Camera serial communication I/F specification

1.Outline

This I/F specification is for transferring the data, while using RS-232 to control 54G2.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:

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".

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.

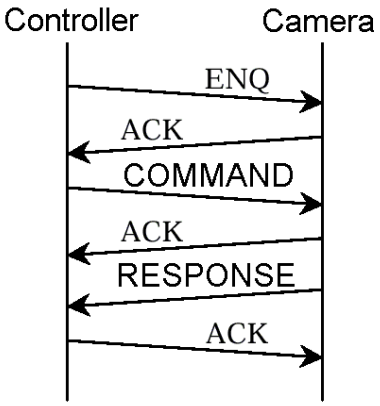


Fig-2 Communaction Flow

"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.

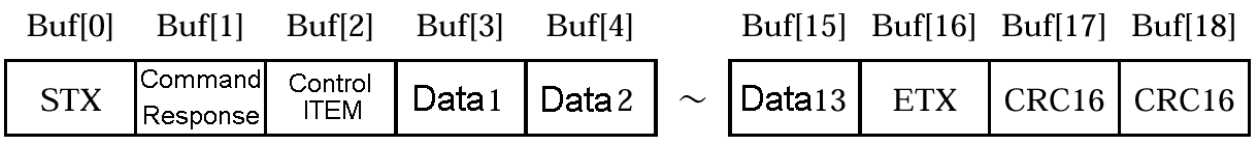


Fig-3 Command & Response

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)

	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” 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

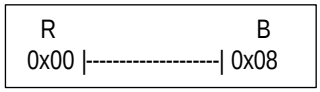
(16)COLOR item, “WB ATW Level” setting (settable, when WB at ATW mode condition)

· 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)

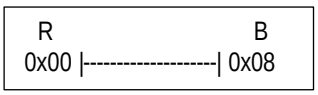
· Buf[2]=0x1B

· 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

(42)AGC · SENS item," Freeze mode Filed or Frame" setting

· Buf[2]=0x1A

· Buf[3]=0x04(Freeze setting)

· Buf[4]=0x00(Field),0x01(Frame)

· Buf[5]~Buf[15]= non-use

(43)POSITION item Freeze NO/OFF setting (this item settable at "INITIAL ON"&"AGC.SENS" item Freeze OFF condition)

- Buf[2]=0x52
- Buf[3]=0x04(Freeze setting)
- Buf[4]=0x00(OFF),0x01(ON)
- Buf[5]~Buf[15]= non-use

(44)REV item image POSI/NEGA setting

?(29) If have not executed REV item renew command, the setting data would not be stored?

- Buf[2]=0x1D
- Buf[3]=0x07(POSI/NEGA setting)
- Buf[4]=0x00(POSI),0x01(NEGA)
- Buf[5]~Buf[15]=non-use

(45)MARK item ON/OFF setting

- Buf[2]=0x56
- Buf[3]=0x00(MARK setting)
- Buf[4]=0x00(OFF),0x01(ON)
- Buf[5]~Buf[15]=non-use

(46)MARK display position setting (this item settable at " MARK ON" and must be at the display range)

- Buf[2]=0x56
- Buf[3]=0x01(Position setting)
- Buf[4]=0x00~0x0FF (HOR. position)
- Buf[5]=0x00~0x0FF (VER. position)
- Buf[6]~Buf[15]=non-use

(47)POSITION item, "POSITION DATA" setting

?Write ZOOM position data, FOCUS position data?

- Buf[2]=0x0F
- Buf[3]=0x02
- Buf[4]=0x00~0x7F(Address)
- Buf[5]=0x00~0XFF(Zoom/Focus Data HIGH BYTE)
- Buf[6]=0x00~0XFF(Zoom/Focus Data LOW BYTE)
- Buf[7]~Buf[15]= non-use

Buf[4]=(EVEN number) , Buf[5]&Buf[6] are Zoom data
Buf[4]=(ODD number) , Buf[5]&Buf[6] are Focus data
Address

0x01 : Zoom position for Position No.1
0x02 : Focus position for Position No.1
0x03 : Zoom position for Position No.2
0x04 : Focus position for Position No.2
0x05 : Zoom position for Position No.3
0x06 : Focus position for Position No.3
:
:
:
:
:
0x7A : Zom position for Position No.62
0x7B : Fcus position for Position No.62
0x7C : Zoom position for Position No.63

0x7D : Focus position for Position No.63
0x7E : Zoom position for Position No.64
0x7F : Focus position for Position No.64

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)
- 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” 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

2.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

2.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

2.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

2.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

2.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

2.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

2.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

2.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

2. 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

(40)AGC . SENS item ” Freeze Field/Frame” mode reading

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

- Buf[2]=0x1A
- Buf[3]=0x04(Freeze mode reading)
- Buf[4]=0x00 (Field)，0x01 (Frame)
- Buf[5]~Buf[15]=non-use

(41)POSITION item Freeze ON/OFF state reading

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

- Buf[2]=0x52
- Buf[3]=0x02(Freeze state reading)
- Buf[4]=0x00 (OFF)，0x01 (ON)

· Buf[5]~Buf[15]=non-used

(42)REV item “POSI/NEGA” mode reading

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

- Buf[2]=0x1D
- Buf[3]=0x07(POSI/NEGA mode reading)
- Buf[4]=0x00 (POSI)，0x01 (NEGA)
- Buf[5]~Buf[15]=non-use

(43)MARK item “ON/OFF” state reading

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

- Buf[2]=0x56
- Buf[3]=0x00(MARK state reading)
- Buf[4]=0x00 (OFF)，0x01 (ON)
- Buf[5]~Buf[15]=non-use

(44)MARK item display position data reading

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

- Buf[2]=0x56
- Buf[3]=0x00(Display position data read)
- Buf[4]=0x00~0xFF (Hor. position)
- Buf[5]=0x00~0xFF (Ver. position)
- Buf[6]=0x00~0xFF (Hor. Position can be set min. data)
- Buf[7]=0x00~0xFF (Hor. Position can be set max. data)
- Buf[8]=0x00~0xFF (Ver. Position can be set min. data)
- Buf[9]=0x00~0xFF (Ver. Position can be set max. data)
- Buf[10]~Buf[15]=non-use

(45)POSITION item, “POSITION DATA” reading

?Read ZOOM position data, FOCUS position data?

- Buf[2]=0x0F
- Buf[3]=0x02
- Buf[4]=0x00~0x7F(Address)
- Buf[5]=0x00~0XFF(Zoom/Focus Data HIGH BYTE)
- Buf[6]=0x00~0XFF(Zoom/Focus Data LOW BYTE)
- Buf[7]~Buf[15]= non-use

Buf[4]=(EVEN number) , Buf[5]&Buf[6] are Zoom data
Buf[4]=(ODD number) , Buf[5]&Buf[6] are Focus data
Address

0x01： Zoom position for Position No.1
0x02： Focus position for Position No.1
0x03： Zoom position for Position No.2
0x04： Focus position for Position No.2
0x05： Zoom position for Position No.3
0x06： Focus position for Position No.3
:
:
:
:
0x7A： Zom position for Position No.62
0x7B： Fcus position for Position No.62
0x7C： Zoom position for Position No.63

0x7D : Focus position for Position No.63
0x7E : Zoom position for Position No.64
0x7F : Focus position for Position No.64

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"?

54G2 Macro read Instruction set

Buf[0]	Buf[1]	Buf[2]	Buf[3]	Buf[4]		Buf[15]	Buf[16]	Buf[17]	Buf[18]
STX	Command Response	Control ITEM	Data1	Data2	~	Data13	ETX	CRC16	CRC16

(1)Macro readout instruction 1
?Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x00(Instruction 1)
- Buf[4]=0x00~0xFF(TITLE item 1st ID character ASCII CODE HIGH BYTE)
- Buf[5]=0x00~0xFF(TITLE item 1st ID character ASCII CODE LOW BYTE)
- Buf[6]=0x00~0xFF(TITLE item 2nd ID character ASCII CODE HIGH BYTE)
- Buf[7]=0x00~0xFF(TITLE item 2nd ID character ASCII CODE LOW BYTE)
- Buf[8]=0x00~0xFF(TITLE item 3rd ID character ASCII CODE HIGH BYTE)
- Buf[9]=0x00~0xFF(TITLE item 3rd ID character ASCII CODE LOW BYTE)
- Buf[10]=0x00~0xFF(TITLE item 4th ID character ASCII CODE HIGH BYTE)
- Buf[11]=0x00~0xFF(TITLE item 4th ID character ASCII CODE LOW BYTE)
- Buf[12]=0x00~0xFF(TITLE item 5th ID character ASCII CODE HIGH BYTE)
- Buf[13]=0x00~0xFF(TITLE item 5th ID character ASCII CODE LOW BYTE)
- Buf[14]=0x00~0xFF(DSP-address 0x01 set data HIGH BYTE)
- Buf[15]=0x00~0xFF(DSP-address 0x01 set data LOW BYTE)

(2) Macro readout instruction 2
?Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x01(Instruction 2)
- Buf[4]=0x00~0xFF(TITLE item 6th ID character ASCII CODE HIGH BYTE)
- Buf[5]=0x00~0xFF(TITLE item 6th ID character ASCII CODE LOW BYTE)
- Buf[6]=0x00~0xFF(TITLE item 7th ID character ASCII CODE HIGH BYTE)
- Buf[7]=0x00~0xFF(TITLE item 7th ID character ASCII CODE LOW BYTE)
- Buf[8]=0x00~0xFF(TITLE item 8th ID character ASCII CODE HIGH BYTE)
- Buf[9]=0x00~0xFF(TITLE item 8th ID character ASCII CODE LOW BYTE)
- Buf[10]=0x00~0xFF(TITLE item 9th ID character ASCII CODE HIGH BYTE)
- Buf[11]=0x00~0xFF(TITLE item 9th ID character ASCII CODE LOW BYTE)
- Buf[12]=0x00~0xFF(TITLE item 10th ID character ASCII CODE HIGH BYTE)
- Buf[13]=0x00~0xFF(TITLE item 10th ID character ASCII CODE LOW BYTE)

· Buf[14]=0x00~0xFF(DSP-address 0x40 set data HIGH BYTE)
· Buf[15]=0x00~0xFF(DSP-address 0x40 set data LOW BYTE)

(3) Macro readout instruction 3

2. Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x02(Instruction 3)
- Buf[4]=0x00~0xFF(TITLE item 11th ID character ASCII CODE HIGH BYTE)
- Buf[5]=0x00~0xFF(TITLE item 11th ID character ASCII CODE LOW BYTE)
- Buf[6]=0x00~0xFF(TITLE item 12th ID character ASCII CODE HIGH BYTE)
- Buf[7]=0x00~0xFF(TITLE item 12th ID character ASCII CODE LOW BYTE)
- Buf[8]=0x00~0xFF(TITLE item 13th ID character ASCII CODE HIGH BYTE)
- Buf[9]=0x00~0xFF(TITLE item 13th ID character ASCII CODE LOW BYTE)
- Buf[10]=0x00~0xFF(TITLE item 14th ID character ASCII CODE HIGH BYTE)
- Buf[11]=0x00~0xFF(TITLE item 14th ID character ASCII CODE LOW BYTE)
- Buf[12]=0x00~0xFF(TITLE item 15th ID character ASCII CODE HIGH BYTE)
- Buf[13]=0x00~0xFF(TITLE item 15th ID character ASCII CODE LOW BYTE)
- Buf[14]=0x00(OFF)，0x01(ON) (REV item V • REV ON/OFF)
- Buf[15]=0x00(OFF)，0x01(ON) (REV item H • REV ON/OFF)

(4) Macro readout instruction 4

2. Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x03(Instruction 4)
- Buf[4]=0x00~0xFF(TITLE item 16th ID character ASCII CODE HIGH BYTE)
- Buf[5]=0x00~0xFF(TITLE item 16th ID character ASCII CODE LOW BYTE)
- Buf[6]=0x00~0xFF(TITLE item 17th ID character ASCII CODE HIGH BYTE)
- Buf[7]=0x00~0xFF(TITLE item 17th ID character ASCII CODE LOW BYTE)
- Buf[8]=0x00~0xFF(TITLE item 18th ID character ASCII CODE HIGH BYTE)
- Buf[9]=0x00~0xFF(TITLE item 18th ID character ASCII CODE LOW BYTE)
- Buf[10]=0x00~0xFF(TITLE item 19th ID character ASCII CODE HIGH BYTE)
- Buf[11]=0x00~0xFF(TITLE item 19th ID character ASCII CODE LOW BYTE)
- Buf[12]=0x00~0xFF(TITLE item 20th ID character ASCII CODE HIGH BYTE)
- Buf[13]=0x00~0xFF(TITLE item 20th ID character ASCII CODE LOW BYTE)
- Buf[14]=0x00(UP)，0x01(DOWN) (TITLE item ID display UP/DOWN)
- Buf[15]=0x00(OFF)，0x01(ON) (BLC item ON/OFF)

(5) Macro readout instruction 5

?Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x04(Instruction 5)
- Buf[4]=0x00~0xFF(BLC item Area 1ST line : LEFT - LSB ,RIGHT - MSB)
- Buf[5]=0x00~0xFF(BLC item Area 2nd line : LEFT - LSB ,RIGHT - MSB)
- Buf[6]=0x00~0xFF(BLC item Area 3rd line : LEFT - LSB ,RIGHT - MSB)
- Buf[7]=0x00~0xFF(BLC item Area 4th line : LEFT - LSB ,RIGHT - MSB)
- Buf[8]=0x00~0xFF(BLC item Area 5th line : LEFT - LSB ,RIGHT - MSB)
- Buf[9]=0x00~0xFF(BLC item Area 6th line : LEFT - LSB ,RIGHT - MSB)
  (Buf[4]~Buf[9]Area select bit=1)

	LSB						MSB
Buf[4]	0	0	0	0	0	0	0
Buf[5]	0	0	0	0	0	0	0
Buf[6]	0	0	1	1	1	0	0
Buf[7]	0	0	1	1	1	0	0
Buf[8]	0	0	1	1	1	0	0
Buf[9]	0	0	0	0	0	0	0

- Buf[10]=0x00(ATW)，0x01(AWB) (COLOR item WB ATW/AWB)
- Buf[11]=0x00~0x08(COLOR item ATW Level)
- Buf[12]=0x00~0x08(COLOR item AWB Level)
- Buf[13]=0x00~0x08(COLOR item GAIN R-Y Level)
- Buf[14]=0x00~0x08(COLOR item GAIN R-Y Level)
- Buf[15]=0x00(stop)，0x01(operation) (COLOR item WB AWB state)

(6) Macro readout instruction 6

?Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x05(Instruction 6)
- Buf[4]=0x00(OFF),0x01(ON) (PRESET item PHASE ON/OFF)
- Buf[5]=0x00~0xFF(PRESET item PHASE settable maximum position HIGH BYTE)
- Buf[6]=0x00~0xFF(PRESET item PHASE settable maximum position LOW BYTE)
- Buf[7]=0x00~0xFF(PRESET item PHASE settable minimum position HIGH BYTE)
- Buf[8]=0x00~0xFF(PRESET item PHASE settable minimum position LOW BYTE)
- Buf[9]=0x00~0xFF(PRESET item PHASE current position HIGH BYTE)
- Buf[10]=0x00~0xFF(PRESET item PHASE current position LOW BYTE)
- Buf[11]=0x00~0x07(BLC item SENS LEVEL)
- Buf[12]=0x00~0x08(AGC • SENS item AGC LEVEL)
- Buf[13]=0x00~0x08(AGC • SENS item SENS LEVEL)
- Buf[14]=0x00(OFF)，0x01(ON) (AGC • SENS item Freeze ON/OFF)
- Buf[15]=0x00(OFF)，0x01(ON) (PRESET item INITIAL ON/OFF)

(7) Macro readout instruction 7

?Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x06(Instruction 7)
- Buf[4]=0x00(OFF),0x01(ON) (IRIS item PEAK ON/OFF)
- Buf[5]=0x00~0x08(IRIS item PEAK ON LEVEL)
- Buf[6]=0x00(AUTO),0x01(FIX) (IRIS item ALC AUTO/FIX)
- Buf[7]=0x00~0x08(IRIS item ALC AUTO LEVEL)
- Buf[8]=0x00~0x08(IRIS item ALC FIX LEVEL)
- Buf[9]=0x00(AUTO),0x01(FIX) (IRIS item AES AUTO/FIX)
- Buf[10]=0x00~0x08(IRIS item AES AUTO LEVEL)
- Buf[11]=0x00~0x07(IRIS item AES FIX select)
- Buf[12]=0x00~0x0C(APC item H • GAIN LEVEL)
- Buf[13]=0x00~0x0C(APC item V • GAIN LEVEL)
- Buf[14]=0x00~0x40(POSITION item ALARM NO.)
- Buf[15]= 0x00(OFF)，0x01(ON) (LENST item DIGITAL ZOOM ON/OFF)

(8) Macro readout instruction 8

?Buf[4]~Buf[15] by non-setting condition to get the data from camera

- Buf[2]=0x60(Macro read)
- Buf[3]=0x07(Instruction 8)
- Buf[4]=0x00~0xFF(LENS item ZOOM target position HIGH BYTE)
- Buf[5]=0x00~0xFF(LENS item ZOOM target position LOW BYTE)
- Buf[6]=0x00~0xFF(LENS item ZOOM current position HIGH BYTE)
- Buf[7]=0x00~0xFF(LENS item ZOOM current position LOW BYTE)
- Buf[8]=0x00~0xFF(LENS item FOCUS settable maximum position HIGH BYTE)
- Buf[9]=0x00~0xFF(LENS item FOCUS settable maximum position LOW BYTE)
- Buf[10]=0x00~0xFF(LENS item FOCUS settable minimum position HIGH BYTE)
- Buf[11]=0x00~0xFF(LENS item FOCUS settable minimum position LOW BYTE)
- Buf[12]=0x00~0xFF(LENS item FOCUS target position HIGH BYTE)
- Buf[13]=0x00~0xFF(LENS item FOCUS target position LOW BYTE)
- Buf[14]=0x00~0xFF(LENS item FOCUS current position HIGH BYTE)
- Buf[15]=0x00~0xFF(LENS item FOCUS current position LOW BYTE)

(9) Macro readout instruction 9

?Buf[4]~Buf[15] by non-setting condition to get the data from camera

· Buf[2]=0x60(Macro read)

· Buf[3]=0x08(Instruction 9)

· Buf[4]=0x00(MANUAL),0x01(AUTO) (LENS item FOCUS MANUAL/AUTO)

· Buf[5]=0x00~0x04(LENS item ZOOM SPEED LEVEL)

· Buf[6]=0x00~0x04(LENS item FOCUS SPEED LEVEL)

· Buf[7]=0x00~0x40(POSITION item POSITION NO.)

· Buf[8]=0x00(OFF),0x01(ON) (PRESET item PRESET ON/OFF)

· Buf[9]=0x00(OFF),0x01(ON) (POSITION item FREEZE ON/OFF)

· Buf[10]=0x00(FIELD),0x01(FRAME) (AGC • SENS item FREEZE FIELD/FRAME)

· Buf[11]=0x00(POSI),0x01(NEGA) (REV item POSI/NEGA POSI/NEGA)

· Buf[12]~Buf[15]=non-used

(10) Macro readout instruction 10

?Buf[4]~Buf[15] by non-setting condition to get the data from camera

· Buf[2]=0x60(Macro read)

· Buf[3]=0x09(Instruction 10)

· Buf[4]=0x00(OFF),0x01(ON) (MARK item ON/OFF)

· Buf[5]=0x00~0xFF (Hor. position)

· Buf[6]=0x00~0xFF (Ver. position)

· Buf[7]=0x00~0xFF (Hor. Position can be set min. data)

· Buf[8]=0x00~0xFF (Hor. Position can be set max. data)

· Buf[9]=0x00~0xFF (Ver. Position can be set min. data)

· Buf[10]=0x00~0xFF (Ver. Position can be set max. data)

· Buf[11]~Buf[15]=non-used