54G1H Camera serial communication I/F specification

1.Outline

This I/F specification is for transferring the data, while using RS-232 to control 54G1.By this communication I/F, zoom, Focus, Lens Iris, slow scan, BLC, white balance…etc functions can be adjusted. About the I/F description as below:

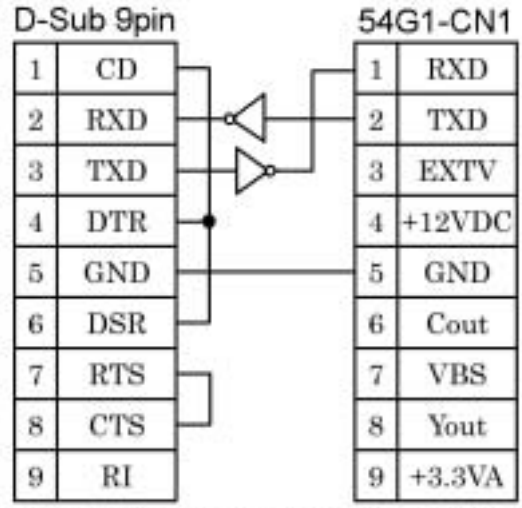


Fig-1 Coumperter & Camera connect

2.Serial communication I/F

The connection between the controller and camera is as indicated on "Fig-1". Based on the serial communication parameter of RS-232C to execute the control.

*Communicating speed 9600kbps

*Data length 8bit

*Non-Parity

*Stop bit 1

*Non-flow control

The communication is by internal synchronization way, the communication flow chart as indicated on "Fig-2".

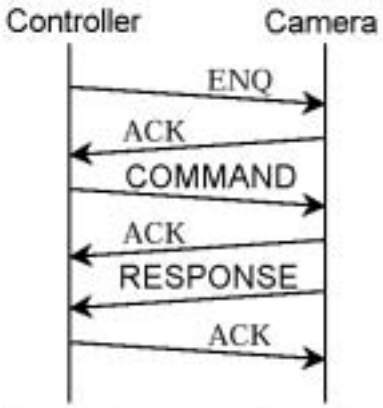


Fig-2 Communaction Flow

The connecting confirmation of the communication is by control port to send out of "ENQ", after received the "ACK" signal it will start to communicate. (The connecting confirmation of the communication can be omitted.) Then from the control port to send out the command "COMMAND" signal, and after received it the camera will return "ACK" signal back, after that the camera will proceed the "command" then send response "RESPONSE" signal back to control port; and after the control port received the signal then it will sends " "ACK" signal to the camera. This kind of communication "COMMAND" & "RESPONSE" will be executed repeatedly.

"COMMAND" & "RESPONSE" signal are 19Byte fixed length. (Fig-3)

"COMMAND" included "WRITE" command and "READ" command that through controller to set up. Besides "RESPONSE" has individual response signal to each command signal.

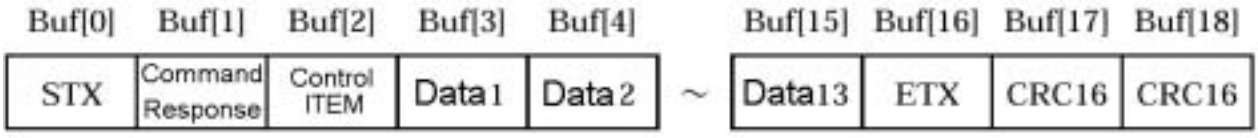


Fig-3 Command & Response

Below is the description for 1 byte & 19 byte related communication data, format of command and response.

3. Communication data format

Based on the communication data length can be divided into 2 formats

3.1 1 byte communication

To make sure the connection of “COMMAND” & “RESPONSE” communication; as well as the confirmation for “COMMAND” & “RESPONSE” of 19 byte.

Command condition

- Buf[0]=0x05 (ENQ: Make sure the connection)

Response and acknowledge condition

- Buf[0]=0x06(ACK ：OK), 0x15(NAK：error), 0x04 (EOT：Transmission end)

3.2 19byte communication data

19byte Command , Response (as indicated on Fig-3)。

- Buf[0]=0x02(STX ：Start Code)

Command condition

- Buf[1]=0x21(Write command)， 0x31(Read command)

Response condition

- Buf[1]=0xA0(OK response)， 0xA2(Buf[1] non-effective response)， 0xA3(Buf[2]~Buf[15]non-effective response)， 0xA4 (storage setting failure response) ,0xA5 (other response)
- Buf[2]=0x00~0xFF (control items)
- Buf[3]~Buf[15]=0x00~0xFF(according to Buf[2] the items come to different)
  (Buf[2]~Buf[15] effective content will be mentioned later)
- Buf[16]=0x03(ETX ：ending code)
- Buf[17]=Buf[1]~Buf[16] CRC code (calculation：$X^{16} + X^{15} + X^2 + 1$)HIGH BYTE
- Buf[18]=Buf[1]~Buf[16] CRC code (calculation：$X^{16} + X^{15} + X^2 + 1$)LOW BYTE

4.COMMAND Type:

Regarding 19byte command of Buf[2]~Buf[15] Write, Read will be mentioned aside。

4.1 Write command

Regarding the write command (Buf[1]=0x21) setting as below。

(1)IRIS item, “Peak ON/OFF” setting

- Buf[2]=0x48
- Buf[3]=0x00(Peak setting)
- Buf[4]=0x00(ON/OFF setting)
- Buf[5]=0x00(OFF),0x01(ON)
- Buf[6]~Buf[15]= non-use

(2)IRIS item, “Peak ON level” setting (Settable at “Peak ON” condition)

- Buf[2]=0x48
- Buf[3]=0x00(Peak setting)
- Buf[4]=0x01(level setting)
- Buf[5]=0x00~0x08(level)， (0x00 min， 0x08 max)
- Buf[6]~Buf[15]= non-use

(3)IRIS item, “ALC AUTO/FIX” setting
- Buf[2]=0x48
- Buf[3]=0x01(ALC setting)
- Buf[4]=0x00(AUTO/FIX setting)
- Buf[5]=0x00(AUTO),0x01(FIX)
- Buf[6]~Buf[15]= non-use

(4)IRIS item, “ALC AUTO level” setting (settable at “ALC AUTO” condition)
- Buf[2]=0x48
- Buf[3]=0x01(ALC setting)
- Buf[4]=0x01(level setting)
- Buf[5]=0x00(AUTO level)
- Buf[6]=0x00~0x08(level)，(0x00 min，0x08 max)
- Buf[7]~Buf[15]= non-use

(5)IRIS item, “ALC FIX level” setting (settable at “ALC FIX” condition)
- Buf[2]=0x48
- Buf[3]=0x01(ALC setting)
- Buf[4]=0x01(level setting)
- Buf[5]=0x01(FIX level)
- Buf[6]=0x00~0x08(level)，(0x00 min，0x08 max)
- Buf[7]~Buf[15]= non-use

(6)IRIS item, “AES AUTO/FIX” setting
- Buf[2]=0x48
- Buf[3]=0x02(AES setting)
- Buf[4]=0x00(AUTO/FIX setting)
- Buf[5]=0x00(AUTO),0x01(FIX)
- Buf[6]~Buf[15]= non-use

(7)IRIS item, “AES AUTO level” setting (settable at “AES AUTO” condition)
- Buf[2]=0x48
- Buf[3]=0x02(AES setting)
- Buf[4]=0x01(level setting)
- Buf[5]=0x00(AUTO level)
- Buf[6]=0x00~0x08(level)，(0x00 min，0x08 max)
- Buf[7]~Buf[15]= non-use

(8)IRIS item, “AES FIX Selection” setting (settable at ”AES FIX” condition)
- Buf[2]=0x48
- Buf[3]=0x02(AES setting)
- Buf[4]=0x01(level setting)
- Buf[5]=0x01(FIX selection)
- Buf[6]=0x00~0x07(selection)，
  (00-OFF，01-1/100(1/120)，02-1/250，03-1/500，04-1/1000，05-1/2000，06-1/4000，07-1/10000)
- Buf[7]~Buf[15]= non-use

(9)BLC item, “ON/OFF” setting

※ When BLC ON, and IRIS Peak will OFF。
- Buf[2]=0x18
- Buf[3]=0x00(ON/OFF setting)
- Buf[4]=0x00(OFF),0x01(ON)
- Buf[5]~Buf[15]= non-use

(10)BLC item, “Area Selection” setting (Settable at “BLC ON” condition)

- Buf[2]=0x19
- Buf[3]=0x00~0xFF(Area 1st line：left LSB, right MSB)
- Buf[4]=0x00~0xFF(Area 2nd line: left LSB, right MSB)
- Buf[5]=0x00~0xFF(Area 3rd line：left LSB, right MSB)
- Buf[6]=0x00~0xFF(Area 4th line：left LSB, right MSB)
- Buf[7]=0x00~0xFF(Area 5th line : left LSB, right MSB)
- Buf[8]=0x00~0xFF(Area 6th line：left LSB, right MSB)

  (Buf[3]~Buf[8] Area , selected bit=1)
- Buf[9]~Buf[15]= non-use

	LSB						MSB
Buf[3]	0	0	0	0	0	0	0
Buf[4]	0	0	0	0	0	0	0
Buf[5]	0	0	1	1	1	0	0
Buf[6]	0	0	1	1	1	0	0
Buf[7]	0	0	1	1	1	0	0
Buf[8]	0	0	0	0	0	0	0

(11)BLC item, “Sens Level” setting (Settable at “BLC ON” condition)

- Buf[2]=0x50
- Buf[3]=0x00~0x07(level)，(0x00 min，0x07 max)
- Buf[4]~Buf[15]= non-use

(12)AGC ・SENS item, “Freeze ON/OFF” setting

- Buf[2]=0x1A
- Buf[3]=0x03(Freeze setting)
- Buf[4]=0x00(OFF),0x01(ON)
- Buf[5]~Buf[15]= non-use

(13)AGC ・SENS item, “AGC Level” setting

- Buf[2]=0x1A
- Buf[3]=0x01(AGC setting)
- Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
- Buf[5]~Buf[15]= non-use

(14)AGC ・SENS item, “Sens Level” setting

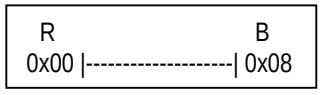
- Buf[2]=0x1A
- Buf[3]=0x02(Sens setting)
- Buf[4]=0x00~0x08(level)
- Buf[5]~Buf[15]= non-use

(15)COLOR item, “WB ATW/AWB” setting

- Buf[2]=0x1B
- Buf[3]=0x00(WB setting)
- Buf[4]=0x00(ATW),0x01(AWB)
- Buf[5]~Buf[15]= non-use

(16)COLOR item, “WB ATW Level” setting (settable, when WB at ATW mode condition)

- Buf[2]=0x1B
- Buf[3]=0x05(ATW setting)
- Buf[4]=0x00~0x08(level)
- Buf[5]~Buf[15]= non-use

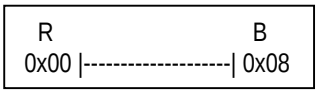


(17)COLOR item, “WB AWB ” (settable, when WB at AWB mode condition)

- Buf[2]=0x1B
- Buf[3]=0x04(AWB action)
- Buf[4]~Buf[15]= non-use

(18)COLOR item, “WB AWB Level” setting (settable, when WB at AWB mode condition)

- Buf[2]=0x1B
- Buf[3]=0x06(AWB setting)
- Buf[4]=0x00~0x08(level)
- Buf[5]~Buf[15]= non-use



(19)COLOR item, “GAIN R-Y Level” setting
- Buf[2]=0x1B
- Buf[3]=0x02(R-Y setting)
- Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
- Buf[5]~Buf[15]= non-use

(20)COLOR item, “GAIN B-Y Level” setting
- Buf[2]=0x1B
- Buf[3]=0x03(B-Y setting)
- Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
- Buf[5]~Buf[15]= non-use

(21)APC item, “H ・GAIN Level” setting
- Buf[2]=0x47
- Buf[3]=0x00(H ・GAIN setting)
- Buf[4]=0x00~0x0C(level)，(0x00 min，0x0C max)
- Buf[5]~Buf[15]= non-use

(22)APC item, “V ・GAIN Level” setting
- Buf[2]=0x47
- Buf[3]=0x01(V ・GAIN setting)
- Buf[4]=0x00~0x0C(level)，(0x00 min，0x0C max)
- Buf[5]~Buf[15]= non-use

(23)LENS item, “ZOOM Position” setting (this item settable only at “INITIAL ON” & ”Freeze” OFF & ZOOM condition, and settable range within[0x1000~0x20B0]，Digital ZOOM ON/OFF changeable condition.)

※Buf[6]~Buf[11] by non-setting condition to get the data from camera
- Buf[2]=0x45
- Buf[3]=0x00 (ZOOM position setting)
- Buf[4]=0x00~0xFF(ZOOM target position HIGH BYTE)
- Buf[5]=0x00~0xFF(ZOOM target position LOW BYTE)
- Buf[6]=0x00~0xFF(ZOOM current position HIGH BYTE)
- Buf[7]=0x00~0xFF(ZOOM current position LOW BYTE)
- Buf[8]=0x00~0xFF(FOCUS settable maximum position HIGH BYTE)
- Buf[9]=0x00~0xFF(FOCUS settable maximum position LOW BYTE)
- Buf[10]=0x00~0xFF(FOCUS settable minimum position HIGH BYTE)
- Buf[11]=0x00~0xFF(FOCUS settable minimum position LOW BYTE)
- Buf[12]~Buf[15]= non-use

(24)LENS item, “FOCUS MANUAL/AUTO” setting (this item settable only at “INITIAL ON” & Freeze OFF condition)
- Buf[2]=0x45
- Buf[3]=0x02(FOCUS setting)
- Buf[4]=0x00(MANUAL),0x01(AUTO)
- Buf[5]~Buf[15]= non-use

(25)LENS item, “FOCUS Position” setting (this item settable only at “INITIAL ON” & Freeze OFF & FOCUS MANUAL” condition and FOCUS at within settable range (ZOOM position changeable)

※Buf[6],Buf[7] by non-setting condition to get the data from camera。
- Buf[2]=0x45
- Buf[3]=0x01(FOCUS position setting)
- Buf[4]=0x00~0xFF(FOCUS target position HIGH BYTE)
- Buf[5]=0x00~0xFF(FOCUS target position LOW BYTE)
- Buf[6]=0x00~0xFF(FOCUS current position HIGH BYTE)
- Buf[7]=0x00~0xFF(FOCUS current position LOW BYTE)
- Buf[8]~Buf[15]= non-use

(26)LENS item, “One Push Auto Focus” (FOCUS MANUAL, settable)
※OSD Manual (No this item on it)
・Buf[2]=0x45
・Buf[3]=0x03(One Push Auto Focus)
・Buf[4]~Buf[15]= non-use
(27)REV item, “H ・REV ON/OFF” setting (settable at “Freeze OFF” condition)
※(29) If have not executed REV item renew command, the setting data would not be stored。
・Buf[2]=0x1D
・Buf[3]=0x05(H ・REV setting)
・Buf[4]=0x00(OFF),0x01(ON)
・Buf[5]~Buf[15]= non-use
(28)REV item, “V ・REV ON/OFF” setting
※(29) If have not executed REV item renew command, the setting data would not be stored。
・Buf[2]=0x1D
・Buf[3]=0x04(V ・REV setting)
・Buf[4]=0x00(OFF),0x01(ON)
・Buf[5]~Buf[15]= non-use
(29)REV item, “Renew”
・Buf[2]=0x1D
・Buf[3]=0x06(renew)
・Buf[4]~Buf[15]= non-use
(30)POSITION item, “ALARM NO” setting (this item settable only at “INITIAL ON” & “Freeze OFF” condition)
・Buf[2]=0x51
・Buf[3]=0x00~0x64(ALARM NO)
・Buf[4]~Buf[15]= non-use
(31)POSITION item, “POSITION” setting (this item settable only at “INITIAL ON” & “Freeze OFF” condition)
※Store ZOOM current position, FOCUS current position。
・Buf[2]=0x52
・Buf[3]=0x01(POSITION setting)
・Buf[4]=0x01~0x64(POSITION NO)
・Buf[5]~Buf[15]= non-use
(32)TITLE item, “ID Character” setting
・Buf[2]=0x10
・Buf[3]=0x01(character setting)
・Buf[4]=0x00(character 1 ~character 5：n=1)，
0x01(character 6 ~character 10：n=6)，0x02(character 11 ~character 15：n=11)，0x03(character16 ~character 20：n=16)
・Buf[5]=0x00~0xFF(n character ASCII CODE HIGH BYTE)
・Buf[6]=0x00~0xFF(n character ASCII CODE LOW BYTE)
・Buf[7]=0x00~0xFF((n+1) character ASCII CODE HIGH BYTE)
・Buf[8]=0x00~0xFF((n+1) character ASCII CODE LOW BYTE)
・Buf[9]=0x00~0xFF((n+2) character ASCII CODE HIGH BYTE)
・Buf[10]=0x00~0xFF((n+2) character ASCII CODE LOW BYTE)
・Buf[11]=0x00~0xFF((n+3) character ASCII CODE HIGH BYTE)
・Buf[12]=0x00~0xFF((n+3) character ASCII CODE LOW BYTE)
・Buf[13]=0x00~0xFF((n+4) character ASCII CODE HIGH BYTE)
・Buf[14]=0x00~0xFF((n+4) character ASCII CODE LOW BYTE)
・Buf[15]= non-use

(33)TITLE item, “ID Position UP/DOWN” setting
- Buf[2]=0x10
- Buf[3]=0x03(position setting)
- Buf[4]=0x00(UP),0x01(DOWN)
- Buf[5]~Buf[15]= non-use

(34)PRESET item, “PRESET ON/OFF” setting
- Buf[2]=0x20
- Buf[3]=0x02(ON/OFF setting)
- Buf[4]=0x00(OFF),0x01(ON)
- Buf[5]~Buf[15]= non-use

(35)PRESET item, “PRESET ” (this item settable only at “PRESET ON” condition)
- Buf[2]=0x20
- Buf[3]=0x01(action)
- Buf[4]~Buf[15]= non-use

(36)PRESET item, ”INITIAL ON/OFF” setting
- Buf[2]=0x49
- Buf[3]=0x00(OFF),0x01(ON)
- Buf[4]~Buf[15]= non-use

(37)PRESET item, “PHASE ON/OFF” setting
- Buf[2]=0x1C
- Buf[3]=0x00(ON/OFF setting)
- Buf[4]=0x00(OFF),0x01(ON)
- Buf[5]~Buf[15]= non-use

(38)PRESET item, “PHASE Position” setting (“PHASE ON” & “PHASE” at within settable range (TV mode & resolution changeable) condition.)
- Buf[2]=0x1C
- Buf[3]=0x01(position setting)
- Buf[4]=0x00~0xFF(PHASE position HIGH BYTE)
- Buf[5]=0x00~0xFF(PHASE position LOW BYTE)
- Buf[6]~Buf[15]= non-use

(39)LENS item, “ZOOM Speed level” setting (this item settable at “INITIAL ON” & “Freeze OFF” condition)
- Buf[2]=0x45
- Buf[3]=0x05(ZOOM Speed setting)
- Buf[4]=0x00~0x04(Level)
- Buf[5]~Buf[15]= non-use

(40)LENS item, “FOCUS Speed level” setting (this item settable at “INITIAL ON” & “Freeze OFF” condition)
- Buf[2]=0x45
- Buf[3]=0x07(FOCUS Speed setting)
- Buf[4]=0x00~0x04(Level)
- Buf[5]~Buf[15]= non-use

(41)LENS item, “Digital ZOOM ON/OFF” setting (this item settable at “INITIAL ON” & “Freeze OFF” condition.)
- Buf[2]=0x45
- Buf[3]=0x06(Digital ZOOM setting)
- Buf[4]=0x00(OFF)， 0x01(ON)
- Buf[5]~Buf[15]= non-use

4.2 Read Command

Regarding Read Command (Buf[1]=0x31) setting as below。

(1)IRIS item, “Peak ON/OFF” reading

※Buf[5] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x00(Peak reading)

・Buf[4]=0x00(ON/OFF reading)

・Buf[5]=0x00(OFF),0x01(ON)

・Buf[6]~Buf[15]= non-use

(2)IRIS item, “Peak ON Level” reading

※Buf[5] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x00(Peak reading)

・Buf[4]=0x01(level reading)

・Buf[5]=0x00~0x08(level)，(0x00 min，0x08 max)

・Buf[6]~Buf[15]= non-use

(3)IRIS item “ALC AUTO/FIX” reading

※Buf[5] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x01(ALC reading)

・Buf[4]=0x00(AUTO/FIX reading)

・Buf[5]=0x00(AUTO),0x01(FIX)

・Buf[6]~Buf[15]= non-use

(4)IRIS item, “ALC AUTO Level” reading

※Buf[6] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x01(ALC reading)

・Buf[4]=0x01(level reading)

・Buf[5]=0x00(AUTO level)

・Buf[6]=0x00~0x08(level)，(0x00 min，0x08 max)

・Buf[7]~Buf[15]= non-use

(5)IRIS item “ALC FIX Level” reading

※Buf[6] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x01(ALC reading)

・Buf[4]=0x01(level reading)

・Buf[5]=0x01(FIX level)

・Buf[6]=0x00~0x08(level)，(0x00 min，0x08 max)

・Buf[7]~Buf[15]= non-use

(6)IRIS item, “AES AUTO/FIX” reading

※Buf[5] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x02(AES reading)

・Buf[4]=0x00(AUTO/FIX reading)

・Buf[5]=0x00(AUTO),0x01(FIX)

・Buf[6]~Buf[15]= non-use

(7)IRIS item, “AES AUTO Level” reading

※Buf[6] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x02(AES reading)

・Buf[4]=0x01(level reading)

・Buf[5]=0x00(AUTO level)

・Buf[6]=0x00~0x08(level)，(0x00 min，0x08 max)

・Buf[7]~Buf[15]= non-use

(8)IRIS item, “AES FIX Selection” reading

※Buf[6] by non-setting condition to get the data from camera

・Buf[2]=0x48

・Buf[3]=0x02(AES reading)

・Buf[4]=0x01(level reading)

・Buf[5]=0x01(FIX selecting)

・Buf[6]=0x00~0x07(selecting)，(00-OFF，01-1/100(1/120)，02-1/250，03-1/500，04-1/1000，05-1/2000，06-1/4000，07-1/10000)

・Buf[7]~Buf[15]= non-use

(9)BLC item, “ON/OFF” reading

※Buf[4] by non-setting condition to get the data from camera

・Buf[2]=0x18

・Buf[3]=0x00(ON/OFF reading)

・Buf[4]=0x00(OFF),0x01(ON)

・Buf[5]~Buf[15]= non-use

(10)BLC item, “Area Selection” reading

※Buf[3]~Buf[8] by non-setting condition to get the data from camera

・Buf[2]=0x19

・Buf[3]=0x00~0xFF(Area 1st line：left LSB, right MSB)

・Buf[4]=0x00~0xFF(Area 2nd line：left LSB, right MSB)

・Buf[5]=0x00~0xFF(Area 3rd line：left LSB, right MSB)

・Buf[6]=0x00~0xFF(Area 4th line：left LSB, right MSB)

・Buf[7]=0x00~0xFF(Area 5th line：left LSB, right MSB)

・Buf[8]=0x00~0xFF(Area 6th line：left LSB, right MSB)

(Buf[3]~Buf[8]Area selected bit=1)

	LSB						MSB
Buf[3]	0	0	0	0	0	0	0
Buf[4]	0	0	0	0	0	0	0
Buf[5]	0	0	1	1	1	0	0
Buf[6]	0	0	1	1	1	0	0
Buf[7]	0	0	1	1	1	0	0
Buf[8]	0	0	0	0	0	0	0

・Buf[9]~Buf[15]= non-use

(11)BLC item, “Sens Level” reading

※Buf[3] by non-setting condition to get the data from camera

・Buf[2]=0x50

・Buf[3]=0x00~0x07(level)，(0x00 min，0x07 max)

・Buf[4]~Buf[15]= non-use

(12)AGC ・SENS item, “Freeze ON/OFF “ reading

※Buf[4] by non-setting condition to get the data from camera

・Buf[2]=0x1A

・Buf[3]=0x03(Freeze reading)

・Buf[4]=0x00(OFF),0x01(ON)

・Buf[5]~Buf[15]= non-use

(13)AGC ・SENS item, “AGC Level” reading

※Buf[4] by non-setting condition to get the data from camera

・Buf[2]=0x1A

・Buf[3]=0x01(AGC reading)

・Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)

・Buf[5]~Buf[15]= non-use

(14)AGC ・SENS item, “Sens Level” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1A
・Buf[3]=0x02(Sens reading)
・Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
・Buf[5]~Buf[15]= non-use
(15)COLOR item, “WB ATW/AWB” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1B
・Buf[3]=0x00(WB reading)
・Buf[4]=0x00(ATW),0x01(AWB)
・Buf[5]~Buf[15]= non-use
(16)COLOR item, “WB ATW Level” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1B
・Buf[3]=0x05(ATW reading)
・Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
・Buf[5]~Buf[15]= non-use
(17)COLOR item, “WB AWB” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1B
・Buf[3]=0x04(AWB reading)
・Buf[4]=0x00(stop),0x01(reading)
・Buf[5]~Buf[15]= non-use
(18)COLOR item, “WB AWB Level” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1B
・Buf[3]=0x06(AWB reading)
・Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
・Buf[5]~Buf[15]= non-use
(19)COLOR item, “GAIN R-Y Level” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1B
・Buf[3]=0x02(R-Y reading)
・Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
・Buf[5]~Buf[15]= non-use
(20)COLOR item, “GAIN B-Y Level” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1B
・Buf[3]=0x03(B-Y reading)
・Buf[4]=0x00~0x08(level)，(0x00 min，0x08 max)
・Buf[5]~Buf[15]= non-use
(21)APC item, “H ・GAIN Level” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x47
・Buf[3]=0x00(H ・GAIN reading)
・Buf[4]=0x00~0x0C(level)，(0x00 min，0x0C max)
・Buf[5]~Buf[15]= non-use

(22)APC item, “V ・GAIN Level” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x47
・Buf[3]=0x01(V ・GAIN reading)
・Buf[4]=0x00~0x0C(level)，(0x00 min，0x0C max)
・Buf[5]~Buf[15]= non-use
(23)LENS item, “ZOOM Position” reading
※Buf[4]~Buf[11] by non-setting condition to get the data from camera
・Buf[2]=0x45
・Buf[3]=0x00(ZOOM position setting)
・Buf[4]=0x00~0xFF(ZOOM target position HIGH BYTE)
・Buf[5]=0x00~0xFF(ZOOM target position LOW BYTE)
・Buf[6]=0x00~0xFF(ZOOM current position HIGH BYTE)
・Buf[7]=0x00~0xFF(ZOOM current position LOW BYTE)
・Buf[8]=0x00~0xFF(FOCUS settable maximum position HIGH BYTE)
・Buf[9]=0x00~0xFF(FOCUS settable maximum position LOW BYTE)
・Buf[10]=0x00~0xFF(FOCUS settable minimum position HIGH BYTE)
・Buf[11]=0x00~0xFF(FOCUS settable minimum positon LOW BYTE)
・Buf[12]~Buf[15]= non-use
(24)LENS item, “FOCUS MANUAL/AUTO” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x45
・Buf[3]=0x02(FOCUS reading)
・Buf[4]=0x00(MANUAL),0x01(AUTO)
・Buf[5]~Buf[15]= non-use
(25)LENS item, “FOCUS Position” reading
※Buf[4]~Buf[7] by non-setting condition to get the data from camera
・Buf[2]=0x45
・Buf[3]=0x01(FOCUS position reading)
・Buf[4]=0x00~0xFF(FOCUS current position HIGH BYTE)
・Buf[5]=0x00~0xFF(FOCUS current position LOW BYTE)
・Buf[6]=0x00~0xFF(FOCUS current position HIGH BYTE)
・Buf[7]=0x00~0xFF(FOCUS current position LOW BYTE)
・Buf[8]~Buf[15]= non-use
(26)REV item, “H ・REV ON/OFF” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1D
・Buf[3]=0x05(H ・REV reading)
・Buf[4]=0x00(OFF),0x01(ON)
・Buf[5]~Buf[15]= non-use
(27)REV item, “V ・REV ON/OFF” reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x1D
・Buf[3]=0x04(V ・REV reading)
・Buf[4]=0x00(OFF),0x01(ON)
(28)POSITION item, “ALARM NO” reading
※Buf[3] by non-setting condition to get the data from camera
・Buf[2]=0x51
・Buf[3]=0x00~0x64(ALARM NO)
・Buf[4]~Buf[15]= non-use

(29)POSITION item,　“POSITION NO” reading

※Buf[4] by non-setting condition to get the data from camera

・Buf[2]=0x52

・Buf[3]=0x00(POSITION NO reading)

・Buf[4]=0x01~0x64(POSITION NO)

・Buf[5]~Buf[15]= non-use

((30)POSITION item, “POSITION” reading (this item readable at “INITIAL ON” & “Freeze OFF” condition)

※Camera POSITION NO / “ZOOM position” & “FOCUS position”。

・Buf[2]=0x52

・Buf[3]=0x01(POSITION reading)

・Buf[4]=0x01~0x64(POSITION NO)

・Buf[5]~Buf[15]= non-use

(31)TITLE item, “ID Character” reading

※Buf[5]~Buf[14] by non-setting condition to get the data from camera

・Buf[2]=0x10

・Buf[3]=0x01(character reading)

・Buf[4]=0x00(character1 ~character 5：n=1)，
0x01(character 6 ~ character10：n=6)，0x02(character 11 ~character 15：n=11)，0x03(character 16 ~character 20：n=16)

・Buf[5]=0x00~0xFF(n character ASCII CODE　HIGH BYTE)

・Buf[6]=0x00~0xFF(n character ASCII CODE　LOW BYTE)

・Buf[7]=0x00~0xFF((n+1) character ASCII CODE　HIGH BYTE)

・Buf[8]=0x00~0xFF((n+1) character ASCII CODE　LOW BYTE)

・Buf[9]=0x00~0xFF((n+2) character ASCII CODE　HIGH BYTE)

・Buf[10]=0x00~0xFF((n+2) character ASCII CODE　LOW BYTE)

・Buf[11]=0x00~0xFF((n+3) character ASCII CODE　HIGH BYTE)

・Buf[12]=0x00~0xFF((n+3) character ASCII CODE　LOW BYTE)

・Buf[13]=0x00~0xFF((n+4) character ASCII CODE　HIGH BYTE)

・Buf[14]=0x00~0xFF((n+4) character ASCII CODE　LOW BYTE)

・Buf[15]= non-use

(32)TITLE item, “ID position” UP/DOWN reading

※Buf[4] by non-setting condition to get the data from camera

・Buf[2]=0x10

・Buf[3]=0x03(position reading)

・Buf[4]=0x00(UP),0x01(DOWN)

・Buf[5]~Buf[15]= non-use

(33)PRESET item, “PRESET ON/OFF” reading

※Buf[4] by non-setting condition to get the data from camera

・Buf[2]=0x20

・Buf[3]=0x02(ON/OFF reading)

・Buf[4]=0x00(OFF),0x01(ON)

・Buf[5]~Buf[15]= non-use

(34)PRESET item, “INITIAL ON/OFF” reading

※Buf[3] by non-setting condition to get the data from camera

・Buf[2]=0x49

・Buf[3]=0x00(OFF),0x01(ON)

・Buf[4]~Buf[15]= non-use

(35)PRESET item “PHASE ON/OFF” reading
※Buf[4]~Buf[8] by non-setting condition to get the data from camera
・Buf[2]=0x1C
・Buf[3]=0x00(ON/OFF reading)
・Buf[4]=0x00(OFF),0x01(ON)
・Buf[5]=0x00~0xFF(PHASE settable maximum position HIGH BYTE)
・Buf[6]=0x00~0xFF(PHASE settable maximum position LOW BYTE)
・Buf[7]=0x00~0xFF(PHASE settable minimum position HIGH BYTE)
・Buf[8]=0x00~0xFF(PHASE settable minimum position LOW BYTE)
・Buf[9]~Buf[15]= non-use
(36)PRESET item, “PHASE Position” reading
※Buf[4],Buf[5] by non-setting condition to get the data from camera
・Buf[2]=0x1C
・Buf[3]=0x01(position reading)
・Buf[4]=0x00~0xFF(PHASE position HIGH BYTE)
・Buf[5]=0x00~0xFF(PHASE position LOW BYTE)
・Buf[6]~Buf[15]= non-use
(37)LENS item, “ZOOM Speed level” position reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x45
・Buf[3]=0x05(ZOOM Speed reading)
・Buf[4]=0x00~0x04(Level)
・Buf[5]~Buf[15]= non-use
(38)LENS item, “FOCUS Speed level” position reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x45
・Buf[3]=0x07(FOCUS Speed reading)
・Buf[4]=0x00~0x04(Level)
・Buf[5]~Buf[15]= non-use
(39)LENS item, “Digital ZOOM ON/OFF “reading
※Buf[4] by non-setting condition to get the data from camera
・Buf[2]=0x45
・Buf[3]=0x06(Digital ZOOM reading)
・Buf[4]=0x00 (OFF)，0x01 (ON))
・Buf[5]~Buf[15]= non-use

5. Response type:
Regarding19byte Response Buf[2]~Buf[15], it’s the same, from Buf[1] changed to “response”19byte Command。
Regarding Write Command Corresponding Response，to “Write Command Response”，and to “Read Command Response”，Please refer to the individual “Read Command”。