

KP-FD30 remote control protocol (Rev.1)

1) Comms* specifications

Sync system	Start-stop sync
Bit rate	9600 bps
Data length	8 bits
Start bit	1
Stop bits	1
Parity	None
Bit transfer	LSB first

***Comms : Communications**

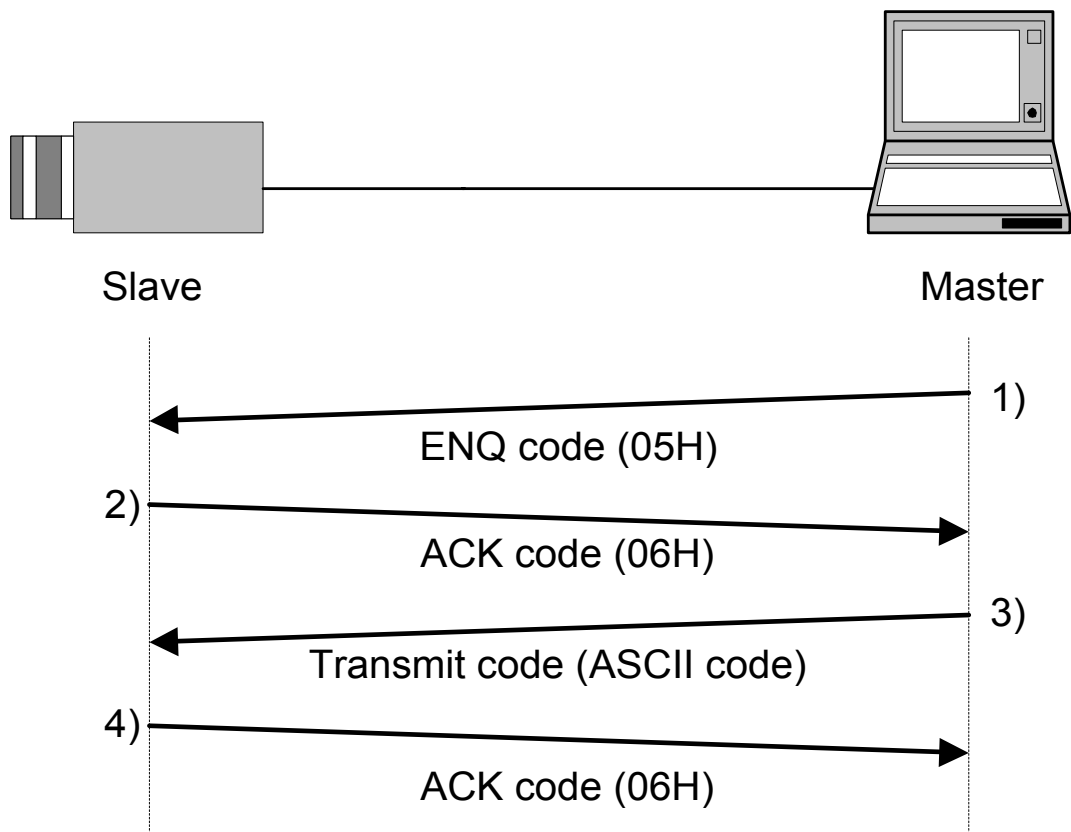
2) Comms control

The remote control software controls all communications. Data send/receive (BSC handshake) is by transferring TEXT data to the camera controller chip.

3) Comms procedure

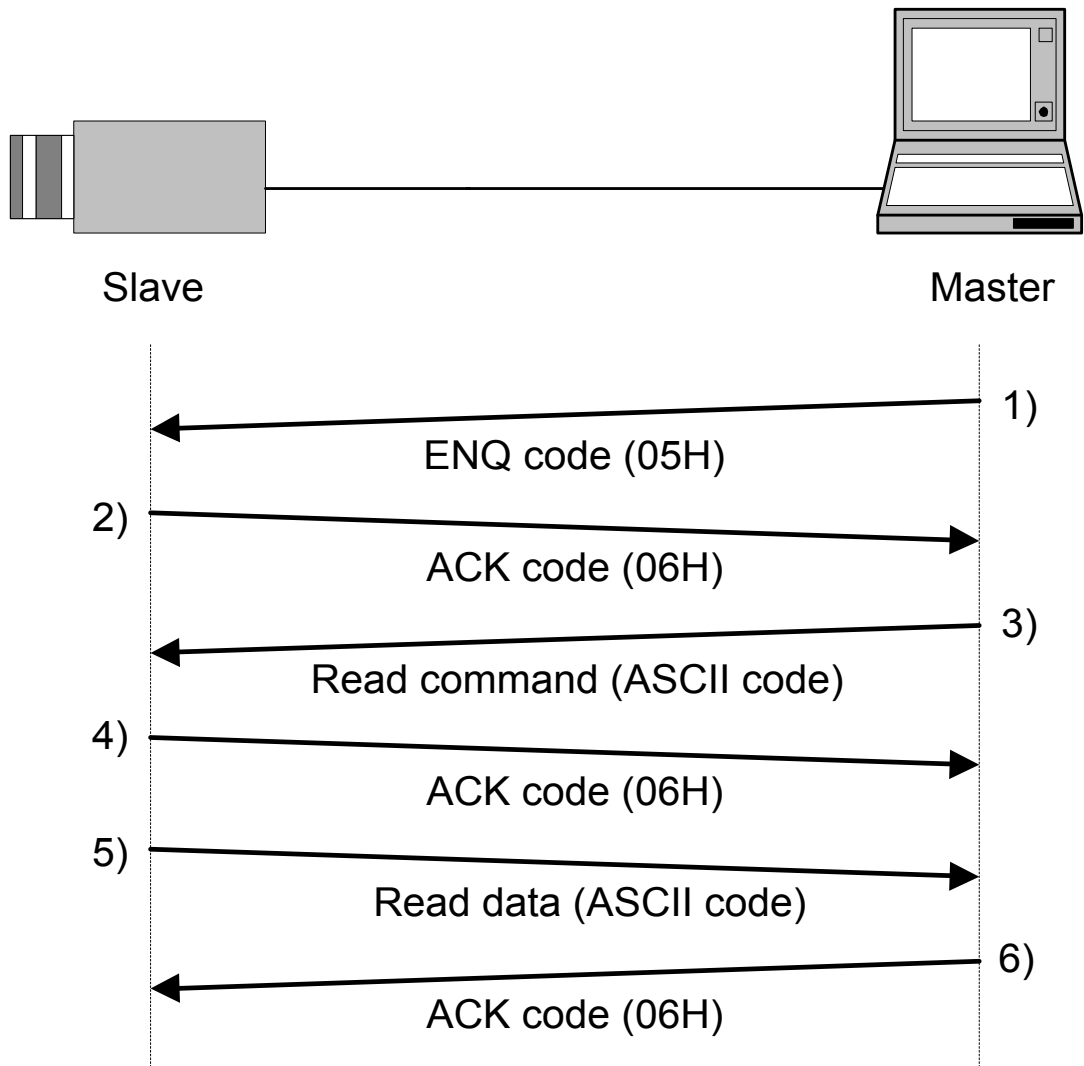
- The following pages indicate the camera controller chip and remote control software data protocol. In the description, the camera is designated as slave and the software as master.
- Receive protect timer (time out error)
The receive protect timer for master and slave processes is 1 second. For example, if 1 block of TEXT data is being received, if the data interval exceeds 1 second, error is produced and the data are lost. An acknowledgment of data receipt is not produced.

a) Transmission from master (normal process)



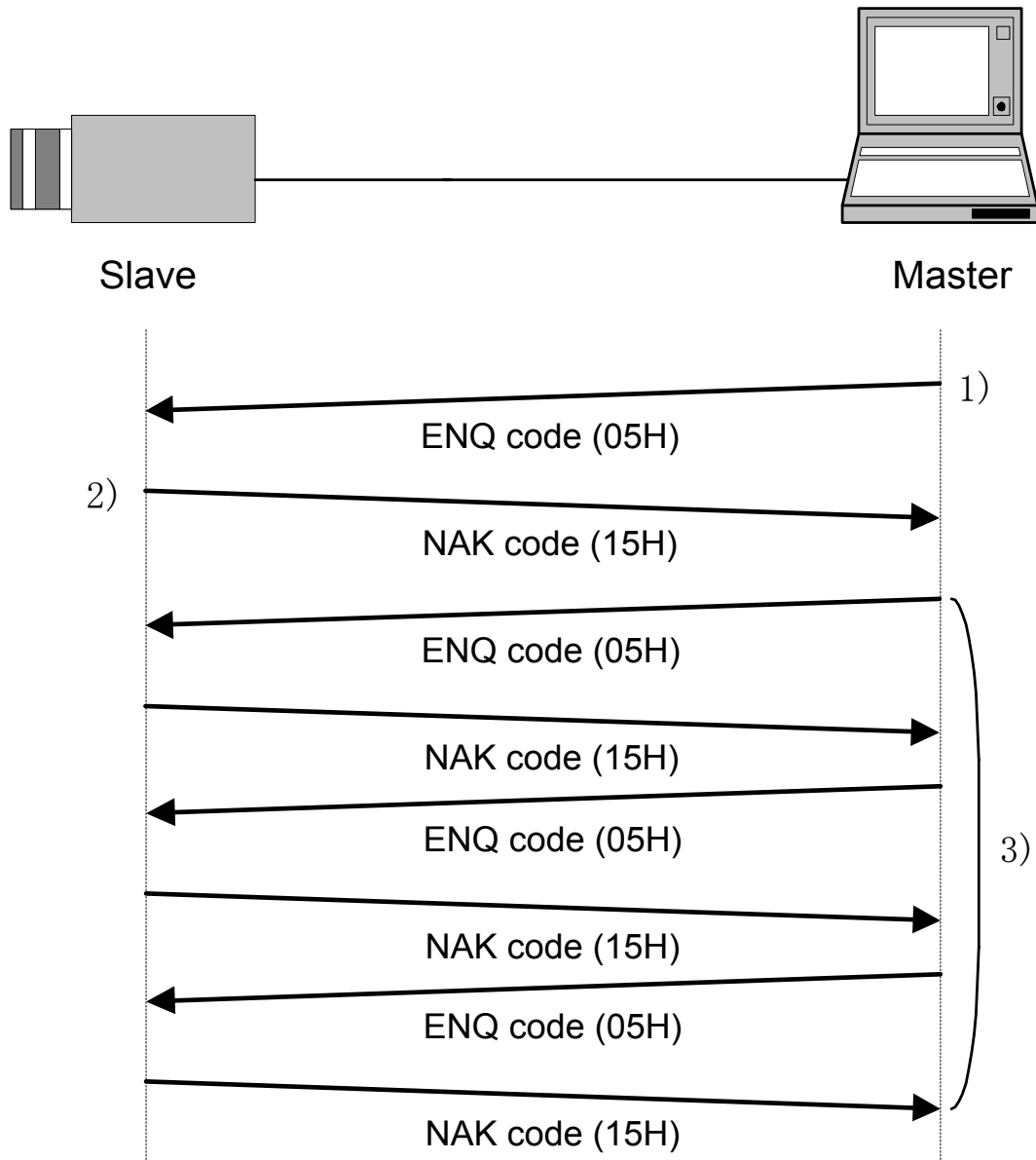
- 1) Session starts when ENQ is sent from master to slave.
- 2) Slave acknowledges by returning ACK to master.
- 3) Master sends data to slave.
- 4) Slave acknowledges receipt of data by again returning ACK to master and end the handshake.

b) Master reads data (normal process)



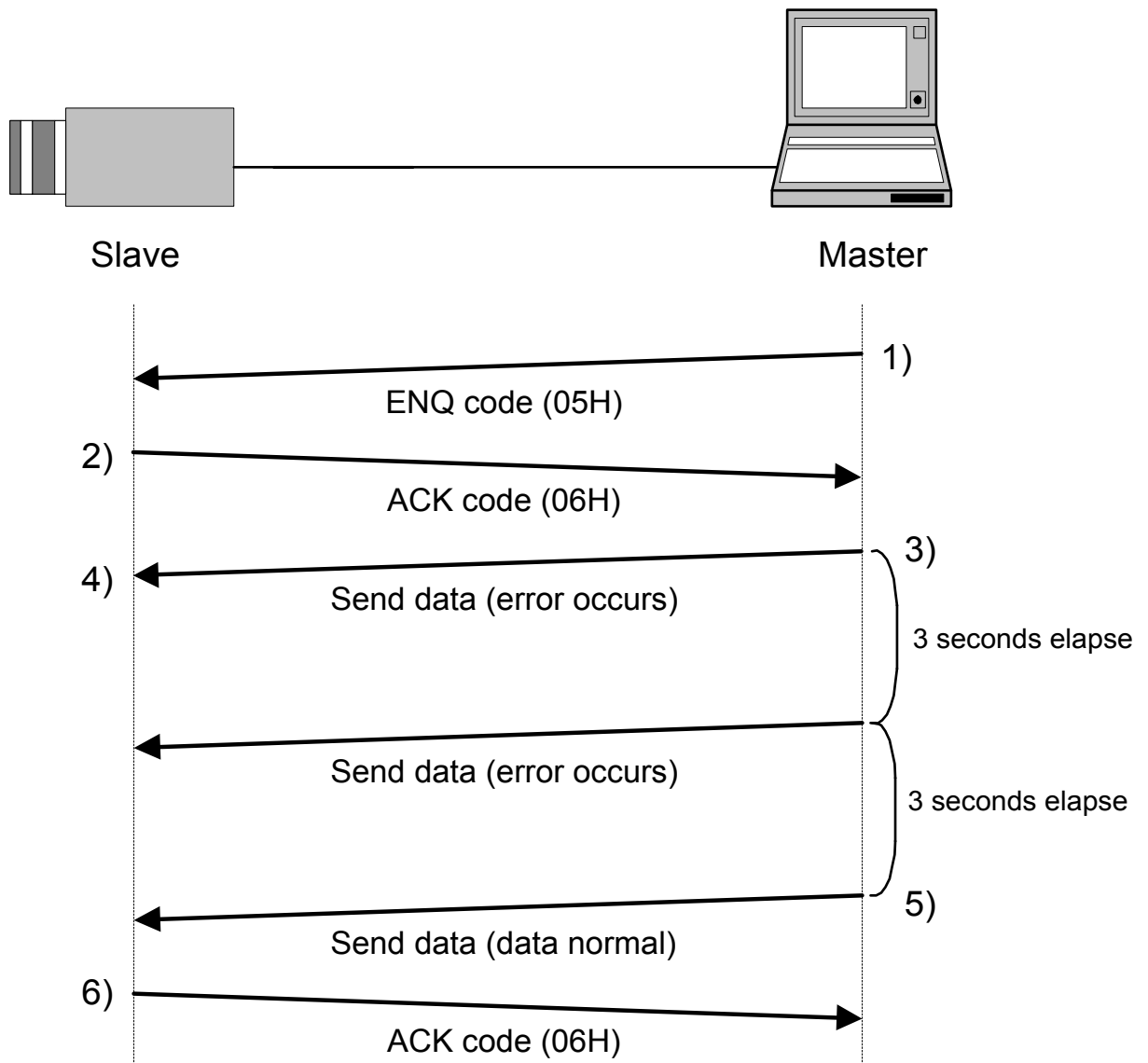
- 1) Session starts when ENQ is sent from master to slave.
- 2) Slave acknowledges by returning ACK to master.
- 3) Master sends read data command to slave.
- 4) Slave receives read data command, then acknowledges by returning ACK code to master.
- 5) Slave sends read data to master.
- 6) Master receives read data, then acknowledges by returning ACK code to slave.

c) Data transmitted by master (control abort process)



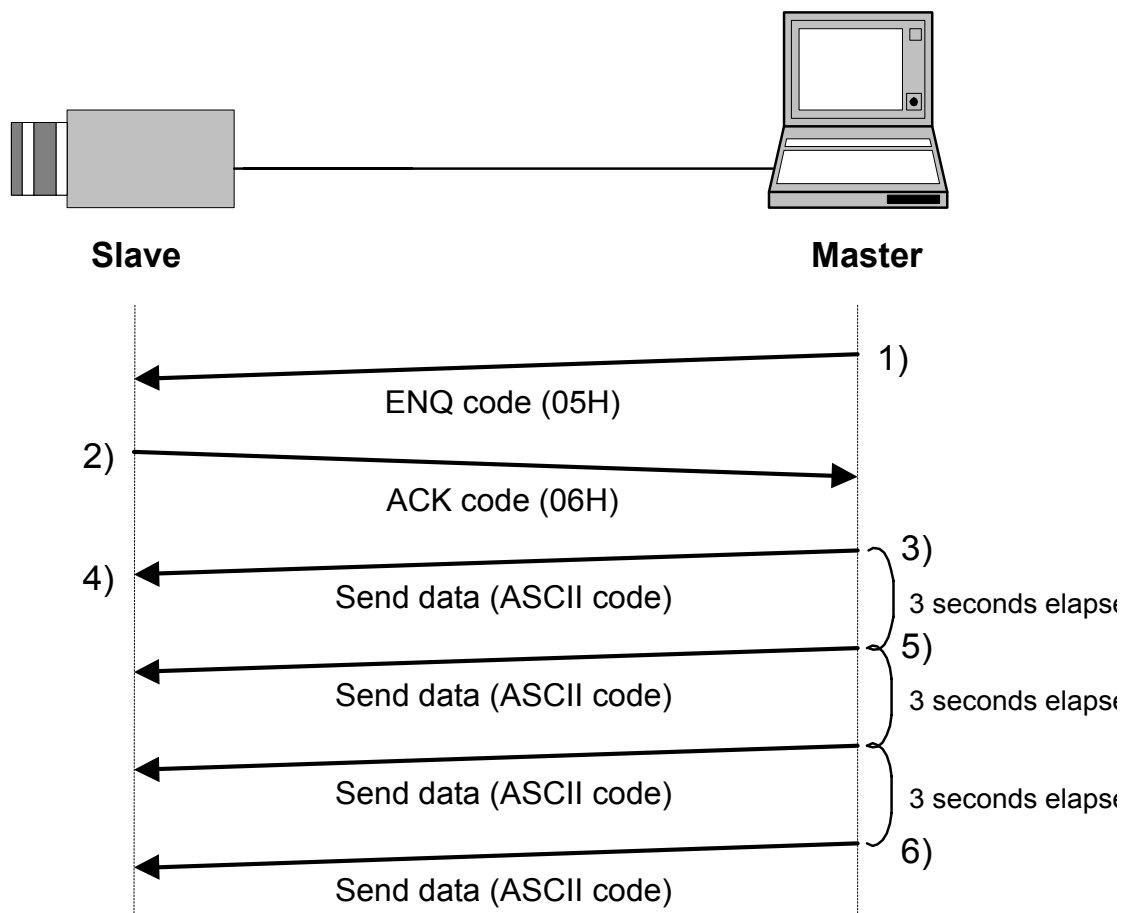
- 1) Master sends ENQ code to slave.
- 2) Since ACK code cannot be sent, slave sent NAK code to master.
- 3) Sequence is repeated 3 times in attempts to retransmit. After receiving the 3rd successive NAK code, comms control is aborted.

d) Data transmitted by master (data error process)



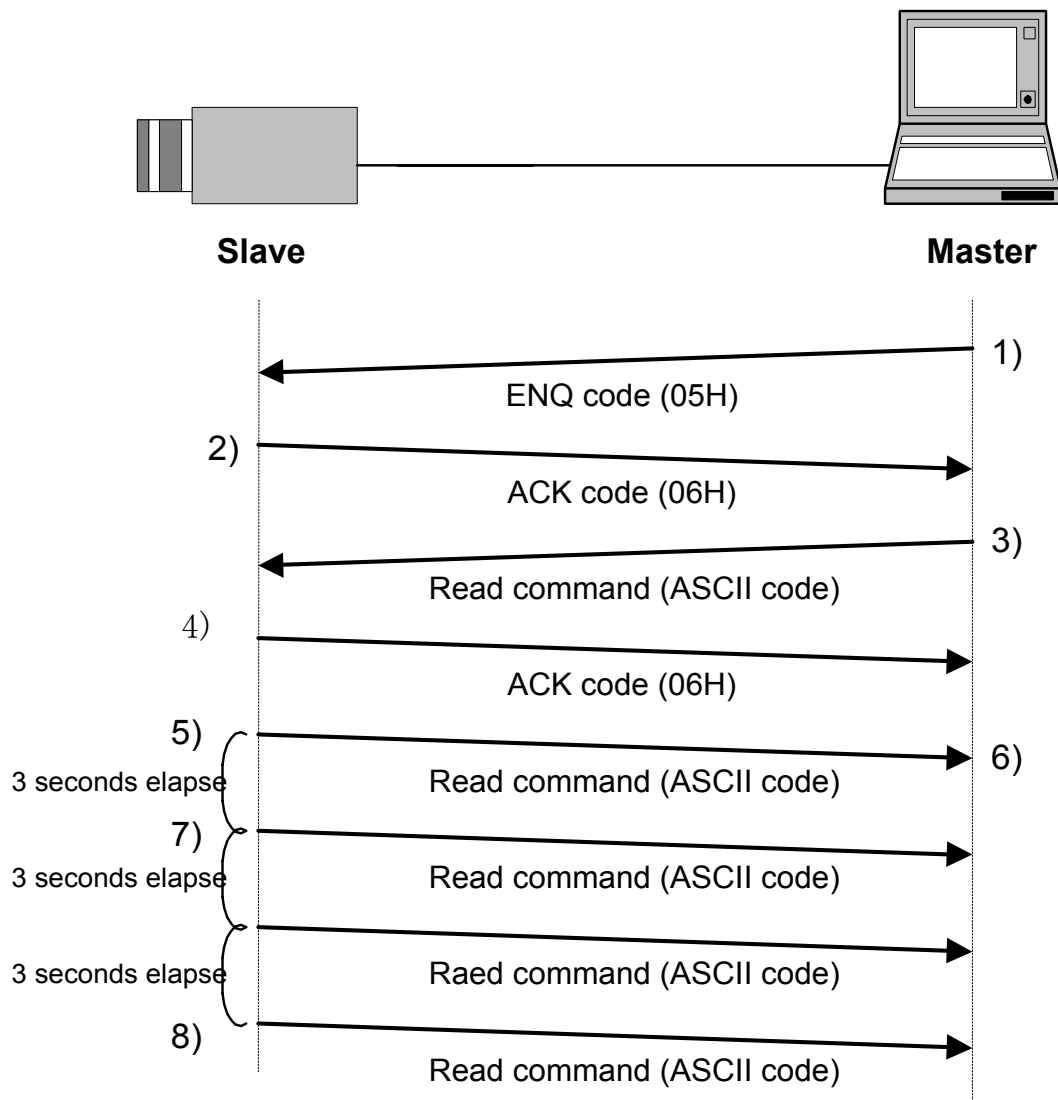
- 1) Session starts when ENQ is sent from master to slave.
- 2) Slave acknowledges by returning ACK to master.
- 3) Master sends data, but error detected (framing, over-run error).
- 4) Slave detects error and does not accept data.
- 5) Sequence 3 and 4 repeats, then master transfers normal data.
- 6) Slave detects normal data and returns ACK code to master to end the session.

e) Data frame error (Master transmission)



- 1) Session starts when ENQ is sent from master to slave.
- 2) Slave acknowledges by returning ACK to master.
- 3) Master sends data.
- 4) For some reason, slave does not receive data.
- 5) Master does not receive acknowledgment to the send code and repeats the sequence every 3 seconds for 3 times.
- 6) If unsuccessful after 3 attempts, master aborts the sequence and ends communication.

f) Transmission frame error (Master receive)



- 1) Session starts when ENQ is sent from master to slave.
- 2) Slave acknowledges by returning ACK to master.
- 3) Master sends read command.
- 4) Slave returns ACK code to acknowledge read command.
- 5) Slave sends corresponding read data to master.
- 6) For some reason, master fails to receive read data.
- 7) Slave fails to receive acknowledgment of read data and attempts to resend every 3 seconds for 3 times.
- 8) After the third failure, slave aborts the sequence and ends communication.

KP-FD30 remote control command table (Rev.1)

1) Standard command

a) Write command (Set data)

Item	STX	TEXT data								ETX	SUM									
		Status	ID	Area	R.No	Data														
Auto Light Control Mode (ALC)	AVE ^(*)	02	01	FF	01	3A	00	00	00	03	18									
	AREA	02	01	FF	01	3A	01	00	00	03	17									
	PEAK/AVE	02	01	FF	01	3A	00	00	00	03	16									
Area of Light measurement AREA SELECT (ALC: AREA) • Image <table border="1" style="margin-left: 20px;"> <tr><td>6</td><td>5</td><td>4</td></tr> <tr><td>2</td><td>1</td><td>3</td></tr> <tr><td>7</td><td>8</td><td>9</td></tr> </table>	6	5	4	2	1	3	7	8	9	NO.1 ^(*)	02	01	FF	01	1C	00	00	00	03	18
	6	5	4																	
	2	1	3																	
	7	8	9																	
	NO.2	02	01	FF	01	1C	01	00	00	03	17									
	NO.3	02	01	FF	01	1C	02	00	00	03	16									
	NO.4	02	01	FF	01	1C	03	00	00	03	15									
	NO.5	02	01	FF	01	1C	04	00	00	03	14									
	NO.6	02	01	FF	01	1C	05	00	00	03	13									
	NO.7	02	01	FF	01	1C	06	00	00	03	12									
NO.8	02	01	FF	01	1C	07	00	00	03	11										
NO.9	02	01	FF	01	1C	08	00	00	03	10										
Ratio of Peak & Average (ALC :PK/AV)	0/100 ^(*)	02	01	FF	01	39	00	00	00	03	20									
	15/ 85	02	01	FF	01	39	01	00	00	03	1F									
	30/ 70	02	01	FF	01	39	02	00	00	03	1E									
	50/ 50	02	01	FF	01	39	03	00	00	03	1D									
	75/ 25	02	01	FF	01	39	04	00	00	03	1C									
	100/ 0	02	01	FF	01	39	05	00	00	03	1B									
Video Level (ALC: LEVEL) [00-FF]	Min	02	01	FF	01	0C	00	00	00	03	19									
		02	01	FF	01	0C	**	00	00	03	**									
	Mid ^(*)	02	01	FF	01	0C	80	00	00	03	11									
		02	01	FF	01	0C	**	00	00	03	**									
	Max	02	01	FF	01	0C	FF	00	00	03	ED									
Auto Gain Control Mode (AGC)	OFF ^(*)	02	01	FF	01	06	00	00	00	03	26									
	ON	02	01	FF	01	06	01	00	00	03	25									
FIX. GAIN (AGC: OFF) [00-FF] <u>FIX. GAIN(dB) = 0.132 x DATA</u>	Min ^(*)	02	01	FF	01	2D	00	00	00	03	16									
		02	01	FF	01	2D	**	00	00	03	**									
	Max	02	01	FF	01	2D	88	00	00	03	06									
AGC LIMIT (AGC: ON) [00-FF] <u>AGC LIMIT(dB) = 0.132x DATA</u>	Min	02	01	FF	01	2F	00	00	00	03	14									
		02	01	FF	01	2F	**	00	00	03	**									
	Max ^(*)	02	01	FF	01	2F	88	00	00	03	04									

^(*) : Factory setting

Item		STX	TEXT data							ETX	SUM
			Status	ID	Area	R.No	Data				
Shutter Mode (SHUTTER)	OFF ^(*)	02	01	FF	01	17	00	00	00	03	24
	PRESET	02	01	FF	01	17	01	00	00	03	23
	VARIABL	02	01	FF	01	17	02	00	00	03	22
	AES	02	01	FF	01	17	03	00	00	03	21
	EXT TIG	02	01	FF	01	17	04	00	00	03	20
Preset Shutter Speed (SHUTTER: PRESET)	8.0 s	02	01	FF	01	08	00	00	00	03	24
	7.5 s	02	01	FF	01	08	01	00	00	03	23
	7.0 s	02	01	FF	01	08	02	00	00	03	22
	6.5 s	02	01	FF	01	08	03	00	00	03	21
	6.0 s	02	01	FF	01	08	04	00	00	03	20
	5.5 s	02	01	FF	01	08	05	00	00	03	1F
	5.0 s	02	01	FF	01	08	06	00	00	03	1E
	4.5 s	02	01	FF	01	08	07	00	00	03	1D
	4.0 s	02	01	FF	01	08	08	00	00	03	1C
	3.5 s	02	01	FF	01	08	09	00	00	03	1B
	3.0 s	02	01	FF	01	08	0A	00	00	03	13
	2.5 s	02	01	FF	01	08	0B	00	00	03	12
	2.0 s	02	01	FF	01	08	0C	00	00	03	11
	1.5 s	02	01	FF	01	08	0D	00	00	03	10
	1.0 s	02	01	FF	01	08	0E	00	00	03	0F
	1/1.5 s	02	01	FF	01	08	0F	00	00	03	0E
	1/2.0 s	02	01	FF	01	08	10	00	00	03	23
	1/2.5 s	02	01	FF	01	08	11	00	00	03	22
	1/3.0 s	02	01	FF	01	08	12	00	00	03	21
	1/3.75 s	02	01	FF	01	08	13	00	00	03	20
	1/5.0 s	02	01	FF	01	08	14	00	00	03	1F
	1/6.0 s	02	01	FF	01	08	15	00	00	03	1E
	1/7.5 s	02	01	FF	01	08	16	00	00	03	1D
	1/10 s	02	01	FF	01	08	17	00	00	03	1C
	1/15 s	02	01	FF	01	08	18	00	00	03	1B
	1/30 s	02	01	FF	01	08	19	00	00	03	1A
	1/60 s ^(*)	02	01	FF	01	08	1A	00	00	03	12
	1/100 s	02	01	FF	01	08	1B	00	00	03	11
	1/250 s	02	01	FF	01	08	1C	00	00	03	10
	1/500 s	02	01	FF	01	08	1D	00	00	03	0F
	1/1000 s	02	01	FF	01	08	1E	00	00	03	0E
1/2000 s	02	01	FF	01	08	1F	00	00	03	0D	
1/4000 s	02	01	FF	01	08	20	00	00	03	22	
1/10000 s	02	01	FF	01	08	21	00	00	03	21	

^(*) : Factory setting

Item		STX	TEXT data							ETX	SUM
			Status	ID	Area	R.No	Data				
	1/20000 s	02	01	FF	01	08	22	00	00	03	20
	1/30000 s	02	01	FF	01	08	23	00	00	03	1F
	1/50000 s	02	01	FF	01	08	24	00	00	03	1E
Variable Shutter Speed (SHUTTER: VARIABLE) [0000-0209]	1/60 s(Min) ^(*)	02	01	FF	01	09	00	00	00	03	23
		02	01	FF	01	09	**	**	00	03	**
	1/10309 s(Max)	02	01	FF	01	09	02	09	00	03	18
Exposure time(Approx.) = 16.667ms -(0.0318ms x DATA) -> SHUTTER SPEED = 1 / Exposure time											
AES Response (SHUTTER: AES)	SLOW	02	01	FF	01	41	00	00	00	03	27
	NORMAL ^(*)	02	01	FF	01	41	01	00	00	03	26
	FAST	02	01	FF	01	41	02	00	00	03	25
Ext. Trigger Mode (SHUTTER: Ext. TRIG)	ONE TRIGGER ^(*)	02	01	FF	01	51	00	00	00	03	26
	FIXED SHUTTER	02	01	FF	01	51	01	00	00	03	25
Shutter Speed (FIXED SHUTTER)	NORMAL(1/60) ^(*)	02	01	FF	01	52	00	00	00	03	25
	1/250	02	01	FF	01	52	01	00	00	03	24
	1/500	02	01	FF	01	52	02	00	00	03	23
	1/1000	02	01	FF	01	52	03	00	00	03	22
	1/2000	02	01	FF	01	52	04	00	00	03	21
	1/4000	02	01	FF	01	52	05	00	00	03	20
	1/10000	02	01	FF	01	52	06	00	00	03	1F
	1/50000	02	01	FF	01	52	07	00	00	03	1E
Polarity of Trigger Input	POSITIVE ^(*)	02	01	FF	01	53	00	00	00	03	24
	NEGATIVE	02	01	FF	01	53	01	00	00	03	23
Polarity of WEN Output	POSITIVE ^(*)	02	01	FF	01	54	00	00	00	03	23
	NEGATIVE	02	01	FF	01	54	01	00	00	03	22
White Balance mode	ATW	02	01	FF	01	04	00	00	00	03	28
	AWC	02	01	FF	01	04	01	00	00	03	27
	MANUAL ^(*)	02	01	FF	01	04	02	00	00	03	26
WB AREA mode [WHITE BALANCE :ATW]	OFF ^(*)	02	01	FF	01	3B	00	00	00	03	17
	ON	02	01	FF	01	3B	01	00	00	03	16
Area of WB Area AREA SELECT (WB AREA: ON) ● Image	NO.1 ^(*)	02	01	FF	01	3C	00	00	00	03	16
	NO.2	02	01	FF	01	3C	01	00	00	03	15
	NO.3	02	01	FF	01	3C	02	00	00	03	14
	NO.4	02	01	FF	01	3C	03	00	00	03	13
	NO.5	02	01	FF	01	3C	04	00	00	03	12
	NO.6	02	01	FF	01	3C	05	00	00	03	11
	NO.7	02	01	FF	01	3C	06	00	00	03	10
	NO.8	02	01	FF	01	3C	07	00	00	03	0F
	NO.9	02	01	FF	01	3C	08	00	00	03	0E

^(*) : Factory setting

Item	STX	TEXT data							ETX	SUM	
		Status	ID	Area	R.No	Data					
AWC(PRESET) restart	02	00	FF	01	07	00	00	00	03	26	
R-GAIN OFFSET for AWC [00-FF]	Min	02	01	FF	01	36	00	00	00	03	23
		02	01	FF	01	36	**	00	00	03	**
	Mid ^(*)	02	01	FF	01	36	80	00	00	03	1B
		02	01	FF	01	36	**	00	00	03	**
	Max	02	01	FF	01	36	FF	00	00	03	F7
B-GAIN OFFSET for AWC [00-FF]	Min	02	01	FF	01	37	00	00	00	03	22
		02	01	FF	01	37	**	00	00	03	**
	Mid ^(*)	02	01	FF	01	37	80	00	00	03	1A
		02	01	FF	01	37	**	00	00	03	**
	Max	02	01	FF	01	37	FF	00	00	03	F6
R-GAIN for MANUAL [00-FF]	Min	02	01	FF	01	0D	00	00	00	03	18
		02	01	FF	01	0D	**	00	00	03	**
	Mid ^(*)	02	01	FF	01	0D	80	00	00	03	10
		02	01	FF	01	0D	**	00	00	03	**
	Max	02	01	FF	01	0D	FF	00	00	03	EC
B-GAIN for MANUAL [00-FF]	Min	02	01	FF	01	0E	00	00	00	03	17
		02	01	FF	01	0E	**	00	00	03	**
	Mid ^(*)	02	01	FF	01	0E	80	00	00	03	0F
		02	01	FF	01	0E	**	00	00	03	**
	Max	02	01	FF	01	0E	FF	00	00	03	EB
CHROMA GAIN [00-FF]	Min	02	01	FF	01	16	00	00	00	03	25
		02	01	FF	01	16	**	00	00	03	**
	Mid ^(*)	02	01	FF	01	16	80	00	00	03	1D
		02	01	FF	01	16	**	00	00	03	**
	Max	02	01	FF	01	16	FF	00	00	03	F9
SHARPNESS [00-FF]	Min	02	01	FF	01	15	00	00	00	03	26
		02	01	FF	01	15	**	00	00	03	**
	Mid ^(*)	02	01	FF	01	15	80	00	00	03	1E
		02	01	FF	01	15	**	00	00	03	**
	Max	02	01	FF	01	15	FF	00	00	03	FA
PEDESTAL [00-FF]	Min	02	01	FF	01	10	00	00	00	03	2B
		02	01	FF	01	10	**	00	00	03	**
	Mid ^(*)	02	01	FF	01	10	80	00	00	03	23
		02	01	FF	01	10	**	00	00	03	**
	Max	02	01	FF	01	10	FF	00	00	03	FF

^(*) : Factory setting

Item		STX	TEXT data							ETX	SUM
			Status	ID	Area	R.No	Data				
GAMMA	OFF (=1.0)	02	01	FF	01	14	00	00	00	03	27
	ON (=0.45) (*)	02	01	FF	01	14	01	00	00	03	26
Video Polarity	POSITIVE (*)	02	01	FF	01	01	00	00	00	03	2B
	NEGATIVE	02	01	FF	01	01	01	00	00	03	2A
H Phase for EXT. HD/VD	Min	02	01	FF	01	0B	00	00	00	03	1A
		02	01	FF	01	0B	**	00	00	03	**
	Mid (*)	02	01	FF	01	0B	80	00	00	03	12
		02	01	FF	01	0B	**	00	00	03	**
	Max	02	01	FF	01	0B	FF	00	00	03	EE
OUTPUT	VBS,Y/C	02	01	FF	01	46	00	00	00	03	22
	R,G,B (*)	02	01	FF	01	46	01	00	00	03	21
SYNC/HD OUT	SYNC (*)	02	01	FF	01	47	00	00	00	03	21
	HD	02	01	FF	01	47	01	00	00	03	20
SYNC ON G	OFF (*)	02	01	FF	01	48	00	00	00	03	20
	ON	02	01	FF	01	48	01	00	00	03	1F
LENS TYPE	MANUAL (*)	02	01	FF	01	40	00	00	00	03	28
	AUTO	02	01	FF	01	40	01	00	00	03	27
CAMERA RESET		02	01	FF	01	4F	00	00	00	03	12
CAMERA TITLE MODE	OFF (*)	02	01	FF	01	1D	00	00	00	03	17
	TOP	02	01	FF	01	1D	01	00	00	03	16
	BOTTOM	02	01	FF	01	1D	02	00	00	03	15
INPUT CHARACTER	1 st & 2 nd characters	02	01	FF	01	1E	**	**	00	03	**
	3 rd & 4 th characters	02	01	FF	01	1F	**	**	00	03	**
	5 th & 6 th characters	02	01	FF	01	20	**	**	00	03	**
	7 th & 8 th characters	02	01	FF	01	21	**	**	00	03	**
	9 th & 10 th characters	02	01	FF	01	22	**	**	00	03	**
	11 th & 12 th characters	02	01	FF	01	23	**	**	00	03	**
	13 th & 14 th characters	02	01	FF	01	24	**	**	00	03	**
	15 th & 16 th characters	02	01	FF	01	25	**	**	00	03	**
	17 th & 18 th characters	02	01	FF	01	26	**	**	00	03	**
	19 th & 20 th characters	02	01	FF	01	27	**	**	00	03	**
	21 st & 22 nd characters	02	01	FF	01	28	**	**	00	03	**
23 rd & 24 th characters	02	01	FF	01	29	**	**	00	03	**	

** : Note: Refer to the character-code table for the symbol " ** ".

(*) : Factory setting

Charcter Code	0 (30)	A (41)	K (4B)	U (55)	! (21)	~ (7D)
	1 (31)	B (42)	L (4C)	V (56)	? (3F)	* (2A)
	2 (32)	C (43)	M (4D)	W (57)	# (A2)	% (25)
	3 (33)	D (44)	N (4E)	X (58)	& (20)	+ (2B)
	4 (34)	E (45)	O (30)	Y (59)	((5B)	- (2D)
	5 (35)	F (46)	P (50)	Z (6A)) (5D)	X (78)
	6 (36)	G (47)	Q (51)	SPACE (7F) , (2C)		/ (2F)
	7 (37)	H (48)	R (52)			. (2E) = (3D)
	8 (38)	I (49)	S (53)			: (3A) " (22)
9 (39)	J (4A)	T (54)			; (3B) ' (27)	

^(*) : Factory setting

b) Read Command (Read data)

Item	STX	TEXT data							ETX	SUM
		Status	ID	Area	R.No	Data				
Auto Light Control Mode (ALC)	02	01	FF	81	3A	00	00	00	03	10
Area of Light measurement (ALC: AREA)	02	01	FF	81	1C	00	00	00	03	10
Ratio of Peak & Average (ALC :PK/AV)	02	01	FF	81	39	00	00	00	03	18
Video Level (ALC: LEVEL)	02	01	FF	81	0C	00	00	00	03	11
Auto Gain Control Mode (AGC)	02	01	FF	81	06	00	00	00	03	1E
FIX. GAIN (AGC: OFF)	02	01	FF	81	2D	00	00	00	03	0E
AGC LIMIT (AGC: ON)	02	01	FF	81	2F	00	00	00	03	0C
Shutter Mode (SHUTTER)	02	01	FF	81	17	00	00	00	03	1C
Preset Shutter Speed (SHUTTER: PRESET)	02	01	FF	81	08	00	00	00	03	1C
Variable Shutter Speed (SHUTTER: VARIABLE)	02	01	FF	81	09	00	00	00	03	1B
AES Response (SHUTTER: AES)	02	01	FF	81	41	00	00	00	03	1F
Ext. Trigger Mode (SHUTTER: Ext. TRIG)	02	01	FF	81	51	00	00	00	03	1E
Shutter Speed (FIXED SHUTTER)	02	01	FF	81	52	00	00	00	03	1D
Polarity of Trigger Input	02	01	FF	81	53	00	00	00	03	1C
Polarity of WEN Output	02	01	FF	81	54	00	00	00	03	1B
White Balance mode	02	01	FF	81	04	00	00	00	03	20
WB AREA mode [WHITE BALANCE :ATW]	02	01	FF	81	3B	00	00	00	03	0F
Area of WB Area (WB AREA: ON)	02	01	FF	81	3C	00	00	00	03	0E
R-GAIN OFFSET for AWC	02	01	FF	81	36	00	00	00	03	1B
B-GAIN OFFSET for AWC	02	01	FF	81	37	00	00	00	03	1A
R-GAIN for MANUAL	02	01	FF	81	0D	00	00	00	03	10
B-GAIN for MANUAL	02	01	FF	81	0E	00	00	00	03	0F
CHROMA GAIN	02	01	FF	81	16	00	00	00	03	1D
SHARPNESS	02	01	FF	81	15	00	00	00	03	1E
PEDESTAL	02	01	FF	81	10	00	00	00	03	23
GAMMA	02	01	FF	81	14	00	00	00	03	1F
Video Polarity	02	01	FF	81	01	00	00	00	03	23
H Phase for EXT. HD/VD	02	01	FF	81	0B	00	00	00	03	12
OUTPUT	02	01	FF	81	46	00	00	00	03	1A
SYNC/HD OUT	02	01	FF	81	47	00	00	00	03	19
SYNC ON G	02	01	FF	81	48	00	00	00	03	18
LENS TYPE	02	01	FF	81	40	00	00	00	03	20

Item		STX	TEXT data							ETX	SUM
			Status	ID	Area	R.No	Data				
INPUT CHARACTER	1 st & 2 nd characters	02	01	FF	81	1E	00	00	00	03	0E
	3 rd & 4 th characters	02	01	FF	81	1F	00	00	00	03	0D
	5 th & 6 th characters	02	01	FF	81	20	00	00	00	03	22
	7 th & 8 th characters	02	01	FF	81	21	00	00	00	03	21
	9 th & 10 th characters	02	01	FF	81	22	00	00	00	03	20
	11 th & 12 th characters	02	01	FF	81	23	00	00	00	03	1F
	13 th & 14 th characters	02	01	FF	81	24	00	00	00	03	1E
	15 th & 16 th characters	02	01	FF	81	25	00	00	00	03	1D
	17 th & 18 th characters	02	01	FF	81	26	00	00	00	03	1C
	19 th & 20 th characters	02	01	FF	81	27	00	00	00	03	1B
	21 st & 22 nd characters	02	01	FF	81	28	00	00	00	03	1A
	23 rd & 24 th characters	02	01	FF	81	29	00	00	00	03	19

2) Special command (For adjustment of a factory)

Caution !!

- The item indicated by the special command is adjusted to the optimal value at the time of factory shipments. Please perform after reading the data set up now by the lead command and memorizing a setting value, when changing this item.
- The table shown below is written by the command (Status: 00) which does not memorize a setting value to EEPROM inside a camera. When you memorize a setting value, please set status to "01" and transmit.

a) Write command (Set data)

Item	STX	TEXT data								ETX	SUM
		Status	ID	Area	R.No	Data					
Standard sensitivity adjustment (Standard Gain) [00-77]	Min	02	00	FF	01	2E	00	00	00	03	16
		02	00	FF	01	2E	**	00	00	03	**
	Max	02	00	FF	01	2E	77	00	00	03	08
ALC Level Ref. [00-FF]	Min	02	00	FF	01	19	00	00	00	03	23
		02	00	FF	01	19	**	00	00	03	**
	Max	02	00	FF	01	19	FF	00	00	03	F7
Peak data Ref. [00-FF]	Min	02	00	FF	01	3F	00	00	00	03	14
		02	00	FF	01	3F	**	00	00	03	**
	Max	02	00	FF	01	3F	FF	00	00	03	E8
Auto Iris Ref. [00-FF]	Min	02	00	FF	01	0A	00	00	00	03	1C
		02	00	FF	01	0A	**	00	00	03	**
	Max	02	00	FF	01	0A	FF	00	00	03	F0
White Balance- R gain Ref. [0000-07FF]	Min	02	00	FF	02	81	00	00	00	03	23
		02	00	FF	02	81	**	**	00	03	**
	Max	02	00	FF	02	81	FF	07	00	03	F0
White Balance- B gain Ref. [0000-07FF]	Min	02	00	FF	02	84	00	00	00	03	20
		02	00	FF	02	84	**	**	00	03	**
	Max	02	00	FF	02	84	FF	07	00	03	ED
C-Y Matrix (Gr-y,r-g) [0000-01FF]	Min	02	00	FF	02	9B	00	00	00	03	11
		02	00	FF	02	9B	**	**	00	03	**
	Max	02	00	FF	02	9B	FF	01	00	03	E4
C-Y Matrix (Gb-y,b-g) [0000-01FF]	Min	02	00	FF	02	9C	00	00	00	03	10
		02	00	FF	02	9C	**	**	00	03	**
	Max	02	00	FF	02	9C	FF	01	00	03	E3

Item		STX	TEXT data							ETX	SUM
			Status	ID	Area	R.No	Data				
C-Y Matrix (Gb-y,r-g[+]) [0000-01FF]	Min	02	00	FF	02	9D	00	00	00	03	0F
		02	00	FF	02	9D	**	**	00	03	**
	Max	02	00	FF	02	9D	FF	01	00	03	E2
C-Y Matrix (Gb-y,r-g[-]) [0000-01FF]	Min	02	00	FF	02	9E	00	00	00	03	0E
		02	00	FF	02	9E	**	**	00	03	**
	Max	02	00	FF	02	9E	FF	01	00	03	E1
C-Y Matrix (Gr-y,b-g[+]) [0000-01FF]	Min	02	00	FF	02	9F	00	00	00	03	0D
		02	00	FF	02	9F	**	**	00	03	**
	Max	02	00	FF	02	9F	FF	01	00	03	E0
C-Y Matrix (Gr-y,b-g[-]) [0000-01FF]	Min	02	00	FF	02	A0	00	00	00	03	1B
		02	00	FF	02	A0	**	**	00	03	**
	Max	02	00	FF	02	A0	FF	01	00	03	EE
R output Gain (Kr-y/r-y) [00-FF]	Min	02	00	FF	01	59	00	00	00	03	1F
		02	00	FF	01	59	**	00	00	03	**
	Max	02	00	FF	01	59	FF	00	00	03	F3
B output Gain (Kb-y/b-y) [00-FF]	Min	02	00	FF	01	5A	00	00	00	03	17
		02	00	FF	01	5A	**	00	00	03	**
	Max	02	00	FF	01	5A	FF	00	00	03	EB
G output Gain-1 (Kg-y/r-y) [00-FF]	Min	02	00	FF	01	5B	00	00	00	03	16
		02	00	FF	01	5B	**	00	00	03	**
	Max	02	00	FF	01	5B	FF	00	00	03	EA
G output Gain-2 (Kg-y/b-y) [00-FF]	Min	02	00	FF	01	5C	00	00	00	03	15
		02	00	FF	01	5C	**	00	00	03	**
	Max	02	00	FF	01	5C	FF	00	00	03	E9
CCD Vsub Adjustment [00-FF]	Min	02	00	FF	01	4B	00	00	00	03	17
		02	00	FF	01	4B	**	00	00	03	**
	Max	02	00	FF	01	4B	FF	00	00	03	EB
Test Video mode	OFF	02	00	FF	01	38	00	00	00	03	22
	ON(Gray)	02	00	FF	01	38	01	00	00	03	21
	ON(Color)	02	00	FF	01	38	02	00	00	03	20

b) Read Command (Read data)

Item	STX	TEXT data							ETX	SUM
		Status	ID	Area	R.No	Data				
Standard sensitivity adjustment (Standard Gain)	02	01	FF	81	2E	00	00	00	03	0D
ALC Level Ref.	02	01	FF	81	19	00	00	00	03	1A
Peak data Ref.	02	01	FF	81	3F	00	00	00	03	0B
Auto Iris Ref.	02	01	FF	81	0A	00	00	00	03	13
White Balance- R gain Ref.	02	01	FF	82	81	00	00	00	03	1A
White Balance- B gain Ref.	02	01	FF	82	84	00	00	00	03	17
C-Y Matrix (Gr-y,r-g)	02	01	FF	82	9B	00	00	00	03	08
C-Y Matrix (Gb-y,b-g)	02	01	FF	82	9C	00	00	00	03	07
C-Y Matrix (Gb-y,r-g[+])	02	01	FF	82	9D	00	00	00	03	06
C-Y Matrix (Gb-y,r-g[-])	02	01	FF	82	9E	00	00	00	03	05
C-Y Matrix (Gr-y,b-g[+])	02	01	FF	82	9F	00	00	00	03	04
C-Y Matrix (Gr-y,b-g[-])	02	01	FF	82	A0	00	00	00	03	12
R output Gain (Kr-y/r-y)	02	01	FF	81	59	00	00	00	03	16
B output Gain (Kb-y/b-y)	02	01	FF	81	5A	00	00	00	03	0E
G output Gain-1 (Kg-y/r-y)	02	01	FF	81	5B	00	00	00	03	0D
G output Gain-2 (Kg-y/b-y)	02	01	FF	81	5C	00	00	00	03	0C
CCD Vsub Adjustment	02	01	FF	81	4B	00	00	00	03	0F
Test Video mode	02	00	FF	81	38	00	00	00	03	1A