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Color CCD Zoom Camera

A(V)N(P)200'S Communication Manual

C&B Technology Inc.

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Features

- High Sensitive ¼ inch Super HAD CCD
- Built in Auto Focus / Auto Iris
- Optical Power Zoom Lens
  A(V)N(P)200's : 22x
- Digital Zoom
  A(V)N(P)200's : 10x (220x Zoom)
- RS-232C,RS-232 TTL
  RS-422, RS-485 communication
- Mirror Image function
- Negative / Positive function
- Preset function
- OSD(On Screen Display)
- AN(P)202F
  Freeze, Reverse functions
- AN(P)202L
  Day&Night, Low Shutter functions
  Freeze function

CNB-A(V)N(P)200 Series

CNB-A(V)N(P)200L Series

Basic Functions

A(V)N(P)200 series Zoom/Focus Lens Control

Zoom/Focus Lens Position Range

- Optical zoom lens position range
  → 000 hex ~ 928 hex
- Focus lens position controllable range
  → 0FD hex ~ 516 hex
  (It is not specified)
- Digital zoom position
  → 00 hex ~ E7 hex

Zoom Lens Speed Mode

- Normal(Slow) Zoom Mode
  : Zoom lens speed is slow.
- Quick Zoom Mode
  : Zoom lens speed is faster than Slow Zoom Mode.

Zoom Trace Mode

Zoom Trace : If the zoom lens moves, the focus lens also moves. The focus lens will be moved to a certain calculated position.
So, the picture will be focused while the zoom lens moves to the target zoom position.

- Slow(Normal) Zoom Trace Mode(SZT)
  : It is a zoom trace mode that the zoom speed is Slow(normal).
- Quick Zoom Trace Mode(QZT)
  : It is a zoom trace mode that the zoom speed is Quick.
- Non Zoom Trace Mode(NZT)
  : When the zoom lens moves, the focus lens doesn't move, so the picture will not be focused while the zoom lens moves to the target position.

One Shot Focus

- The camera starts the auto focusing action only one time.
- When the One Shot Focus Command is sent, the focus lens moves to adjust the focus for the subject.

Auto zoom

- The zoom lens have a repeated action in a certain zoom range.

Focus Lens Control Mode

- Auto Focus Mode
  → User can not control the focus lens.
- Manual Focus Mode
  → User can control Focus lens in the restricted range of calculated by camera microcomputer.
- Special Focus Mode
  → User can control Focus lens as wishes. The controllable range of focus Lens is the total focus range(0FD ~ 516 hex). At this mode, the focus lens is controlled by user only.

(!) Auto/Manual mode is called as basic mode.

(!!) Even if the current focus mode is Special mode, you can set the Auto and Manual mode as basic focus mode.

Focus Lens Operation

Contents \ Focus Mode	Auto	Manual	Special
Zoom Trace function	O	O	X
Auto focusing after zoom trace action	O	O	X
Auto focusing in normal condition	O	X	X
Auto focusing in One Shot AF command	O	O	O
Near / Far action (Key Action command)	X	O	XO(*)
S-Near/S-Far action (Key Action command)	X	O	O
Controllable focus range	Not specified	Not specified	Full range

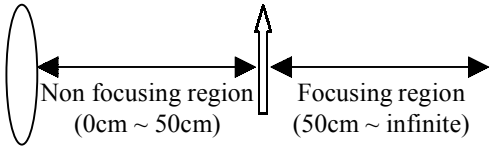
(*) X : in case the basic mode is Auto mode
O : in case the basic mode is Manual mode

Rain Focus Mode

Rain Focus Mode protect focusing in a certain distance. If the object is placed within the rain focus distance, the camera can't focus to the object

- 1m rain focus mode
- 50cm rain focus mode
- 10cm rain focus mode
- 1cm ~ 10cm rain focus mode
  (!!) see the Focus Control Commands

(Example) 50cm rain focus mode



Preset Operation

Internal Preset Mode

- In this mode, the camera memorizes the Zoom/Focus/Digital zoom position into the Internal **Nonvolatile** Memory of the camera.
- Total 64 presets

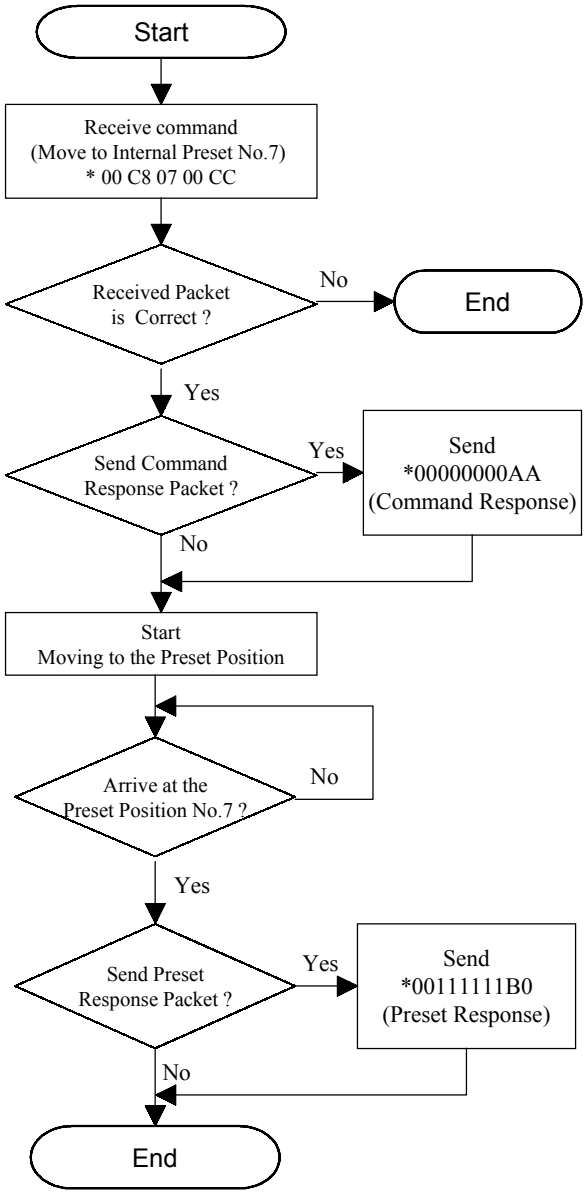
External Preset Mode

- In this mode, the camera memorizes the Zoom/Focus/Digital zoom position into the Internal **Volatile** Memory of the camera.
- Total 8 presets

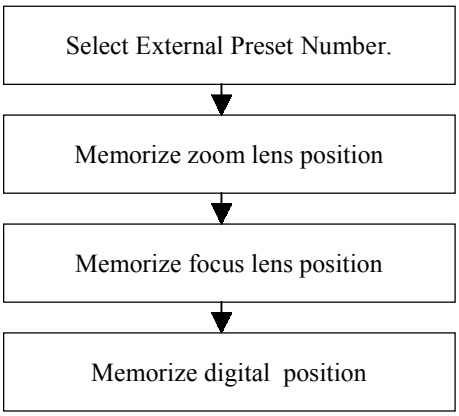
Preset Response Packet

- It is a response that the zoom/focus lens finish moving to the selected preset position.
- Transmission of this packet is decided by the Transmission Preset Response Packet (see Preset Control Commands).
- Preset Response Packet
  : * NN 11 11 11 YY

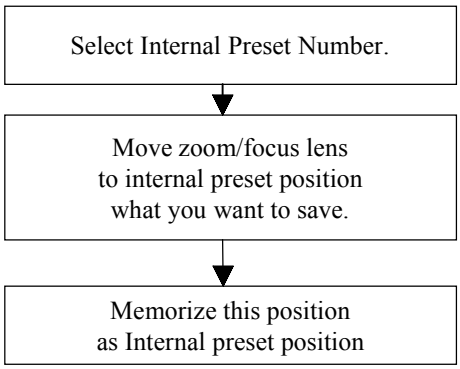
(Example) Preset Position Moving Action



External Preset Position Saving Method



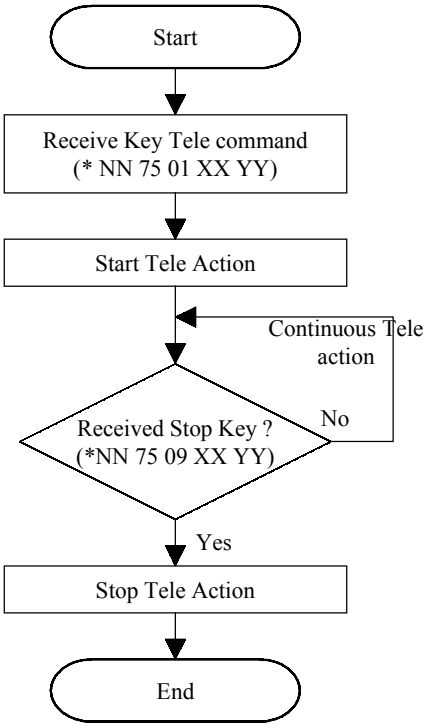
Internal Preset Position Saving Method



Key Action Command(*NN75PPXXYY)

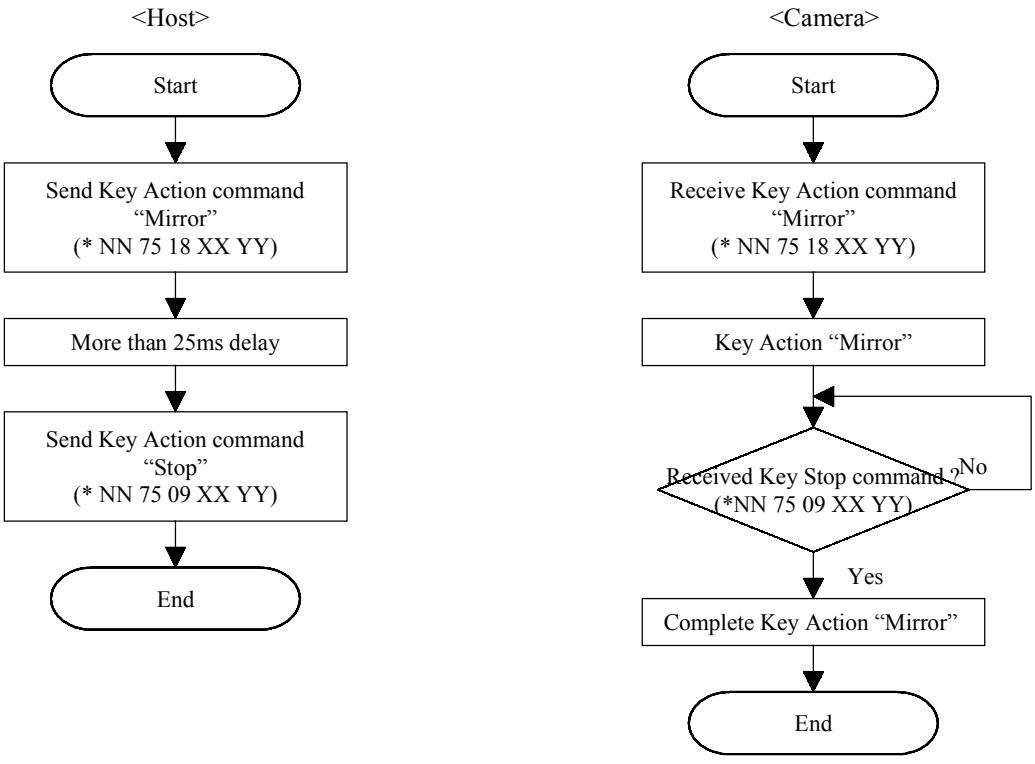
- It is a basic camera control command.
- Key Code
  : It is a command option of key action command.
- The **Key Stop command** of key action command(*NN7509XXYY)
  : This command **must be followed** by key action commands.
- Continuous key action.
  : If you want continuous key action service, do not send the key stop command until you want to stop the continuous key action.
- See the Key Action Command List.

(Example) Zoom in(Tele) action



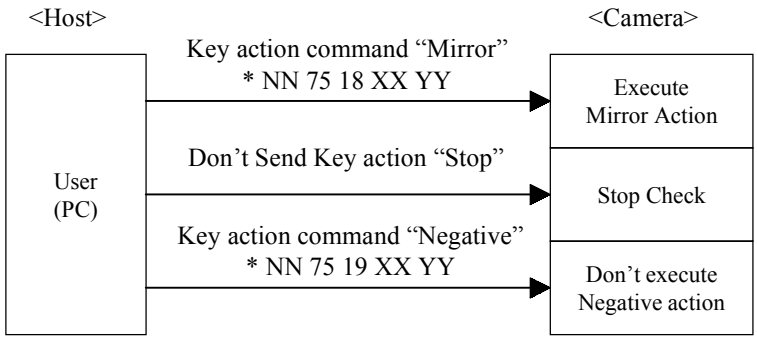
(In the position of the microcomputer of camera)

(Example) Key Action command "Mirror"

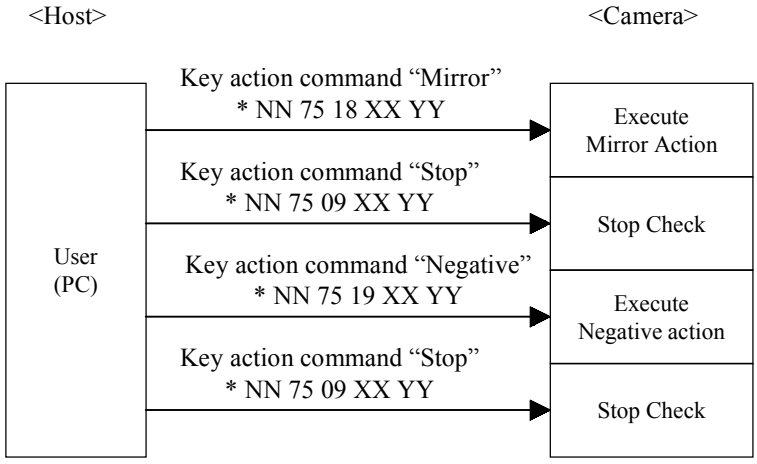


(Example) Successive Key Action commands
"Mirror" → "Negative"

(False Application)



(Right Application)



(!!) User must send Key Action command "STOP" before next command.
If you don't send Key action command "STOP",
the camera will not operate on Next Key action command.

General Operation

Camera ID

- 00 hex ~ FF hex(256 IDs)

Camera ID check Mode

- ID check Skip Mode
  : The camera will not check the camera ID.
- ID check Mode
  : The camera will check the camera ID. If the ID doesn't identical to the Current camera ID, the received command will be ignored and deleted.
- See the General Control Commands-1

Lens Initial Action

If the camera operates more than 24 hours.
then it is recommended that you execute
the camera initial action(lens initial command).

- See General control commands-2.

Motion Detection function

- If the camera detect some movement, it displays "MD" in the upper side of screen and transmit "Motion detected Packet".
- Motion Detected Response Packet
  * NN DD DD DD YY
- User can control the sensitivity of motion detect.
- See General Control Commands-1.

Initial LOGO change
(AV) v2.4

Initial logo can be changed as another characters. But it is possible in the production line only. Total 3 line, 12 characters per line, Total 36 characters.

Default logo : "WAIT"
Another logo example
"WELCOME
TO
CNB TECH"

Freeze function

- A(V)N(P)200F's, A(V)N(P)200L's Freeze : still picture

Reverse function

- A(V)N(P)200F's model only
- Reverse : the picture is rotated in a 180-degree arc.
- See the General Control Commands-2

Day&Night / Slow Shutter function
(AV) v3.0

- A(V)N(P)200L's model only
- See the General Control Commands-2

Day&Night

- Use under low light condition for continuous surveillance.

Day&Night Mode

- OFF mode
  Disable all the Day&Night function.
  In this mode, the Slow shutter function cam operate.

- AUTO mode
  Toggle as the brightness of a picture, day mode ←→night mode
  In this mode, the Slow shutter function can not operate.

- ON mode
  Night mode always.
  In this mode, the Slow shutter function can not operate.

Slow shutter function

- Use under very low light condition for full color surveillance.
- Slow shutter function can operate in Day&Night OFF mode.
- Slow shutter max field
  It is a maximum accumulated field number.
- Slow shutter max field index
  It indicates a maximum accumulated field.

Slow shutter Maximum Field Number

Index	Maximum field
00	00
01	02
02	04
03	08
04	12
05	16
06	24
07	32
08	64
09	128

- See the General Control Commands-2
- See the Key Action Commands-2

Sensitivity Level of Slow shutter

- High Sensitivity of Slow shutter
  The changes of field number is very sensitive to changes in brightness.
- Low Sensitivity of Slow shutter
  The changes of field number is not very sensitive to changes in brightness.

- Sensitivity Level
  00 ~ 1Fhex (32 levels)
  00 : Highest Sensitivity
  1F : Lowest Sensitivity

- See the General Control Commands-2

Communication Format

A(V)N(P)200's RS-232C Communication Format

Communication between camera and user is available by using RS-232C.

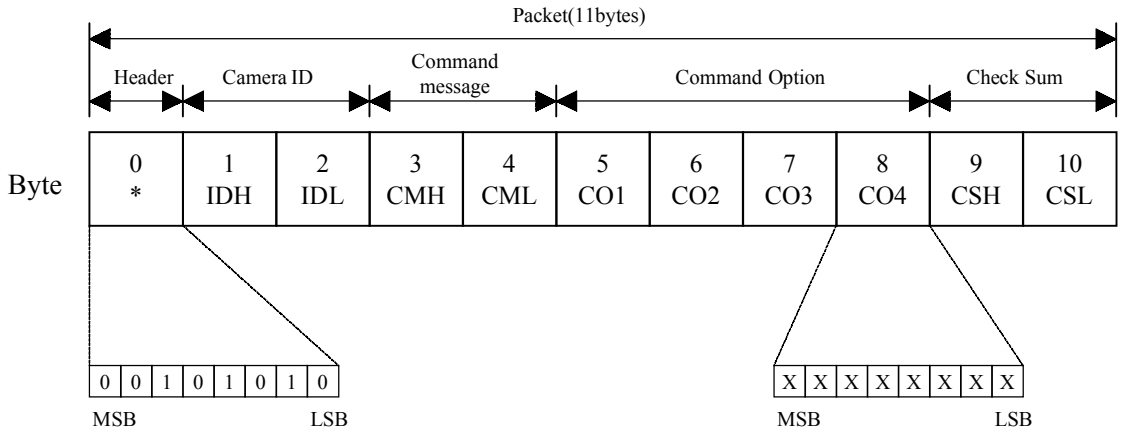
Parameter of RS-232C

- Baud Rate : 9.6kbps
- Start bit : 1
- Stop bit : 1
- Data bits : 8
- None Parity
- Flow control : XON/XOFF,RTS/CTS is not supported.

Packet Structure

The basic unit of AN200's communication is called **'PACKET'**.
All bytes of the packet are ASCII format.
The first byte of the packet is called **'Header'**. And the second and third bytes are **'ID'** of the camera. And the forth and the fifth bytes are **'Command Message'**. And from the sixth to the ninth bytes are **'Command Option'**.
And the last two bytes are **'Check sum'** of the packet.
The check sum is sum of 9 bytes(byte0~byte8).

- The header must be **'*'**.
- All bytes of the packet must be a Capital Letter.



Command Packet Block

Bytes of a packet

- Byte 0 : Header
  It must be the ASCII code '*' (2A hex)

- Byte 1 : High character of camera ID
  Byte 2 : Low character of camera ID

  Ex) current camera ID : 43 decimal
  43 decimal = 2B hex
  Byte 1 : ASCII code '2'(32 hex)
  Byte 2 : ASCII code 'B'(42 hex)

- Byte 3, Byte 4 : Command

- Byte 5 ~ Byte 8 : Option of command

- Byte 9 : High byte of check sum
  Byte 10 : Low byte of check sum

Check Sum Method

The value of check sum is calculated as follows.

Check Sum = Byte0 + Byte1+ … + Byte8

Ex) if ID = 43 d (2B hex), command = 75 hex, command option = 0000

command byte0~byte8 : * 2B 75 0000
ASCII format
: 2A 32 42 37 35 30 30 30 30
Sum = 2A+32+42+37+35+30+30+30+30
= 1CA hex
So, the Check Sum = CA

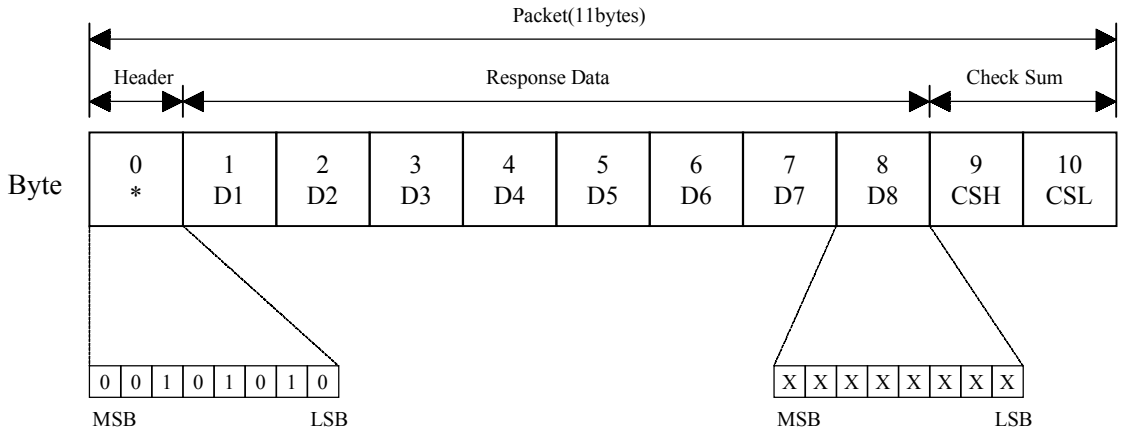
So the complete command packet
= * 2B 75 0000 CA

Response from the camera

If the command packet is transmitted to the camera accurately, the camera will send the **'response packet'**. If the camera doesn't receive the right command packet, it will not send any response packet.

Response Time

Most of the response packet will be transmitted as soon as the camera received the command packet.
This time is more than 2ms.



Response Packet Block

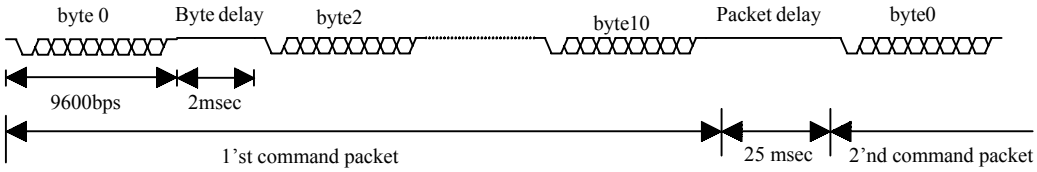
Communication Time Delay

When transmitting 1 packet(11 bytes), keep 2 milli-seconds waiting time between bytes.

After transmitting the first packet, wait for 25 ms to transmit next command packet.

- Byte delay time > 2ms
- Packet delay time > 25ms

*) Byte delay and Packet delay is a time delay for stable communication.



Delay Time Setting

Advice for communication

- If the command packet is transmitted only 4 bytes, then the camera will wait for remain 7 bytes continuously. At that moment, if a new packet is transmitted to the camera, the previous 4 bytes will be ignored.

- If the camera doesn't send any response packet, there should be some troubles in communication line or any other communication condition.

- If the camera response mode is Skip Command response packet mode, then the camera will not send Command response packet. Even if the response mode is Skip Command response packet mode , the Data response packet will be transmitted to PC.

Command List

A(V)N(P)200's RS-232C Command Reference

All of commands must be capital letters.

- '*' : Header
- 'X' : Don't Care
- 'x' : Not specified
- 'NN' : Camera ID
- 'YY' : Check Sum
- 'Z','S','M','P','Q' : Command Option
- 'R' : Response Packet Data
- '📻 ' : Indicate Response packet
- (!!) : Caution
- (AV) : Allowed camera version
  The command was allowed at the camera micro computer version x.x.
  Not describe : allowed all version.

Response Packet

If the camera receives any command, it will judge the Response packet. If the command packet hasn't any error, then the camera will transmit the response packet.

- **Command Response Packet**
  It is a response that the camera received the command packet correctly.
  It has none information of camera status.
  It indicates only that the command is successfully received.

  format : * 00 00 00 00 AA

  Caution) This manual did Not describe Command response packet.

- **Data Response Packet**
  It is a response of the camera status or zoom/focus position, or any other information of the camera.

  format : * QQ RR SS MM YY

- **Preset Action Finished Response Packet**
  It is a response that the camera finish moving to the target preset position.

  Format : * NN 11 11 11 YY

- **Motion Detected Response Packet**

  If the camera detect motions, the camera will be send Motion Detected Response Packet. The motion detection area and sensitivity is set by user – see the General Control command table.

  Format : *NNDDDDDDYY

- **One Shot AF Finished Response Packet**

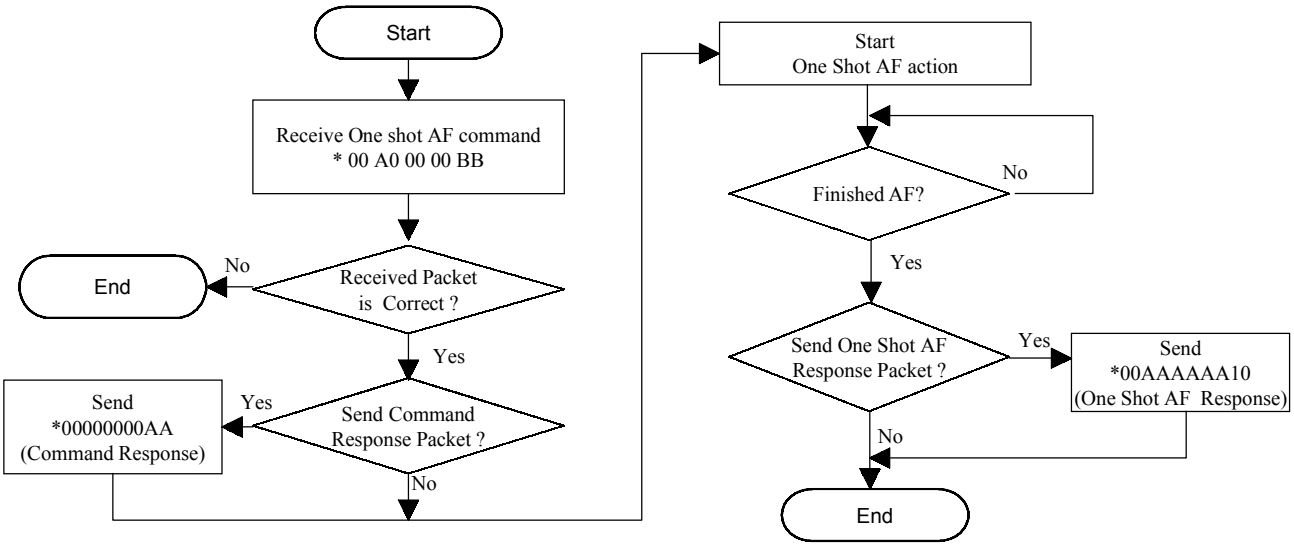
  If user command the One shot AF action command, then the camera will execute one shot AF action. After the action, the camera will send the One Shot AF Finished Response Packet.

  Format : *NNAAAAAAYY

(Set the Response Packet)

Response Packet	Format	Set the Transmission of Response Packet		Example of Commands (cam id = 00)
		Set (Enable mode)	Release (Disable Mode)	
Command Response Packet	*00 00 00 00 AA	*NNA800XXYY	*NNA801XXYY	*00710000B2 (reset) ☛ *00000000AA
Data Response Packet	*QQRRSSMMYY	Non	Non	*007C0200C6 (read camera status) ☛ *01000000AB
Preset Action Finished Response Packet	*NN 111111 YY	*NNAA01XXYY	*NNAA00XXYY	*00C60100C4 (move to external preset 01) ☛ *00 111111 B0
Motion Detected Response Packet	*NNDDDDDDYY	*NNA102PSYY	*NNA100XXYY	If motion is detected ☛ *00DDDDDD22
One Shot AF Finished Response Packet	*NNAAAAAAYY	*NN9F01XXYY	*NN9F00XXYY	*00A00000BB (one shot AF) ☛ *00AAAAAA10

(Example) One Shot AF & One shot AF finished response packet (Camera ID = 00)



General Control Commands - 1

Command Message	Command Packet	Command Option		Contents
Reset camera	*NN71XXXXYY			Reset the camera
ID on/off	*NN72XXXXYY			Toggle the camera ID. ON →OFF→ON…..
ID read	*NN73XXXXYY 📻 *RR000000YY	RR	x	Read Current Camera ID → 00 ~ FF hex(total 256 IDs) Camera ID
ID change	*NN74PPXXYY	PP	x	Change Camera ID → 00 ~ FF hex(total 256 IDs) New Camera ID
Key Action	*NN75PPXXYY	PP	x	Key Action will be activated by this command. → Key Code **See Key action command**
Power on/off	*NN76PPXXYY	PP	00 01	Camera Power ON/OFF →OFF →ON
ID check	*NNA4PPXXYY	PP	00 01	Camera will (not) check the camera ID →Disable ID check →Enable ID check
Set the transmission of Command Response Packet	*NNA8PPXXYY	PP	00 01	(Don't)Transmit Command Response Packet →Enable Transmission of Command Response Data →Don't Transmit the Command Response Data
Motion Detection	*NNA1QQPSYY (AV) v2.4	QQ P S	00 01 02 0 1 2 3 x	→Disable Motion Detection Function →Display only "MD" in the screen →Display "MD" and transmit MD Alarm Packet →MD area : Upper side of the picture →MD area : Lower/Left/Right side of the picture →MD area : Center of the picture →MD area : Whole Region of the picture →2 hex ~ F hex : MD Sensitivity (high sensitivity ~ low sensitivity) (!!) 📻 Motion Detection Response(Alarm) Packet : *NNDDDDDDYY (ex) Set "MD" and transmission of the MD Response packet, "MD" area is Center, MD sensitivity 7. * NN A1 02 27 YY

General Control Commands - 2

Command Message	Command Packet	Command Option		Contents
Lens Initial	*NNADXXXXYY (AV) v2.4	-	-	Execute Lens Initial action. After this action, the zoom and focus lenses will be moved to the working position. And continue the previous working. ☞ If this lens initial action is finished, then the Command Response Packet will be transmitted.
Freeze/Live	*NNAEPPXXYY (AV) v2.4	PP	01 00	→Freeze the picture →Live (release the freeze state) (!!) AN(P)202F,AN(P)202L model only
Reverse/Normal	*NNAFPPXXYY (AV) v2.4	PP	01 00	→Reverse the picture (rotate 180 degrees) →Normal state (release the reverse state) (!!)AN(P)202F model only
Change Day&Night mode	*NN9DXXXXYY (AV) v3.0	-	-	Change Day&Night mode …→ OFF → AUTO → ON → OFF → ….
Set the Slow shutter max field	*NN9CPPXXYY (AV) v3.0	PP	00~ 09	→Slow shutter max field index(00~09) Index : 00 01 02 03 04 05 06 07 08 09 Max Field : 00 02 04 08 12 16 24 32 64 128
Read the Sensitivity level of Slow shutter	*NN9AXXXXYY ☞ *RR000000YY (AV) v3.0	RR	00 ~ 1F	→ Sensitivity level of Slow shutter Level Range : 00 ~ 1F
Set the Sensitivity level of Slow shutter	*NN9BPPXXYY (AV) v3.0	PP	00 ~ 1F	→ Sensitivity level of Slow shutter Level Range : 00 ~ 1F

Focus Control Commands

Command Message	Command Packet	Command Option		Contents
Set Focus Auto Mode	*NN4EXXXXYY			Set Focus Mode as Auto Focusing Mode (Basic focus mode)
Set Focus Manual Mode	*NN4FXXXXYY			Set Focus Mode as Manual Focusing Mode (Basic focus mode)
Set Focus Special Mode	*NNABPPXXYY (AV) v 2.3	PP	00 01	Set Focus Mode as Special Focusing Mode →Disable Focus Special Mode, set Basic focus mode only →Set Focus Special Mode
One shot Auto Focus	*NNA0XXXXYY			Execute Auto Focusing only one time (!!) See Key Action Commands-2
Protect Auto Focusing	*NNA2XXXXYY (AV) v2.3			Toggle command Protect All Auto Focusing function. Protect→release→protect→release→… (!!)Power on : default status is release mode
Set Rain Focus Mode	*NNA3PPSSYY	PP SS	00 01 02 03 04 X	Protect focusing at a certain distance. →RM0 : Disable All Rain Focus Mode →RM1 : 50cm Rain Focus Mode →RM2 : 10cm Rain Focus Mode →RM3 : 10cm~1cm Rain Focus Mode →RM4 : 1m Rain Focus Mode - (AV) v2.3 →00 hex ~ 0A hex : Rain Focus Distance(RM3 only) (ex) protect focusing in the distance 10cm * NN A3 02 00 YY
Set the Transmission of the One Shot AF Finished Response Packet	*NN9FPPXXYY (AV) v2.4	PP	00 01	(Don't) Transmit One Shot AF finish Response Packet when the camera finished the One Shot AF action. →Don't Transmit One Shot AF finish Response Packet →Enable Transmission of One Shot AF finish Response Packet (!!) 📻 One Shot AF finish Response Packet *NNAAAAAAYY

Zoom/Focus Operation Commands - 1

Command Message	Command Packet	Command Option		Contents
Read Zoom Position	*NNC0XXXXYY 📻 *0ZZZRR00YY	ZZZ RR	x x	→Current Zoom Lens Position (000~928 hex) →Digital Zoom Position (00 ~ E0 hex)
Read Focus Position	*NNC1XXXXYY 📻 *0ZZZ0000YY	ZZZ	x	→Current Focus Lens Position (0FDhex~516hex)
Move Zoom lens to selected zoom position(1)	*NN470ZZZYY	ZZZ	x	→Target Zoom Lens Position (000~928 hex) (!!) Moving Method : Non Zoom Tracking Mode
Move Zoom lens to selected zoom position(2)	*NNA90ZZZYY (AV) v2.3	ZZZ	x	→Target Zoom Lens Position (000~928 hex) (!!) Moving Method : Slow Zoom Tracking Mode
Move Zoom lens to selected zoom position(3)	*NNACZZPPYY (AV) v2.3	ZZ PP	x x	→Zoom Ratio (00 ~ 22 hex) →Digital Zoom Position (00 ~ E7 hex) (!!) Moving Method : Slow Zoom Tracking Mode <Digital position for zoom ratio> Zoom ratio PP(Digital position(hex)) 22 00 33 54 44 80 66 AB 88 C0 128 D4 157 DC 220 E7 (ex) Move to zoom ratio x14 * NN AC 14 00 YY (ex) Move to zoom ratio x44 (Digital position = 80h) * NN AC 22 80 YY
Move Focus lens to selected focus position	*NN480ZZZYY	ZZZ	x	→Target Focus Lens Position (0FD~516 hex) (!!) The range of ZZZ Focus Special Mode : 0FD~516hex Focus Auto/Manual Mode : The range of ZZZ is decided by camera.

Zoom/Focus Operation Commands - 2

Command Message	Command Packet	Command Option		Contents
Move Zoom Relative Tele	*NNA5ZZXXYY	ZZ	x	Move Zoom Lens as received steps from current position. →00 ~ FF hex : zoom step to move(Tele) (!!) Moving Method : Non Zoom Tracking Mode (!!) See Key Action Commands-2 (ex) move 4 steps to tele * NN A5 04 00 YY
Move Zoom Relative Wide	*NNA6ZZXXYY	ZZ	x	Move Zoom Lens as received steps from current position. →00 ~ FF hex : zoom step to move(Wide) (!!) Moving Method : Non Zoom Tracking Mode
Set Zoom Step for S-Tele,S-Wide	*NNA7ZZXXYY	ZZ	x	Set Zoom steps to use in S-Tele,S-Wide command of Key Action Command. → 00 ~ FF hex : zoom step of S-Tele,S-Wide
Set Zoom Start ratio / Stop ratio	*NN9ESSRRYY (AV) v2.4	SS RR	x x	Set zoom start ratio and zoom stop ratio. →Zoom Start Ratio (00 ~ 16 hex) 16hex = 22dec →Zoom Stop Ratio (00 ~ DC hex) DChex = 220dec (!!) If SS=00, the zoom start ratio doesn't change. If RR=00, the zoom stop ratio doesn't change. Must be SS <= RR (!!) RR 16hex ~ DChex, **RR must be the integral time of 11** Ratio : 00 ~ 22 RR (hex) : 00 ~ 16 Ratio : 22, 33, 44, 55, 66, 77, 88, 99, 110 RR (hex) : 16, 21, 2C, 37, 42, 4D,58, 63, 6E Ratio : 121,132,143,154,165,176 RR (hex) : 79, 84, 8F, 9A, A5, B0 Ratio : 187,198,209,220 RR (hex) : BB, C6, D1, DC (ex) Set zoom start : 3x, zoom stop 128x(=80hex) * NN 9E 03 80 YY (ex) Set zoom stop ratio 44x(=2C hex), zoom start ratio : do not change * NN 9E 00 2C YY

Preset Control Commands

Command Message	Command Packet	Command Option		Contents
Save current position as Internal Preset Position	*NNC7PPXXYY	PP	x	→00 ~ 3F hex : Index of Internal Preset Position (total 64 preset position)
Move to selected Internal Preset Position(NZT)	*NNC8PPXXYY	PP	x	→00 ~ 3F hex : Index of Internal Preset Position (total 64 preset position) (!!) Moving Method : Non Zoom Tracking Mode
Move to selected Internal Preset Position(SZT)	*NNCFPPXXYY	PP	x	→00 ~ 3F hex : Index of Internal Preset Position (total 64 preset position) (!!) Moving Method : Slow Zoom Tracking Mode
Move to selected Internal Preset Position(QZT)	*NND0PPXXYY	PP	x	→00 ~ 3F hex : Index of Internal Preset Position (total 64 preset position) (!!) Moving Method : Quick Zoom Tracking Mode
Save received Zoom position as External Preset Position	*NNC3PZZZYY	P ZZZ	x x	→0 ~ 7 hex : Index of External Preset Position (total 8 preset position) →Zoom Position (000 ~ 928 hex)
Save received Focus position as External Preset Position	*NNC4PZZZYY	P ZZZ	x x	→0 ~ 7 hex : Index of External Preset Position (total 8 preset position) → Focus Position (0FD ~ 516 hex)
Save received D-Zoom position as External Preset Position	*NNC50PZZYY	P ZZ	x x	→0 ~ 7 hex : Index of External Preset Position (total 8 preset position) → Digital Zoom Position (00 ~ E7 hex)
Move to selected External Preset Position(NZT)	*NNC60PXXYY	P	x	→0 ~ 7 hex : Index of External Preset Position (!!) Moving Method : Non Zoom Tracking Mode
Move to selected External Preset Position(SZT)	*NNC90PXXYY	P	x	→0 ~ 7 hex : Index of External Preset Position (!!) Moving Method : Slow Zoom Tracking Mode
Move to selected External Preset Position(QZT)	*NNCA0PXXYY	P	x	→0 ~ 7 hex : Index of External Preset Position (!!) Moving Method : Quick Zoom Tracking Mode
Set the Transmission of the Preset Response Packet	*NNAAPPXXYY (AV) v2.4	PP	00 01	(Don't) Transmit Preset Response Packet when the zoom lens moved to the target preset position. →Don't Transmit Preset Response Data →Enable Transmission of Preset Response Data (!!) 📻 Preset response packet : *NN111111YY

Camera Status Control Commands - 1

Command Message	Command Packet	Command Option		Contents
Read Function OSD display mode	*NN79XXXXYY 📻 *RR000000YY	RR	00 01	Read the function OSD display mode of camera →ON mode : All OSD display is enable →OFF mode : All OSD display is disable except for Menu OSD display.
Change F-OSD display mode	*NN7APPXXYY	PP	00 01	Change the Function-OSD display mode of camera →F-OSD display ON mode →F-OSD display OFF mode
Mirror on/off	*NN7BPPXXYY	PP	00 01	→Mirror OFF →Mirror ON
Read Camera Status	*NN7C0PXXYY 📻 *0R000000YY	P	0 1 3 4 8	Focus Mode → R(0)[auto], R(1)[manual] ID display mode → R(0)[OFF],R(1)[ON] Backlight state → R(0)[OFF],R(1)[ON] Flickerless state → R(0)[OFF],R(1)[ON] Auto Backlight mode → R(0)[OFF],R(1)[ON]
Read Camera Version	*NN7DXXXXYY 📻 *RR000000YY	RR	x	→ Current Camera u-com Version RR = 23, version2.3
Read current Digital Effect state	*NN7EXXXXYY 📻 *0R000000YY	R	0 1 2 3 4 5 6	→ No Digital effect is activated →WIDE(Cinema) effect ON →ART on →Mirror on →Negative on →Color off →Mosaic on
Read Exposure Mode	*NN80XXXXYY 📻 *0R000000YY	R	0 1 2 3 4	→Auto Exposure mode →Shutter Manual mode →Iris Manual mode →AGC Manual mode →Shutter/Iris/AGC all Manual mode
Set Exposure Mode	*NN810PXXYY	P	0 1 2 3 4 5	→Auto Exposure mode →Shutter Manual mode →Iris Manual mode →AGC Manual mode →Shutter/Iris/AGC all Manual mode →AGC Off mode

Camera Status Control Commands - 2

Command Message	Command Packet	Command Option		Contents
Set Backlight Mode	*NN82PPXXYY	PP	00 01	→Backlight mode OFF →Backlight mode ON
Read Backlight Level	*NN83XXXXYY 📻 *RR000000YY	RR	x	→ 00 ~ FF : Backlight level
Adjust Backlight Level	*NN84PPXXYY	PP	x	→ 00 ~ FF : Backlight level
Read Shutter Speed Counter	*NN85XXXXYY 📻 *RR000000YY	RR	x	→00 ~ 27 : Shutter counter 00 : 1/60 01 : 1/125 04 : 1/250 09 : 1/500 14 : 1/1000 21 : 1/2000 25 : 1/4000 27 : 1/10000
Set Shutter Speed	*NN86PPXXYY	PP	x	→ 00 ~ 27 : Shutter counter
Set AGC Level	*NN87PPXXYY	PP	x	→ 00 hex ~ FF hex : AGC level data
Read Brightness Level	*NN88XXXXYY 📻 *RR000000YY	RR	x	→ 00 hex ~ 60 hex : Brightness level data
Read Iris Level	*NN89XXXXYY 📻 *RR000000YY	RR	x	→ 00 hex ~ FF hex : Iris control level data
Set Iris Level	*NN8APPXXYY	PP	x	Set the Iris Open Level → 00 hex ~ FF hex : Iris control level data
Read AGC Level	*NN8BXXXXYY 📻 *RR000000YY	RR	x	→ 00 hex ~ FF hex : AGC control level data
Set Negative On/Off	*NN8CPPXXYY	PP	00 01	→Negative mode ON →Negative mode OFF
Read Iris Area Weighting value	*NN8EXXXXYY 📻 *RS000000YY	R S		→Inner area weight data →Outer area weight data

Camera Status Control Commands - 3

Command Message	Command Packet	Command Option		Contents
Write Iris Area Weighting value	*NN8FPQXXYY	P Q		→Inner area weight data →Outer area weight data
Set Flickerless Mode	*NN90PPXXYY	PP	00 01	→OFF(inactive) →ON(active)
Set Brightness Level	*NN91PPXXYY	PP		→ 00 hex ~ 60 hex : Brightness level data
Color On/Off	*NNB0PPXXYY	PP	00 01	→Color OFF →Color ON
Read White Balance Mode	*NNB1XXXXYY 📻 *RR000000YY	RR	00 01 02 03 04 05	→Auto Mode →Special →Indoor →Outdoor →Manual →Push Auto
Set White Balance Mode	*NNB2PPXXYY	PP	00 01 02 03 04 05	→Auto Mode →Special →Indoor →Outdoor →Manual →Push Auto
Read current Manual WB Mode Data	*NNB3XXXXYY 📻 *RR000000YY	RR		→ 00 hex ~ 60 hex : Manual WB control data
Set Manual WB Mode Data	*NNB4PPXXYY	PP		→ 00 hex ~ 60 hex : Manual WB control data
Read current Sharpness Data	*NNB5XXXXYY 📻 *RR000000YY	RR		→ 00 hex ~ 0F hex : Sharpness data
Set Sharpness Data	*NNB6PPXXYY	PP		→ 00 hex ~ 0F hex : Sharpness data
Read RED adjust data at Special WB mode	*NNB7XXXXYY 📻 *RR000000YY	RR		→ 00 hex ~ FF hex : RED adjust data

Camera Status Control Commands - 4

Command Message	Command Packet	Command Option		Contents
Read BLUE adjust data at Special WB mode	*NNB8XXXXYY 📻 *RR000000YY	RR		→ 00 hex ~ FF hex : BLUE adjust data
Set RED adjust data at Special WB mode	*NNB9PPXXYY	PP		→ 00 hex ~ FF hex : RED adjust data
Set BLUE adjust data at Special WB mode	*NNBAPPXXYY	PP		→ 00 hex ~ FF hex : BLUE adjust data
Read Digital Effect status	*NN92XXXXYY 📻*RR000000YY (AV) v2.7	RR		→ Current Digital Effect status RR : 1byte hex bit7 : not used, bit6 : not used bit5: <1>mosaic On <0> off bit4: <1>monochrome <0> color bit3 : <1>negative On <0>off bit2 : <1>mirror On <0>off bit1 : <1>art On <0>off bit0 : <1>wide cinema On <0>off ex) RR = 23, then, Current Digital Effect status = 23hex 23(hex) = 0010 0011 (bin) mosaic On, art On, wide cinema On

Key Action Commands - 1 (*NN 75 PP XX YY)

Command Option(PP)	Key Code	Contents
09	KC_STOP	▪Key Action Stop Action This Command must be followed after the other key action commands below. If continuous key service is needed, don't send this command. And, when you want to stop the continuous action, send this Stop command.
00	KC_NKEY	▪Non Key Service
01	KC_TELE	▪Slow zoom Tele
02	KC_QTELE	▪Quick zoom Tele
03	KC_WIDE	▪Slow zoom Wide
04	KC_QWIDE	▪Quick zoom Wide
05	KC_FAR	▪Move focus to Far (in manual focus mode)
06	KC_NEAR	▪Move focus to Near(in manual focus mode)
07	KC_SFAR	▪Move focus to S-Far (in manual focus mode) (1step)
08	KC_SNEAR	▪Move focus to S-Near(in manual focus mode)(1step)
0A	KC_POWER	▪Toggles Power ON/OFF
0B	KC_FOCUS_AM	▪Toggles Focus Auto/Manual Mode
0C	KC_F_PUSH	▪Activates focus auto Action only one time(in manual focus mode)
0D	KC_M_SET	▪In Menu mode, toggles item selection mode / item adjust mode
0E	KC_INITIAL	▪Initialize camera to Manufacturer's conditions
0F	KC_OSD_ONOFF	▪Toggles Function OSD Off/On mode
10	KC_MENU	▪Toggles Menu On/Off
11	KC_SET_MENU	▪Toggles Menu On/Off
12	KC_LANGUAGE	▪Change OSD language
13	KC_BL	▪Toggles Backlight mode
14	KC_FLICKER	▪Toggles Flicker mode
15	KC_SSC_UP	▪Sutter speed counter Up
16	KC_SSC_DN	▪Sutter speed counter Down
17	KC_D_EFT	▪Switches Digital Effect modes(Cinema→Art→Mirror→Nega→Mono→Mosaic)
18	KC_MIRROR	▪Toggles Mirror mode
19	KC_NEGA	▪Toggles Negative mode
1A	KC_MONO	▪Toggles Mono/Color mode
1B	KC_WB_MODC	▪Change White Balance mode
1C	KC_SRP_UP	▪Sharpness Data Up
1D	KC_SRP_DN	▪Sharpness Data Down
1E	KC_BRT_UP	▪Brightness Data Up
1F	KC_BRT_DN	▪Brightness Data Down
20	KC_ZM_SUP	•Zoom Start Ratio Up
21	KC_ZM_SDN	•Zoom Start Ratio Down
22	KC_ZM_EUP	•Zoom Stop Ratio Up
23	KC_ZM_EDN	•Zoom Stop Ratio Down
24	KC_WB_PUSH	•In white balance push auto mode(manual mode), It indicates Push Action.
25	KC_AWB_UP	•Switch AWB modes (auto→special→indoor→outdoor→hue control→push auto)
26	KC_AWB_DN	•Switch AWB modes in reverse sequence of KC_AWB_UP

Key Action Commands - 2 (*NN 75 PP XX YY)

Command Option(PP)	Key Code	Contents
27	KC_R_UP	•In Special WB mode, R gain Up
28	KC_R_DN	•In Special WB mode, R gain Down
29	KC_B_UP	•In Special WB mode, B gain Up
2A	KC_B_DN	•In Special WB mode, B gain Down
2B	KC_HUE_UP	•In Hue adjust WB mode, Hue up(the picture become Reddish)
2C	KC_HUE_DN	•In Hue adjust WB mode, Hue down(the picture become Bluish)
2D	KC_AE_MAN	•Set AE mode to Manual mode
2E	KC_IRIS_UP	•Increase Iris Level
2F	KC_IRIS_DN	•Decrease Iris Level
30	KC_AGC_UP	▪Increase AGC gain
31	KC_AGC_DN	▪Decrease AGC gain
32	KC_LED	▪External LED On/Off toggle
33	KC_AUTOZOOM	▪Start Auto Zoom Action
34	KC_AGC_OFF	▪Set AGC fix mode
38	KC_CINEMA	▪Toggles Wide Picture mode
39	KC_MOSAIC	▪Toggles Mosaic mode
3A	KC_ART	▪Toggles Art mode
3B	KC_AUTO_PAN	▪Auto Panning action(only act in digital zoom region)
3C	KC_PAN_RIGHT	▪Pan Right action(only act in digital zoom region)
3D	KC_PAN_LEFT	▪Pan Left action(only act in digital zoom region)
3E	KC_TILT_UP	▪Tilt Up action(only act in digital zoom region)
3F	KC_TILT_DN	▪Tilt Down action(only act in digital zoom region)
40	KC_AUTO_TILT	▪Auto Tilting action (only act in digital zoom region)
41	KC_STELE	▪Step Tele, (AV)v2.3
42	KC_SWIDE	▪Step Wide, (AV)v2.3
43	KC_MB_RESET	▪Memory Board Reset , (AV)v2.3 AN(P)200F,200L model only
44	KC_FREEZE	▪Toggles Freeze/Live mode , (AV)v2.3 AN(P)200F,200L model only
45	KC_REVERSE	▪Toggles Reverse/Normal mode , (AV)v2.3 AN(P)200F model only
46	KC_1SHOT_AF	▪Execute Auto Focusing one time , (AV)v2.3
47	KC_DAYNIGHT	▪Day&Night mode change, OFF→AUTO→ON, (AV)v3.0, AN(P)200L only
48	KC_MAXFLDUP	▪Slow shutter max field up, (AV)v3.0, AN(P)200L only
49	KC_MAXFLDDN	▪Slow shutter max field down, (AV)v3.0, AN(P)200L only

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