

VC-C4

COMMUNICATION CAMERA

PROGRAMMER'S MANUAL

Contents

1. Getting Started.....	5
2. Connection with your Computer.....	5
2.1 Connection	5
2.2 Connector & Pin Assignment.....	5
3. Communication Format.....	6
3.1 Signal Format	6
3.2 Understanding	6
3.3 Communication Timing Diagram	7
4. Control Command Format	9
5. Answer Format	9
5.1 Answer Format.....	9
5.2 Error Code.....	9
5.3 Status.....	10
6. Function of the Command Termination Notification.....	11
6.1 Function In General.....	11
6.2 Format of Command Termination Notification	11
7. Cascade Global Notification	11
7.1 In General.....	11
7.2 Format of Cascade Global Notification Data.....	12
7.3 Notification Code	12
8. Function of Remote Control.....	13
8.1 In general.....	13
8.2 Data Format of Remote Controller Through.....	13
8.3 Table of Remote Control code	14
9. Classification of Command.....	15
9.1 Classification by Operation.....	15
9.2 Classification by Executive Format	15
10. Control Command Table.....	17
10.1 Pedestal Control Command Table.....	17
10.2 Camera Control Command Table	18
10.3 System control Command Table.....	19
11. Detail of Pedestal Control Command.....	20
11.1 Pan Speed Assignment	20
11.2 Tilt Speed Assignment	21
11.3 Pan Speed Request	22
11.4 Tilt Speed Request	23
11.5 Pan Tilt Stop	24
11.6 Pan Right Start	25
11.7 Pan Left Start	26
11.8 Tilt Up Start	27
11.9 Tilt Down Start	28
11.10 Home Position	29
11.11 Pedestal Initialize 1	30
11.12 Pedestal Initialize 2	31

11.13	Pan Slowest Speed Request	32
11.14	Pan Fastest Speed Request	33
11.15	Tilt Slowest Speed Request	34
11.16	Tilt Fastest Speed Request	35
11.17	Pan Angle Pulse Ratio Request	36
11.18	Tilt Angle Pulse Ratio Request	37
11.19	Pan Minimum Angle Request	38
11.20	Pan Maximum Angle Request	39
11.21	Tilt Minimum Angle Request	40
11.22	Tilt Maximum Angle Request	41
11.23	Pan/Tilt Stop	42
11.24	Pan/Tilt Start Stop	43
11.25	Pan/Tilt Angle Assignment	45
11.26	Pan/Tilt Angle Request	47
11.27	Pan Movable Range Assignment	49
11.28	Tilt Movable Range Assignment	51
11.29	Pan Movable Range Request	53
11.30	Tilt Movable Range Request	54
12.	Details of Camera Control Command.....	55
12.1	Camera OFF	55
12.2	Camera ON	56
12.3	Focus Auto	57
12.4	Focus Manual	58
12.5	Focus Near	59
12.6	Focus Far	60
12.7	Focus Position Assignment	61
12.8	Focus Position Request	62
12.9	One Push AF	63
12.10	Focus Range Request	64
12.11	Zoom Stop	65
12.12	Zoom Wide	66
12.13	Zoom Tele	67
12.14	Zoom Hi Wide	68
12.15	Zoom Hi Tele	69
12.16	Zoom Position 1 Assignment	70
12.17	Zoom Position 1 Request	71
12.18	Zoom Position 2 Assignment	72
12.19	Zoom Position 2 Request	73
12.20	Zoom Speed Assignment	74
12.21	Zoom Speed Request	75
12.22	Zoom Maximum Request	76
12.23	Backlight Compensation OFF	77
12.24	Backlight Compensation ON	78
12.25	Exposure AUTO	79
12.26	Exposure Manual	80
12.27	AE Lock OFF	81

12.28	AE Lock ON	82
12.29	Shutter Speed Program	83
12.30	Shutter Speed 1/60 (PAL:1/50)	84
12.31	Shutter Speed 1/100 (PAL:1/120)	85
12.32	Shutter Speed Assignment	86
12.33	Shutter Speed Request	87
12.34	AGC Gain Assignment	89
12.35	AGC Gain Request	90
12.36	Iris Assignment	91
12.37	Iris Request	92
12.38	AE target Value Assignment	94
12.39	AE Target Value Request	95
12.40	Auto White Balance Normal	96
12.41	Auto White Balance Lock	97
12.42	White Balance Manual Mode	98
12.43	White Balance Value Assignment	99
12.44	White Balance Value Request	100
12.45	Fade Normal	101
12.46	Fade White	102
12.47	Fade Hi Speed White	103
12.48	Fade Hi Speed Black	104
12.49	Camera Reset	105
12.50	Zoom Ratio Request	106
12.51	Pixel Size Request	107
12.52	Product Version Request	108
12.53	EEPROM Version Request	109
13.	Details of System Control Command	110
13.1	Remote Control ON	110
13.2	Remote Control OFF	111
13.3	Operation Status Request	112
13.4	Extended Operation Status Request	113
13.5	Product Name Request	115
13.6	ROM Version Request	116
13.7	Preset Set	117
13.8	Preset Move	118
13.9	Preset Status Request	120
13.10	Extended Preset Status Request	121
13.11	Remote Controller Through Setting	123
13.12	LED Normal Display	124
13.13	LED Forced Control	125
13.14	Cascade OFF	126
13.15	Cascade ON	127
13.16	Host Control Mode	128
13.17	Local Control Mode	129
13.18	Screen Control	130
13.19	Display Character Data Assignment	132

13.20	Display Character Data Request	134
13.21	Display Date Assignment	136
13.22	Display Data Request	137
13.23	Display Time Setting	138
13.24	Display Time Request	139
13.25	Turning ON Time Request	140
13.26	Default Setting	141
13.27	Command Termination Notification Setting	142
13.28	Global Notification Setting	143
13.29	Pedestal Model Request	144
13.30	Camera Model Request	145
14.	Connection Cable	146
14.1	Example 1 Connection with PC-AT.....	146
14.2	Example 2 Connection with PC-AT.....	147
14.3	Example 3 Connection with Macintosh	148
14.4	Connection Cable Between Cameras	149
15.	Example of Host Control Sequence	150
15.1	Assignment of Host Control.....	150
15.2	Initial Setting	151
15.3	Command Termination Notification	152
15.4	Remote Controller Through	153
15.5	Cascade ON Assignment.....	154
15.6	Cascade Individual Assignment.....	155
15.7	Cascade Global Assignment.....	156
16.	VC-C1 Emulation Mode	157
16.1	Difference of Hardware.....	157
16.2	Communication Specification	158
16.3	Host Control & Remote Control	158
16.4	Additional Command	158
16.5	Not Supported Command.....	159
16.6	Additional Remote Controller Code	159
16.7	Changed Items of Camera Section	160
16.8	Changed Items of Pedestal Section	161
16.9	Changed Items of System Section.....	161
17.	VC-C3 Emulation Mode	162
17.1	Distinguished points of Hardware.....	162
17.2	Communication Condition	163
17.3	Not supported Command	163
17.4	Additional Remote Controller Code	163
17.5	Changed Items of Camera Section	164
17.6	Changed Items of Pan/Tilt Section.....	164

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.

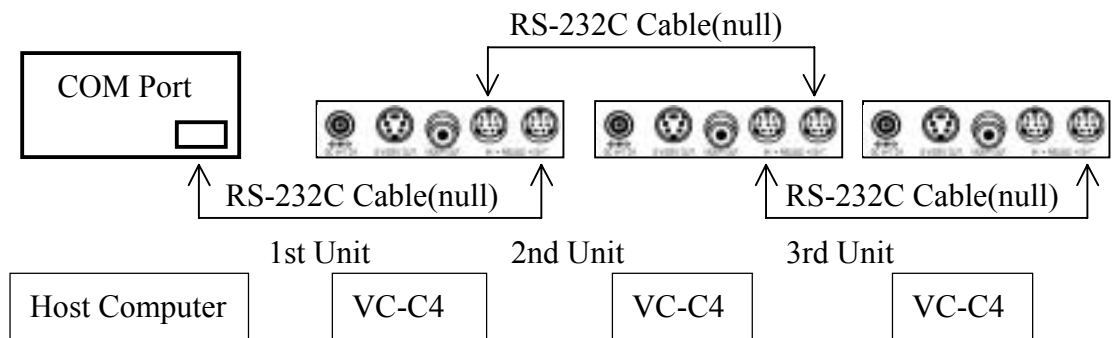
CAUTION:

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



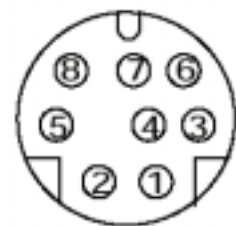
- Connect RS-232C Connector of VC-C4 with COM Port of your computer by RS-232C null cable.
- In case of the operation for multiple VC-C4, connect between IN and OUT of VC-C4, using RS-232C null cable.
- VC-C4 has capability to connect maximum 9 units.
- When Command Cascade ON is issued in multiple VC-C4 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

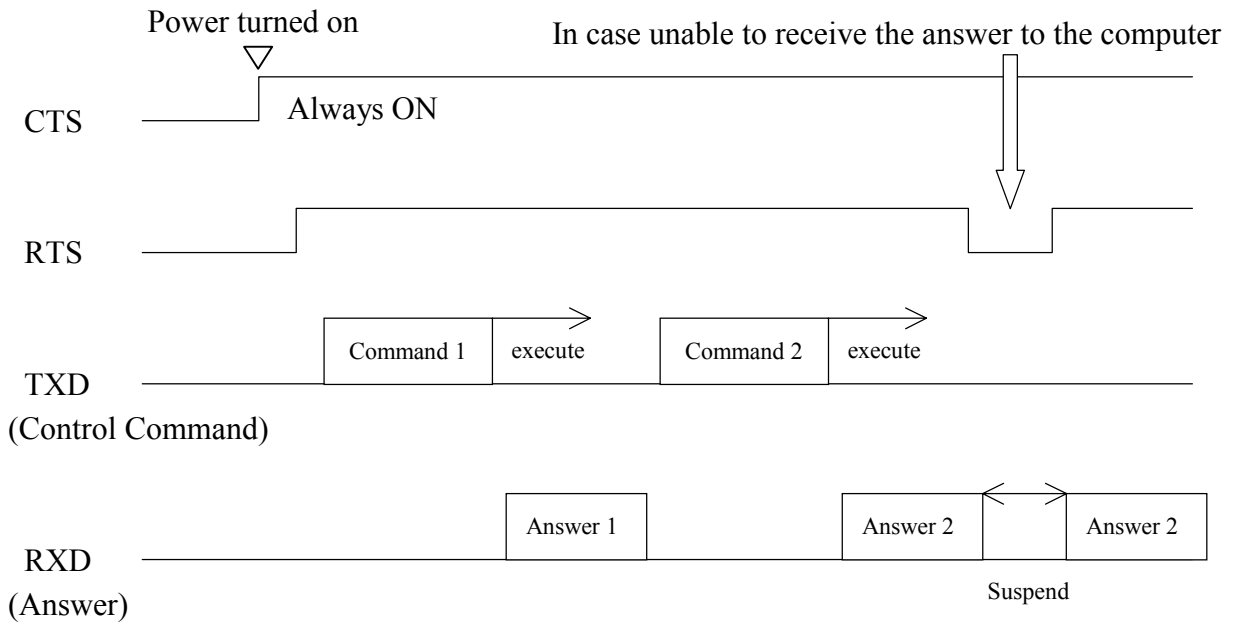
The followings are described based on the signal from the computer terminal(RS-232C).

- 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:



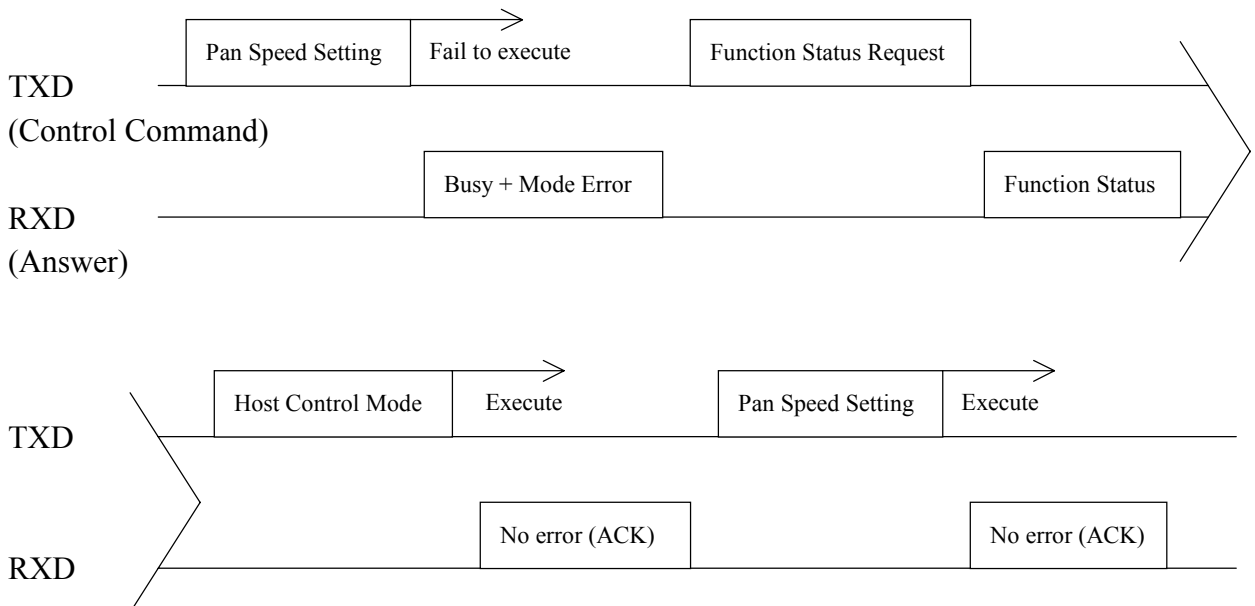
Example 2: Unable to execute the commands due to error

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

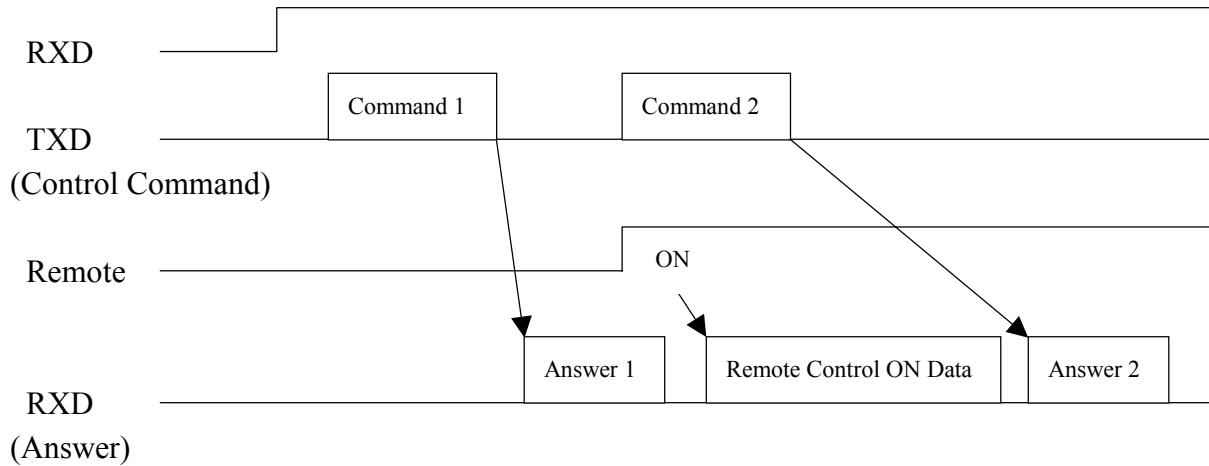


Example 3: The case using Remote Control Through Function

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:

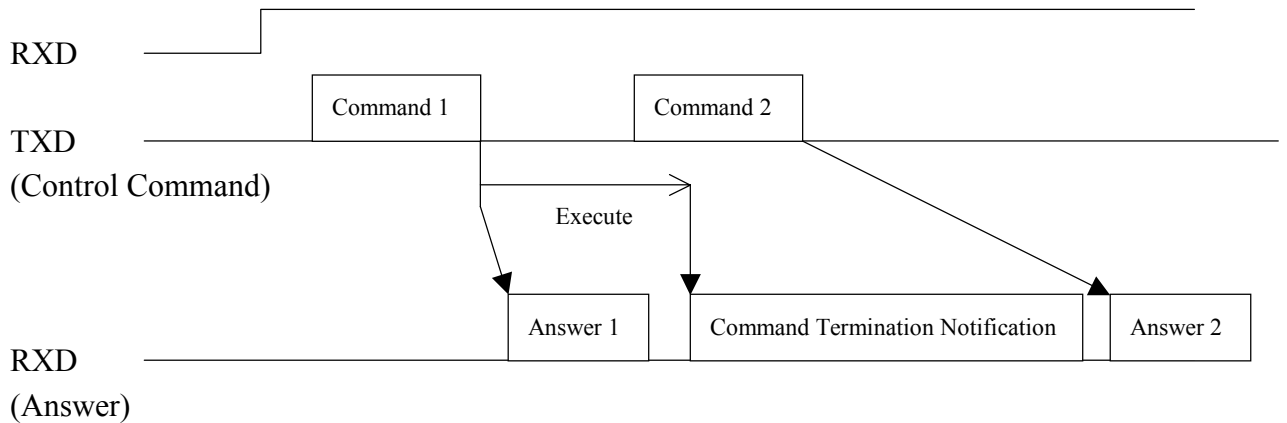


Example 4: The case using the function of Command Termination Notification

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.
	: 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.

<u>1st byte</u> b7 = 0, b6 = 0, b5 = 1, b4 = 1 3h → 33h (Hexadecimal Indication → ASCII code conversion)	<u>2nd byte</u> b3 = 0, b2 = 0, b1 = 0, b0 = 0 0h → 30h
---	---

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 exist, 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 9 th
b7	b6	b5	b4	b3	b2	b1	b0(LSB)
Cascade 6 th	Cascade 7 th	Cascade 6 th	Cascade 5 th	Cascade 4 th	Cascade 3 rd	Cascade 2 nd	Cascade 1 st

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

1st byte	2nd byte
b7 = 0, b6 = 0, b5 = 0, b4 = 0	b3 = 0, b2 = 0, b1 = 0, b0 = 0
0h → 30h	0h → 30h
3 rd byte	4 th byte
b7 = 0, b6 = 0, b5 = 0, b4 = 1	b3 = 0, b2 = 0, b1 = 0, b0 = 1
1h → 31h	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

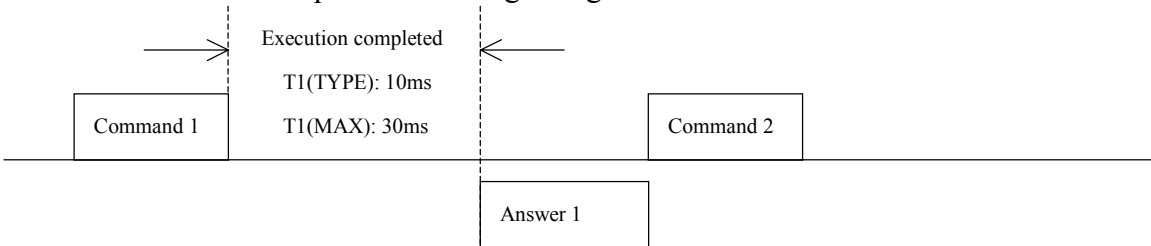
Each command classify as one of Synchronous Execution (type 1) and other of Non-Synchronous Execution (type 2)

(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)

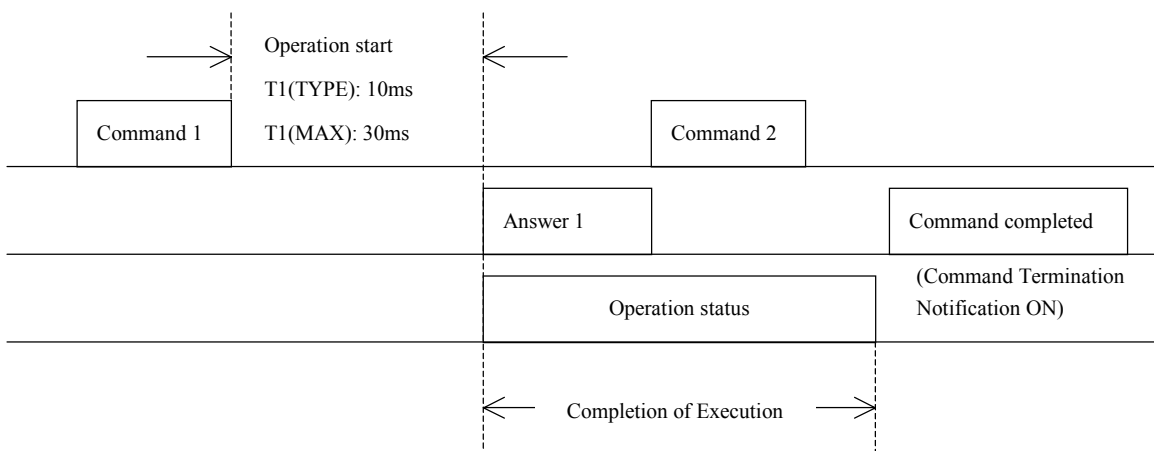
On receipt of the command code, this command transmits the command without waiting of the completion to execute. The completion of operation can be found by the status of flag among the operation status, or by the Termination Notification of Command Termination Notification.

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 Speed 1/100 (PAL: 1/120)	To change shutter speed to 1/12 (OPAL: 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~FFFh	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	<ul style="list-style-type: none"> •1LSB of parameter value is equal to 0.1125 degree/s •The running time of Pan can calculate as under $\frac{(\text{Pan position after run}) - (\text{Pan position before run})}{(\text{Pan Running Speed})}$ (refer to 11.27, 11.29 concerning Pan position of pedestal) Example set Pan Running Speed 800. In this case, the running time is approx. 2 seconds from +800 position to -800 position of pedestal. $\frac{800\{\text{position +90degree}\} - (-800)\{\text{position -90degree}\}}{800\{\text{Pan Running Speed}\}}$ •The command unable to set speed, is Home Position, Pedestal Initialize 1 and Pedestal Initialize 2, total 3 commands 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:
$150 \Rightarrow 096h \Rightarrow \begin{matrix} p0 & p1 & p2 \\ 30h & 39h & 36h \end{matrix}$

● 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 ASCII code value
Example
<ul style="list-style-type: none"> ■ In case of No Error : $00000000B \Rightarrow 00h \Rightarrow \begin{matrix} e0 & e1 \\ 30h & 30h \end{matrix}$ ■ In case of Busy : $00010000B \Rightarrow 10h \Rightarrow \begin{matrix} e0 & e1 \\ 31h & 30h \end{matrix}$ ■ In case of Parameter Error : $01010000B \Rightarrow 50h \Rightarrow \begin{matrix} e0 & e1 \\ 35h & 30h \end{matrix}$ ■ In case of Mode Error : $10010000B \Rightarrow 90h \Rightarrow \begin{matrix} e0 & e1 \\ 39h & 30h \end{matrix}$

● Condition of Error flag to be set

Busy	•In case of executing Preset Move Command . *1
Parameter Error	<ul style="list-style-type: none"> •Assigned parameter comes out less than minimum value. •Assigned parameter comes out more than maximum value.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •1LSB of parameter value is equal to 0.1125 degree/s •The running time of Tilt can calculate as under $\frac{(\text{Tilt position after run}) - (\text{Tilt position before run})}{(\text{Tilt Running Speed})}$ (refer to 11.28, 11.30 concerning Tilt position of pedestal) 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. $\frac{267\{\text{position} +30\text{degree}\} - (-267)\{\text{position} -30\text{degree}\}}{600\{\text{Tilt Running Speed}\}}$ •The command unable to set speed, is Home Position, Pedestal Initialize 1 and Pedestal Initialize 2, total 3 commands •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:

350	⇒	15Eh	⇒	p0	p1	p2
				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 ASCII 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. •Assigned parameter comes out more than maximum value.
Mode Error	•Not in status of Camera ON •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:

150	⇒	096h	⇒	s0	s1	s2
				30h	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 ASCII 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 •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:	350	⇒ 15Eh ⇒ s0 s1 s2 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 ASCII 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 •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	<ul style="list-style-type: none"> •To stop the running of Pan/Tilt except the running by Pedestal Initialize 1 and Pedestal Initialize 2 Commands. •By issuing this command, the Panning flag and Tilting flag to clear. •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:	0000000B ⇒ 00h	⇒ 30h 30h
■ In case of Busy :	0001000B ⇒ 10h	⇒ 31h 30h
■ In case of Parameter Error :	0101000B ⇒ 50h	⇒ 35h 30h
■ In case of Mode Error :	1001000B ⇒ 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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Until Pan Tilt Stop Command issues, or right limit position, continue to run. •The running speed is able to set by Pan Speed Assignment Command. •By issuing this Command, 1 is set in Panning flag among the Operating Status 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 and 1 of Pan Limit Position flag will be set. <p>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,</p>	

● 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:	0000000B ⇒ 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	<ul style="list-style-type: none"> •In case of executing Pedestal Initialize 1 and Pedestal Initialize 2 Commands •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Pan running by Pedestal Control Command.
Parameter Error	•Assign illegal parameters.
Mode Error	<ul style="list-style-type: none"> •After Power ON, Not executed Pedestal Initialize •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Until Pan/Tilt Stop Command issues, or reaches to the left limit, continue to run. •The running speed is able to set by Pan Speed Assignment Command. •By issuing this command, 1 is set in Pan running flag among the running status. <p>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.</p> <p>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,</p>	

● 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	<ul style="list-style-type: none"> •In case of executing Pedestal Initialize 1 and Pedestal Initialize 2 Commands •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Pan running by Pedestal Control Command.
Parameter Error	•Assign illegal parameters.
Mode Error	<ul style="list-style-type: none"> •After turn ON, Pedestal Initialize has never been done. •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Until Pan/Tilt Stop Command issues, or reaches to the upper limit, continue to run. •The running speed is able to set by Tilt Speed Assignment Command. •By issuing this command, 1 is set in Tilt running flag among the running status. •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. <p>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,</p>	

● 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

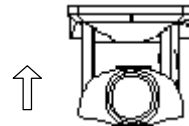
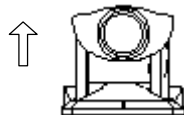
d0	d1	d2	d3	d4	d5
Header	Device Num		Error Code		End mark
EFh	30h	3Xh	e0	e1	EFh



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	<ul style="list-style-type: none"> •In case of executing Pedestal Initialize 1 and Pedestal Initialize 2 Commands •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Tilt running by Pedestal Control Command.
Parameter Error	•Assign illegal parameters.
Mode Error	<ul style="list-style-type: none"> •After turn ON, Pedestal Initialize has never been done. •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Until Pan/Tilt Stop Command issues, or reaches to the lower limit, continue to run. •The running speed is able to set by Tilt Speed Assignment Command. •By issuing this command, 1 is set in Tilt running flag among the running status. <p>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.</p> <p>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,</p>	

● 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

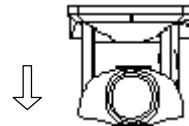
d0	d1	d2	d3	d4	d5
Header	Device Num		Error Code		End mark
EFh	30h	3Xh	e0	e1	EFh



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	<ul style="list-style-type: none"> •In case of executing Pedestal Initialize 1 and Pedestal Initialize 2 Commands •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Tilt running by Pedestal Control Command.
Parameter Error	•Assign illegal parameters.
Mode Error	<ul style="list-style-type: none"> •After turn ON, Pedestal Initialize has never been done. •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Home Position(Front) is originally set at the following position. Angle of Pan direction(position) 0 (8000h) Angle of Tilt direction(position) 0 (8000h) •Regardless of the running speed setting of Pan/Tilt direction, Pan/Tilter will return to home position with the fastest speed. •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. <p>In process of Home position running, Pan/Tilt stop command is effective. 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 out zero.</p> <p>Note: In case that Pan & Tilt are in Home position, Pan & Tilt do not run.</p>

● 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	<ul style="list-style-type: none"> •In case of executing Pedestal Initialize 1 and Pedestal Initialize 2 Commands •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Pan/Tilt running by Pedestal Control Command.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •After initialization, run to Home Position. •Home Position(Front) is originally set at the following position. <ul style="list-style-type: none"> Angle of Pan direction(position) 0(8000h) Angle of Tilt direction(position) 0(8000h) •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. 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	<ul style="list-style-type: none"> •In case of executing Pan running by Pedestal Control Command. •In case of executing Tilt running by Pedestal Control Command. •In case of executing Preset Move Command.
Parameter Error	•Assign illegal parameters.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •After initialization, runs to former position. •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. 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	<ul style="list-style-type: none"> •In case of executing Pan running by Pedestal Control Command. •In case of executing Tilt running by Pedestal Control Command. •In case of executing Preset Move Command.
Parameter Error	•Assign illegal parameters.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To return the slowest speed enable to set the running speed of Pan direction. •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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To return the fastest speed enable to set the running speed of Pan direction. •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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To return the slowest speed enable to set the running speed of Tilt direction. •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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To return the fastest speed enable to set the running speed of Tilt direction. •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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> To return integral value multiplied 100000 to the conversion coefficient of true Pan angle. In case of angle conversion, divide it by 10000 Example below, $\text{Status value} / 100000 = 11250 / 100000 = 0.1125$ The parameter of Pan Assignment Command can be converted as under. $\text{Pan speed} = 800\text{PPS} = 800 \times 0.1125 = 90 \text{ degrees/s}$	

● 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 •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	<p>•To return integral value multiplied 100000 to the conversion coefficient of true Tilt angle. In case of angle conversion, divide it by 10000. Example below,</p> <p style="text-align: center;">Status value /100000 = 11250 /100000 = 0.1125</p> <p>The parameter of Tilt Assignment Command can be converted as under.</p> <p style="text-align: center;">Tilt speed = 622 PPS = 622 × 0.1125 = 70 degrees/s</p>	

● 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 •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	<ul style="list-style-type: none"> •Status Value (-889) in normal mounting is the position rotated approx. 100degree to left as zero degree for front. •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 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 •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	<ul style="list-style-type: none"> •Status Value (+889) in normal mounting is the position rotated approx. 100degree to right as zero degree for front. •Status Value (+1511) in inverse mounting is the position rotated approx. 170degrees 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 •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	<ul style="list-style-type: none"> •Status Value(-267) in normal mounting is the position rotated approx. 30degree to down as zero degree for horizontal. •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 •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	<ul style="list-style-type: none"> •Status Value(+800) in normal mounting is the position rotated approx 90degrees to upper as zero degree for horizontal. •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 •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	<ul style="list-style-type: none"> •To stop the motion of Pan/Tilt excluding the motion by Pedestal Initialize 1 & Pedestal Initialize 2. •By issuing this command, flag in Pan/Tilt motion among of the executing status comes out zero. •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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<p>•First parameter assigns Pan motion, and second parameter assigns Tilt motion Depend on the combination of first and second parameter, the following nine(9) kind of motion can be assigned.</p> <table border="0"> <thead> <tr> <th>first parameter</th> <th>Second Parameter</th> <th>Pan/Tilt Motion</th> </tr> </thead> <tbody> <tr> <td>0h</td> <td>0h</td> <td>: Pan Stop, Tilt Stop</td> </tr> <tr> <td>0h</td> <td>1h</td> <td>: Pan Stop, Tilt up Start</td> </tr> <tr> <td>0h</td> <td>2h</td> <td>: Pan Stop, Tilt Down Start</td> </tr> <tr> <td>1h</td> <td>0h</td> <td>: Pan Right Start, Tilt Stop</td> </tr> <tr> <td>1h</td> <td>1h</td> <td>: Pan Right Start, Tilt Up Start</td> </tr> <tr> <td>1h</td> <td>2h</td> <td>: Pan Right Start, Tilt Down Start</td> </tr> <tr> <td>2h</td> <td>0h</td> <td>: Pan Left Start, Tilt Stop</td> </tr> <tr> <td>2h</td> <td>1h</td> <td>: Pan Left Start, Tilt Up Start</td> </tr> <tr> <td>2h</td> <td>2h</td> <td>: Pan Left Start, Tilt Down Start</td> </tr> </tbody> </table> <p>•The stop motion of Pan(0h) is different from the one of Tilt(0) See 11.23 Pan/Tilt Stop</p> <p>•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.</p> <p>•Pan/Tilt speed assignment command is able to set Pan/Tilt running speed.</p> <p>•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 clears it zero and When Tilt motion stops, flag of Tilt in action clear it zero.</p> <p>Note: 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.</p>		first parameter	Second Parameter	Pan/Tilt Motion	0h	0h	: Pan Stop, Tilt Stop	0h	1h	: Pan Stop, Tilt up Start	0h	2h	: Pan Stop, Tilt Down Start	1h	0h	: Pan Right Start, Tilt Stop	1h	1h	: Pan Right Start, Tilt Up Start	1h	2h	: Pan Right Start, Tilt Down Start	2h	0h	: Pan Left Start, Tilt Stop	2h	1h	: Pan Left Start, Tilt Up Start	2h	2h	: Pan Left Start, Tilt Down Start
first parameter	Second Parameter	Pan/Tilt Motion																														
0h	0h	: Pan Stop, Tilt Stop																														
0h	1h	: Pan Stop, Tilt up Start																														
0h	2h	: Pan Stop, Tilt Down Start																														
1h	0h	: Pan Right Start, Tilt Stop																														
1h	1h	: Pan Right Start, Tilt Up Start																														
1h	2h	: Pan Right Start, Tilt Down Start																														
2h	0h	: Pan Left Start, Tilt Stop																														
2h	1h	: Pan Left Start, Tilt Up Start																														
2h	2h	: Pan Left Start, Tilt Down Start																														

● 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

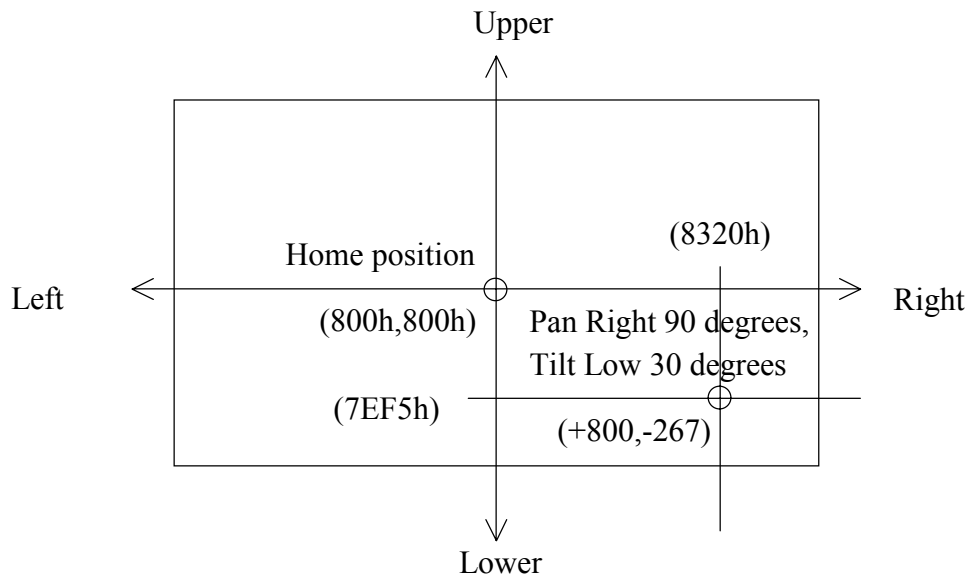
● Condition of Error flag to be set

Busy	In case of executing Home Position, Pedestal Initialize 1 and Pedestal Initialize 2 Commands •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Pan/Tilt running by Pedestal Control Command
Parameter Error	•Assign illegal parameters.
Mode Error	•After Power ON, Not executed Pedestal Initialize •Not in status of Camera ON •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	<ul style="list-style-type: none"> Parameter Value (1LSB) of both Pan/Tilt is equal to approx.0.1125 by converting to angle (see 11.17 and 11.18) Parameter section (8 byte) splits p0~p3 as angle (position) section, and p4~p7 as Tilt (position) section. 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) 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. Assign each parameter with the angle (position) at Home position. (Home position is 8000h) Assigned sample of Pan/tilt Angle(position) as below <ul style="list-style-type: none"> Pan right 90 degrees $\Rightarrow +90/0.1125 \Rightarrow +800 \Rightarrow +320h$ $\Rightarrow 8000h+320h = 8320h$ Tilt lower 30 degrees $\Rightarrow -30/0.1125 \Rightarrow -267 \Rightarrow -10Bh$ $\Rightarrow 8000h-10Bh = 7EF5h$ Pan/Tilt stop Command can stop motion by force. The running speed can be set by Pan/Tilt Speed Assignment command. 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. <p>Note : After power ON, in case of receipt of this command without executing Pedestal Initialize 1 & 2, return Mode Error and execute Pedestal Initialize2</p>	



● 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 ASCII 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	<ul style="list-style-type: none"> •In case of executing Home Position, Pedestal Initialize 1 and Pedestal Initialize 2 Commands •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •In case of Panning by Pedestal Control Command •In case of Tilting by Pedestal Control Command
Parameter Error	<ul style="list-style-type: none"> •Assign illegal parameters. •In case that Pan/Tilt angle(position) is out-of-range Pan/Tilt Movable Range
Mode Error	<ul style="list-style-type: none"> •After Power ON, Not executed Pedestal Initialize •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Parameter Value (1LSB) of both Pan/Tilt is equal to approx.0.1125 by converting to angle (see 11.17 and 11.18) •Parameter section (8 byte) splits s0~s3 as angle (position) section, and s4~s7 as Tilt (position) section. •The value of each status is indicated as angle at Home position(8000h). •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 <p>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)</p>	

● 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	<ul style="list-style-type: none"> •In case of executing Pedestal Initialize 1 and Pedestal Initialize 2 Commands
Mode Error	<ul style="list-style-type: none"> •After Power ON, Not executed Pedestal Initialize *1 •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Maximum & Minimum(position) movable angle can be set, when Pan Motion Setting is executing. •To set Pan Maximum & Minimum Angle(position) which can be set by Pan/Tilt Angle Assignment Command. •Parameter Value(1LSB) of Pan is equal to approx.0.1125 by converting to angle(see 11.17) •Minimum parameter value can be obtained by Pan Maximum Angle request(11.20) and Pan minimum Angle Request(11.19). •Parameter section(9byte) splits minimum angle(position) as p1~p4 and maximum angle (position) as p5~p8. •Minimum & Maximum Pan Parameter Value is to set at angle of Home position(8000h) See 11.25 Pan/tilt Angle Assignment •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. •When Pedestal Initialize 1 command executes, move to home position, even though out of range. •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. 	

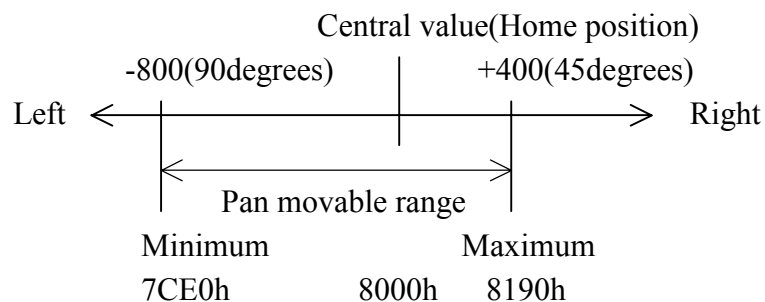
● Format of Control Code

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 ASCII 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	<p>In case of executing Home Position, Pedestal Initialize 1 and Pedestal Initialize 2 Commands</p> <ul style="list-style-type: none"> •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Pan/Tilt running by Pedestal Control Command
Parameter Error	<ul style="list-style-type: none"> •In case of assigned parameter over value to the Max. & Min Parameter Range •In case of assigned Minimum value over Maximum value.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

● 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 •In case of executing Pan/Tilt Angle Assignment and Preset Move Commands •Executing Pan/Tilt running by Pedestal Control Command
Parameter Error	•In case of assigned parameter over value to the Max. & Min. Parameter Range •In case of assigned Minimum value over Maximum value.
Mode Error	•Not in status of Camera ON •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	<ul style="list-style-type: none"> Parameter Value(1LSB) of Pan is equal to approx.0.1125 by converting to angle(see 11.17) Parameter section(8byte) splits minimum angle(position) as s0~s3 and maximum angle (position) as s4~s7. 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	d5	d6	d7	d8	d9	d10	d11	d12	d13
Header	Device Num		Error Code		Minimum Angle Status				Maximum Angle Status				End mark
FEh	30h	3Xh	30h	30h	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		
■ In case of Parameter Error :	01010000B ⇒ 50h ⇒	e0 e1 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 •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	<ul style="list-style-type: none"> •Parameter Value(1LSB) of Tilt is equal to approx.0.1125 by converting to angle(see 11.18) •Parameter section(8byte) splits minimum angle(position) as s0~s3 and maximum angle (position) as s4~s7. •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 ASCII code value			
Example			
■ 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 •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	<ul style="list-style-type: none"> •To power Camera section OFF(Picture signal of camera comes out OFF) •If this command issues, this command is waiting status until Initialize operation finish, when Pedestal 1 & 2 are in process. (Pan/Tilt motion operation besides the above, will be forced to stop.) •During this process of camera OFF by this command, Busy error will occur, when Camera ON or Camera OFF command is issued. •By issuing this command, flag of Camera Power OFF command is set as 1. •After this setting, the command except the following command will come out Mode Error. <ul style="list-style-type: none"> •Operation Status Request, Extended Operation Status Request Command •Camera ON, Camera OFF Command •LED Normal Display, LED Forced Control Command •Cascade ON, Cascade OFF Command •Host Control Mode, Local Control Mode Command •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 ASCII 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	<ul style="list-style-type: none"> •In case of executing Camera ON Command •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	<ul style="list-style-type: none"> •To power Camera section Power ON (Picture signal of camera turns out) •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. •During this process of camera ON by this Command, Busy error will occur, when Camera ON or Camera OFF Command is issued. •After Camera ON process finished, flag of Camera Power OFF among operating status comes out zero •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 ASCII code value		
Example		e0 e1
■ In case of No Error:	0000000B ⇒ 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	<ul style="list-style-type: none"> •In case of executing Camera ON Command •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	<ul style="list-style-type: none"> •Flags in Focusing of Operation Status Request and manual Focus come out 0 at AF Mode. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Focus operation by Manual •In process of One Push AF operation •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •In case of Auto Focus Mode, cancels AF Mode and set Manual Mode. •To stop focus operation under focusing by Manual mode. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of One Push AF operation •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •In case of Auto Focus Mode, cancels AF Mode and set Manual Mode. •Flags in Focusing of Operation Status Request comes out zero and Manual Focus come out 1. •By Focus manual command, possible to stop running. •To stop running at Focus Limit point(Near point) and flag in focusing comes out zero. •To return Notification at the moment of reaching to Focus Operation Limit (Near point), when Command Termination Notification ON is to be set. <p>Note: In case that focus ia already in Focus Operation Limit(Near point), flag in focusing doesn't set 1 because of focus not operating.</p>	

● 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Focus operation by Manual •In process of One Push AF operation •In process of Zooming operation •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •In case of Auto Focus Mode, cancel AF Mode and set Manual Mode. •Flags in Focusing of Operation Status Request comes out zero and Manual Focus come out 1. •By Focus manual command, possible to stop running. •To stop running at Focus Limit point(Far point) and flag in focusing comes out zero. •To return Notification at the moment of reaching to Focus Operation Limit (Near point), when Command Termination Notification ON is to be set. <p>Note: In case that focus ia already in Focus Operation Limit(Far point), flag in focusing doesn't set 1 because of focus not operating.</p>	

● 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Focus operation by Manual •In process of One Push AF operation •In process of Zooming operation •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •In case of Auto Focus Mode, cancel AF Mode and set Manual Mode. •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.. •By Focus Manual Command, stop focusing, and flag in focusing comes out zero. •To stop running at Focus Limit point(Near point) and flag in focusing comes out zero. •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:			0000000B	⇒	00h ⇒ 30h 30h
■ In case of Busy :			0001000B	⇒	10h ⇒ 31h 30h
■ In case of Parameter Error :			0101000B	⇒	50h ⇒ 35h 30h
■ In case of Mode Error :			1001000B	⇒	90h ⇒ 39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Focus operation by Manual •In process of One Push AF operation •In process of Zooming operation •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter over value to upper and lower.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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
	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 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Flags in Focusing of Operation Status Request in AF Mode comes out zero and Manual Focus come out 1 after getting in focus.. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Focus operation by Manual •In process of One Push AF operation •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

12.11 Zoom Stop

Function	To stop Zoom operation.	
Command	00A2h	
Parameter	Length	1 byte
	Value	0h
Status	None	
Reference	<ul style="list-style-type: none"> •Flags in Zooming of Operation Status Request comes out zero •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:	0000000B ⇒ 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Flags in Zooming of Operation Status Request comes out 1. •Possible to stop running by Zoom Stop Command •To stop running at the Zoom Operation Limit point(Wide), and Flag in Zooming comes out zero.. •To return Notification at the moment of reaching to Zoom Operation Limit point(Wide). Note: 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Zooming operation. •In process of Focus operation by Manual •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Flags in Zooming of Operation Status Request comes out 1. •Possible to stop running by Zoom Stop Command •To stop running at the Zoom Operation Limit point(Tele), and Flag in Zooming comes out zero.. •To return Notification at the moment of reaching to Zoom Operation Limit point(Tele). <p>Note: 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.</p>	

● 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Zooming operation •In process of Focus operation by Manual •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Flags in Zooming of Operation Status Request comes out 1. •Possible to stop running by Zoom Stop Command •To stop running at the Zoom Operation Limit point(Wide), and Flag in Zooming comes out zero.. •To return Notification at the moment of reaching to Zoom Operation Limit point(Wide). Note: 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of zooming operation •In process of Focus operation by Manual •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Flags in Zooming of Operation Status Request comes out 1. •Possible to stop running by Zoom Stop Command •To stop running at the Zoom Operation Limit point(Tele), and Flag in Zooming comes out zero.. •To return Notification at the moment of reaching to Zoom Operation Limit point(Tele). <p>Note: 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.</p>	

● 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of zooming operation •In process of Focus operation by Manual •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To assign zoom position by Pre-Assigned Step Value, within movable range. •Flags in Zooming of Operation Status Request comes out 1. Zooming will stop after moving assigned position and flag in zooming comes 0. •To stop zooming by Zoom Stop Command and flag in zooming comes out zero. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Zooming operation •In process of Focus operation by Manual •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter over value to upper and lower.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To assign zoom position by Pre-Assigned Step Value, within movable range. •Possibly error will be within $\pm 1\%$ 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:
$64 \Rightarrow 40h \Rightarrow \begin{matrix} s0 & s1 \\ 34h & 30h \end{matrix}$

■ 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
<ul style="list-style-type: none"> ■ In case of Busy : $00010000B \Rightarrow 10h \Rightarrow \begin{matrix} e0 & e1 \\ 31h & 30h \end{matrix}$ ■ In case of Mode Error : $10010000B \Rightarrow 90h \Rightarrow \begin{matrix} e0 & e1 \\ 39h & 30h \end{matrix}$

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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)	
		Max. Value: Returned by Zoom Maximum Position Request	
Status	None		
Reference	<ul style="list-style-type: none"> •To assign zoom position in effective value. •Flags in Focusing of Operation Status Request comes out 1. Zooming will stop after moving assigned position and flag in zooming comes 0. •To stop zooming by Zoom Stop Command and flag in zooming comes out zero. •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:							
256	⇒	0100h	⇒	p0 30h	p1 31h	p2 30h	p3 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					
■ In case of No Error:	00000000B	⇒	00h	⇒	e0 e1 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In process of Zooming operation •In process of Focus operation by Manual •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter over value to upper.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To assign zoom position in effective value. •Possibly error will be within $\pm 5\%$ 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:						
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		
■ In case of Busy :	00010000B ⇒ 10h ⇒	e0 e1 31h 30h
■ In case of Mode Error :	10010000B ⇒ 90h ⇒	e0 e1 39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Speed set by this command is reflected in Zoom Wide, Zoom Tele, Zoom position Assignment and Preset Running •Default value is 7 	

● Format of Control Code

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



Zoom position indicates in Hexadecimal 1 figure and parameter value is its ASSII code	
Example:	p0
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:	0000000B ⇒ 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Parameter Error	•In case of out of range of assigned parameter.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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:	
4	⇒ 4h ⇒ p0 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	
■ In case of Busy :	00010000B ⇒ 10h ⇒ e0 e1 31h 30h
■ In case of Mode Error :	10010000B ⇒ 90h ⇒ 39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

12.23 Backlight Compensation OFF

Function	To change to Backlight non-compensation mode.	
Command	00A5h	
Parameter	Length	1 byte
	Value	0h
Status	None	
reference	<ul style="list-style-type: none"> •To receive command at Auto exposure Mode. •To operate identical operation as to assign 46h by AE Target Assignment Command. •To be set by default at the moment of executing Camera Reset Command •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of Exposure Manual Mode •In status of AE Lock ON •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To receive command at Auto exposure Mode. •To operate identical operation as to assign 90h by AE Target Assignment Command. •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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of Exposure Manual Mode •In status of AE Lock ON •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •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 •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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of AE Lock ON •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To set Exposure Mode Auto ON. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Manual •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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

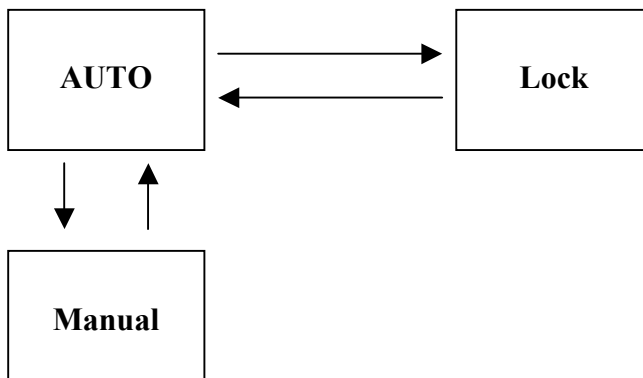


Error Flag indicates in 2 figures Hexadecimal and returns ASCII code value		
Example		e0 e1
■ In case of No Error:	00000000B ⇒ 00h ⇒	30h 30h
■ In case of Busy :	00010000B ⇒ 10h ⇒	31h 30h
■ In case of Mode Error :	10010000B ⇒ 90h ⇒	39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Manual •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To change Shutter Speed automatically at the moment of Hi Luminance Shot and prevent resolution from lowering by small iris diffraction •To receive command at Auto exposure Mode. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Manual •In status of AE Lock ON •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To receive command at the moment of Exposure Mode Auto •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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Manual •In status of AE Lock ON •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To be able to lower flicker. •To receive command at the moment of Exposure Mode Auto. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Manual •In status of AE Lock ON •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

12.32 Shutter Speed Assignment

Function	To assign Shutter Speed.	
Command	00A5h	
Parameter	Length	3 byte, including fixed value(35h).
	Range	00h~19h
Status	None	
Reference	<ul style="list-style-type: none"> •To assign step value between shutter speed 1/60(PAL:1/50)~1/1000. see corresponding table. •To receive command at the moment of Exposure Mode Manual. •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:	<p>10 ⇒ p0 ⇒ 0Ah ⇒ p2 ⇒ 30h 41h</p>

● 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:	0000000B ⇒ 00h ⇒ 30h 30h
■ In case of Busy :	0001000B ⇒ 10h ⇒ 31h 30h
■ In case of Parameter Error :	0101000B ⇒ 50h ⇒ 35h 30h
■ In case of Mode Error :	1001000B ⇒ 90h ⇒ 39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Auto. •In status of AE Lock ON •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter out of range
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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:

10 ⇒ 0Ah ⇒ s0 s1
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 ASCII code value

Example

■ In case of Busy : 00010000B ⇒ 10h ⇒ e0 e1
31h 30h
■ In case of Mode Error : 10010000B ⇒ 90h ⇒ 39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To change AGC magnification. •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:				
10	⇒	0Ah	⇒	p0 p2 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				
■ In case of No Error:	0000000B	⇒	00h	⇒ 30h 30h
■ In case of Busy :	0001000B	⇒	10h	⇒ 31h 30h
■ In case of Parameter Error :	0101000B	⇒	50h	⇒ 35h 30h
■ In case of Mode Error :	1001000B	⇒	90h	⇒ 39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Auto •In status of AE Lock ON •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter out of range
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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:							
	10	⇒	0Ah	⇒	s0	s1	
					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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

12.36 Iris Assignment

Function	To assign AGC Gain.	
Command	00A5h	
Parameter	Length	3 byte, including fixed value(39h).
	Range	02h~10h
Status	None	
Reference	<ul style="list-style-type: none"> •In case of decreasing a value to close iris and comes to darken. •In case of increasing a value to open iris and comes to brighten. •The assignable range is less narrow than the value returned by Iris Request Command •To receive a command, when Exposure mode is Manual mode. •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:			
⇒	10	⇒	0Ah ⇒ p0 30h p2 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			
■ In case of No Error:	00000000B	⇒	00h ⇒ e0 30h e1 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Auto •In status of AE Lock ON •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter out of range
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

12.37 Iris Request

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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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

Function	To assign Target value of AE brightness.	
Command	00A5h	
Parameter	Length	3 byte, including fixed value(3Bh).
	Range	10h~FFh
Status	None	
Reference	<ul style="list-style-type: none"> •To receive command at the moment of Exposure Mode Auto. •To brighten subject by increasing and darken subject by decreasing. •Default value is 46h •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:	70	⇒	46h ⇒	p0	p2
				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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of Exposure Mode Manual •In status of AE Lock ON •In case of executing Preset Move Command
Parameter Error	In case of assigned parameter out of range
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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 ASCII code is Status value.	
Example:	
70	⇒ 46h ⇒
	s0 s1 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 ASCII code value	
Example	
■ 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To adjust white balance automatically. •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of white balance manual mode •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

12.42 White Balance Manual Mode

Function	To set white balance manual mode.	
Command	00A7h	
Parameter	Length	1 byte.
	Value	2h
Status	None	
Reference	<ul style="list-style-type: none"> •To set white balance by using White Balance Manual Setting Command. •To move only to normal mode from this mode. • possible to move only to normal mode from this mode. •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

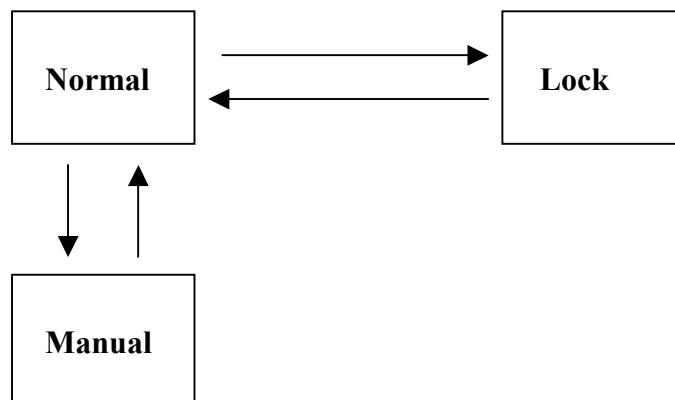


Error Flag indicates in 2 figures Hexadecimal and returns ASCII code value		
Example	e0	e1
■ In case of No Error:	00000000B ⇒ 00h	⇒ 30h 30h
■ In case of Busy :	00010000B ⇒ 10h	⇒ 31h 30h
■ In case of Mode Error :	10010000B ⇒ 90h	⇒ 39h 30h

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In status of auto white balance in lock •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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:	<table style="margin-left: 40px;"> <tr> <td></td> <td>p0</td> <td>p2</td> </tr> <tr> <td>128</td> <td>⇒ 80h</td> <td>⇒ 38h 30h</td> </tr> </table>		p0	p2	128	⇒ 80h	⇒ 38h 30h
	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	<table style="margin-left: 40px;"> <tr> <td></td> <td>e0</td> <td>e1</td> </tr> <tr> <td>■ In case of No Error:</td> <td>00000000B</td> <td>⇒ 00h ⇒ 30h 30h</td> </tr> <tr> <td>■ In case of Busy :</td> <td>00010000B</td> <td>⇒ 10h ⇒ 31h 30h</td> </tr> <tr> <td>■ In case of Parameter Error :</td> <td>01010000B</td> <td>⇒ 50h ⇒ 35h 30h</td> </tr> <tr> <td>■ In case of Mode Error :</td> <td>10010000B</td> <td>⇒ 90h ⇒ 39h 30h</td> </tr> </table>		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
	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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •Except White balance manual mode •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter out of range
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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:							
	128	⇒	80h	⇒	s0	s1	
					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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To fade in from white in case of white fade status, and from black in case of black fade in •To change operation by receiving command, even though executing another fade related command. •To be set in default value at the moment of executing Camera Reset and Camera ON during power ON •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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To change operation by receiving command, even though executing another fade related command. •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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To change operation by receiving command, even though executing another fade related command. •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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To change operation by receiving command, even though executing another fade related command. •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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To stop executing another operation of camera(except preset running) and to force to set in initialized status regardless of Pedestal Initialize. •Not to accept camera command during executing Camera Reset •To set in status of Focus AF, Zoom Stop, Auto White Balance Normal, Fade Normal, Shutter Speed Program, Backlight Compensation OFF and Exposure Auto. •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					
■ 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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 ASCII code is Status value.	
Example:	
128 ⇒ 80h ⇒	s0 s1 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 ASCII 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> To come out and return 14h because of using 1/4 inch CCD. 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:	$1/4 \Rightarrow 14h \Rightarrow \begin{matrix} s0 & s1 \\ 31h & 34h \end{matrix}$

■ 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	$\begin{matrix} \blacksquare \text{ In case of Busy :} & 00010000B & \Rightarrow & 10h & \Rightarrow & 31h & 30h \\ \blacksquare \text{ In case of Mode Error :} & 10010000B & \Rightarrow & 90h & \Rightarrow & 39h & 30h \end{matrix}$

● Condition of Error flag to be set

Busy	<ul style="list-style-type: none"> In process of Camera Initializing operation by Camera Reset Command, etc. In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> Not in status of Camera ON 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:							
		87	⇒	57h	⇒	s0	s1
						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					
■ 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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:	
07	⇒ 07h ⇒ s0 s1 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	<ul style="list-style-type: none"> •In process of Camera Initializing operation by Camera Reset Command, etc. •In case of executing Preset Move Command
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To set Remote Control ON by default during Power ON. •By issuing this command, forbidden flag of remote control in operation status comes out zero. •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) •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 ASCII 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	<ul style="list-style-type: none"> •In case of executing Camera Control Command •In case of executing Pedestal Control Command •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter illegal
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •To set remote control ON by default during power ON. •By issuing this command, remote control forbidden flag sets 1 and not receive key code from remote control •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 ASCII 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	<ul style="list-style-type: none"> •In case of executing Camera Control Command •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter illegal
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<p>The followings shows status, in case that each bit is 1 among of status.</p> <p>(MSB)</p> <p>b11 Tilting under operation</p> <p>b10 Tilt movable limit position</p> <p>b9 Panning under operation</p> <p>b8 Pan movable limit position</p> <p>b7 Zooming under operation</p> <p>b6 Remote Control operate OFF</p> <p>b5 Camera Power OFF</p> <p>b4 Un executing Pedestal Initialize</p> <p>b3 Shutter speed flag 1</p> <p>b2 Shutter speed flag 2</p> <table border="0" style="margin-left: 40px;"> <tr> <td>b3</td> <td>b2</td> <td>NTSC</td> <td>PAL</td> </tr> <tr> <td>0</td> <td>0</td> <td>program</td> <td>program</td> </tr> <tr> <td>0</td> <td>1</td> <td>1/60</td> <td>1/50</td> </tr> <tr> <td>1</td> <td>0</td> <td>1/100</td> <td>1/120</td> </tr> <tr> <td>1</td> <td>1</td> <td>Not use</td> <td>Not use</td> </tr> </table> <p>b1 Manual Focus mode</p> <p>b0 Focusing under operation</p> <p>(LSB)</p>		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
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																			

● 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	<p>The followings shows status, in case that each bit is 1 among of status.</p> <p>(MSB)</p> <p>b19 In process of Menu</p> <p>b18 Local Control Mode</p> <p>b17 Time unset</p> <p>b16 Date unset</p> <p>b15 Not use</p> <p>b14 Not use</p> <p>b13 Exposure(AE) mode not AUTO</p> <p>b12 White balance mode not AUTO</p> <p>b11 Tilting under operation</p> <p>b10 Tilt movable limit position</p> <p>b 9 Panning under operation</p> <p>b 8 Pan movable limit position</p> <p>b7 Zooming under operation</p> <p>b6 Remote Control operate OFF</p> <p>b5 Camera Power OFF</p> <p>b4 Un executing Pedestal Initialize</p> <p>b3 Shutter speed flag 1</p> <p>b2 Shutter speed flag 2</p> <table border="0"> <tr> <td>b3</td> <td>b2</td> <td>NTSC</td> <td>PAL</td> </tr> <tr> <td>0</td> <td>0</td> <td>program</td> <td>program</td> </tr> <tr> <td>0</td> <td>1</td> <td>1/60</td> <td>1/50</td> </tr> <tr> <td>1</td> <td>0</td> <td>1/100</td> <td>1/120</td> </tr> <tr> <td>1</td> <td>1</td> <td>Not use</td> <td>Not use</td> </tr> </table> <p>b 1 Manual Focus mode</p> <p>b 0 Focusing under operation</p> <p>(LSB)</p> <p>•The information of b0 ~ b11 is equal to the information of 13.3 Operation Status Request.</p> <p>•In case that b19 is 1 (In process of Menu), unable to Host Control Mode.</p> <p>•In case that b18 is 1 (Local Control Mode), unable to control through Host.</p>		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
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																			

● 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							
Header	Device Num		Error Code								
FEh	30h	3Xh	30h	30h							
			d5	d6	d7	d8	d9	d10			
			Status					End mark			
			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 e1
■ In case of Mode Error :	10010000B ⇒ 90h ⇒ 39h 30h

● Condition of Error flag to be set

Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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 e1
■ In case of Mode Error :	10010000B ⇒ 90h ⇒ 39h 30h

● Condition of Error flag to be set

Parameter Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •Assign memory address to be stored by parameter value (memory address is position from 1 to 9) •Not to erase stored memory , even though power OFF (to be stored in nonvolatile memory) •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
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 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	<ul style="list-style-type: none"> •In case of executing Camera Control Command •In case of executing Pedestal Control Command •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter outside of 1~9
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •This command is an 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) •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) •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. •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 •By this command, Pan/Tilt ,Zoom Movement operations or Pan/Tilt stop Command(11.5 or 11.23) stop. But AE Target Value compensation operation doesn't stop. <p>Note: After power ON, return Mode error and execute Pedestal Initialize, at the moment to receive this command without executing Pedestal Initialize 1 &2 Commands.</p>	

● 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		
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 ASCII 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	<ul style="list-style-type: none"> •In case of executing Camera Control Command •In case of executing Pedestal Control Command •In case of executing Preset Move Command
Parameter Error	<ul style="list-style-type: none"> •In case of assigned parameter outside of 1~9
Mode Error	<ul style="list-style-type: none"> •After Power ON, Not executed Pedestal Initialize •Not in status of Camera ON •Not in status of Host Control Mode

13.9 Preset Status Request

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	<ul style="list-style-type: none"> •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. •The followings show the case of each bit 1 among of Preset Status, <p style="text-align: center;">(MBS)</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>b7</td><td>Memory Address 4 settled</td></tr> <tr><td>b6</td><td>Memory Address 3 settled</td></tr> <tr><td>b5</td><td>Memory Address 2 settled</td></tr> <tr><td>b4</td><td>Memory Address 1 settled</td></tr> <tr><td>b3</td><td>Not used</td></tr> <tr><td>b2</td><td>Not used</td></tr> <tr><td>b1</td><td>Memory Address 6 settled</td></tr> <tr><td>b0</td><td>Memory Address 5 settled</td></tr> </table> <p style="text-align: center;">(LSB)</p>		b7	Memory Address 4 settled	b6	Memory Address 3 settled	b5	Memory Address 2 settled	b4	Memory Address 1 settled	b3	Not used	b2	Not used	b1	Memory Address 6 settled	b0	Memory Address 5 settled
b7	Memory Address 4 settled																	
b6	Memory Address 3 settled																	
b5	Memory Address 2 settled																	
b4	Memory Address 1 settled																	
b3	Not used																	
b2	Not used																	
b1	Memory Address 6 settled																	
b0	Memory Address 5 settled																	

● 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 ASCII code as Status value.	
Example: in case of use of memory 2 and 3	
01100000B	⇒ 60h ⇒
s0	s1
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 ASCII code value	
Example	
■ In case of Mode Error :	10010000B ⇒ 90h ⇒ 39h 30h
e0	e1

● Condition of Error flag to be set

Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode
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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	<p>•The followings show the case of each bit 1 among of Preset Status,</p> <p style="text-align: center;">(MBS)</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>b11</td><td>Not used(0)</td></tr> <tr><td>b10</td><td>Not used(0)</td></tr> <tr><td>b 9</td><td>Not used(0)</td></tr> <tr><td>b 8</td><td>Memory Address 9 settled</td></tr> <tr><td>b 7</td><td>Memory Address 8 settled</td></tr> <tr><td>b 6</td><td>Memory Address 7 settled</td></tr> <tr><td>b 5</td><td>Memory Address 6 settled</td></tr> <tr><td>b 4</td><td>Memory Address 5 settled</td></tr> <tr><td>b 3</td><td>Memory Address 4 settled</td></tr> <tr><td>b2</td><td>Memory Address 3 settled</td></tr> <tr><td>b1</td><td>Memory Address 2 settled</td></tr> <tr><td>b0</td><td>Memory Address 1 settled</td></tr> </table> <p style="text-align: center;">(LSB)</p>		b11	Not used(0)	b10	Not used(0)	b 9	Not used(0)	b 8	Memory Address 9 settled	b 7	Memory Address 8 settled	b 6	Memory Address 7 settled	b 5	Memory Address 6 settled	b 4	Memory Address 5 settled	b 3	Memory Address 4 settled	b2	Memory Address 3 settled	b1	Memory Address 2 settled	b0	Memory Address 1 settled
b11	Not used(0)																									
b10	Not used(0)																									
b 9	Not used(0)																									
b 8	Memory Address 9 settled																									
b 7	Memory Address 8 settled																									
b 6	Memory Address 7 settled																									
b 5	Memory Address 6 settled																									
b 4	Memory Address 5 settled																									
b 3	Memory Address 4 settled																									
b2	Memory Address 3 settled																									
b1	Memory Address 2 settled																									
b0	Memory Address 1 settled																									

● 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		
000000000110B	⇒	006h ⇒ s0 s1 s2 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		
■ In case of Parameter Error :	01010000B ⇒ 50h ⇒	e0 e1 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 •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	<ul style="list-style-type: none"> •To set remote controller through ON/OFF(Admit/Forbid). •By Remote Control ON, to notify received key from remote control and ON/OFF information to host computer. •At the moment of Power ON, to be in status of remote control through OFF by default. •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. •In case of operating by Host Control Mode, not to operate corresponding to received key code from remote controller. •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
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 e1
■ In case of No Error:	0000000B ⇒ 00h ⇒ 30h 30h
■ In case of Parameter Error :	0101000B ⇒ 50h ⇒ 35h 30h
■ In case of Mode Error :	1001000B ⇒ 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 •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 •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, Preset Moving, Menu Setting
	1 sec cycle	Pedestal Initializing, 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

13.14 Cascade OFF

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

Function	To connect Cascade connection ON.	
Command	008Fh	
Parameter	Length	1 byte
	Value	1h
Status	None	
Reference	<ul style="list-style-type: none"> • Cascade Connection status comes out OFF by default at the moment of power ON • Multiple VC-C4 (Max. 9 units) able to control by this command • Necessary to issue this command before issuing Cascade OFF command (13.14) • Device Num. of this command is only "3030h" fixed • Connected VC-C4 by this command, comes out Host Control Mode. • Answer by this command is returned with device number of the last VC-C4 connected in Cascade. • While Pan/Tilt moving, receiving this command causes Busy error, and after that, Cascade ON operation will stop for the rest of VC-C4. • Note: The processing time by this command requires approx. 100ms per unit and 500ms for last VC-C4. (After that, answer will return) • The commands issuing in process of this command will be ignored. • 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) • Only last VC-C4 in Cascade connection returns the answer for Global Command • 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					
■ In case of No Error:	00000000B	⇒	00h	⇒	e0 e1 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	<ul style="list-style-type: none"> •At the moment of power ON, Default sets Local Control Mode. •To be able to control by only Host computer through RS-232C and unable to control by remote controller. •Local Control Mode flag in operation status by this command is cleared to 0 •In case to control by remote controller in Host Control Mode, by using remote control through function, possible to control through computer. •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	<ul style="list-style-type: none"> •At the moment of power ON, Default sets Local Control Mode. •To be controlled by remote control and unable to control by Host computer. •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, <ul style="list-style-type: none"> •Operation Status Request and Extended Operation Status Request command •Cascade ON and Cascade OFF commands •Host Control Mode and Local Control Mode commands •In case of Remote Control Receipt forbidden by Remote Control OFF command before issuing this command, Remote Control Operation is forbidden, even in Local Control Mode status. •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 ASCII 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	<p>•The following display indication can be set, Parameter</p> <table> <tr> <td>00h : Display Indication OFF</td> <td>(Screen Display OFF)</td> </tr> <tr> <td>01h : Display Indication ON</td> <td>(Screen Display ON)</td> </tr> <tr> <td>02h : Character Indication OFF</td> <td></td> </tr> <tr> <td>03h : Character Indication ON</td> <td></td> </tr> <tr> <td>04h : Time Indication OFF</td> <td></td> </tr> <tr> <td>05h : Time Indication ON1</td> <td>(Indication Format 1)</td> </tr> <tr> <td>06h : Time Indication ON 2</td> <td>(Indication Format 2)</td> </tr> <tr> <td>07h : Date Indication OFF</td> <td></td> </tr> <tr> <td>08h : Date Indication ON1</td> <td>(Indication Format 1)</td> </tr> <tr> <td>09h : Date Indication ON2</td> <td>(Indication Format 2)</td> </tr> </table> <p>•At the moment of power ON, Display Indication OFF, Character Indication ON, Date Indication ON2, Date Indication ON2 are set by default.</p> <p>•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</p> <p>•Time Indication Format has two type as under,</p> <table> <tr> <td>Indication Format 1</td> <td>hh : mm : ss</td> </tr> <tr> <td>Indication Format 2</td> <td>HH : mm : ss AP</td> </tr> <tr> <td>hh</td> <td>⇒ Hour (00~24)</td> </tr> <tr> <td>HH</td> <td>⇒ Hour (00~12)</td> </tr> <tr> <td>mm</td> <td>⇒ Minute (00~59)</td> </tr> <tr> <td>ss</td> <td>⇒ Second (00~59)</td> </tr> <tr> <td>AP</td> <td>⇒ AM or PM</td> </tr> </table> <p>•Date Indication Format has two type as under,</p> <table> <tr> <td>Indication Format 1</td> <td>yy : mm : dd</td> </tr> <tr> <td>Indication Format 2</td> <td>dd : MM : yy</td> </tr> <tr> <td>yy</td> <td>⇒ Year (00~99)</td> </tr> <tr> <td>mm</td> <td>⇒ Month (01~12)</td> </tr> <tr> <td>MM</td> <td>⇒ Month (JAN, FEB, MAR, APL, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC)</td> </tr> <tr> <td>dd</td> <td>⇒ Date (01~31)</td> </tr> </table> <p>Note: At the moment of power ON, Time Indication & Date Indication start flashing when Display Indication sets ON before setting of Time & Date.</p>		00h : Display Indication OFF	(Screen Display OFF)	01h : Display Indication ON	(Screen Display ON)	02h : Character Indication OFF		03h : Character Indication ON		04h : Time Indication OFF		05h : Time Indication ON1	(Indication Format 1)	06h : Time Indication ON 2	(Indication Format 2)	07h : Date Indication OFF		08h : Date Indication ON1	(Indication Format 1)	09h : Date Indication ON2	(Indication Format 2)	Indication Format 1	hh : mm : ss	Indication Format 2	HH : mm : ss AP	hh	⇒ Hour (00~24)	HH	⇒ Hour (00~12)	mm	⇒ Minute (00~59)	ss	⇒ Second (00~59)	AP	⇒ AM or PM	Indication Format 1	yy : mm : dd	Indication Format 2	dd : MM : yy	yy	⇒ Year (00~99)	mm	⇒ Month (01~12)	MM	⇒ Month (JAN, FEB, MAR, APL, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC)	dd	⇒ Date (01~31)
00h : Display Indication OFF	(Screen Display OFF)																																															
01h : Display Indication ON	(Screen Display ON)																																															
02h : Character Indication OFF																																																
03h : Character Indication ON																																																
04h : Time Indication OFF																																																
05h : Time Indication ON1	(Indication Format 1)																																															
06h : Time Indication ON 2	(Indication Format 2)																																															
07h : Date Indication OFF																																																
08h : Date Indication ON1	(Indication Format 1)																																															
09h : Date Indication ON2	(Indication Format 2)																																															
Indication Format 1	hh : mm : ss																																															
Indication Format 2	HH : mm : ss AP																																															
hh	⇒ Hour (00~24)																																															
HH	⇒ Hour (00~12)																																															
mm	⇒ Minute (00~59)																																															
ss	⇒ Second (00~59)																																															
AP	⇒ AM or PM																																															
Indication Format 1	yy : mm : dd																																															
Indication Format 2	dd : MM : yy																																															
yy	⇒ Year (00~99)																																															
mm	⇒ Month (01~12)																																															
MM	⇒ Month (JAN, FEB, MAR, APL, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC)																																															
dd	⇒ Date (01~31)																																															

● 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 ASCII 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 •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	<ul style="list-style-type: none"> The character data to be indicated are as followings. <ul style="list-style-type: none"> p0 Fixed value ⇒ 31h p1, p2 Horizontal position ⇒ 0~23 (00h~17h) p3 Vertical position ⇒ 0~10 (0h~Ah) p4, p5 Character Code ⇒ 32~95 (20F~5Fh) See next page (Display Indication Character Code Table) concerning Character Code At the moment of Power ON, Indicating range comes out blank data(5Fh) <p>Note:</p> <ul style="list-style-type: none"> 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	d10	d11
Header	Device Num		Command		Fixed	Horizontal		Vertical	Character Code		End mark
FFh	30h	3Xh	00h	91h	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						
14h	5h	41h	⇒	p1 31h	p2 34h	p3 35h
				p4 34h	p5 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 ASCII code value					
Example					
■ In case of No Error:	00000000B	⇒	00h	⇒	e0 e1 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 •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	<ul style="list-style-type: none"> The character data to be indicated are as followings. <ul style="list-style-type: none"> p0 Fixed vale ⇒ 32h p1, p2 Horizontal position ⇒ 0~23 (00h~17h) p3 Vertical position ⇒ 0~10 (0h~Ah) See previous page (Display Indication Character Code Table) concerning Character Code At the moment of Power ON, Indicating range comes out blank data(5Fh) <p>Note:</p> <ul style="list-style-type: none"> 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
<p style="text-align: center;">p1 p2 p3</p> <p style="text-align: center;">14h 5h ⇒ 31h 34h 35h</p>

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	<ul style="list-style-type: none"> •The Date data to be indicated are as followings. <ul style="list-style-type: none"> p0 Fixed vale ⇒ 33h p1~ p2 Year Data ⇒ 00h~99h p3~ p4 Month Data ⇒ 01h~12h p5~ p6 Day Data ⇒ 01h~31h •At the moment of power ON, to be set 00 year 01 month 01 day by default •Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h) •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: year00 month07day25 ⇒ p1 p2 p3 p4 p5 p6 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
<ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •The Day data to be returned as followings. <ul style="list-style-type: none"> s1~ s2 Year Data ⇒ 00h~99h s3~ s4 Month Data ⇒ 01h~12h s5~ s6 Day Data ⇒ 01h~31h •At the moment of power ON, to be set 00 year 01 month 01 day by default •Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h) •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: year00 month07 day25 ⇒ s1 s2 s3 s4 s5 s6 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 ASCII code value
Example <ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •The time data to be indicated are as followings. <ul style="list-style-type: none"> p0 Fixed ⇒ 35h p1~ p2 Hour Data ⇒ 00h~23h p3~ p4 Minute Data ⇒ 00h~59h p5~ p6 Second Data ⇒ 00h~59h •At the moment of power ON, to be set 00 hour 00 minute 00 second by default •Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h) •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: hour17 minute30 second25 ⇒ p1 p2 p3 p4 p5 p6 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
<ul style="list-style-type: none"> ■ In case of No Error: 0000000B ⇒ 00h ⇒ 30h 30h ■ In case of Parameter Error : 0101000B ⇒ 50h ⇒ 35h 30h ■ In case of Mode Error : 1001000B ⇒ 90h ⇒ 39h 30h

● Condition of Error flag to be set

Parameter Error	•In case of assigned parameter outside range.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •Not in status of Host Control Mode

13.24 Display Time Request

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	<ul style="list-style-type: none"> •The Time data to be set as followings. <ul style="list-style-type: none"> p0 Fixed ⇒ 36h p1~ p2 Hour Data ⇒ 00h~23h p3~ p4 Minute Data ⇒ 00h~59h p5~ p6 Second Data ⇒ 00h~59h •At the moment of power ON, to be set 00 hour 00 minute 00 second by default •Setting data is set BCD type Hexadecimal (20 in decimal equal to 20h) •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:
hour17 minute30 second25 ⇒ s1 s2 s3 s4 s5 s6
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
■ 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 •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	<ul style="list-style-type: none"> •Camera accumulated turn ON time calculates total camera turn ON time in one hour as one unit. •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
p0
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:
573 hours ⇒ 0023Dh ⇒ s0 s1 s2 s3
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 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 •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	<ul style="list-style-type: none"> •To return to status of factory setting at shipping from factory. (to re-write memory data of built in nonvolatile IC) •By this command, all items except the followings reset default values at the shipping status from factory. <ul style="list-style-type: none"> •Pedestal Initial Information •Date, Time setting •Indication Character setting •By this command, camera section is rest. •By this command, communication section with Host is reinitialized (Baud rate: 9600 bps, stop: 1 bit) •Host Control Mode unchanged, but cascade OFF status comes out. •By this command, CTS signal of Host stop one second OFF. <p>Note:</p> <ul style="list-style-type: none"> •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	<ul style="list-style-type: none"> •In case of executing of Camera Control Command. •In case of executing Pedestal Control Command •In case of executing Preset Move Command
Parameter Error	•In case of assigned parameter except 0h
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	<ul style="list-style-type: none"> •At the moment of power ON, to OFF by default. •Command Termination Notification comes out to effective at the command after issuing this command. •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
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:	0000000B ⇒ 00h ⇒ 30h 30h
■ In case of Parameter Error :	0101000B ⇒ 50h ⇒ 35h 30h
■ In case of Mode Error :	1001000B ⇒ 90h ⇒ 39h 30h

● Condition of Error flag to be set

Parameter Error	•In case of assigned parameter except 0h or 1h.
Mode Error	<ul style="list-style-type: none"> •Not in status of Camera ON •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	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
-----------------	--

13.30 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	e1
■ In case of Parameter error	01010000B ⇒ 50h	⇒ 35h 30h

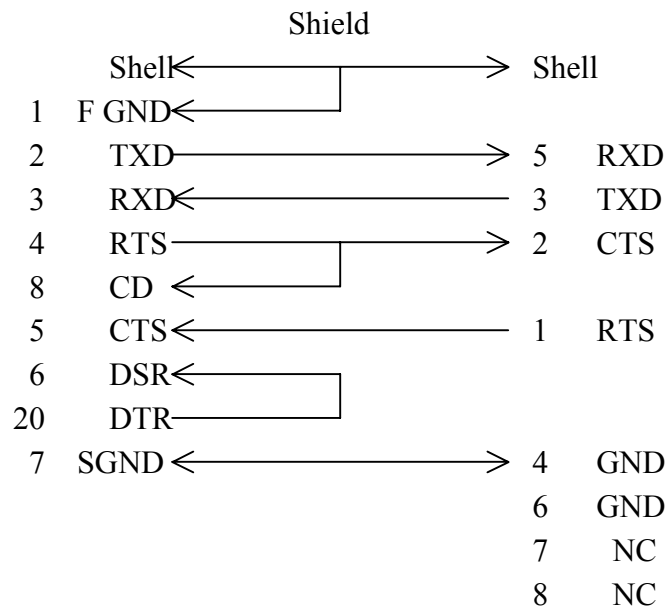
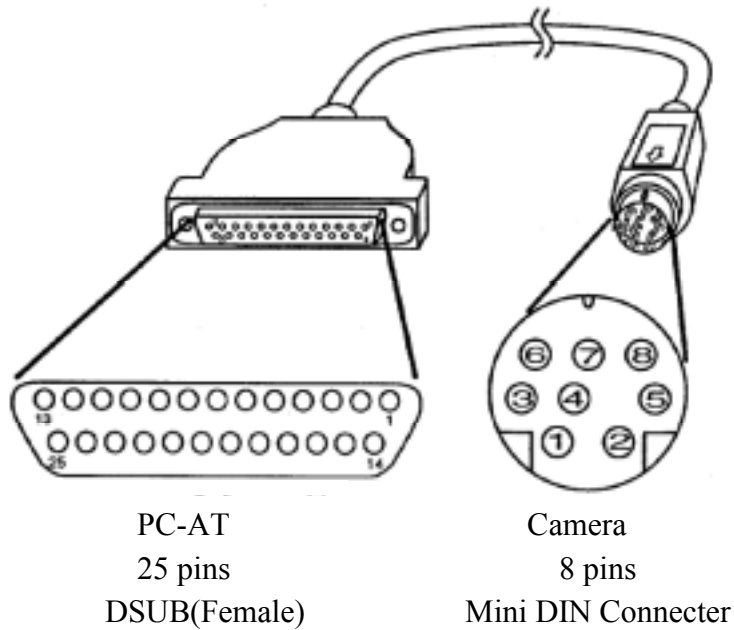
● Condition of Error flag to be set

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

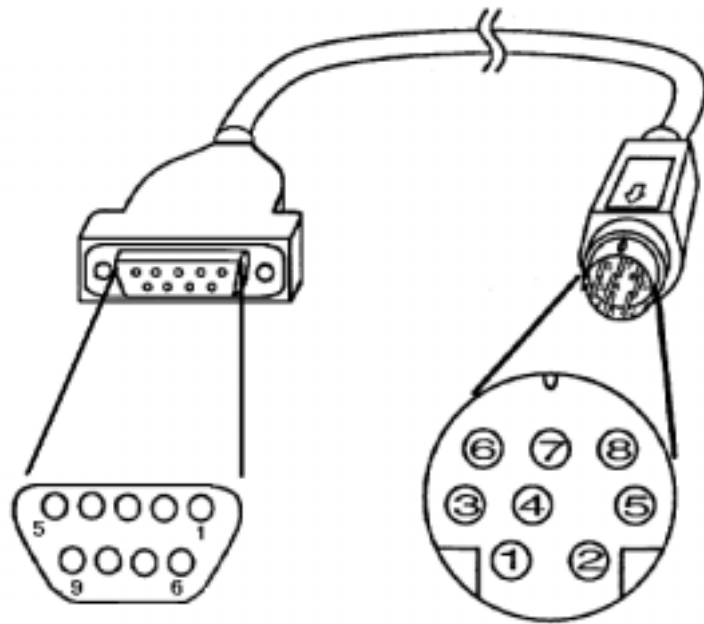
14. Connection Cable

14.1 Example 1 Connection with PC-AT

DSUB type with 25 pins

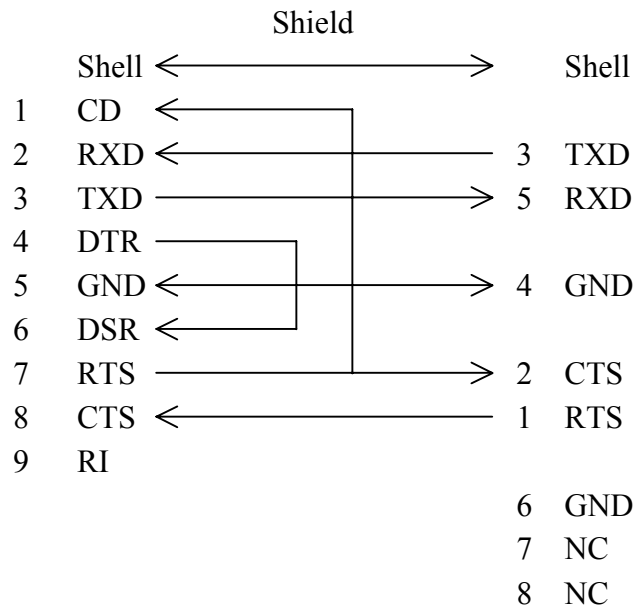


14.2 Example 2 Connection with PC-AT
 9 pins DSUB type

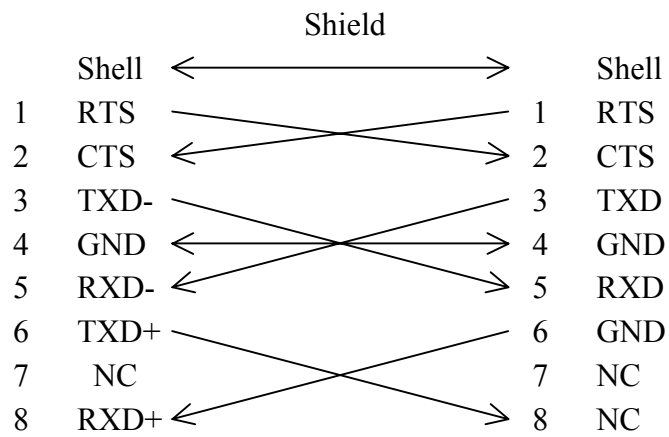
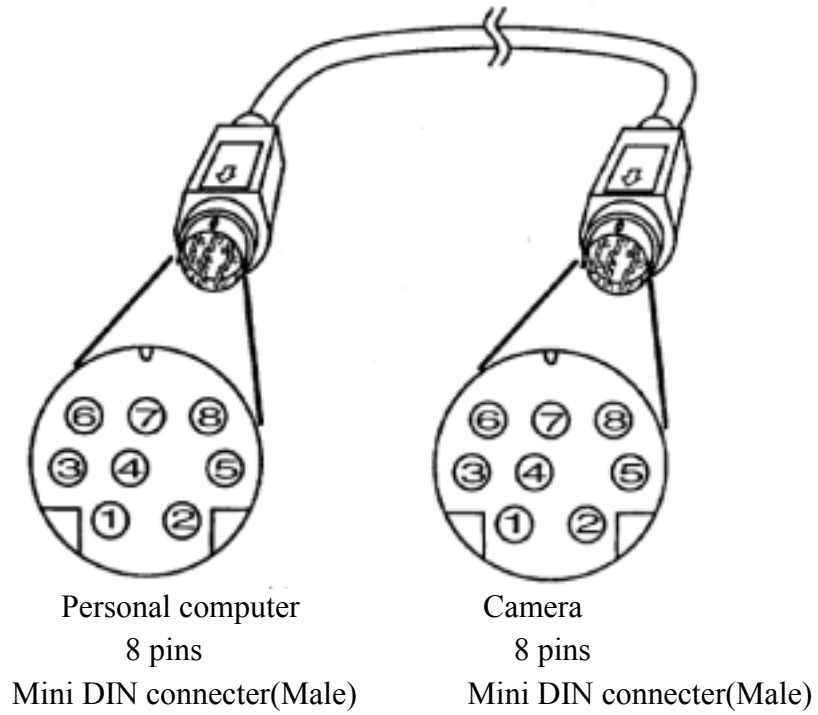


PC-AT
 9 pins
 DSUB(Female)

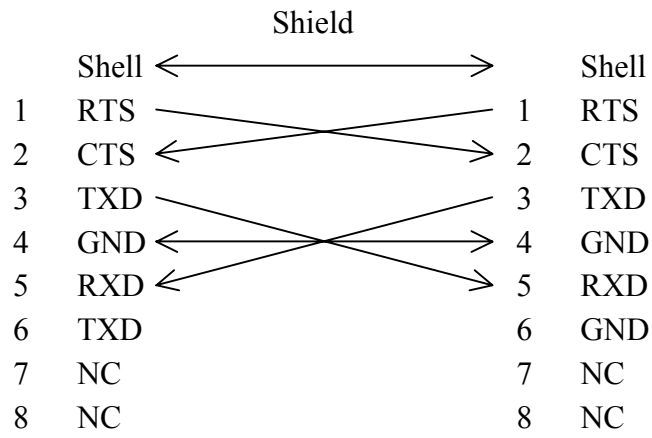
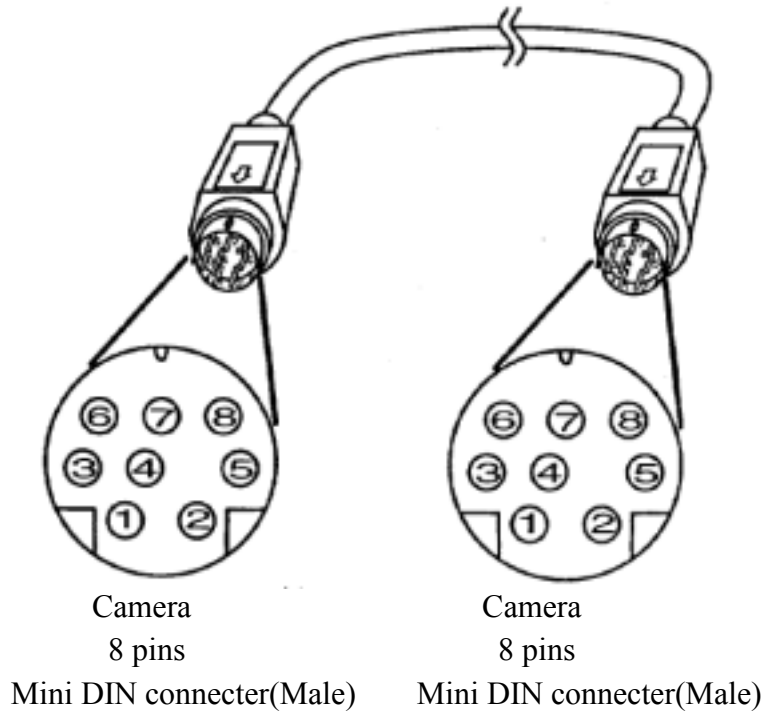
Camera
 8 pins
 Mini DIN Connector



14.3 Example 3 Connection with Macintosh



14.4 Connection Cable Between Cameras

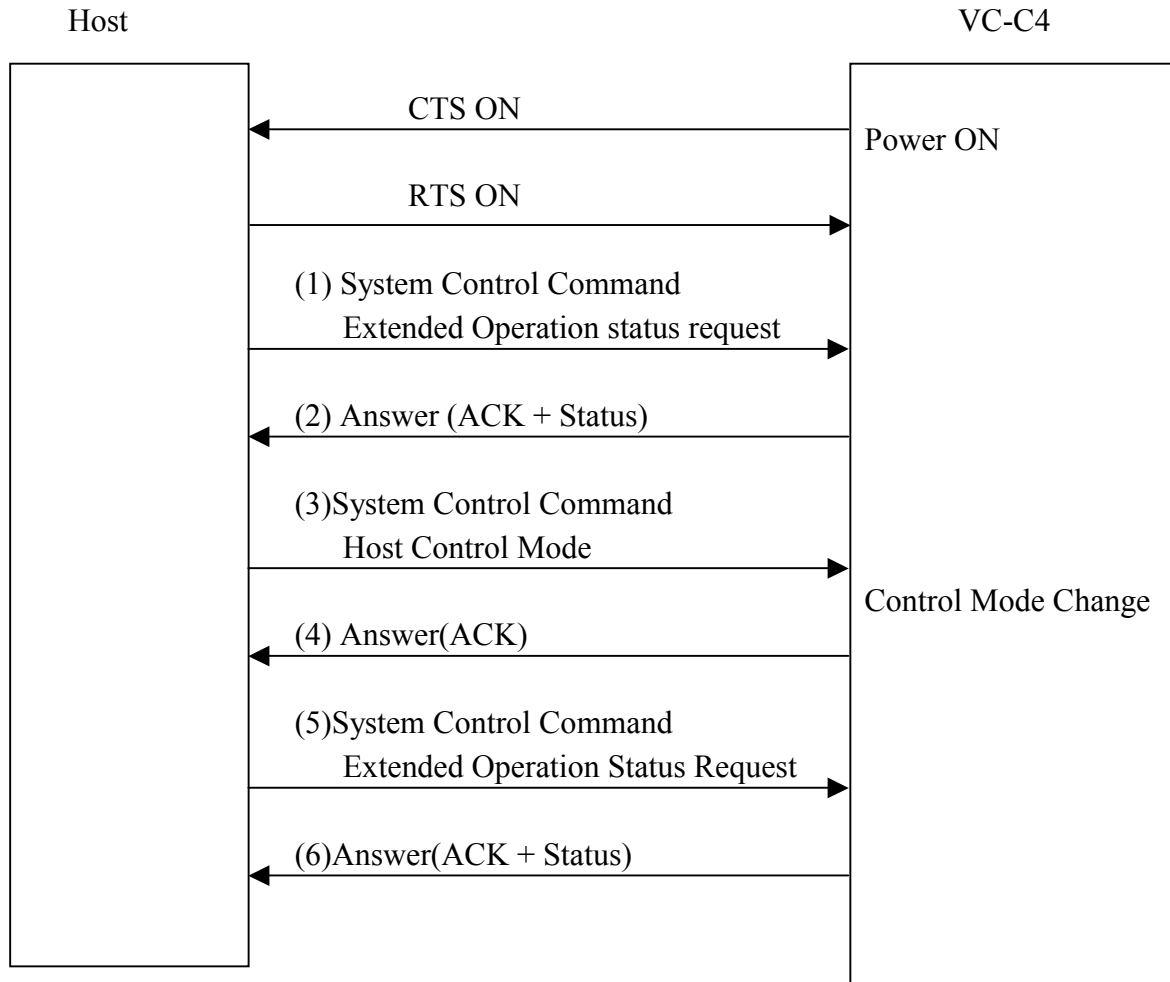


15. Example of Host Control Sequence

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.



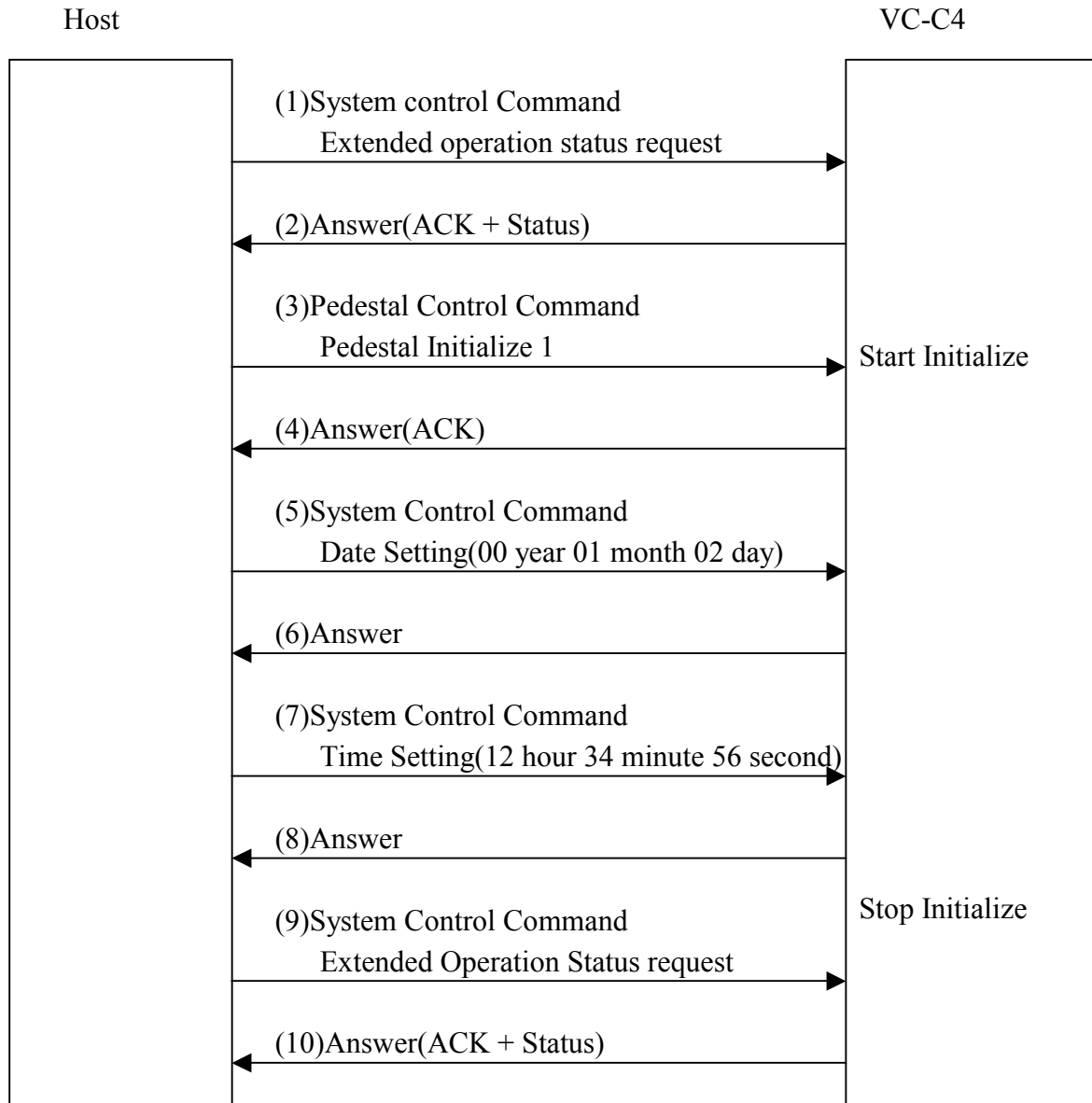
Corresponding Frame Code

	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.

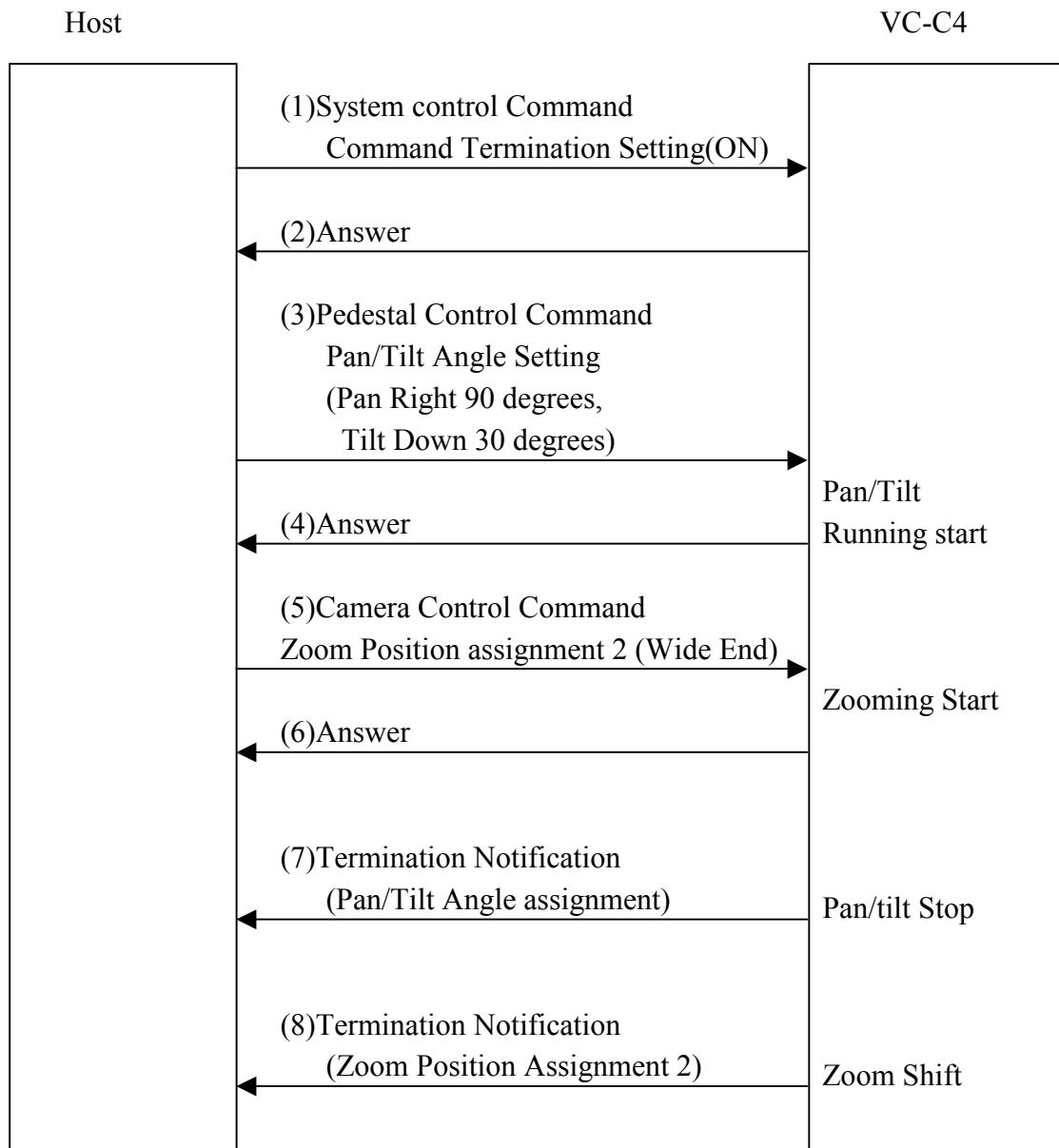


Corresponding Frame table

	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

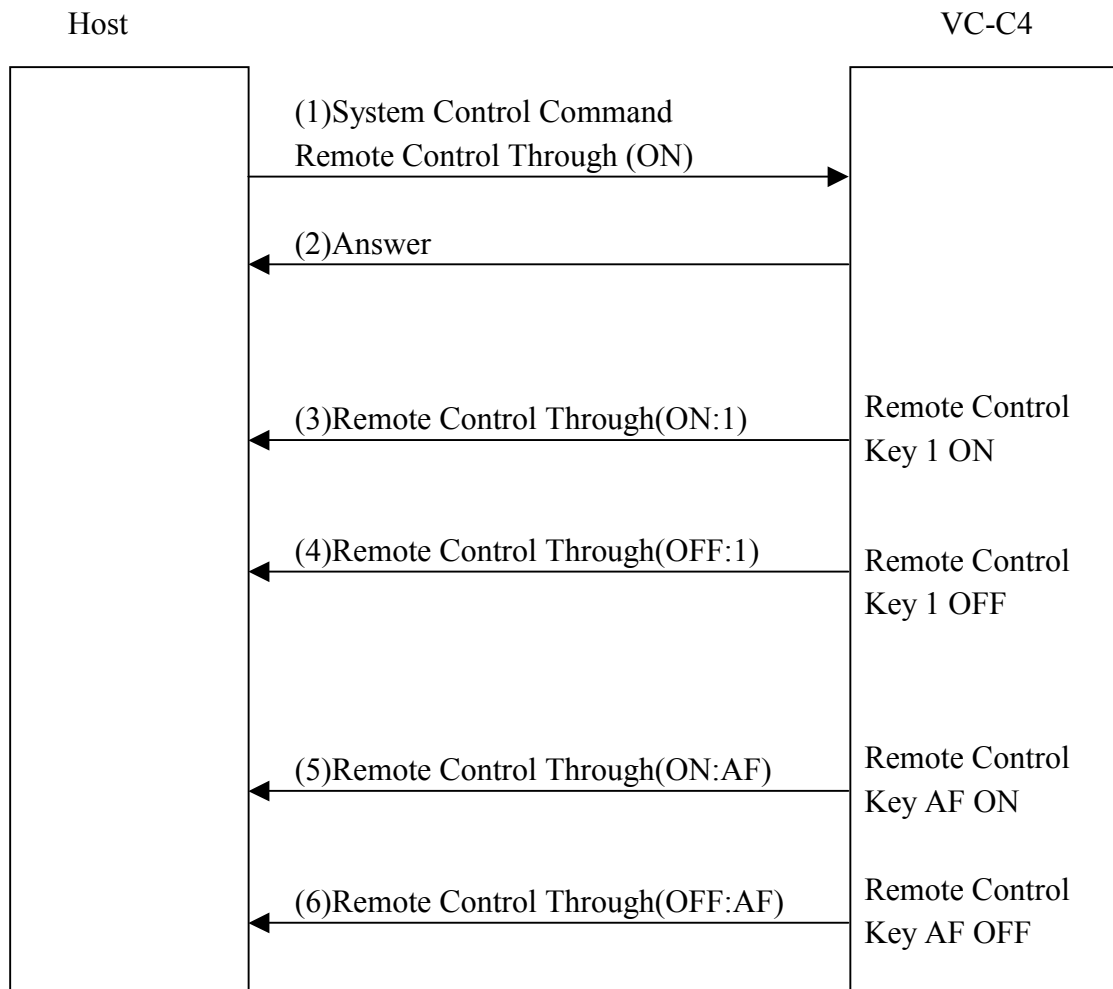


Corresponding Frame Code

	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

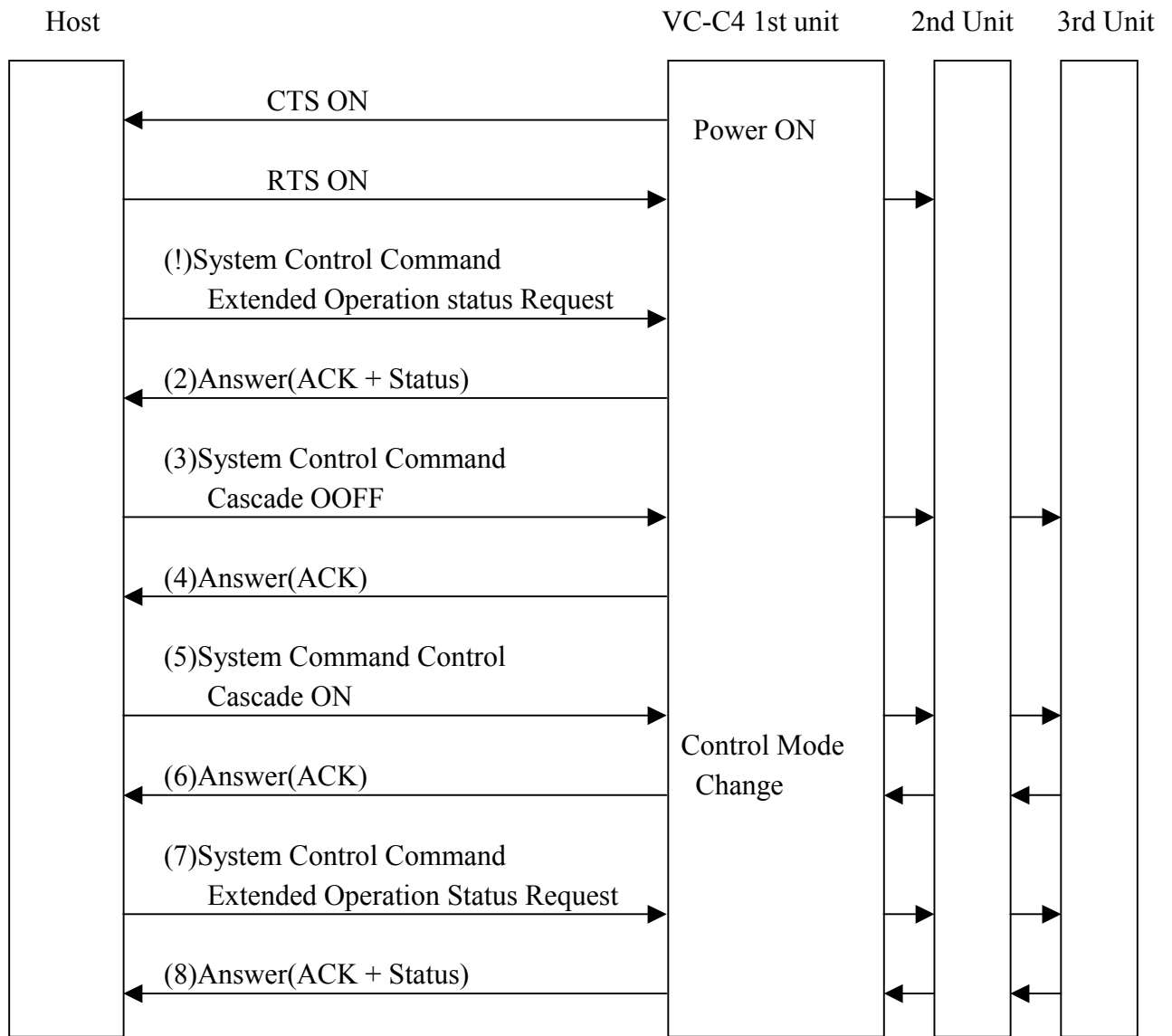


Corresponding frame Table

	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.

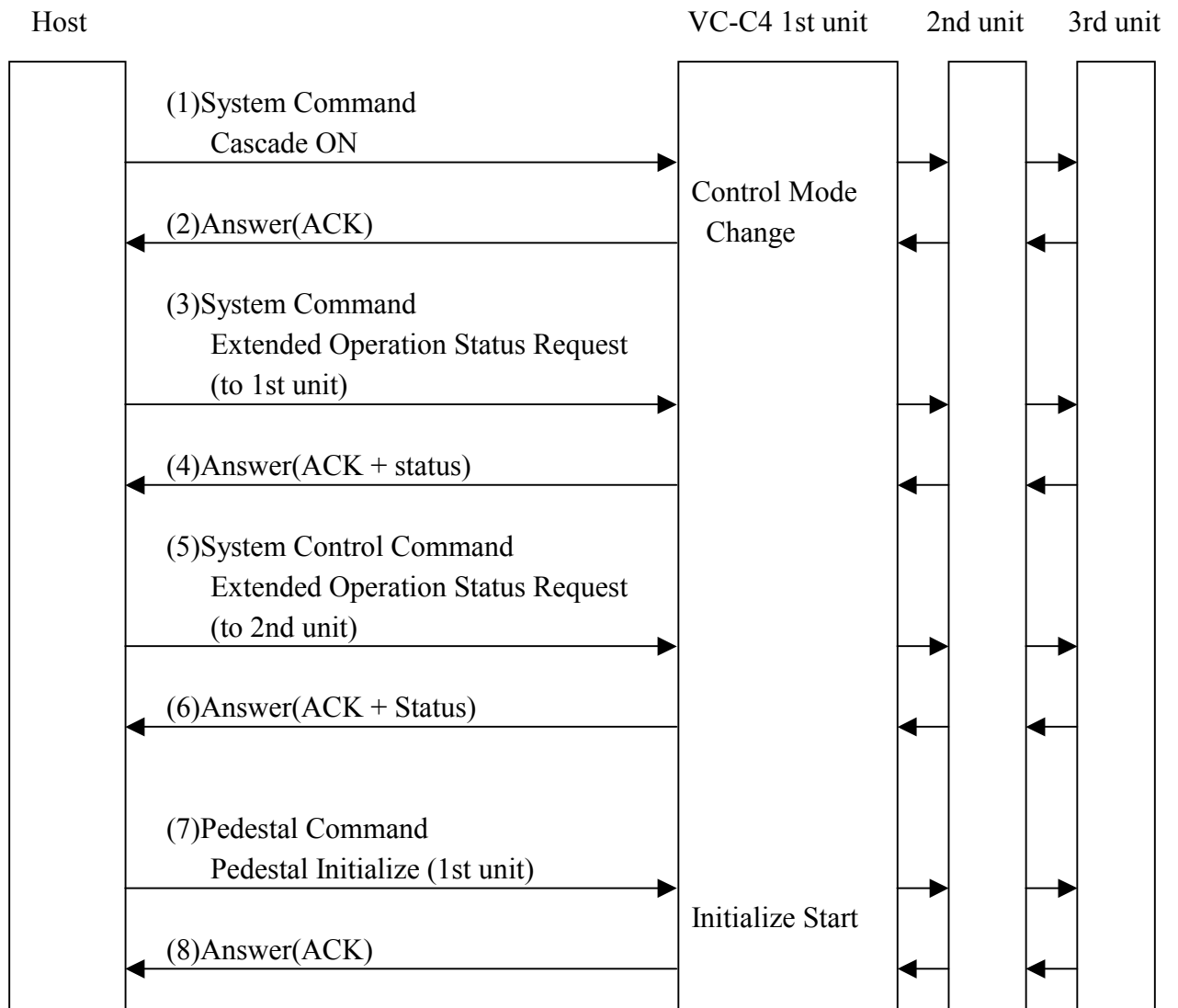


Corresponding Frame Code

	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



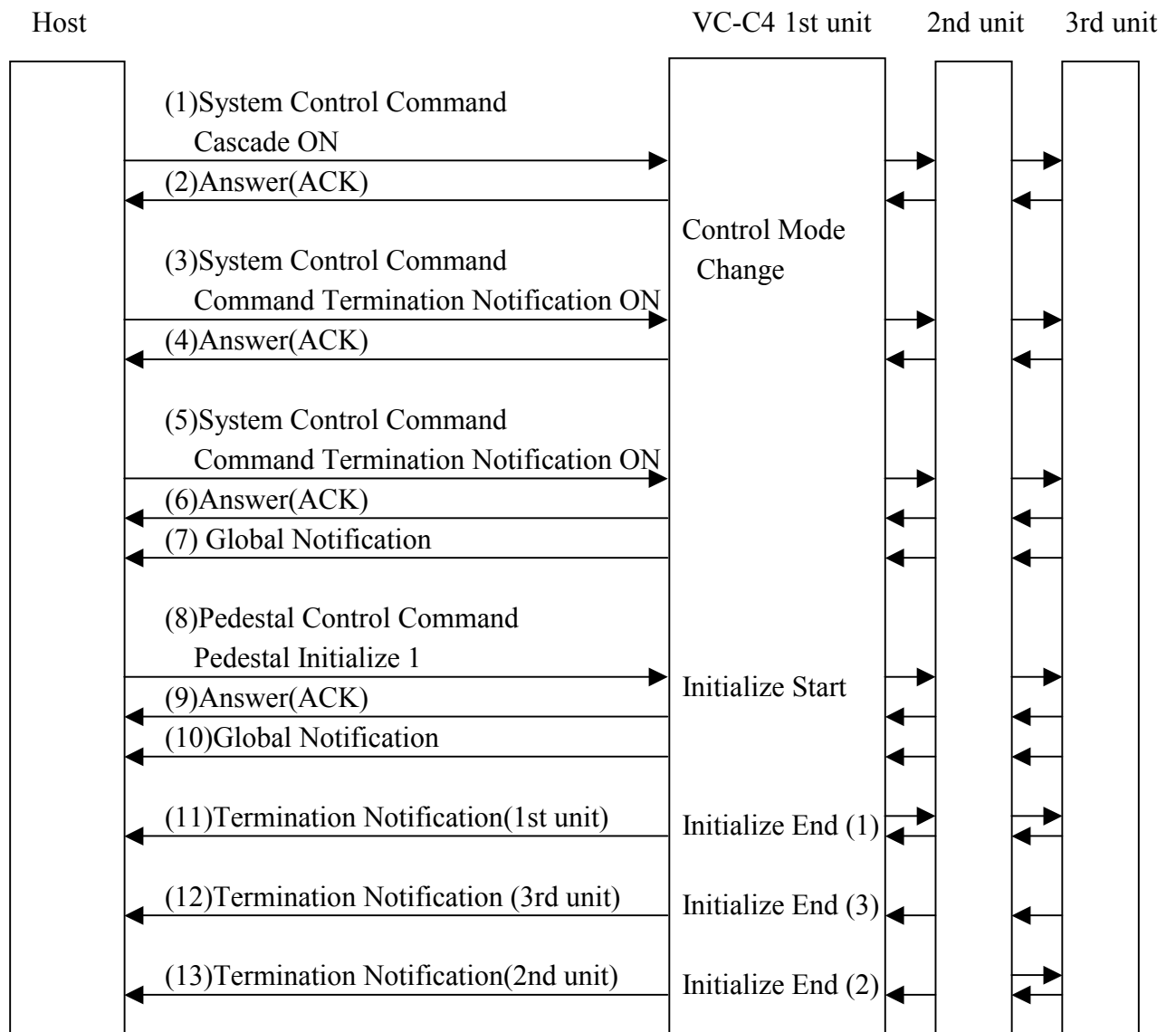
Corresponding Frame Code

	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 Tilt running stop	0060h	3030h	None
Pan Stop, Tilt Up Start	Pan running stop Tilt up start	0060h	3031h	None
Pan Stop, Tilt Down Start	Pan running stop Tilt down start	0060h	3032h	None
Pan Right Start, Tilt Stop	Pan right start Tilt running stop	0060h	3130h	None
Pan Right Start, Tilt Up Start	Pan right start Tilt up start	0060h	3131h	None
Pan Right Start, Tilt Down Start	Pan right start Tilt down start	0060h	3132h	None
Pan Left Start, Tilt Stop	Pan left start Tilt running stop	0060h	3230h	None
Pan Left Start, Tilt Up Start	Pan left start Tilt up start	0060h	3231h	None
Pan Left Start, Tilt Down Start	Pan left start 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 $\pm 1\%$ 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 (1 ~ 76 degrees/sec)	8 ~ 800 pps (1 ~ 90 degrees/sec)	
Tilt Speed	8 ~ 622 pps (1 ~ 70 degrees/sec)	8 ~ 622 pps (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 (Not cleared power OFF)	Number 1 ~9 (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

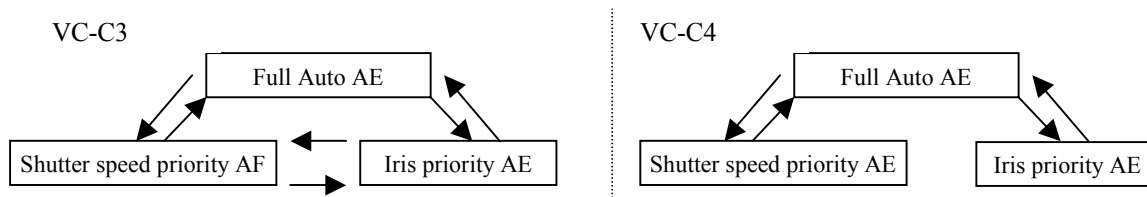
17.4 Additional Remote Controller Code

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