera OFF command is issued.<br>•By issuing this command, flag of Camera Power OFF command is set as 1.<br>•After this setting, the command except the following command will come out Mode Error.<br>•Operation Status Request, Extended Operation Status Request Command<br>•Camera ON, Camera OFF Command<br>•LED Normal Display, LED Forced Control Command<br>•Cascade ON, Cascade OFF Command<br>•Host Control Mode, Local Control Mode Command<br>•Global Notification Setting Command. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A0h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Camera ON** Command<br>•In case of executing **Camera OFF** Command |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Host Control Mode** |

## 12.2 Camera ON

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To Camera Section Power ON, and start operation of Camera and Pedestal | |
| Command | 00A0h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •To power Camera section Power ON (Picture signal of camera turns out)<br>•Zoom Position, AE target Value (Back light compensation status, BRIGHT), Shutter Speed1/100 (flicker less AE) will return to the setting condition prior to executing Camera OFF Command and another set values come out default value.<br>•During this process of camera ON by this Command, Busy error will occur, when Camera ON or Camera OFF Command is issued.<br>•After Camera ON process finished, flag of Camera Power OFF among operating status comes out zero<br>•In order to confirm Power ON by this command, necessary to confirm Power OFF flag of Camera section in operated status or answer of Termination Notification at Camera ON command after finishing Command Termination Notification. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A0h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing **Camera ON** Command<br>•In case of executing **Camera OFF** Command |
| Parameter Error | •Assign illegal parameters. |
| Mode Error | •Not in status of **Host Control Mode** |

## 12.3 Focus Auto

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To set Auto Focus Mode. | |
| Command | 00A1h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •Flags in Focusing of Operation Status Request and manual Focus come out 0 at AF Mode.<br>•AF Mode sets default value at the time of executing Camera Reset, Camera ON Command during power ON. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A1h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Focus operation by Manual<br>•In process of **One Push AF** operation<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.4 Focus Manual — Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To stop focus operation and set Manual Mode. | |
| Command | 00A1h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •In case of Auto Focus Mode, cancels AF Mode and set Manual Mode.<br>•To stop focus operation under focusing by Manual mode.<br>•Flags in Focusing of Operation Status Request comes out zero and Manual Focus come out 1. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A1h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of **One Push AF** operation<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.5 Focus Near

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To move focus point near. | |
| Command | 00A1h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | None | |
| Reference | •In case of Auto Focus Mode, cancels AF Mode and set Manual Mode.<br>•Flags in Focusing of Operation Status Request comes out zero and Manual Focus come out 1.<br>•By Focus manual command, possible to stop running.<br>•To stop running at Focus Limit point(Near point) and flag in focusing comes out zero.<br>•To return Notification at the moment of reaching to Focus Operation Limit (Near point), when Command Termination Notification ON is to be set.<br>Note:<br>In case that focus ia already in Focus Operation Limit(Near point), flag in focusing doesn't set 1 because of focus not operating. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A1h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Focus operation by Manual<br>•In process of **One Push AF** operation<br>•In process of **Zooming** operation<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.6 Focus Far

Camera Control Command

Type 2

| | | |
|---|---|---|
| Function | To move focus point far. | |
| Command | 00A1h | |
| Parameter | Length | 1 byte |
| | Range | 3h |
| Status | None | |
| Reference | •In case of Auto Focus Mode, cancel AF Mode and set Manual Mode.<br>•Flags in Focusing of Operation Status Request comes out zero and Manual Focus come out 1.<br>•By Focus manual command, possible to stop running.<br>•To stop running at Focus Limit point(Far point) and flag in focusing comes out zero.<br>•To return Notification at the moment of reaching to Focus Operation Limit (Near point), when Command Termination Notification ON is to be set.<br>Note:<br>In case that focus ia already in Focus Operation Limit(Far point), flag in focusing doesn't set 1 because of focus not operating. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A1h | 33h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Focus operation by Manual<br>•In process of **One Push AF** operation<br>•In process of **Zooming** operation<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.7 Focus Position Assignment

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To move focus position assigned. | |
| Command | 00B0h | |
| Parameter | Length | 4 byte |
| | Range | within the range to be returned by Focus Range Request |
| Status | None | |
| Reference | •In case of Auto Focus Mode, cancel AF Mode and set Manual Mode.<br>•Flags in Focusing of Operation Status Request and Manual Focus come out 1 and when focus stops after moving assigned point, flag in focusing comes out zero..<br>•By Focus Manual Command, stop focusing, and flag in focusing comes out zero.<br>•To stop running at Focus Limit point(Near point) and flag in focusing comes out zero.<br>•To return Notification at the moment of reaching to Assigned Point, when Command Termination Notification ON is to be set. But not return Notification, in case of stopping focus by Manual Command before reaching assigned point. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | | End mark |
| FFh | 30h | 3Xh | 00h | B0h | p0 | p1 | p2 | p3 | EFh |

⇓

| Focus position indicates in Hexadecimal and returns ASII value. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example | | | | p0 | p1 | p2 | p3 |
| 256 | ⇒ | 0100h | ⇒ | 30h | 31h | 30h | 30h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Focus operation by Manual<br>•In process of **One Push AF** operation<br>•In process of **Zooming** operation<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter over value to upper and lower. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.8 Focus Position Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return present focus position. | |
| Command | 00B1h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 4 byte |
| | Range | within range to be return by Focus Range Request |
| Reference | | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | B1h | 30h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Focus Position | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | s3 | EFh |

⇓

| |
|---|
| Present position indicates in Hexadecimal 4 figures and its ASII code is Status value. |
| Example: s0 s1 s2 s3<br>256 ⇒ 0100h 30h 31h 30h 30h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
| Example e0<br>e1<br>■ In case of Busy : 00010000B ⇒ 10h ⇒ 31h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.9 One Push AF

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To set Manual Mode after changing Mode to AF and getting Focus. | |
| Command | 00B1h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •Flags in Focusing of Operation Status Request in AF Mode comes out zero and Manual Focus come out 1 after getting in focus..<br>•To return Notification at the moment of setting Command Termination Notification ON | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | B1h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Focus operation by Manual<br>•In process of **One Push AF** operation<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.10 Focus Range Request

Camera Control Command type 1

| Function | To return movable range of focus | |
|---|---|---|
| Command | 00B1h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | Length | 8 byte |
| | Range | change according to zoom position |
| Reference | | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | B1h | 32h | EFh |

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Error Code | |
| FEh | 30h | 3Xh | 30h | 30h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 | d13 |
|---|---|---|---|---|---|---|---|---|
| Minimum Movable value | | | | Maximum Movable value | | | | End mark |
| s0 | s1 | s2 | s3 | s4 | s5 | s6 | s7 | EFh |

⇓

| Movable Range indicates in Hexadecimal 8 figures and its ASCII is status value | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example | | | | | | | |
| Movable Min. Value | | | | s0 | s1 | s2 | s3 |
| 256 | ⇒ | 0100h | ⇒ | 30h | 31h | 30h | 30h |
| Movable Max. Value | | | | s4 | s5 | s6 | s7 |
| 512 | ⇒ | 0200h | | 30h | 32h | 30h | 30h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
|---|---|
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.11 Zoom Stop

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To stop Zoom operation. | |
| Command | 00A2h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •Flags in Zooming of Operation Status Request comes out zero<br>•To set Zoom Stop by default at the moment of setting Camera Reset, Camera ON Command during power ON | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A2h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 e1 |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.12 Zoom Wide

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To zooming to Wide. | |
| Command | 00A2h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •Flags in Zooming of Operation Status Request comes out 1.<br>•Possible to stop running by Zoom Stop Command<br>•To stop running at the Zoom Operation Limit point(Wide), and Flag in Zooming comes out zero..<br>•To return Notification at the moment of reaching to Zoom Operation Limit point(Wide).<br>Note:<br>When Zoom Position reached to the Zoom Operation Limit Position of Wide end, Flag in zooming doesn't come out 1 because of not zoom running. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A2h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Zooming operation.<br>•In process of Focus operation by Manual<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.13 Zoom Tele

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To zooming to Tele | |
| Command | 00A2h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | None | |
| Reference | •Flags in Zooming of Operation Status Request comes out 1.<br>•Possible to stop running by Zoom Stop Command<br>•To stop running at the Zoom Operation Limit point(Tele), and Flag in Zooming comes out zero..<br>•To return Notification at the moment of reaching to Zoom Operation Limit point(Tele).<br>Note:<br>When Zoom Position reached to the Zoom Operation Limit Position of Tele end, Flag in zooming doesn't come out 1 because of not zoom running. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A2h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Zooming operation<br>•In process of Focus operation by Manual<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.14 Zoom Hi Wide

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To zooming to Wide in Hi Speed. | |
| Command | 00A2h | |
| Parameter | Length | 1 byte |
| | Value | 3h |
| Status | None | |
| Reference | •Flags in Zooming of Operation Status Request comes out 1.<br>•Possible to stop running by Zoom Stop Command<br>•To stop running at the Zoom Operation Limit point(Wide), and Flag in Zooming comes out zero..<br>•To return Notification at the moment of reaching to Zoom Operation Limit point(Wide).<br>Note:<br>When Zoom Position reached to the Zoom Operation Limit Position of Wide end, Flag in zooming doesn't come out 1 because of not zoom running. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A2h | 33h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of zooming operation<br>•In process of Focus operation by Manual<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.15 Zoom Hi Tele

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To zooming to Tele in Hi Speed. | |
| Command | 00A2h | |
| Parameter | Length | 1 byte |
| | Value | 4h |
| Status | None | |
| Reference | •Flags in Zooming of Operation Status Request comes out 1.<br>•Possible to stop running by Zoom Stop Command<br>•To stop running at the Zoom Operation Limit point(Tele), and Flag in Zooming comes out zero..<br>•To return Notification at the moment of reaching to Zoom Operation Limit point(Tele).<br>Note:<br>When Zoom Position reached to the Zoom Operation Limit Position of Tele end, Flag in zooming doesn't indicate 1 because of not zoom running. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A2h | 34h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of zooming operation<br>•In process of Focus operation by Manual<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.16 Zoom Position 1 Assignment

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To move to zoom position assigned. | |
| Command | 00A3h | |
| Parameter | Length | 2 byte |
| | Range | 00h(End Wide)~80h(End Tele) |
| Status | None | |
| Reference | •To assign zoom position by Pre-Assigned Step Value, within movable range.<br>•Flags in Zooming of Operation Status Request comes out 1. Zooming will stop after moving assigned position and flag in zooming comes 0.<br>•To stop zooming by Zoom Stop Command and flag in zooming comes out zero.<br>•To return Notification at the moment of setting Command Termination Notification after reaching to assigned position. But not to return Notification, when zooming stops by Stop Command before reaching assigned position. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | End mark |
| FFh | 30h | 3Xh | 00h | A3h | p0 | p1 | EFh |

⇓

| Zoom position indicates in Hexadecimal 2 figures and parameter value is its ASSII code | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | p0 | p1 |
| 64 | ⇒ | 40h | ⇒ | | 34h | 30h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| •Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Zooming operation<br>•In process of Focus operation by Manual<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter over value to upper and lower. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.17 Zoom Position 1 Request

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To return present zoom position. | |
| Command | 00A4h | |
| Parameter | None | |
| Status | Length | 2 byte |
| | Range | 00h (End Wide) ~ 80h (End Tele) |
| Reference | •To assign zoom position by Pre-Assigned Step Value, within movable range.<br>•Possibly error will be within ±1% before executing Camera Reset Command and Camera ON Command or after returning camera. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | A4h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Zoom Position | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| |
|---|
| Present position indicates in Hexadecimal 2 figures and its ASII code is Status value. |
| Example: s0 s1<br>64 ⇒ 40h ⇒ 34h 30h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag comes out in Hexadecimal 2 figures and returns ASII value |
| Example e0<br>e1<br>■ In case of Busy : 00010000B ⇒ 10h ⇒ 31h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of Camera ON<br>•Not in status of Host control Mode |

## 12.18 Zoom Position 2 Assignment

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To move to zoom position assigned. | |
| Command | 00B3h | |
| Parameter | Range | Min. Value: 0000h (End Wide)<br>Max. Value: Returned by Zoom Maximum Position Request |
| Status | None | |
| Reference | •To assign zoom position in effective value.<br>•Flags in Focusing of Operation Status Request comes out 1. Zooming will stop after moving assigned position and flag in zooming comes 0.<br>•To stop zooming by Zoom Stop Command and flag in zooming comes out zero.<br>•To return Notification at the moment of setting Command Termination Notification after reaching to assigned position. But not to return Notification, when zooming stops by Stop Command before reaching assigned position. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | | End mark |
| FFh | 30h | 3Xh | 00h | B3h | p0 | p1 | p2 | p3 | EFh |

⇓

| Focus position indicates in Hexadecimal and returns ASII value. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example: | | | | p0 | p1 | p2 | p3 |
| 256 | ⇒ | 0100h | ⇒ | 30h | 31h | 30h | 30h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h | 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h | 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h | 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h | 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In process of Zooming operation<br>•In process of Focus operation by Manual<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter over value to upper. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.19 Zoom Position 2 Request

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To return present Zoom position. | |
| Command | 00B4h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 4 byte |
| | Range | Min. Value:0000h (End Wide) |
| | | Max.: Value returned by Zoom Maximum Position Request |
| Reference | •To assign zoom position in effective value.<br>•Possibly error will be within ±5% before executing Camera Reset Command and Camera ON Command or after returning camera. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | B4h | 30h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Zoom Position | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | s3 | EFh |

⇓

| Present position indicates in Hexadecimal 4 figures and its ASII code is Status value. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Example: | | | | s0 | s1 | s2 | s3 | |
| 256 | ⇒ | 0100h | ⇒ | 30h | 31h | 30h | 30h | |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates Hexadecimal 2 figures and returns ASII value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.20 Zoom Speed Assignment

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To assign Zooming Speed | |
| Command | 00B4h | |
| Parameter | Length | 2 byte, including "31h"(fixed value) |
| | Range | 0~7 |
| Status | None | |
| reference | •Speed set by this command is reflected in Zoom Wide, Zoom Tele, Zoom position Assignment and Preset Running<br>•Default value is 7 | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | B4h | 31h p1 | EFh |

⇓

| Zoom position indicates in Hexadecimal 1 figure and parameter value is its ASSII code |
|---|
| Example: p0<br>4 ⇒ 4h ⇒ 34h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| •Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of out of range of assigned parameter. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.21 Zoom Speed Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return present Zooming Speed | |
| Command | 00B4h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | Length | 1 byte |
| | Range | 0~7 |
| Reference | •Default value is 7 | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | B4h | 32h | EFh |

● Answer Format

In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Speed | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | EFh |

⇓

| Zoom position indicates in Hexadecimal 1 figure and status value is its ASSII code |
|---|
| Example: p0<br>4 ⇒ 4h ⇒ 34h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of Busy : 00010000B ⇒ 10h ⇒ 31h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.22 Zoom Maximum Request

Camera Control Command

Type 1

| | | |
|---|---|---|
| Function | To return maximum value of zoom position | |
| Command | 00B4h | |
| Parameter | Length | 1 byte |
| | Value | 3h |
| Status | Length | 4 byte |
| | Range | fixed every unit by value between 0000h and FFFFh |
| Reference | •To return movable max. value of zoom position. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | B4h | 33h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Zoom Movable Max. Value | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | s3 | EFh |

⇓

| Present position indicates in Hexadecimal 4 figures and its ASII code is Status value. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example: | | | | s0 | s1 | s2 | s3 |
| 2145 | ⇒ | 085Eh | ⇒ | 30h | 31h | 35h | 45h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.23 Backlight Compensation OFF

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To change to Backlight non-compensation mode. | |
| Command | 00A5h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| reference | •To receive command at Auto exposure Mode.<br>•To operate identical operation as to assign 46h by AE Target Assignment Command.<br>•To be set by default at the moment of executing Camera Reset Command<br>•At the moment of Command Termination Notification ON setting, to return Notification, when operation finished. But when Backlight Compensation ON, AE Target Value Assignment Command are executing, not to return Notification of Backlight Compensation OFF | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of Exposure Manual Mode<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.24 Backlight Compensation ON

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To change to Backlight Compensation mode. | |
| Command | 00A5h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| reference | •To receive command at Auto exposure Mode.<br>•To operate identical operation as to assign 90h by AE Target Assignment Command.<br>•At the moment of Command Termination Notification ON setting, to return Notification, when operation finished. But when Backlight Compensation ON, AE Target Value Assignment Command are executing, not to return Notification of Backlight Compensation OFF | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of Exposure Manual Mode<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.25 Exposure AUTO

Camera Control Command

Type 1

| | | |
|---|---|---|
| Function | To change to Exposure Auto Mode. | |
| Command | 00A5h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | None | |
| Reference | •The related Exposure Commands which enable to set in Auto Backlight Compensation OFF/ON, are Shutter Speed Program, Shutter speed 1/60, 1/100 and AE Target Value Assignment<br>•Default value is set at the moment of executing Camera Reset and Camera ON Command during power on. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.26 Exposure Manual

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To change to Exposure Manual Mode. | |
| Command | 00A5h | |
| Parameter | Length | 1 byte |
| | Value | 3h |
| Status | None | |
| Reference | •The related Exposure Commands which enable to set in Manual Exposure Mode, are Shutter Speed Assignment, AGC Gain Assignment and Iris Assignment. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 33h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.27 AE Lock OFF

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To cancel AE Lock ON Status. | |
| Command | 00A5h | |
| Parameter | Length | 2 byte |
| | Value | 40h |
| Status | None | |
| Reference | •To set Exposure Mode Auto ON.<br>•Default value is set at the moment of executing Camera Reset and Camera ON Command during power on. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 34h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Manual<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.28 AE Lock ON

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To lock the exposure of AE Mode. | |
| Command | 00A5h | |
| Parameter | Length | 2 byte |
| | Value | 41h |
| Status | None | |
| Reference | •To set in status to disapprove Exposure Setting Value | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 34h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

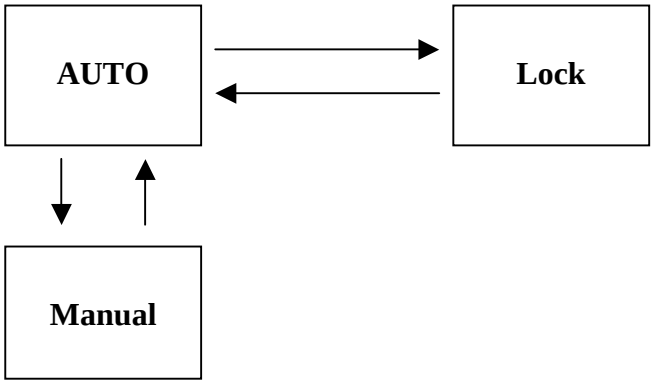
⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Manual<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

In status of Exposure Mode Changeable



## 12.29 Shutter Speed Program

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To change Shutter Speed to Program mode. | |
| Command | 00A8h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •To change Shutter Speed automatically at the moment of Hi Luminance Shot and prevent resolution from lowering by small iris diffraction<br>•To receive command at Auto exposure Mode.<br>•To be set by default at the moment of executing Camera Reset Command | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A8h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| •Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Manual<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.30 Shutter Speed 1/60 (PAL:1/50)

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To change Shutter Speed to 1/60(Pal:1/50) mode. | |
| Command | 00A8h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •To receive command at the moment of Exposure Mode Auto<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But not return Notification of Shutter Speed 1/60 Command, in case of executing Shutter speed program, Shutter speed 1/100 during operation. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A8h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| •Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Manual<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.31 Shutter Speed 1/100 (PAL:1/120)

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To change Shutter Speed to 1/100(Pal:1/120) mode. | |
| Command | 00A8h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | None | |
| Reference | •To be able to lower flicker.<br>•To receive command at the moment of Exposure Mode Auto.<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But not return Notification of Shutter Speed 1/100 Command, in case of executing Shutter speed program, Shutter speed 1/60 during operation. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A8h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| •Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Manual<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.32 Shutter Speed Assignment

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To assign Shutter Speed. | |
| Command | 00A5h | |
| Parameter | Length | 3 byte, including fixed value(35h). |
| | Range | 00h~19h |
| Status | None | |
| Reference | •To assign step value between shutter speed 1/60(PAL:1/50)~1/1000. see corresponding table.<br>•To receive command at the moment of Exposure Mode Manual.<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But not return Notification in case of changing Exposure Mode to Auto during operation. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 35h | p1 | p2 | EFh |

⇓

| Shutter Speed Parameter indicates in Hexadecimal 2 figures and parameter value is its ASSII code | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | p0 | p2 | | |
| | 10 | ⇒ | 0Ah | ⇒ | 30h | 41h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Auto.<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter out of range |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 12.33 Shutter Speed Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return present Shutter Speed. | |
| Command | 00A5h | |
| Parameter | Length | 3 byte |
| | Value | 6h |
| Status | Length | 2 byte |
| | Range | 00h~19h |
| Reference | •To assign step value between shutter speed 1/60(PAL:1/50)~1/1000. see corresponding table. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 36h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Shutter Speed | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| |
|---|
| Shutter Speed Parameter indicates in Hexadecimal 2 figures and its ASCII Code comes out status value. |
| Example: s0 s1<br>10 ⇒ 0Ah ⇒ 30h 41h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
| Example e0<br>e1<br>■ In case of Busy : 00010000B ⇒ 10h ⇒ 31h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

•Shutter Speed Corresponding Table

| VC-C4 Parameter | NTSC Shutter Speed | PAL Shutter Speed |
|---|---|---|
| 00h | 1/60 | 1/50 |
| 01h | 1/75 | 1/60 |
| 02h | 1/90 | 1/90 |
| 03h | 1/100 | 1/100 |
| 04h | 1/125 | 1/120 |
| 05h | 1/150 | 1/150 |
| 06h | 1/180 | 1/180 |
| 07h | 1/215 | 1/215 |
| 08h | 1/250 | 1/250 |
| 09h | 1/300 | 1/300 |
| 0Ah | 1/350 | 1/350 |
| 0Bh | 1/425 | 1/425 |
| 0Ch | 1/500 | 1/500 |
| 0Dh | 1/600 | 1/600 |
| 0Eh | 1/725 | 1/725 |
| 0Fh | 1/850 | 1/850 |
| 10h | 1/1000 | 1/1000 |
| 11h | 1/1250 | 1/1250 |
| 12h | 1/1500 | 1/1500 |
| 13h | 1/1750 | 1/1750 |
| 14h | 1/2000 | 1/2000 |
| 15h | 1/2500 | 1/2500 |
| 16h | 1/3000 | 1/3000 |
| 17h | 1/4000 | 1/4000 |
| 18h | 1/6000 | 1/6000 |
| 19h | 1/10000 | 1/10000 |

## 12.34 AGC Gain Assignment

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To assign AGC Gain. | |
| Command | 00A5h | |
| Parameter | Length | 3 byte, including fixed value(37h). |
| | Range | 00h~FFh |
| Status | None | |
| Reference | •To change AGC magnification.<br>•To receive command at the moment of Exposure Mode Manual. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 37h | p1 | p2 | EFh |

⇓

| AGC Gain value indicates in Hexadecimal 2 figures and parameter value is its ASSII code | | | | | |
|---|---|---|---|---|---|
| Example: | | | | p0 | p2 |
| 10 | ⇒ | 0Ah | ⇒ | 30h | 41h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Auto<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter out of range |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.35 AGC Gain Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return present AGC Gain. | |
| Command | 00A5h | |
| Parameter | Length | 1 byte. |
| | Value | 8h |
| Status | Length | 2 byte |
| | Range | 00h~FFh |
| Reference | | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 38h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | AGC Gain Value | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| |
|---|
| Shutter Speed parameter indicates in Hexadecimal 2 figures and its ASII code is Status value. |
| Example: s0 s1<br>10 ⇒ 0Ah ⇒ 30h 41h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
| Example e0<br>e1<br>■ In case of Busy : 00010000B ⇒ 10h ⇒ 31h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.36 Iris Assignment

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To assign AGC Gain. | |
| Command | 00A5h | |
| Parameter | Length | 3 byte, including fixed value(39h). |
| | Range | 02h~10h |
| Status | None | |
| Reference | •In case of decreasing a value to close iris and comes to darken.<br>•In case of increasing a value to open iris and comes to brighten.<br>•The assignable range is less narrow than the value returned by Iris Request Command<br>•To receive a command, when Exposure mode is Manual mode.<br>•when Command Termination Notification is assigned ON, Notification will be returned at the moment of the operation terminated During operation, Exposure Mode is changed to Auto, Notification will not be returned. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 39h | p1 | p2 | EFh |

⇓

| AGC Gain value indicates in Hexadecimal 2 figures and parameter value is its ASSII code | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | p0 | p2 |
| ⇒ | 10 | ⇒ | 0Ah | ⇒ | 30h | 41h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Auto<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter out of range |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.37 Iris Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return present Iris value. | |
| Command | 00A5h | |
| Parameter | Length | 1 byte. |
| | Value | "3Ah" (Fixed value) |
| Status | Length | 2 byte |
| | Range | 00h~11h |
| Reference | •Outside range value assigned by Iris Assignment Command might be returned, then Status range is different from Iris Assignment Command. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 3Ah | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Iris Value | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| Iris value indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | | |
|---|---|---|---|---|---|
| Example: | | | | s0 | s1 |
| 10 | ⇒ | 0Ah | ⇒ | 30h | 41h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

• **Iris Value Table**

| | |
|---|---|
| 00h | Close mechanically |
| 01h | Close optically |
| 02h | F16.0 |
| 03h | F13.3 |
| 04h | F11.0 |
| 05h | F9.4 |
| 06h | F8.0 |
| 07h | F6.7 |
| 08h | F5.6 |
| 09h | F4.7 |
| 0Ah | F4.0 |
| 0Bh | F3.3 |
| 0Ch | F2.8 |
| 0Dh | F2.4 |
| 0Eh | F2.0 |
| 0Fh | F1.9 |
| 10h | F1.8 |
| 11h | Open |

## 12.38 AE target Value Assignment

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To assign Target value of AE brightness. | |
| Command | 00A5h | |
| Parameter | Length | 3 byte, including fixed value(3Bh). |
| | Range | 10h~FFh |
| Status | None | |
| Reference | •To receive command at the moment of Exposure Mode Auto.<br>•To brighten subject by increasing and darken subject by decreasing.<br>•Default value is 46h<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But return only Notification of last assigned value command in case of resetting another value during operation. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 3Bh | p1 | p2 | EFh |

⇓

| AE target value indicates in Hexadecimal 2 figures and parameter value is its ASSII code | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | p0 | p2 |
| | 70 | ⇒ | 46h | ⇒ | 34h | 36h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h | 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h | 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h | 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h | 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of Exposure Mode Manual<br>•In status of AE Lock ON<br>•In case of executing **Preset Move** Command |
| Parameter Error | In case of assigned parameter out of range |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.39 AE Target Value Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return target value of present AE brightness. | |
| Command | 00A5h | |
| Parameter | Length | 1 byte. |
| | Value | "3Ch" (Fixed value) |
| Status | Length | 2 byte |
| | Range | 10h~FFh |
| Reference | •Default value is 46h. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A5h | 3Ch | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | AE Target Value | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| Iris value indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | s0 | s1 |
| | 70 | ⇒ | 46h | ⇒ | 34h | 36h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.40 Auto White Balance Normal

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To set Auto white balance. | |
| Command | 00A7h | |
| Parameter | Length | 1 byte. |
| | Value | 0h |
| Status | None | |
| Reference | •To adjust white balance automatically.<br>•To set in default value at the moment of Camera Reset Command, Camera ON Command and Power O. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A7h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 e1 |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.41 Auto White Balance Lock

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To stop auto white balance control and set in lock status. | |
| Command | 00A7h | |
| Parameter | Length | 1 byte. |
| | Value | 1h |
| Status | None | |
| Reference | • possible to move only to Normal Mode from this mode. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A7h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of white balance manual mode<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.42 White Balance Manual Mode

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To set white balance manual mode. | |
| Command | 00A7h | |
| Parameter | Length | 1 byte. |
| | Value | 2h |
| Status | None | |
| Reference | •To set white balance by using White Balance Manual Setting Command.<br>•To move only to normal mode from this mode.<br>• possible to move only to normal mode from this mode.<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But not return Notification in case of not changing to normal mode by executing White balance Normal Command during operation. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A7h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

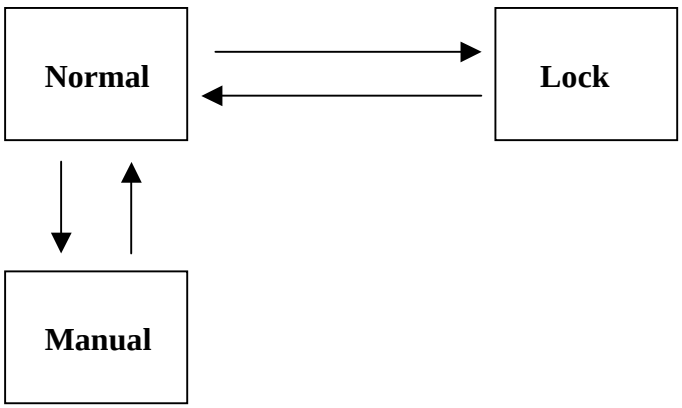
⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In status of auto white balance in lock<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

In status of changeable White balance Mode



## 12.43 White Balance Value Assignment

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To set manual value of white balance. | |
| Command | 00A7h | |
| Parameter | Length | 3 byte including fixed value (34h). |
| | Range | 00h (enhanced Red) ~ FFh (enhanced Blue) |
| Status | None | |
| Reference | •To receive command at White Balance manual Mode. | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | | End mark |
| FFh | 30h | 3Xh | 00h | A7h | 34h | p1 | p2 | EFh |

⇓

| Manual value indicates in Hexadecimal 2 figures and parameter value is its ASSII code | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | p0 | p2 |
| | 128 | ⇒ | 80h | ⇒ | 38h | 30h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•Except White balance manual mode<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter out of range |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.44 White Balance Value Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return value of present white balance. | |
| Command | 00A7h | |
| Parameter | Length | 1 byte. |
| | Value | 5h |
| Status | Length | 2 byte |
| | Range | 00h (enhanced Red) ~ FFh (enhanced Blue) |
| Reference | •To return 80h at the moment of executing command except White Balance Manual Mode. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A7h | 35h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Manual Value | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| Manual value indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | s0 | s1 |
| 128 | ⇒ | 80h | ⇒ | 38h | 30h | |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.45 Fade Normal

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To return to normal output of image and release fade status slowly. | |
| Command | 00A9h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •To fade in from white in case of white fade status, and from black in case of black fade in<br>•To change operation by receiving command, even though executing another fade related command.<br>•To be set in default value at the moment of executing Camera Reset and Camera ON during power ON<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But return only Notification of last executed command, in case of executing another fade command during operation. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A9h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.46 Fade White

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To fade in white slowly. | |
| Command | 00A9h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •To change operation by receiving command, even though executing another fade related command.<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But return only Notification of last executed command, in case of executing another fade command during operation. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A9h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.47 Fade Hi Speed White

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To fade in white with Hi Speed. | |
| Command | 00A9h | |
| Parameter | Length | 1 byte |
| | Value | 2h |
| Status | None | |
| Reference | •To change operation by receiving command, even though executing another fade related command.<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But return only Notification of last executed command, in case of executing another fade command during operation. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A9h | 32h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.48 Fade Hi Speed Black

Camera Control Command Type 2

| | | |
|---|---|---|
| Function | To fade in black with Hi Speed. | |
| Command | 00A9h | |
| Parameter | Length | 1 byte |
| | Value | 3h |
| Status | None | |
| Reference | •To change operation by receiving command, even though executing another fade related command.<br>•To return Notification at the moment of setting Command Termination Notification ON, when operation terminates. But return only Notification of last executed command, in case of executing another fade command during operation. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | A9h | 33h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.49 Camera Reset

Camera Control Command Type 2

| | |
|---|---|
| Function | To Camera Reset operation |
| Command | 00AAh |
| Parameter | None |
| Status | None |
| Reference | •To stop executing another operation of camera(except preset running) and to force to set in initialized status regardless of Pedestal Initialize.<br>•Not to accept camera command during executing Camera Reset<br>•To set in status of Focus AF, Zoom Stop, Auto White Balance Normal, Fade Normal, Shutter Speed Program, Backlight Compensation OFF and Exposure Auto.<br>•To return Notification at the moment of setting Command Termination Notification ONN, when Command Normal finish. |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | AAh | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.50 Zoom Ratio Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return Zoom Ratio. | |
| Command | 00ABh | |
| Parameter | None | |
| Status | Length | 2 byte |
| | Value | 10h |
| Reference | •To come out 10h and return it equal to zoom ratio 16 times. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | ABh | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Zoom ratio | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| Zoom ratio indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | s0 | s1 |
| | 128 | ⇒ | 80h | ⇒ | 35h | 30h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.51 Pixel Size Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return Pixel Size of CCD | |
| Command | 00ACh | |
| Parameter | None | |
| Status | Length | 2 byte |
| | Value | 14h(fixed) |
| Reference | •To come out and return 14h because of using 1/4 inch CCD.<br>1/4 Numerator : first byte, Denominator : second byte. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | ACh | EFh |

● Answer Format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | pixel size ratio | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0h | s1h | EFh |

⇓

| Pixel size ratio indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | s0 | s1 |
| | 1/4 | ⇒ | 14h | ⇒ | 31h | 34h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.52 Product Version Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return Version value of Camera section. | |
| Command | 00BEh | |
| Parameter | Length | 1 byte. |
| | Value | 0h |
| Status | Length | 2 byte |
| | Range | 00h~FFh |
| Reference | •To return version value in Hexadecimal 2 figures. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | BEh | 30h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Version Value | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| Version value indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | s0 | s1 |
| | 87 | ⇒ | 57h | ⇒ | 35h | 37h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 12.53 EEPROM Version Request

Camera Control Command Type 1

| | | |
|---|---|---|
| Function | To return EEPROM Version value of Camera section. | |
| Command | 00BEh | |
| Parameter | Length | 1 byte. |
| | Value | 1h |
| Status | Length | 2 byte |
| | Range | 00h~FFh |
| Reference | •To return version value in Hexadecimal 2 figures. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | BEh | 31h | EFh |

● Answer format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Version Value | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| Version value indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | | | | s0 | s1 |
| | 07 | ⇒ | 07h | ⇒ | 30h | 37h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In process of Camera Initializing operation by **Camera Reset** Command, etc.<br>•In case of executing **Preset Move** Command |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13. Details of System Control Command

### 13.1 Remote Control ON

System Control Command Type 1

| | | |
|---|---|---|
| Function | To available Remote Controller. | |
| Command | 0080h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •To set Remote Control ON by default during Power ON.<br>•By issuing this command, forbidden flag of remote control in operation status comes out zero.<br>•In case of Host Control Mode, receive Key Code from remote control even in remote control ON, but not work remote control operation. Operation Key Code can be confirmed by remote control through command ON.(see 8. Remote Control Through Function)<br>•In case of Local Control Mode, to operate at Key Code in status of Remote Control ON. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 80h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing Camera Control Command<br>•In case of executing Pedestal Control Command<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter illegal |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.2 Remote Control OFF

System Control Command Type 1

| | | |
|---|---|---|
| Function | To inhibited Remote Control | |
| Command | 0080h | |
| Parameter | Length | 1 byte |
| | Range | 1h |
| Status | None | |
| Reference | •To set remote control ON by default during power ON.<br>•By issuing this command, remote control forbidden flag sets 1 and not receive key code from remote control<br>•not to execute remote control through operation under remote control OFF, even though remote control through command ON comes out. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 80h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing Camera Control Command<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter illegal |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.3 Operation Status Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return information of inside status of VC-C4(operation status) | |
| Command | 0086h | |
| Parameter | None | |
| Status | Length | 3 byte |
| | Value | value of operation status which indicates inside status (12 bits) |
| Reference | The followings shows status, in case that each bit is 1 among of status. | |

(MSB)

| | |
|---|---|
| b11 | Tilting under operation |
| b10 | Tilt movable limit position |
| b9 | Panning under operation |
| b8 | Pan movable limit position |
| b7 | Zooming under operation |
| b6 | Remote Control operate OFF |
| b5 | Camera Power OFF |
| b4 | Un executing Pedestal Initialize |
| b3 | Shutter speed flag 1 |
| b2 | Shutter speed flag 2 |

| b3 | b2 | NTSC | PAL |
|---|---|---|---|
| 0 | 0 | program | program |
| 0 | 1 | 1/60 | 1/50 |
| 1 | 0 | 1/100 | 1/120 |
| 1 | 1 | Not use | Not use |

| | |
|---|---|
| b1 | Manual Focus mode |
| b0 | Focusing under operation |

(LSB)

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | 86h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | EFh |

⇓

| Inside operation status (12bits) indicated camera inside status indicates in 3 figures Hexadecimal returns ASII code as status | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Example | | | | | | | | | | | | |
| | s0 | | | | s1 | | | | s2 | | | |
| | b11 | b10 | b9 | b8 | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
| | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | "4" | | | | "8" | | | | "0" | | | |
| | ⇓ | | | | ⇓ | | | | ⇓ | | | |
| | 34h | | | | 38h | | | | 30h | | | |

● Condition of Error flag to be set

None

### 13.4 Extended Operation Status Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return extended information of inside status of VC-C4(operation status) | |
| Command | 0086h | |
| Parameter | 0h | |
| Status | Length | 5 byte |
| | Value | value of operation status which indicates inside status (20 bits) |
| Reference | The followings shows status, in case that each bit is 1 among of status. | |

(MSB)

| | |
|---|---|
| b19 | In process of Menu |
| b18 | Local Control Mode |
| b17 | Time unset |
| b16 | Date unset |
| b15 | Not use |
| b14 | Not use |
| b13 | Exposure(AE) mode not AUTO |
| b12 | White balance mode not AUTO |
| b11 | Tilting under operation |
| b10 | Tilt movable limit position |
| b 9 | Panning under operation |
| b 8 | Pan movable limit position |
| b7 | Zooming under operation |
| b6 | Remote Control operate OFF |
| b5 | Camera Power OFF |
| b4 | Un executing Pedestal Initialize |
| b3 | Shutter speed flag 1 |
| b2 | Shutter speed flag 2 |

| b3 | b2 | NTSC | PAL |
|---|---|---|---|
| 0 | 0 | program | program |
| 0 | 1 | 1/60 | 1/50 |
| 1 | 0 | 1/100 | 1/120 |
| 1 | 1 | Not use | Not use |

| | |
|---|---|
| b 1 | Manual Focus mode |
| b 0 | Focusing under operation |

(LSB)

•The information of b0 ~ b11 is equal to the information of 13.3 Operation Status Request.
•In case that b19 is 1 (In process of Menu), unable to Host Control Mode.
•In case that b18 is 1 (Local Control Mode), unable to control through Host.

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 86h | 30h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 | d10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | s3 | s4 | EFh |

⇓

Inside operation status (12bits) indicated camera inside status indicates in 5 figures Hexadecimal returns ASII code as status

Example

| s0 | | | | s1 | | | |
|---|---|---|---|---|---|---|---|
| b19 | b18 | b17 | b16 | b15 | b14 | b13 | b12 |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| "F" | | | | "0" | | | |
| ⇓ | | | | ⇓ | | | |
| 46h | | | | 30h | | | |

| s2 | | | | s3 | | | | s4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| b11 | b10 | b9 | b8 | b7 | b6 | b5 | b4 | b3 | b2 | b1 | b0 |
| 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| "4" | | | | "8" | | | | "0" | | | |
| ⇓ | | | | ⇓ | | | | ⇓ | | | |
| 34h | | | | 38h | | | | 30h | | | |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

Error Flag comes out Hexadecimal 2 figures and returns ASII value

Example e0

e1

■ In case of Parameter error 01010000B ⇒ 50h ⇒ 35h 30h

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter illegal |

## 13.5 Product Name Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return product name | |
| Command | 0087h | |
| Parameter | None | |
| Status | Length | 5 byte |
| | Value | "VC-C4" (56h,43h,2Dh,43h,34h) |
| Reference | To return fixed value | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | 87h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Error Code | |
| FEh | 30h | 3Xh | 30h | 30h |

| d5 | d6 | d7 | d8 | d9 | d10 |
|---|---|---|---|---|---|
| Status | | | | | End mark |
| 56h | 43h | 2Dh | 43h | 34h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.6 ROM Version Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return ROM Version of VC-C4 | |
| Command | 0088h | |
| Parameter | None | |
| Status | Length | 5 byte |
| | Value | "V5-16"(56h,35h,2Dh,31h,36h) |
| Reference | Status value(Version number) may be changed in future | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | 88h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Error Code | |
| FEh | 30h | 3Xh | 30h | 30h |

| d5 | d6 | d7 | d8 | d9 | d10 |
|---|---|---|---|---|---|
| Status | | | | | End mark |
| 56h | 35h | 2Dh | 31h | 36h | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.7 Preset Set

System Control Command

Type 1

| | | |
|---|---|---|
| Function | To store Pan angle (position), Tilt angle (position), Zoom position and AE Target Value (Brightness value) in assigned preset memory address. | |
| Command | 0089h | |
| Parameter | Length | 1 byte. |
| | Range | 1~9 |
| Reference | •Assign memory address to be stored by parameter value (memory address is position from 1 to 9)<br>•Not to erase stored memory , even though power OFF (to be stored in nonvolatile memory)<br>•Because of using the same memory as preset function of remote control operation, overwrite it , when the same address as memory address assigned by remote controller is assigned. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 89h | p0 | EFh |

⇓

| |
|---|
| Memory address(1~9) to be stored indicates in ASCII 1 byte. |
| Example: store memory address 1 p0<br>1 ⇒ 01h ⇒ 31h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag comes out Hexadecimal 2 figures and returns ASII value |
| Example e0<br>e1<br>■ In case of No Error: 00000000B ⇒ 00h ⇒ 30h 30h<br>■ In case of Busy : 00010000B ⇒ 10h ⇒ 31h 30h<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing Camera Control Command<br>•In case of executing Pedestal Control Command<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter outside of 1~9 |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.8 Preset Move

System Control Command Type 2

| | | |
|---|---|---|
| Function | To move to Pan angle (position), Tilt angle (position), Zoom position and AE Target Value (Brightness value) stored in assigned preset memory address. | |
| Command | 008Ah | |
| Parameter | Length | 1 byte. |
| | Range | 1~9 |
| Reference | •This command is un effective until to store preset position by remote control operation or Pre set Command, since nonvolatile memory is unused at the factory shipping moment.(return without answer error)<br>•By issuing this command, start Pan/Tilt/Zoom/AE Target value operations to the assigned Preset position, and flags in operation of Pan/Tilt/Zoom come out 1. When each operation reaches to Preset position, all of operation will stop and corresponding flags be cleared to zero.(Flag corresponding to AE Target Compensation Operation doesn't exist among of status in operation)<br>•Necessary to confirm Termination Notification Answer to this command by setting Command Termination Notification ON, in order to confirm Termination of Shift Operation by this command.<br>•The running speed of this command is reflective of the speed assigned by Pan/Tilt Speed Assignment (11.1,11.2),Zoom Speed Assignment(12.20) commands<br>•By this command, Pan/Tilt ,Zoom Movement operations or Pan/Tilt stop Command(11.5 or 11.23) stop.<br>But AE Target Value compensation operation doesn't stop.<br><br>Note:<br>After power ON, return Mode error and execute Pedestal Initialize, at the moment to receive this command without executing Pedestal Initialize 1 &2 Commands. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 8Ah | p0 | EFh |

⇓

| |
|---|
| Memory address(1~6) to be called indicates in ASCII 1 byte. |
| Example: move to Pan/Tilt angle and Zoom position stored in memory address 2<br>p0<br>2 ⇒ 02h ⇒ 32h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing Camera Control Command<br>•In case of executing Pedestal Control Command<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter outside of 1~9 |
| Mode Error | •After Power ON, Not executed Pedestal Initialize<br>•Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.9 Preset Status Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return situation in use for memory for Preset position store | |
| Command | 008Bh | |
| Parameter | None | |
| Status | Length | 2 byte. |
| | Value | status value(8 bits) indicating situation in use of memory. |
| Reference | •This command return information of memory address (1 to 6). If necessary to have 1 to 9 information, need to use Extended Preset Status Request.<br>•The followings show the case of each bit 1 among of Preset Status,<br><br>(MBS)<br>b7 Memory Address 4 settled<br>b6 Memory Address 3 settled<br>b5 Memory Address 2 settled<br>b4 Memory Address 1 settled<br>b3 Not used<br>b2 Not used<br>b1 Memory Address 6 settled<br>b0 Memory Address 5 settled<br>(LSB) | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device num | | Command | | End mark |
| FFh | 30h | 3Xh | 00h | 8Bh | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| |
|---|
| Status(8bits) indicating situation of memory in use for Preset position store indicates in Hexadecimal 2 figures and returns its ASIIC code as Status value. |
| Example: in case of use of memory 2 and 3<br>s0 s1<br>01100000B ⇒ 60h ⇒ 36h 30h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
| Example e0<br>e1<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 13.10 Extended Preset Status Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return situation in use for memory for Preset position store | |
| Command | 008Bh | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 2 byte. |
| | Value | status value (12 bits) indicating situation in use of memory. |
| Reference | •The followings show the case of each bit 1 among of Preset Status,<br><br>(MBS)<br>b11 Not used(0)<br>b10 Not used(0)<br>b 9 Not used(0)<br>b 8 Memory Address 9 settled<br>b 7 Memory Address 8 settled<br>b 6 Memory Address 7 settled<br>b 5 Memory Address 6 settled<br>b 4 Memory Address 5 settled<br>b 3 Memory Address 4 settled<br>b2 Memory Address 3 settled<br>b1 Memory Address 2 settled<br>b0 Memory Address 1 settled<br>(LSB) | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 8Bh | 30h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 |
|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | EFh |

⇓

| Status(12bits) indicating situation of memory in use for Preset position store indicates in Hexadecimal 2 figures and return its ASIIC code as Status value. | | | | | | |
|---|---|---|---|---|---|---|
| Example: In case of use of memory 2 and 3 | | | | | | |
| | | | | s0 | s1 | s2 |
| 000000000110B | ⇒ | 006h | ⇒ | 30h | 30h | 36h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter illegal |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 13.11 Remote Controller Through Setting

System Control Command Type 1

| | | |
|---|---|---|
| Function | To switch Notification of remote control data ON/OFF | |
| Command | 008Dh | |
| Parameter | Length | 1 byte |
| | Value | 0h : Remote Control Through ON(Admit) |
| | | 1h : Remote Control Through OFF(Forbid) |
| Status | None | |
| Reference | •To set remote controller through ON/OFF(Admit/Forbid).<br>•By Remote Control ON, to notify received key from remote control and ON/OFF information to host computer.<br>•At the moment of Power ON, to be in status of remote control through OFF by default.<br>•Not to issue remote control through data even though remote control through ON sets, in case of flag 1 setting in remote control operation forbidden by remote control OFF command.<br>•In case of operating by Host Control Mode, not to operate corresponding to received key code from remote controller.<br>•In case of operating by Local Control Mode, to operate corresponding to received key code from remote controller and notify its key code and ON/OFF information | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 8Dh | p0 | EFh |

⇓

| |
|---|
| Remote Control Through(0:ON 1:OFF) indicates in ASII code 1 byte |
| Example: Remote Control Through OFF (forbid) p0<br>1h ⇒ 31h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
| Example e0<br>e1<br>■ In case of No Error: 00000000B ⇒ 00h ⇒ 30h 30h<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter besides 1 |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.12 LED Normal Display

System Control Command Type 1

| | | |
|---|---|---|
| Function | To set LED lighting mode under the normal condition. | |
| Command | 008Eh | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •LED normal display comes out by default at the moment of power ON. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 8Eh | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter besides 1 |
| Mode Error | •Not in status of **Camera ON** *1<br>•Not in status of **Host Control Mode** |

*1: Not applicable ROM Version V5-16 or newer

**LED lighting Status in LED Normal Display Mode**

| LED Lighting Status | | Operating Status |
|---|---|---|
| Green ON | | Status in Camera ON |
| Green blinking | 0.1 sec cycle | Operating Remote Control buttons ON |
| | 0.5 sec cycle | Preset Memory Setting,<br>Preset Moving,<br>Menu Setting |
| | 1 sec cycle | Pedestal Initializing,<br>Camera Initializing |
| Orange ON | | Unmatched Remote Control ID |
| Orange blinking | 0.1 sec cycle | Operating remote control with unmatched ID |
| | 0.5 sec cycle | Setting Remote control ID |
| Red ON | | In status of Camera OFF |

## 13.13 LED Forced Control

System Control Command Type 1

| | | |
|---|---|---|
| Function | To set LED lighting mode under the normal condition. | |
| Command | 008Eh | |
| Parameter | Length | 1 byte |
| | Range | 1h~4h |
| Status | None | |
| Reference | •LED normal display comes out by default at the moment of power ON.<br>•The followings settings available by Parameter<br>Parameter Value 1h: Green LED forced ON<br>2h: All LED forced OFF<br>3h: Red LED forced ON<br>4h: Orange LED forced ON | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 8Eh | p0 | EFh |

⇓

| LED Display forced Setting indicates in ASCII 1 byte . |
|---|
| Example: All LED forced OFF p0<br>2h ⇒ 32h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of No Error: 00000000B ⇒ 00h ⇒ 30h 30h<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter outside 1h ~ 4h |
| Mode Error | •Not in status of **Camera ON** *1<br>•Not in status of **Host Control Mode** |

*1: Not applicable ROM Version V5-16 or newer

## 13.14 Cascade OFF

System Control Command Type 1

| | | |
|---|---|---|
| Function | To release Cascade Connection OFF. | |
| Command | 008Fh | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •Cascade Connection status comes out OFF by default at the moment of power ON<br>•Multiple VC-C4's unable to control in status of Cascade OFF<br>•Device Num. of this command is only "3030h"<br>•Usable Device Num of in Cascade OFF, is only "3030h"<br>•Cascade ON/OFF commands are effective for all VC-C4 connected even a Cascade OFF status<br>•To force to stop Pan/Tilt operation by this command except operating pedestal Initialize.<br>•Necessary to issue this command before issuing Cascade ON command(13.15) | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 30h | 00h | 8Fh | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 30h | e0 | e1 | EFh |

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Mode Error | •In case of operating **MENU** by **Local Mode** |

## 13.15 Cascade ON

System Control Command Type 3

| | | |
|---|---|---|
| Function | To connect Cascade connection ON. | |
| Command | 008Fh | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •Cascade Connection status comes out OFF by default at the moment of power ON<br>•Multiple VC-C4 (Max. 9 units) able to control by this command<br>•Necessary to issue this command before issuing Cascade OFF command (13.14)<br>•Device Num. of this command is only "3030h" fixed<br>•Connected VC-C4 by this command, comes out Host Control Mode.<br>•Answer by this command is returned with device number of the last VC-C4 connected in Cascade.<br>•While Pan/Tilt moving, receiving this command causes Busy error, and after that, Cascade ON operation will stop for the rest of VC-C4.<br>•Note: The processing time by this command requires approx. 1ooms per unit and 500ms for last VC-C4. (After that, answer will return)<br>•The commands issuing in process of this command will be ignored.<br>•After this process by this command (Cascade On Mode), Each VC-C4 will have own device number.(Device number is in order of "3031h","3032h" .... from computer and "3030h" is Global Command for all)<br>•Only last VC-C4 in Cascade connection returns the answer for Global Command<br>•By Global Notification function(13.28 Global Notification Setting Command), each error status by Global command be known. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 30h | 00h | 8Fh | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing Pedestal Pan/Tilt operation |
| Mode Error | •In case of operating **MENU** by **Local Mode** |

## 13.16 Host Control Mode

System Control Command Type 1

| | | |
|---|---|---|
| Function | To set Host Control Mode. | |
| Command | 0090h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •At the moment of power ON, Default sets Local Control Mode.<br>•To be able to control by only Host computer through RS-232C and unable to control by remote controller.<br>•Local Control Mode flag in operation status by this command is cleared to 0<br>•In case to control by remote controller in Host Control Mode, by using remote control through function, possible to control through computer.<br>•In case of entering ID number of remote control or Set number of Preset during issuing this command, each input status is forced to release. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 90h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned illegal parameter |
| Mode Error | •In case of operating **MENU** by **Local Mode** |

## 13.17 Local Control Mode

System Control Command Type 1

| | | |
|---|---|---|
| Function | To set Local Control mode. | |
| Command | 0090h | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | None | |
| Reference | •At the moment of power ON, Default sets Local Control Mode.<br>•To be controlled by remote control and unable to control by Host computer.<br>•In case that flag of local control mode is set 1 among of operating status, all commands except the following commands come out to mode error,<br>•Operation Status Request and Extended Operation Status Request command<br>•Cascade ON and Cascade OFF commands<br>•Host Control Mode and Local Control Mode commands<br><br>•In case of Remote Control Receipt forbidden by Remote Control OFF command before issuing this command, Remote Control Operation is for bidden, even in Local Control Mode status.<br>•In case of Remote Control Through Function ON by Remote Control Assignment Command before issuing this command, to control by remote control and notify its information to Host computer. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 90h | 31h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned illegal parameter |
| Mode Error | •In case of operating **MENU** by **Local Mode** |

## 13.18 Screen Control

System Control Command Type 1

| | | |
|---|---|---|
| Function | To control screen display of date, time, characters. | |
| Command | 0091h | |
| Parameter | Length | 2 byte |
| | Range | 00h~09h |
| Status | None | |
| Reference | •The following display indication can be set,<br>Parameter<br>00h : Display Indication OFF (Screen Display OFF)<br>01h : Display Indication ON (Screen Display ON)<br>02h : Character Indication OFF<br>03h : Character Indication ON<br>04h : Time Indication OFF<br>05h : Time Indication ON1 (Indication Format 1)<br>06h : Time Indication ON 2 (Indication Format 2)<br>07h : Date Indication OFF<br>08h : Date Indication ON1 (Indication Format 1)<br>09h : Date Indication ON2 (Indication Format 2)<br><br>•At the moment of power ON, Display Indication OFF, Character Indication ON, Date Indication ON2, Date Indication ON2 are set by default.<br>•By Display Indication ON/OFF Control, all function able to controlled, even though each of Character Indication, Time Indication ,Date Indication is set ON/OFF<br><br>•Time Indication Format has two type as under,<br>Indication Format 1 hh : mm : ss<br>Indication Format 2 HH : mm : ss AP<br>hh ⇒ Hour (00~24)<br>HH ⇒ Hour (00~12)<br>mm ⇒ Minute (00~59)<br>ss ⇒ Second (00~59)<br>AP ⇒ AM or PM<br><br>•Date Indication Format has two type as under,<br>Indication Format 1 yy : mm : dd<br>Indication Format 2 dd : MM : yy<br><br>yy ⇒ Year (00~99)<br>mm ⇒ Month (01~12)<br>MM ⇒ Month (JAN, FEB, MAR, APL, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC)<br>dd ⇒ Date (01~31)<br>Note:<br>At the moment of power ON, Time Indication & Date Indication start flashing when Display Indication sets ON before setting of Time & Date. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | | End mark |
| FFh | 30h | 3Xh | 00h | 91h | p0 | p1 | EFh |

⇓

| Status of Screen Display Indication indicates in Hexadecimal 2 figures and returns its ASCII Code as value. | | | |
|---|---|---|---|
| Example: Display Indication ON (All Display ON) | | p0 | p1 |
| | 01h ⇒ | 30h | 31h |
| Date Indication ON2 (Indication Format 2) | | p0 | p1 |
| | 09h ⇒ | 30h | 39h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter besides 00h~09h |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.19 Display Character Data Assignment

System Control Command Type 1

| | | | | |
|---|---|---|---|---|
| Function | To set Character Data to be indicated in the Display. | | | |
| Command | 0091h | | | |
| Parameter | Length | 6 byte | | |
| | Range | Position to be indicated | Horizontal | 00h~17h |
| | | | Vertical | 0h~Ah |
| | | Indicated Character Code | 20h~5Fh | |
| Status | None | | | |
| Reference | •The character data to be indicated are as followings.<br>p0 Fixed value ⇒ 31h<br>p1, p2 Horizontal position ⇒ 0~23 (00h~17h)<br>p3 Vertical position ⇒ 0~10 (0h~Ah)<br>p4, p5 Character Code ⇒ 32~95 (20F~5Fh)<br>See next page (Display Indication Character Code Table) concerning Character Code<br>•At the moment of Power ON, Indicating range comes out blank data(5Fh)<br>Note:<br>•Not to be indicated, even though Character data is set in the following range since Time & Date are indicated within 10 characters ×2 lines at the lower right Display corner (Horizontal position: 14~23, Vertical lines: 9~10) | | | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Command | |
| FFh | 30h | 3Xh | 00h | 91h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 |
|---|---|---|---|---|---|---|
| Fixed | Horizontal | | Vertical | Character Code | | End mark |
| 31h | p1 | p2 | p3 | p4 | p5 | EFh |

⇓

| Character Indication Position and Character Data indicates in Hexadecimal 5 figures and parameter value is its ASCII code. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Example: to character "A" in the range of Horizontal 10, Vertical 5 | | | | | | | | | |
| | | | | p1 | p2 | p3 | p4 | p5 | |
| 14h | 5h | 41h | ⇒ | 31h | 34h | 35h | 34h | 31h | |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter outside range. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

**Display Indication Character Code Table**

| Indicated Character | Character Code | ASCII code | Indicated Character | Character Code | ASCII code |
|---|---|---|---|---|---|
| 0 | 30h | 33.30h | A | 41h | 34.31h |
| 1 | 31h | 33.31h | B | 42h | 34.32h |
| 2 | 32h | 33.32h | C | 43h | 34.33h |
| 3 | 33h | 33.33h | D | 44h | 34.34h |
| 4 | 34h | 33.34h | E | 45h | 34.35h |
| 5 | 35h | 33.35h | F | 46h | 34.36h |
| 7 | 36h | 33.36h | G | 47h | 34.37h |
| 8 | 37h | 33.37h | H | 48h | 34.38h |
| 9 | 38h | 33.38h | I | 49h | 34.39h |
|  | 39h | 33.39h | J | 4Ah | 34.41h |
|  |  |  | K | 4Bh | 34.42h |
| Space | 20h | 32.30h | L | 4Ch | 31.43h |
| ! | 21h | 32.31h | M | 4Dh | 31.44h |
| ( | 28h | 32.38h | N | 4Eh | 34.45h |
| ) | 29h | 32.39h | O | 4Fh | 34.46h |
| + | 2Bh | 32.42h | P | 50h | 35.30h |
| - | 2Dh | 32.44h | Q | 51h | 35.31h |
| . | 2Eh | 32.45h | R | 52h | 35.32h |
| / | 2Fh | 32.46h | S | 53h | 35.33h |
| : | 3Ah | 33.41h | T | 54h | 35.34h |
| ; | 3Bh | 33.42h | U | 55h | 35.35h |
| < | 3Ch | 33.43h | V | 56h | 35.36h |
| > | 3Eh | 33.45h | W | 57h | 35.37h |
| ? | 3Fh | 33.46h | X | 58h | 35.38h |
|  |  |  | Y | 59h | 35.39h |
| Blank | 5Fh | 35.36h | Z | 5Ah | 35.41h |

Note: Character Code indicating "Blank" "5Fh" is equivalent to "_"

## 13.20 Display Character Data Request

System Control Command

Type 1

| | | | | |
|---|---|---|---|---|
| Function | To read Character Data to be indicated in the Display. | | | |
| Command | 0091h | | | |
| Parameter | Length | 4 byte | | |
| | Range | Position to be indicated | Horizontal | 00h~17h |
| | | | Vertical | 0h~Ah |
| Status | Length | 2 byte | | |
| | Range | 32~95 (20h~5Fh) | | |
| Reference | •The character data to be indicated are as followings.<br>p0 Fixed vale ⇒ 32h<br>p1, p2 Horizontal position ⇒ 0~23 (00h~17h)<br>p3 Vertical position ⇒ 0~10 (0h~Ah)<br>See previous page (Display Indication Character Code Table) concerning Character Code<br>•At the moment of Power ON, Indicating range comes out blank data(5Fh)<br>Note:<br>•Not to be indicated, even though Character data is set in the following range since Time & Date are indicated within 10 characters ×2 lines at the lower right Display corner (Horizontal position: 14~23, Vertical lines: 9~10) | | | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Fixed | Horizontal | | Vertical | End mark |
| FFh | 30h | 3Xh | 00h | 91h | 32h | p1 | p2 | p3 | EFh |

⇓

| |
|---|
| Character Indication Position indicates in Hexadecimal 3 figures and parameter value is its ASCII code. |
| Example: to read of Horizontal 10, Vertical 5<br>p1 p2 p3<br>14h 5h ⇒ 31h 34h 35h |

● Answer Format

■ In case of No error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 |
|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | EFh |

⇓

| Data indicates in Hexadecimal 2 figures and its ASII code is Status value. | | | | |
|---|---|---|---|---|
| Example: Data "A" | | | s0 | s1 |
| | 41h | ⇒ | 34h | 31 |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | | |
|---|---|---|---|---|---|---|
| Example | | | | | | e0 |
| e1 | | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h | |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h | |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned address outside range. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.21 Display Date Assignment

System Control Command Type 1

| | | | |
|---|---|---|---|
| Function | To set date data to be indicated in the Display. | | |
| Command | 0091h | | |
| Parameter | Length | 7 byte | |
| | Range | Year Data | 0~99 |
| | | Month Data | 1~12 |
| | | Day Data | 1~31 |
| Status | None | | |
| Reference | •The Date data to be indicated are as followings.<br>p0 Fixed vale ⇒ 33h<br>p1~ p2 Year Data ⇒ 00h~99h<br>p3~ p4 Month Data ⇒ 01h~12h<br>p5~ p6 Day Data ⇒ 01h~31h<br><br>•At the moment of power ON, to be set 00 year 01 month 01 day by default<br>•Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h)<br>•Date setting data is to be directly set in Inside Clock IC. | | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Command | |
| FFh | 30h | 3Xh | 00h | 91h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 |
|---|---|---|---|---|---|---|---|
| Fixed | Year Data | | Month Data | | Day data | | End mark |
| 33h | p1 | p2 | p3 | p4 | p5 | p6 | EFh |

⇓

| Date Data indicates in BCD type Hexadecimal 6 figures and parameter value is its ASCII Code. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example: | | p1 | p2 | p3 | p4 | p5 | p6 |
| year00 month07day25 | ⇒ | 30h | 30h | 30h | 37h | 32h | 35h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter outside range. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.22 Display Data Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To request date data (year, month, day). | |
| Command | 0091h | |
| Parameter | Length | 1 byte |
| | Value | 34h |
| Status | Length | 6 byte |
| | Value | Year (2 byte) + Month(2 byte) + day(2 byte) |
| Reference | •The Day data to be returned as followings.<br>s1~ s2 Year Data ⇒ 00h~99h<br>s3~ s4 Month Data ⇒ 01h~12h<br>s5~ s6 Day Data ⇒ 01h~31h<br>•At the moment of power ON, to be set 00 year 01 month 01 day by default<br>•Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h)<br>•Date setting data is to be directly read out from Inside Clock IC. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 91h | 34h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Command | |
| FEh | 30h | 3Xh | 30h | 30h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 |
|---|---|---|---|---|---|---|
| Year Data | | Month Data | | Day data | | End mark |
| s0 | s1 | s2 | s3 | s4 | s5 | EFh |

⇓

| Date Data indicates in BCD type Hexadecimal 6 figures and Status value is its ASCII Code. | | | | | | | |
|---|---|---|---|---|---|---|---|
| Example: | | s1 | s2 | s3 | s4 | s5 | s6 |
| year00 month07 day25 | ⇒ | 30h | 30h | 30h | 37h | 32h | 35h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned illegal parameter. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.23 Display Time Setting

System Control Command Type 1

| | | | |
|---|---|---|---|
| Function | To set time data(hour, minute, second) to be indicated in the Display. | | |
| Command | 0091h | | |
| Parameter | Length | 7 byte | |
| | Range | Hour Data | 0~23 |
| | | Minute Data | 0~59 |
| | | Second Data | 0~59 |
| Status | None | | |
| Reference | •The time data to be indicated are as followings.<br>p0 Fixed ⇒ 35h<br>p1~ p2 Hour Data ⇒ 00h~23h<br>p3~ p4 Minute Data ⇒ 00h~59h<br>p5~ p6 Second Data ⇒ 00h~59h<br>•At the moment of power ON, to be set 00 hour 00 minute 00 second by default<br>•Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h)<br>•Date setting data is to be directly set in Inside Clock IC. | | |

● Format of Control Code

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Command | |
| FFh | 30h | 3Xh | 00h | 91h |

| d5 | d6 | d7 | d8 | d9 | d10 | d11 | d12 |
|---|---|---|---|---|---|---|---|
| Fixed | Hour Data | | Minute Data | | Second data | | End mark |
| 35h | p1 | p2 | p3 | p4 | p5 | p6 | EFh |

⇓

| Time Data indicates in BCD type Hexadecimal 6 figures and parameter value is its ASCII Code. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | p1 | p2 | p3 | p4 | p5 p6 |
| hour17 minute30 second25 | ⇒ | 31h | 37h | 33h | 30h | 32h 35h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 e1 |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter outside range. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.24 Display Time Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To request time data (hour, minute, second) indicated Display. | |
| Command | 0091h | |
| Parameter | Length | 1 byte |
| | Value | 36h |
| Status | Length | 6 byte |
| | Value | hour (2 byte) + minute (2 byte) + second (2byte) |
| Reference | •The Time data to be set as followings.<br>p0 Fixed ⇒ 36h<br>p1~ p2 Hour Data ⇒ 00h~23h<br>p3~ p4 Minute Data ⇒ 00h~59h<br>p5~ p6 Second Data ⇒ 00h~59h<br>•At the moment of power ON, to be set 00 hour 00 minute 00 second by default<br>•Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h)<br>•Date setting data is to be directly read out from Inside Clock IC. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 91h | 36h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 |
|---|---|---|---|---|
| Header | Device Num | | Error Code | |
| FFh | 30h | 3Xh | 30h | 30h |

| d5 | d5 | d6 | d7 | d8 | d9 | d10 | d11 |
|---|---|---|---|---|---|---|---|
| Hour Data | | Minute Data | | Second Data | | | End mark |
| s0 | s1 | s2 | s3 | s4 | s5 | | EFh |

⇓

| Time Data indicates in BCD type Hexadecimal 6 figures and Status value is its ASCII Code. | | | | | | |
|---|---|---|---|---|---|---|
| Example: | | s1 | s2 | s3 | s4 | s5 s6 |
| hour17 minute30 second25 | ⇒ | 31h | 37h | 33h | 30h | 32h 35h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 e1 |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter illegal. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.25 Turning ON Time Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To request total accumulated turn ON time. | |
| Command | 0092h | |
| Parameter | Length | 1 byte |
| | Value | 0h: accumulated turn ON time of Camera section |
| | | 1h: accumulated turn ON time of Pedestal section |
| Status | Length | 4 byte |
| | Range | 0000h~FFFFh |
| Reference | •Camera accumulated turn ON time calculates total camera turn ON time in one hour as one unit.<br>•Pedestal accumulated turn ON time calculates total power on time in one hour as one unit. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 92h | p0 | EFh |

⇓

| |
|---|
| Request of total turn on time(0:camera section/1:pedestal section) indicates in ASCII Code 1 byte. |
| Example: to request total accumulated time of pedestal section<br>p0<br>01h ⇒ 31h |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 | d7 | d8 | d9 |
|---|---|---|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | | | | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | s1 | s2 | s3 | EFh |

⇓

| |
|---|
| Total accumulated turn on time indicates in Hexadecimal 4 figures and status value is its ASCII Code. |
| Example: s0 s1 s2 s3<br>573 hours ⇒ 0023Dh ⇒ 30h 32h 33h 44h |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| |
|---|
| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
| Example e0<br>e1<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter illegal. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.26 Default Setting

System Control Command Type 1

| | | |
|---|---|---|
| Function | To initialize in status of factory setting. | |
| Command | 0093h | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | None | |
| Reference | •To return to status of factory setting at shipping from factory.<br>(to re-write memory data of built in nonvolatile IC)<br>•By this command, all items except the followings reset default values at the shipping status from factory.<br>•Pedestal Initial Information<br>•Date, Time setting<br>•Indication Character setting<br>•By this command, camera section is rest.<br>•By this command, communication section with Host is reinitialized<br>(Baud rate: 9600 bps, stop: 1 bit)<br>•Host Control Mode unchanged, but cascade OFF status comes out.<br>•By this command, CTS signal of Host stop one second OFF.<br>Note:<br>•Necessary to issue another commands after two seconds passed from issuing this command. | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 93h | 30h | EFh |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 e1 |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Busy : | 00010000B | ⇒ | 10h | ⇒ | 31h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Busy | •In case of executing of Camera Control Command.<br>•In case of executing Pedestal Control Command<br>•In case of executing **Preset Move** Command |
| Parameter Error | •In case of assigned parameter except 0h |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

### 13.27 Command Termination Notification Setting

System Control Command Type 1

| | | |
|---|---|---|
| Function | To set Command Termination Notification ON/OFF after command type 2 completion. | |
| Command | 0094h | |
| Parameter | Length | 1 byte |
| | Value | 0h: OFF (not Notify) |
| | | 1h: ON (Notify) |
| Status | None | |
| Reference | •At the moment of power ON, to OFF by default.<br>•Command Termination Notification comes out to effective at the command after issuing this command.<br>•See Timing of Communication(3.3), Command Termination Notification Function(6), Classification by execution format(9.2) | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 94h | p0 | EFh |

⇓

| Command Termination Notification ON/OFF indicates in ASCII Code 1 byte. |
|---|
| Example: to notify command termination notification p0<br>01h ⇒ 31h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of No Error: 00000000B ⇒ 00h ⇒ 30h 30h<br>■ In case of Parameter Error : 01010000B ⇒ 50h ⇒ 35h 30h<br>■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter except 0h or 1h. |
| Mode Error | •Not in status of **Camera ON**<br>•Not in status of **Host Control Mode** |

## 13.28 Global Notification Setting

System Control Command Type 1

| | | |
|---|---|---|
| Function | To set Global Notification ON/OFF after cascaded global command. | |
| Command | 0095h | |
| Parameter | Length | 1 byte |
| | Value | 0h: OFF (not Notify) |
| | | 1h: ON (Notify) |
| Status | None | |
| Reference | •At the moment of power ON, to OFF by default.<br>•To notify each error to global command in cascade status ON, in case of global notification ON.<br>•Global Notification comes out to effective in case of cascade ON.<br>•Global notification ON comes out effective to the command after issuing this command.<br>•Last device set by cascade connection ON command notify this command.<br>•See cascade global notification function(7) | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 95h | p0 | EFh |

⇓

| Global Notification ON/OFF indicates in ASCII Code 1 byte. |
|---|
| Example: to notify global notification p0<br>01h ⇒ 31h |

● Answer Format

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value | | | | | |
|---|---|---|---|---|---|
| Example | | | | | e0 |
| e1 | | | | | |
| ■ In case of No Error: | 00000000B | ⇒ | 00h | ⇒ | 30h 30h |
| ■ In case of Parameter Error : | 01010000B | ⇒ | 50h | ⇒ | 35h 30h |
| ■ In case of Mode Error : | 10010000B | ⇒ | 90h | ⇒ | 39h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter except 0h or 1h. |
| Mode Error | •Not in status of **Host Control Mode** |

## 13.29 Pedestal Model Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return Pedestal model (Normal Model, Inverse Model) | |
| Command | 009Ah | |
| Parameter | Length | 1 byte |
| | Value | 0h |
| Status | Length | 1 byte. |
| | Value | 0h: Normal Model, 1h: Inverse Model |
| Reference | •Note: additional command. valid for ROM Version V5-16 or newer | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 9Ah | 30h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of Parameter error 01010000B ⇒ 50h ⇒ 35h 30h |

● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter illegal |

## 13.30 Camera Model Request

System Control Command Type 1

| | | |
|---|---|---|
| Function | To return Camera model (NTSC, PAL) | |
| Command | 009Ah | |
| Parameter | Length | 1 byte |
| | Value | 1h |
| Status | Length | 1 byte. |
| | Value | 0h: NTSC, 1h: PAL |
| Reference | •Note: additional command. valid for ROM Version V5-16 or newer | |

● Format of Control Command

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Command | | Parameter | End mark |
| FFh | 30h | 3Xh | 00h | 9Ah | 31h | EFh |

● Answer Format

■ In case of no Error

| d0 | d1 | d2 | d3 | d4 | d5 | d6 |
|---|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | Status | End mark |
| FEh | 30h | 3Xh | 30h | 30h | s0 | EFh |

■ In case of Error

| d0 | d1 | d2 | d3 | d4 | d5 |
|---|---|---|---|---|---|
| Header | Device Num | | Error Code | | End mark |
| FEh | 30h | 3Xh | e0 | e1 | EFh |

⇓

| Error Flag indicates in 2 figures Hexadecimal and returns ASII code value |
|---|
| Example e0<br>e1<br>■ In case of Parameter error 01010000B ⇒ 50h ⇒ 35h 30h |

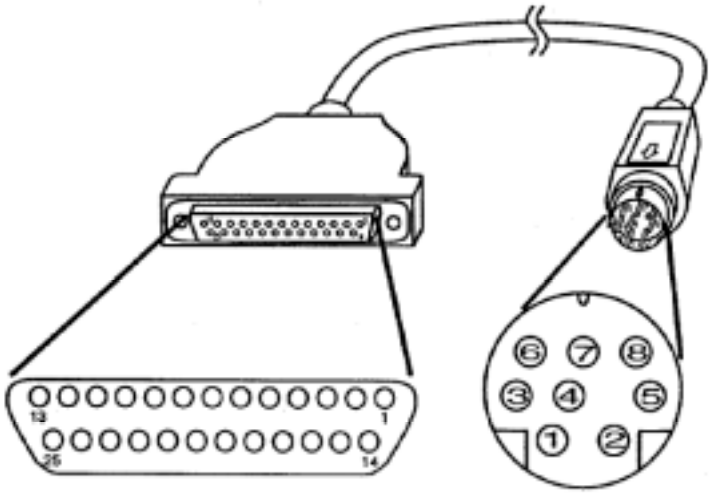
● Condition of Error flag to be set

| | |
|---|---|
| Parameter Error | •In case of assigned parameter illegal |

## 14. Connection Cable

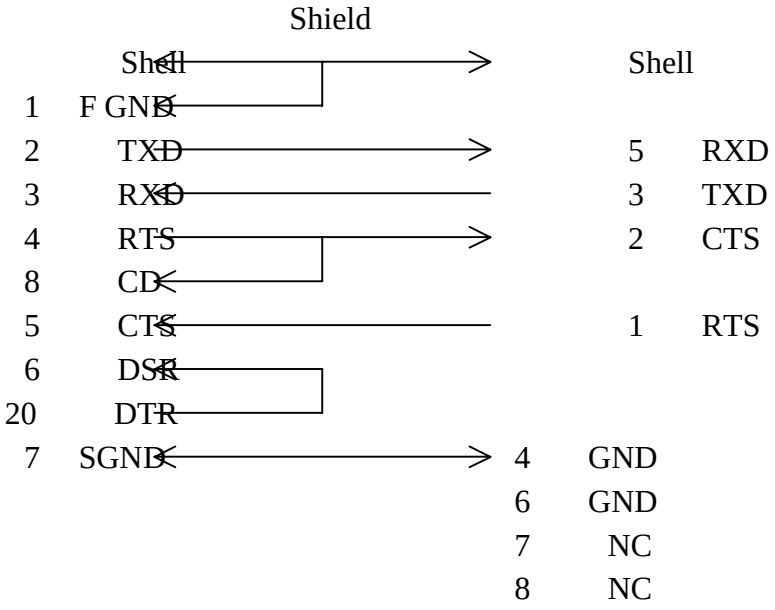
### 14.1 Example 1 Connection with PC-AT

DSUB type with 25 pins



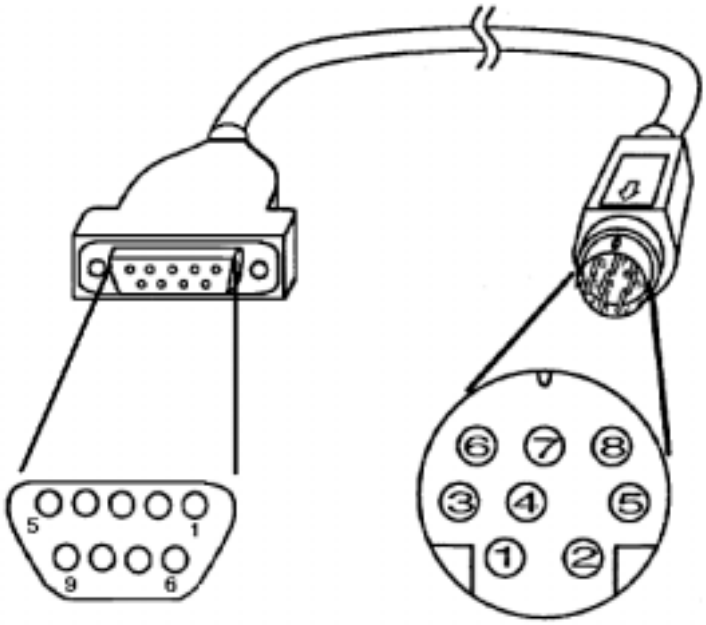
PC-AT
25 pins
DSUB(Female)

Camera
8 pins
Mini DIN Connecter



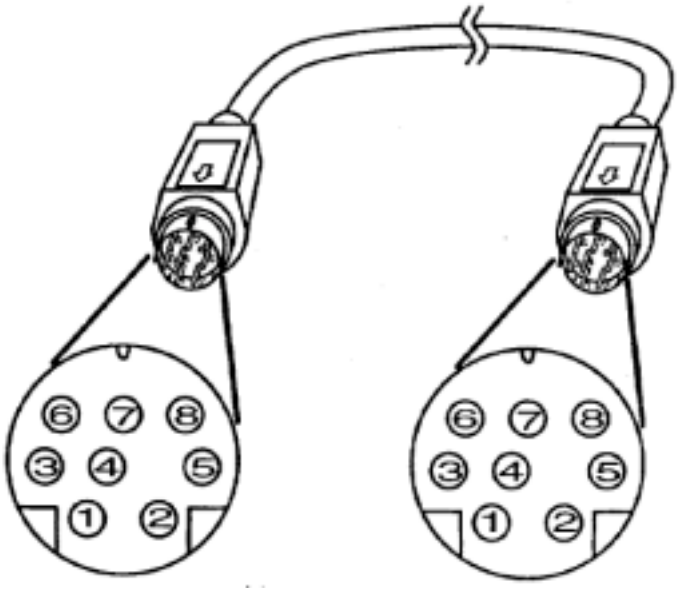
## 14.2 Example 2 Connection with PC-AT

9 pins DSUB type



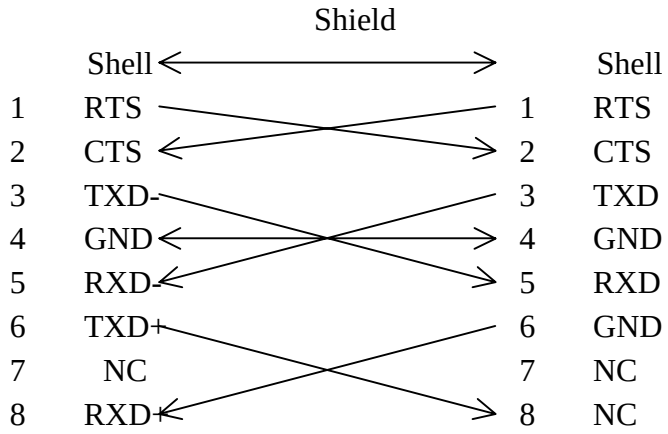

| PC-AT<br>9 pins<br>DSUB(Female) | | Camera<br>8 pins<br>Mini DIN Connecter |
|---|---|---|
| | Shield | |
| | Shell | Shell |
| 1 | CD | |
| 2 | RXD | 3 TXD |
| 3 | TXD | 5 RXD |
| 4 | DTR | |
| 5 | GND | 4 GND |
| 6 | DSR | |
| 7 | RTS | 2 CTS |
| 8 | CTS | 1 RTS |
| 9 | RI | |
| | | 6 GND |
| | | 7 NC |
| | | 8 NC |

### 14.3 Example 3 Connection with Macintosh

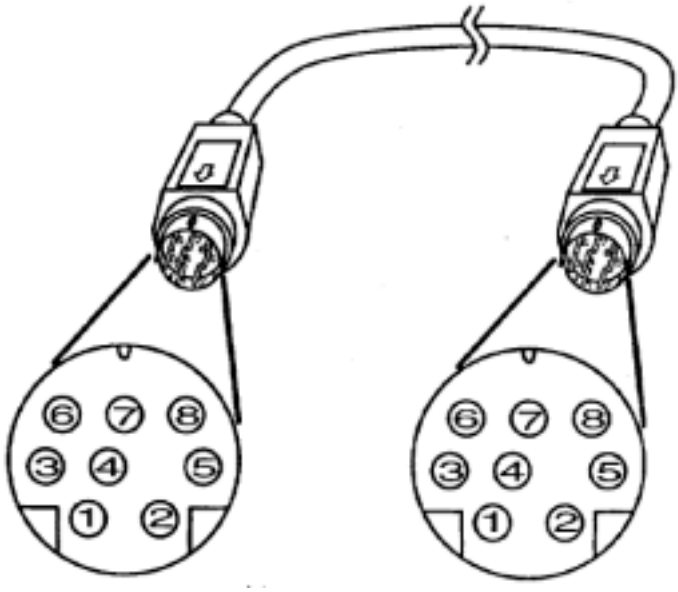



Personal computer
8 pins
Mini DIN connecter(Male)

Camera
8 pins
Mini DIN connecter(Male)



### 14.4 Connection Cable Between Cameras




Camera
8 pins
Mini DIN connecter(Male)

Camera
8 pins
Mini DIN connecter(Male)

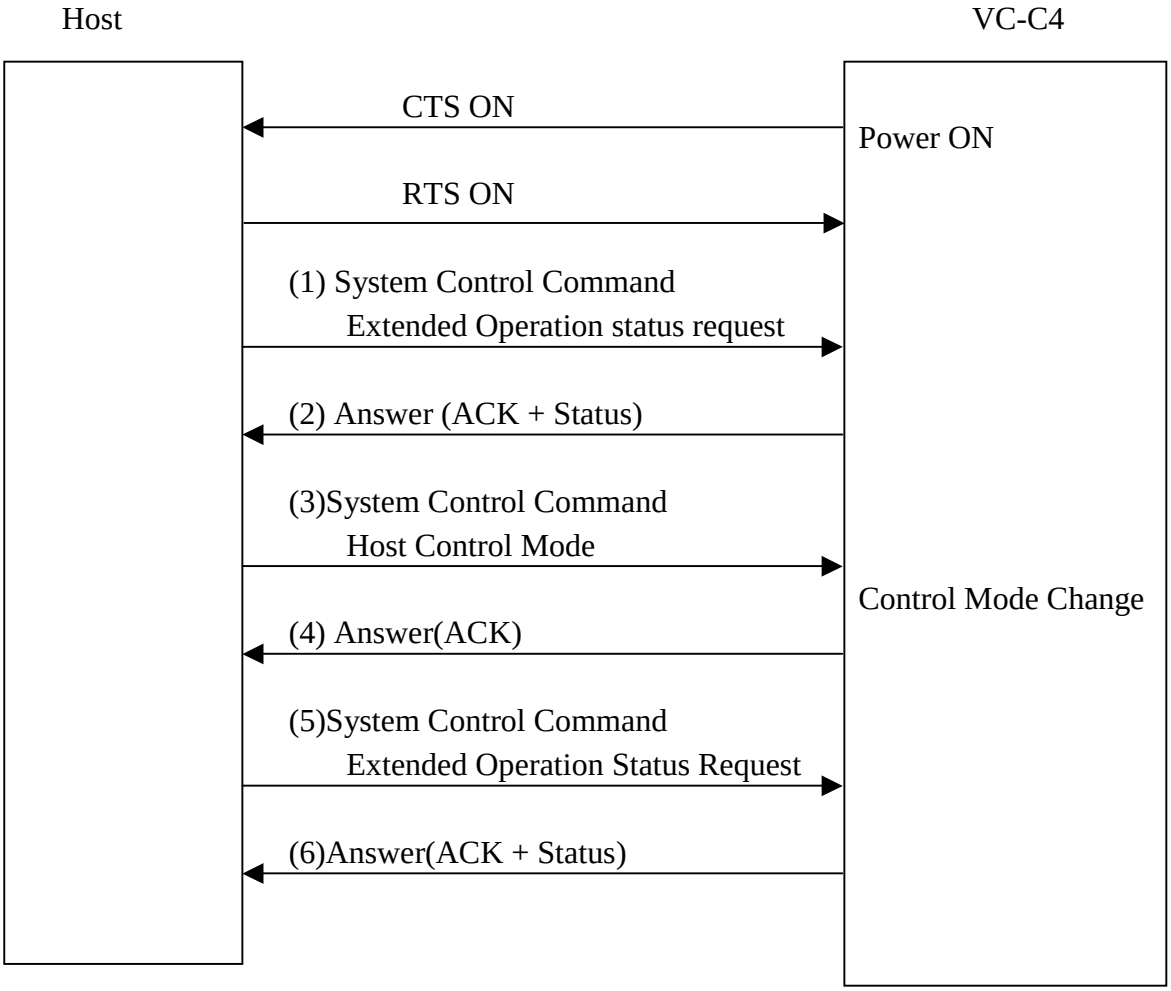
Shield

| | | | |
|---|---|---|---|
| | Shell | | Shell |
| 1 | RTS | 1 | RTS |
| 2 | CTS | 2 | CTS |
| 3 | TXD | 3 | TXD |
| 4 | GND | 4 | GND |
| 5 | RXD | 5 | RXD |
| 6 | TXD | 6 | GND |
| 7 | NC | 7 | NC |
| 8 | NC | 8 | NC |

## 15. Example of Host Control Sequence

### 15.1 Assignment of Host Control

In case of VC-C4 controlled by Host, Necessary to change VC-C4 Control Mode.
By Local Control Mode flag (bit 18) of Operation Status, the current mode can be found Host Control Mode or Local Control Mode.

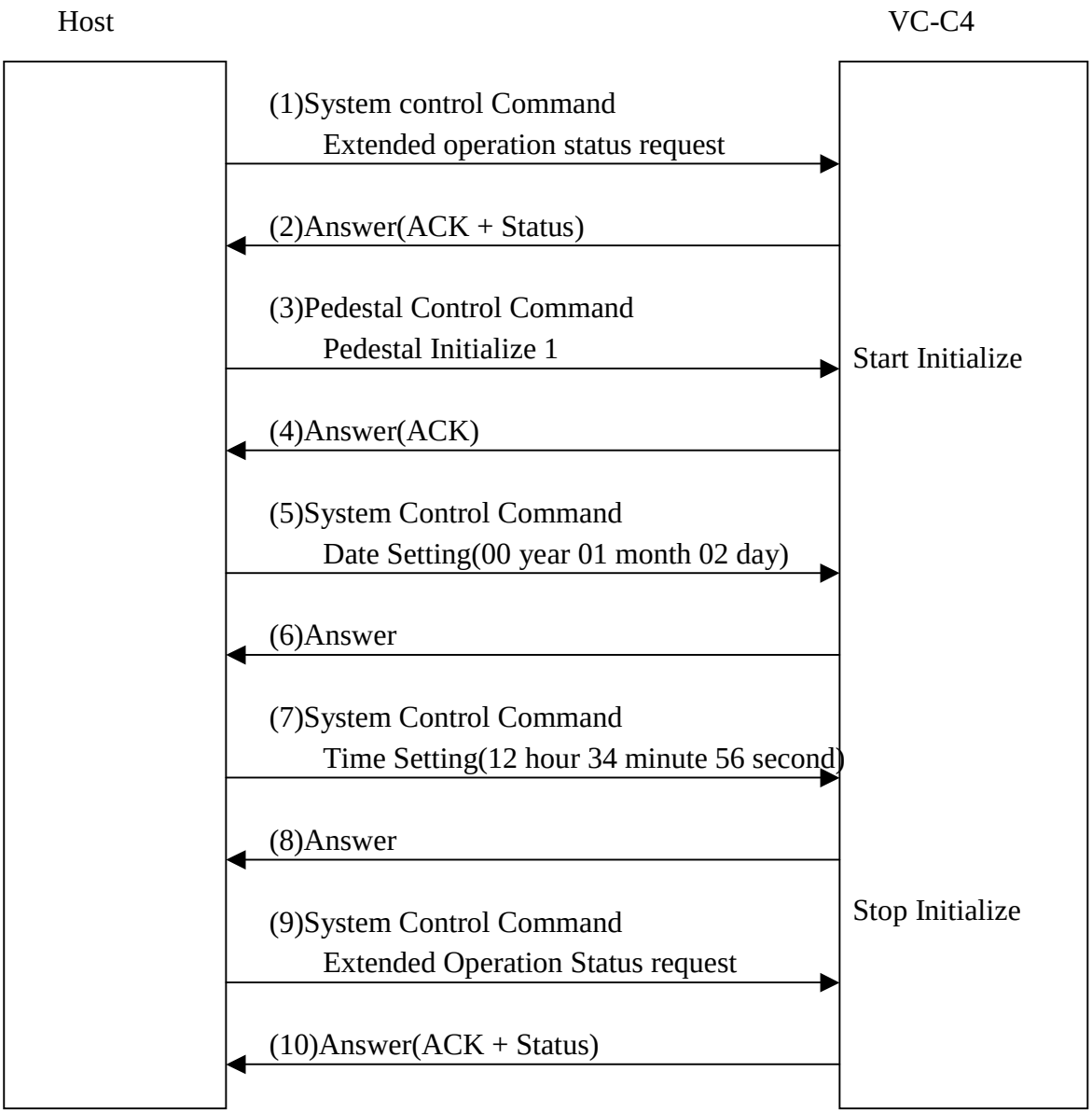



Corresponding Frame Code

| | Command/Answer |
|---|---|
| (1) | FF 30 30 00 86 30 EF |
| (2) | FE 30 30 30 30 37 30 30 31 30 EF |
| (3) | FF 30 30 00 90 30 EF |
| (4) | FE 30 30 30 30 EF |
| (5) | FF 30 30 00 86 30 EF |
| (6) | FE 30 30 30 30 33 30 30 3130 EF |

## 15.2 Initial Setting

In case of Power ON, it is necessary to Pedestal Initialize at first.
In case of using Date and Time, it is necessary to set the present time and date.

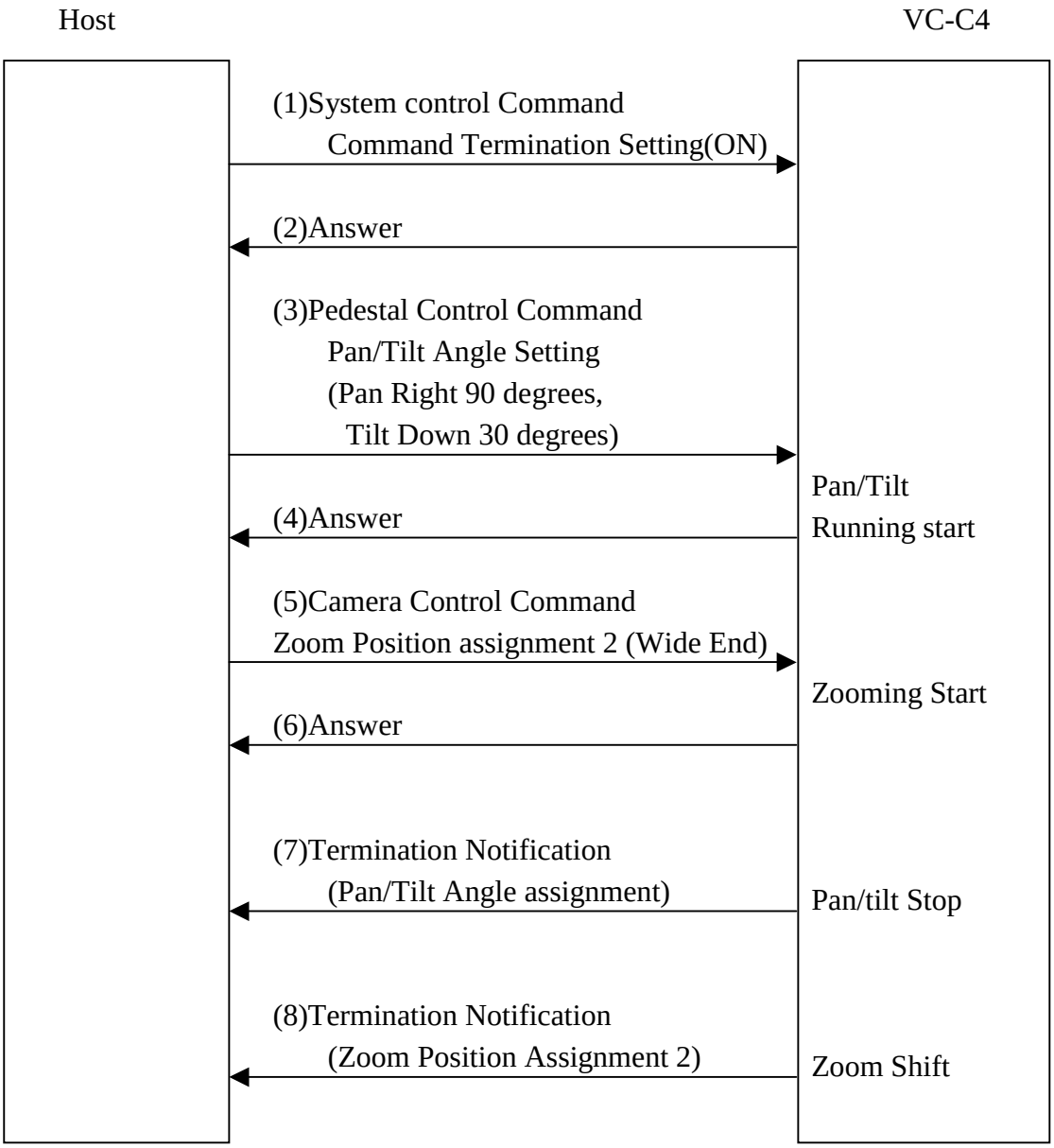



Corresponding Frame table

| | Command/Answer |
|---|---|
| (1) | FF 30 30 00 86 30 EF |
| (2) | FE 30 30 30 30 33 30 31 30 EF |
| (3) | FF 30 30 00 58 30 EF |
| (4) | FE 30 30 30 30 EF |
| (5) | FF 30 30 00 91 33 30 30 30 31 30 32 EF |
| (6) | FE 30 30 30 30 EF |
| (7) | FF 30 30 00 91 35 31 32 33 34 35 36 EF |
| (8) | EF 30 30 30 30 EF |
| (9) | EF 30 30 00 86 30 EF |
| (10) | FE 30 30 30 30 30 30 30 30 EF |

## 15.3 Command Termination Notification

Example Command Termination Notification Through ON

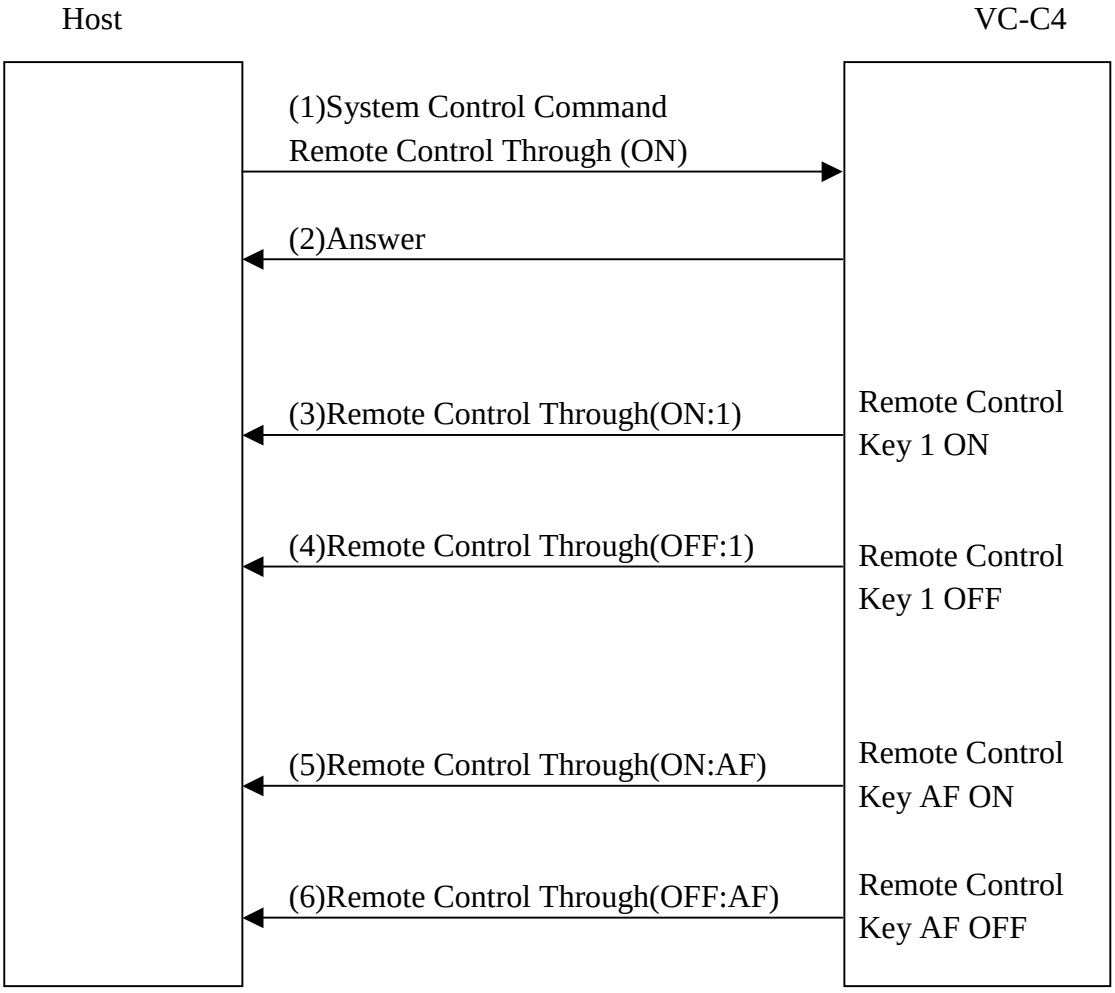



Corresponding Frame Code

| | Command/Answer |
|---|---|
| (1) | FF 30 30 00 94 31 EF |
| (2) | FE 30 30 30 30 EF |
| (3) | EF 30 30 00 62 38 33 32 30 37 45 46 35 EF |
| (4) | FE 30 30 30 30 EF |
| (5) | FF 30 30 00 B3 30 30 30 30 EF |
| (6) | FE 30 30 30 30 EF |
| (7) | FA 30 30 00 62 38 33 32 30 37 45 46 35 EF |
| (8) | FA 30 30 00 B3 30 30 30 EF |

## 15.4 Remote Controller Through

Example of Remote Control Through ON

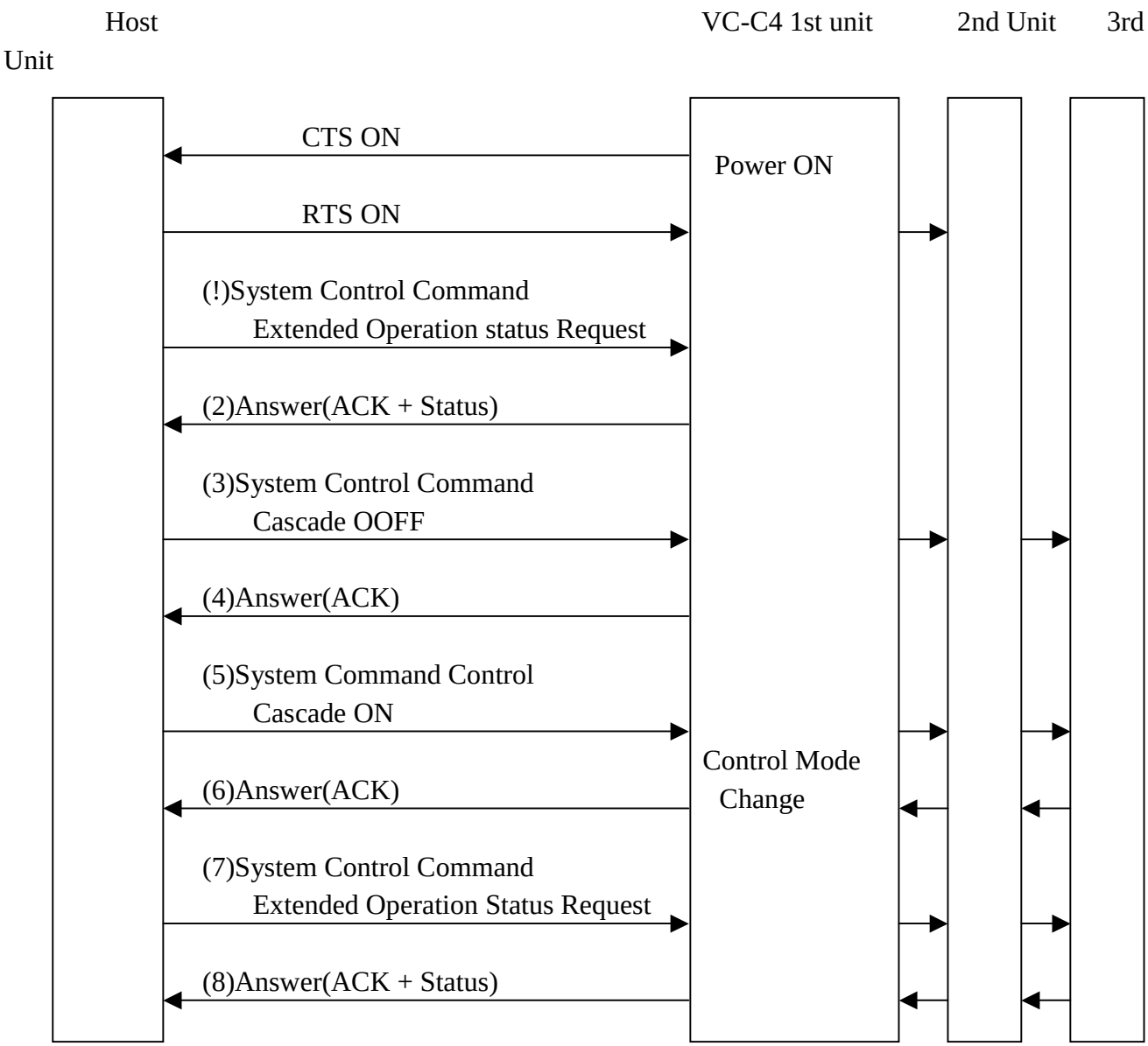



Corresponding frame Table

| | Command/Answer |
|---|---|
| (1) | FF 30 30 00 8D 30 EF |
| (2) | FE 30 30 30 30 EF |
| (3) | FD 30 30 30 31 EF |
| (4) | FC 30 30 30 31 EF |
| (5) | FD 30 30 30 37 EF |
| (6) | FC 30 30 30 37 EF |

### 15.5 Cascade ON Assignment

In case of VC-C4 controlled by Host, Cascade ON Command comes out to Host Control Mode even under Host Control Mode.

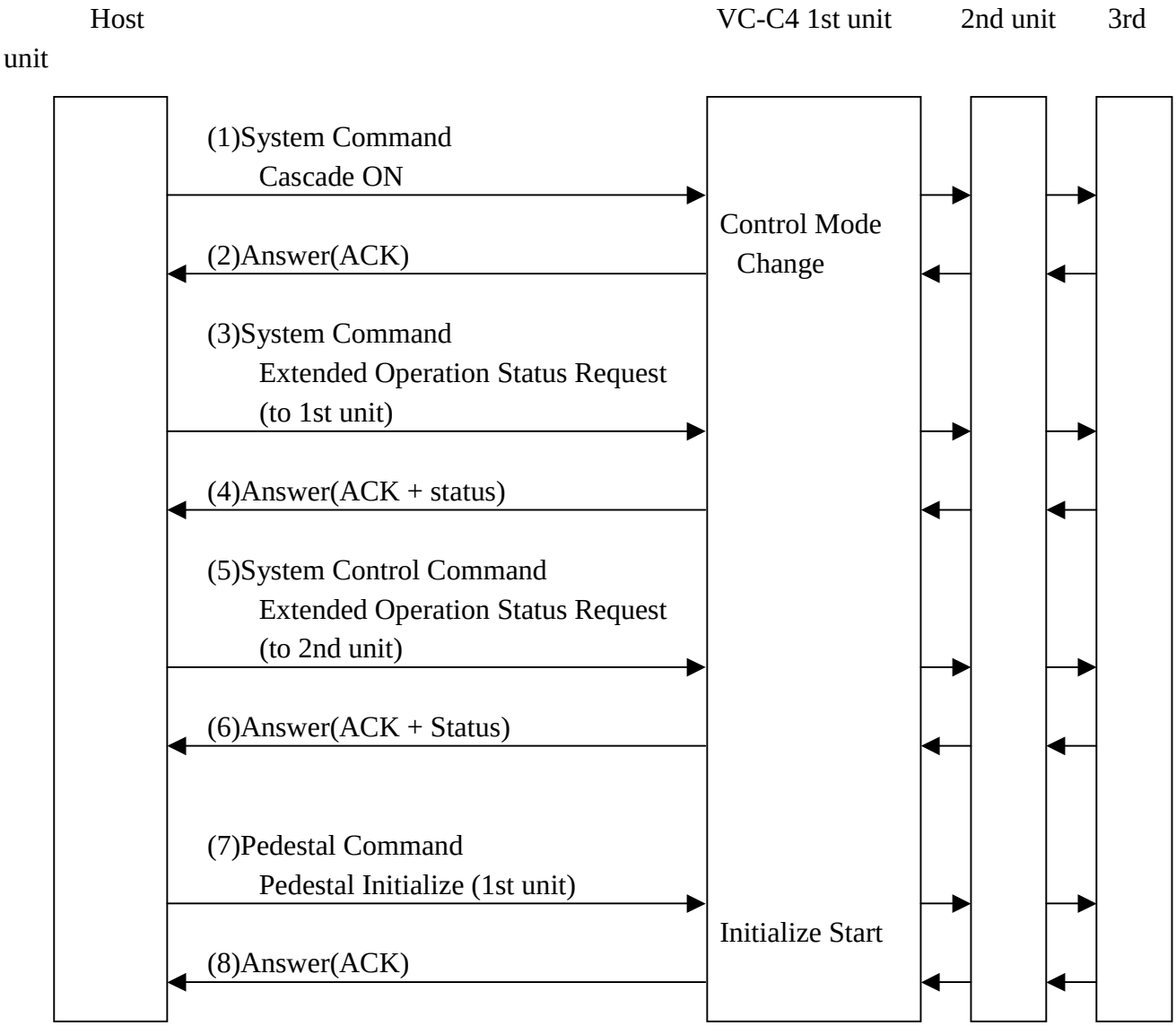



Corresponding Frame Code

| | Command/Answer |
|---|---|
| (1) | FF 30 30 00 86 30 EF |
| (2) | FE 30 30 30 30 37 30 30 31 30 EF |
| (3) | FF 30 30 00 8F 30 EF |
| (4) | FE 30 30 30 30 EF |
| (5) | FF 30 30 00 8F 31 EF |
| (6) | FE 30 33 30 30 EF |
| (7) | FF 30 30 00 86 30 EF |
| (8) | FE 30 33 30 30 33 30 30 31 30 EF |

## 15.6 Cascade Individual Assignment

In case of VC-C4 controlled individually, it is necessary to assign Device Number



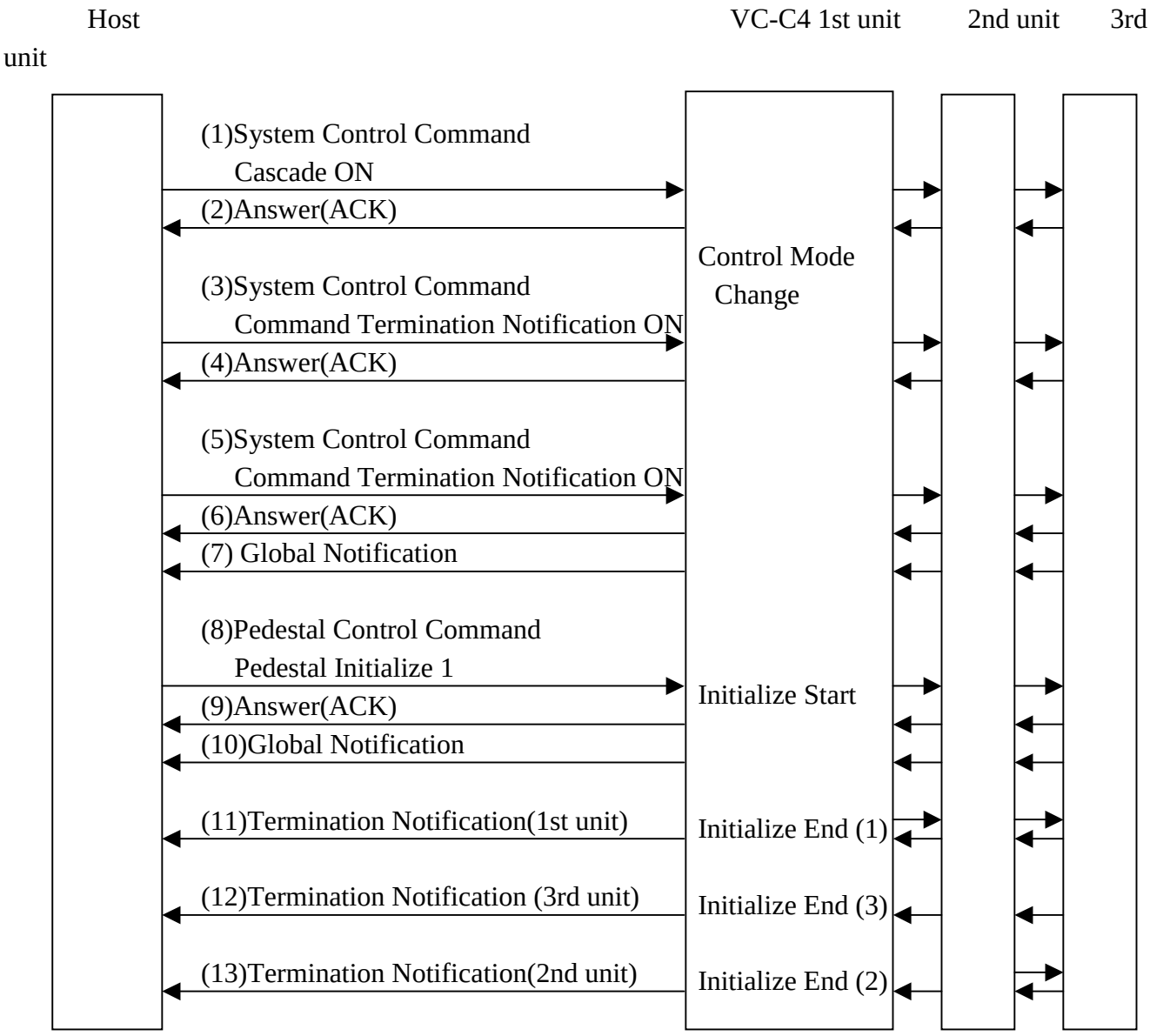

Corresponding Frame Code

| | Command/Answer |
|---|---|
| (1) | FF 30 30 00 8F 31 EF |
| (2) | FE 30 33 30 30 EF |
| (3) | FF 30 31 00 86 30 EF |
| (4) | FE 30 31 30 30 33 30 30 31 30 EF |
| (5) | FF 30 32 00 86 30 EF |
| (6) | FE 30 32 30 30 33 30 30 31 30 EF |
| (7) | FF 30 31 00 58 30 EF |
| (8) | FE 30 31 30 30 EF |

## 15.7 Cascade Global Assignment

In case of VC-C4 controlled simultaneously in cascade connection,
it is necessary to assign device num "3030"

Example of Termination Notification ON by Cascade ON, Global Notification ON




Corresponding Frame Code table

| | Command/Answer |
|---|---|
| (1) | FF 30 30 00 8f EF |
| (2) | FF 30 33 30 30 EF |
| (3) | FF 30 30 00 94 31 EF |
| (4) | FE 30 33 30 30 EF |
| (5) | FF 30 30 00 95 31 EF |
| (6) | FE 30 33 30 30 EF |
| (7) | F8 30 33 30 30 30 30 EF |
| (8) | FF 30 30 00 58 30 EF |
| (9) | FE 30 33 30 30 EF |
| (10) | F8 30 33 30 30 30 30 EF |
| (11) | FA 30 31 00 58 30 EF |
| (12) | FA 30 33 00 58 30 EF |
| (13) | FA 30 32 00 58 30 EF |

## 16. VC-C1 Emulation Mode

Concerning VC-C1 emulation Mode, refer to "Canon VC-C1 Communication Camera Programmer's Manual"

In order to get VC-C1 Emulation Mode, set the followings by remote control.

SET MENU ⇒ COMMAND ⇒ VC-C1 MODE

### 16.1 Difference of Hardware

| Item | VC-C1 | VC-C4 | |
|---|---|---|---|
| Zoom Ratio | x8 | x16 | |
| Pan Angle | ±50 degrees | Normal | ±100 degrees |
| | | Inverse | ±170 degrees |
| Tilt Angle | ±20 degrees | Normal | -30 ~ 90 degrees |
| | | Inverse | -90 ~ +10 degrees |
| Pan Speed | 100~500 pps (8~38 degrees/sec) | 8~800 pps (1~90 degrees) | |
| Tilt Speed | 100~500 pps (7~35 degrees/sec) | 8~622 pps (1~70 degrees/sec) | |
| Pan Gear Ratio | 0.07629 | 0.1125 | |
| Tilt Gear Ratio | 0.06923 | 0.1125 | |
| Pan/Tilt simultaneous drive | No | Yes | |
| Absolute Position Detection Sensor | Right/Left 2 position | Central 1 position | |
| CCD Picture Size | 1/3 inch | 1/4 inch | |
| Preset Memory | Number 1~6 (Clear by Power OFF) | Number 1~9 (Not clear by Power OFF) | |
| Audio Circuit | Yes | No | |
| Display Indication | No | Yes | |
| Cascade Connection | No | Yes | |
| Normal/Inverse model | No | Yes | |
| Power Switch | Yes | No | |

## 16.2 Communication Specification

• In case that VC-C1 has specification such as Baud rate 9600bps, Stop bit: 2bit, VC-C4 has another specification(Baud rate 9600 bps, Stop bit 1 bit)
In case of no communication due to default, it is necessary to change communication condition through Menu window of remote Control.

## 16.3 Host Control & Remote Control

• VC-C4 is separately controlled by remote Control Mode(Local Control Mode) and communication
control mode (Host Control Mode)

• VC-C1 can be simultaneously controlled by remote control and Host control, VC-C4 has completely separated control system.

• RTS signal line of Host computer changes Host Control and Remote Control by the emulation mode of VC-C1

• In case of Host Computer RTS signal ON (+5~+15V), Host control mode functions and in case of OFF (-5~-15V) situation continues, Local control mode functions.

• In order to control by Remote Control Mode under Host Control Mode, it is necessary to interpret remote control key code at Host computer side and execute the control.

## 16.4 Additional Command

VC-C4 has the following additional command, in the same manner as VC-C3 adds ones to VC-C1 emulation mode.

| Function | Meaning | Command | Parameter | Status |
|---|---|---|---|---|
| Pan/Tilt Stop | Pan running stop<br>Tilt running stop | 0060h | 3030h | None |
| Pan Stop, Tilt Up Start | Pan running stop<br>Tilt up start | 0060h | 3031h | None |
| Pan Stop, Tilt Down Start | Pan running stop<br>Tilt down start | 0060h | 3032h | None |
| Pan Right Start, Tilt Stop | Pan right start<br>Tilt running stop | 0060h | 3130h | None |
| Pan Right Start, Tilt Up Start | Pan right start<br>Tilt up start | 0060h | 3131h | None |
| Pan Right Start, Tilt Down Start | Pan right start<br>Tilt down start | 0060h | 3132h | None |
| Pan Left Start, Tilt Stop | Pan left start<br>Tilt running stop | 0060h | 3230h | None |
| Pan Left Start, Tilt Up Start | Pan left start<br>Tilt up start | 0060h | 3231h | None |
| Pan Left Start, Tilt Down Start | Pan left start<br>Tilt down start | 0060h | 3232h | None |
| Pan/Tilt Angle Assignment | Pan/Tilt move to assigned position | 0060h | "XXXXXX" | None |
| Pan/Tilt Angle Request | Request present Pan/Tilt position | 0060h | None | "XXXXXX" |

Note: "XXXXXX" means Pan/Tilt Angle value, and Range: "000000"h ~ "514242"h

### 16.5 Not Supported Command

Answer value to Supported Command returns "no-error", but process none of any operation.

| Command Name | Operation | Command Code |
|---|---|---|
| Camera Reset | Reset Camera to Default | 00AAh |
| Set Volume | Audio output level control | 008Ch |

### 16.6 Additional Remote Controller Code

the following code assigned to the additional key of remote control

| Command for remote control | Remote controller key | Status value |
|---|---|---|
| ID | 11h | 31 31h |
| BRIGHT- | 12h | 31 32h |
| ON SCREEN | 13h | 31 33h |
| CANCEL | 16h | 31 36h |
| * | 17h | 31 37h |
| # | 18h | 31 38h |
| BRIGHT+ | 19h | 31 39h |
| Fn | 1Ah | 31 41h |
| MENU | 1Bh | 31 42h |
| 7 | 1Ch | 31 43h |
| 8 | 1Dh | 31 44h |
| 9 | 1Eh | 31 45h |
| 0 | 1Fh | 31 46h |

### 16.7 Changed Items of Camera Section

Zoom magnification of VC-C4 is different from VC-C1, then Zoom magnification at the Max position(80h) is different.

| | Wide End | Tele End | Ratio |
|---|---|---|---|
| VC-C1 | 00h | 80h | 8 |
| VC-C4 | 00h | 80h | 16 |

- •When Fade Normal starts after Hi speed Fade White (Black), VC-C1 returns to normal scene in a moment, but VC-C4 returns to normal slowly.
- •VC-C4 compensates Backlight under Preset memory shift status,
- •Among Operation OFF executing and Operation ON executing, Zoom Position , AE target Value (Back light compensation status , BRIGHT), Shutter Speed 1/100 (flicker less AE) Another status return by default value.
- •When Focus Near (Far) reaches to the limit position, VC-C1 keeps to set flag in focusing, but VC-C4 clears it.
- •When Zoom Wide (TELE) reaches to the limit position, VC-C1 keeps to set flag in focusing, but VC-C4 clears it.
- •Camera Reset Command of VC-C4 only returns ACK and doesn't execute.
- •When Focus Operation Command is issued during operation of Manual Focusing, Error (0X10) be returned.
- •When AF Command is issued during operation of Manual Focusing, Error (0X10) be returned.
- •When Zoom Operation Command is issued during operation of Manual Focusing, Error (0X10) be returned.
- •When Zoom Operation Command is issued during Zoom operation, Error (0X10) be returned.
- •When Focus Operation Command is issued during Zoom operation, Error (0X10) be returned.
- •The returned value of Zoom Ratio Request for VC-C4 isn't actual zoom ratio and returns 8h as same as VC-C1 returns.
- •The returned value of Pixel size Request for VC-C4 isn't actual pixel size and returns 13h as same as VC-C1 returns.

### 16.8 Changed Items of Pedestal Section

- Pan/Tilt Movable range in VC-C1 Emulation Mode, meets real VC-C1.
  (Pan ±50 degrees, Tilt ±20 degrees. in case of inverse mounting, Tilt ±1 degrees)
- The gear ratio to calculate speed and angle in VC-C1 emulation mode, obtains from VC-C4 gear ratio.(then ±1% error occurs)
- Motor speed and absolute position/angle assignment value of VC-C4 is different from ones of VC-C1 emulation mode.

| | Running speed | VC-C1 | VC-C4 |
|---|---|---|---|
| Pan Speed | 10 degrees/sec | 130 pps | 89 pps |
| Tilt speed | 10 degrees/sec | 144 pps | 89 pps |

- Pan/Tilt Speed Assignment extends to assignable range of VC-C4.

| | Minimum speed | Maximum speed |
|---|---|---|
| Pan speed range | 11 pps (1degree/sec) | 1169 pps (90degrees/sec) |
| Tilt speed range | 11 pps (1degree/sec) | 1011 pps (70degrees/sec) |

- After Power On, when Pan/tilt command received without executing Pedestal initialize 1 or 2 to return Mode Error and execute pedestal Initialize 2.

- The assigned speed of Pan/tilt don't change, even through Pedestal Initialize 1 or 2 executed.

- The fixed value of VC-C1 returned (Pan Slowest Speed, , , , Tilt Gear Ratio, etc.) returns same value as VC-C1.

### 16.9 Changed Items of System Section

- Memory address range of Pre Set position is extend to 1~9
  (In case of Pre set status request is extended on to 1~6)

- Red LED Control is added to LED forced control items
  Parameter 3h : Red LED lighting ON
  4h : Orange LED lighting ON (Both Red & Green LED lighting ON)

- The fixed information of VC-C1 returned (Model Name, ROM Version ) returns same value as VC-C1

## 17. VC-C3 Emulation Mode

• Refer to the operation manual of "Canon VC-C3 Communication Camera Programmer's Manual" concerning VC-C3 emulation Mode.

• In order to get VC-C3 Emulation Mode, set as followings
SET MENU ⇒ COMANND ⇒ VC-C3 MODE

### 17.1 Distinguished points of Hardware

| ITEM | VC-C3 | VC-C4 | |
|---|---|---|---|
| Zoom Ratio | x10 | x16 | |
| Pan Angle | ±90 degrees | Normal | ±100 degrees |
| | | Inverse | ±170 degrees |
| Tilt Angle | -30 ~ +25 degrees | Normal | -30 ~ +90 degrees |
| | | Inverse | -90 ~+10 degrees |
| Pan Speed | 8 ~ 676 pps<br>(1 ~ 76 degrees/sec) | 8 ~ 800 pps<br>(1 ~ 90 degrees/sec) | |
| Tilt Speed | 8 ~ 622 pps<br>(1 ~ 70 degrees/sec) | 8 ~622 pps<br>(1 ~70 degrees/sec) | |
| Pan Gear Ratio | 0.1125 | 0.1125 | |
| Tilt Gear Ratio | 0.1125 | 0.1125 | |
| Pan/Tilt simultaneous drive | Yes | Yes | |
| Absolute Position Detection Sensor | Central 1 position | Central 1 position | |
| CCD Picture Size | 1/4 inch | 1/4 inch | |
| Preset Memory | Number 1~6<br>(Not cleared power OFF) | Number 1 ~9<br>(Not cleared Power OFF) | |
| Audio Circuit | Yes | No | |
| Display Indication | No | Yes | |
| Cascade Connection | No | Yes | |
| Normal/Inverse model | No | Yes | |
| Manual SW | Yes | No | |
| Power SW | Yes | No | |

### 17.2 Communication Condition

Handshake process changed as followings

- Not initialize , even if receiving Cue overflows
  (In case of receiving cue overflow, cancel all after receipt)
- Not initialize, even if receiving ACK suddenly.
  (Received ACK not waiting will be cancelled)

- In case that received data of the first frame length uncompleted within one second in status of receiving command from Host, cancel received data and return Host NACK (sequence error)
- Wait three(3) seconds until Host sends ACK ,after sending command from Host.
  After passing three seconds, clears ACK waiting status and come to in status to be able to send next command.
- After sending command to Host, return again the same command as received to Host, in case of returning NACK. After returning, stop return again and come to in status to be able to send next command.

### 17.3 Not supported Command

- The fixed information of VC-C1 returned(Pan slowest speed, Tilt Gear ratio, etc.) returns same value as VC-C1
- Due to the distinguished Model, the following commands do not proceed, but the response to the command is positive.
  1. CCU command : Mute Request : Voice Request
  2. Camera command : Zoom request : Manual Switch

•Due to the distinguished Model, the following command erased

1. CCU command : Switch Operation notification
2. Pan/Tilter command : Power Notification

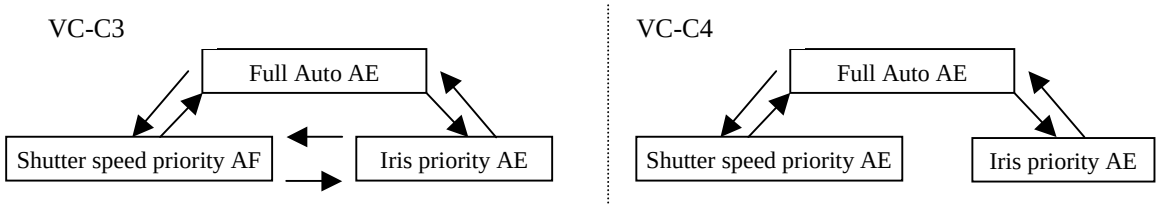
### 17.4 Additional Remote Controller Code

The following Code to additional Key of VC-C4 assigned.

| Remote Controller Key | Key Code |
|---|---|
| BRIGHT- | 21h |
| ON SCREEN | 31h |
| CANCEL | 61h |
| * | 71h |
| # | 81h |
| MENU | B1h |
| 7 | C1h |
| 8 | D1h |
| 9 | E1h |
| 0 | F1h |

### 17.5 Changed Items of Camera Section

- The movable range assigned by Zoom Position extended, because of different magnification of Zoom ratio.
- Zoom position of VC-C3(true value) is not same as picture angle as the value assigned in VC-C3 emulation mode.
- Pay attention to execution of Focus Position Assignment command due to the difference of movable focus range.
- At the moment of changing Exposure AE assignment command by model, Unable to move another mode, unless moving once to full auto.




- Default values of AE Target Value compensation is between 48h to 46h
- Lower value of AE Target Value compensation is between 00h to 10h
  (when assigned under 10h, execute command as received 10h)
  Example : Command executed : 05 01 14 04 00 CS ⇒ response : 05 01 94 04 10 CS
  assigned 00h to execute as 10h

- Setting range of Fade speed is between 0000h~FFFFh
- The followings are returned in status of Camera executed Operate OFF command and ON command. Zoom Position , AE target Value (Back light compensation status , BRIGHT), Shutter Speed 1/100 (flicker less AE) Another status return by default value.

### 17.6 Changed Items of Pan/Tilt Section

- At the moment of Power ON, not execute to detect Pan/Tilt Home Position.
- It is necessary to issue Set Up Request Command before Pan/Tilt Control.
- After power ON, NACK response be returned and operated Set-Up, in case of Pan/Tilt received without executing Set Up Request Command.

- Pan Speed Range is extended to Speed range of VC-C4
  Pan Speed range 1~76 ⇒ 1~90

- Pan/Tilt Operation Range is extended to the same range of VC-C4
  Pan : -90 ~ +90degrees(7CE0~8320) ⇒ Normal mount ±100degrees(7C87~8379)
  Inverse mount ±170degrees(7A19~85E7)
  Tilt : -30 ~ +25degrees(7EF6~80DE) ⇒ Normal mount ±30degrees(7EF5~810B)
  Inverse mount -90 ~ +10degrees(FCE0~8059)
- Preset number is extended to 1~9 from 1~6