

DC211 Protocol

History

No	Issue Date	Version	Description	Apply Firmware
1	2009/12/01	1.0	First version	DHK100

***Notice: First Version**

***Notice: Only for DC211 use**

DC211 Protocol

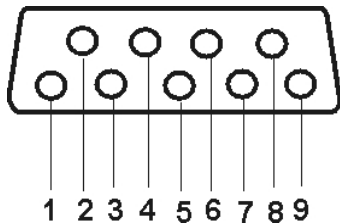
1. Communication Protocol

Transmit Method : Asynchronous Interface Half Duplex Serial Communication.

- Transmit Speed: 9600bps
- Flow control: NA
- Data Bit: 8Bit
- Parity Bit: NA
- Stop Bit: 1Bit

2. The wire diagram

The RS232 wire diagram between presenter and remote controller as below

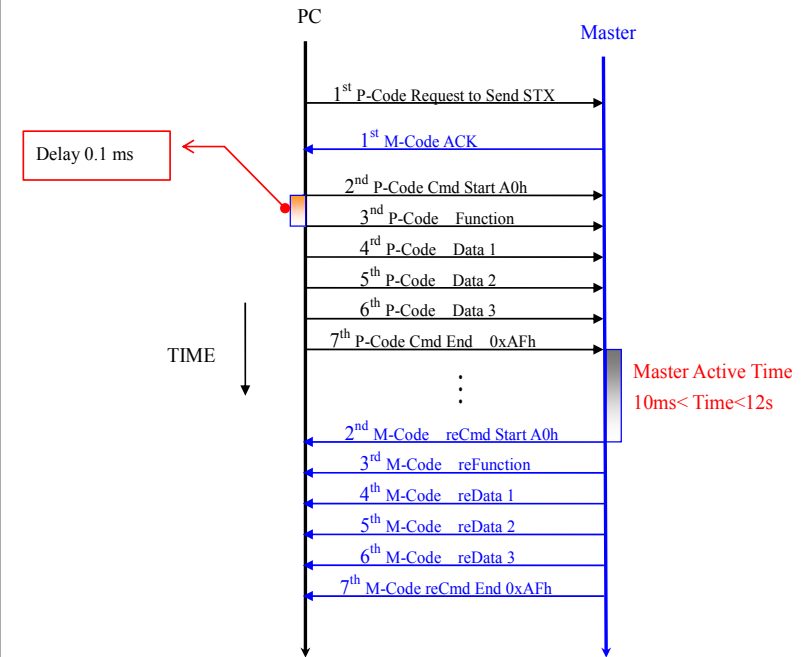


CONNECTIONS		
DB 9F	COLOUR	DB 9F
2	-	3
3	-	2
5	-	5
SHELL	DRAIN	SHELL

3. The command Sets and protocol

Control method

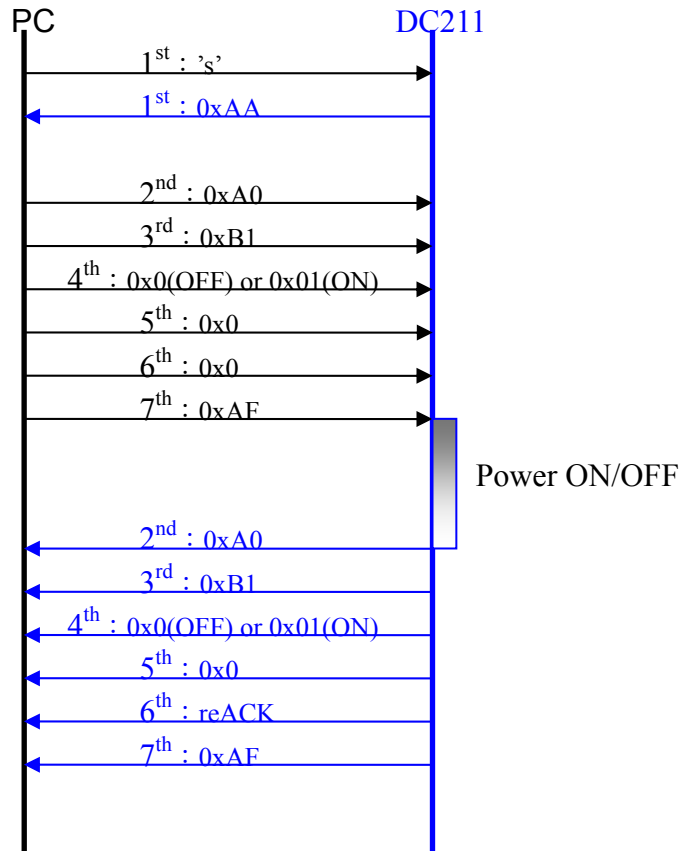
Control scheme as below



- The Acknowledge code from presenter is hex code AA
- PC must wait the ACK code before send the 2nd code
- ' U ' mean the ASCII code o character U
- 0xAA mean the hex code AA

4. Example.

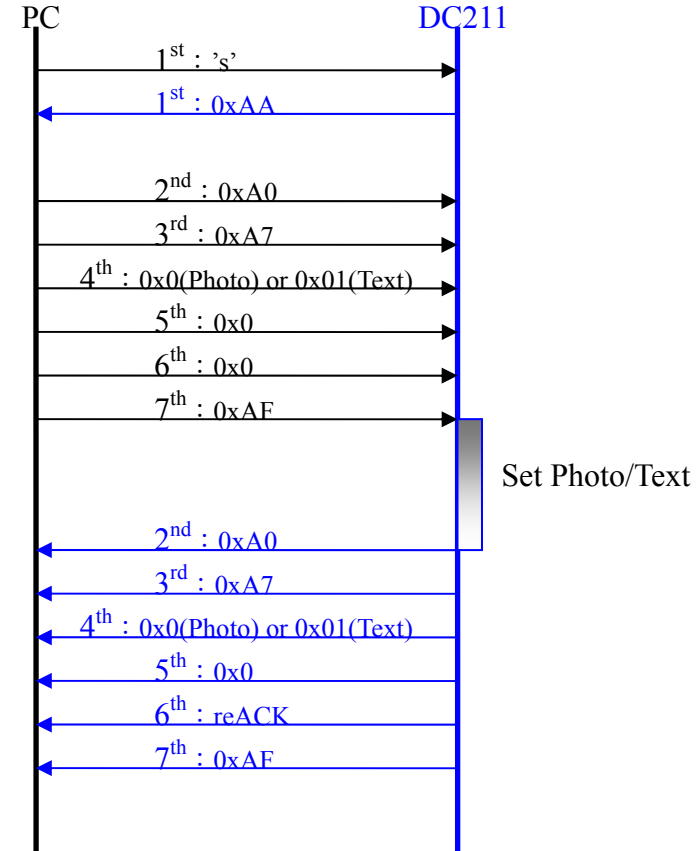
Example 1: Power On/Off



's' ← (PC send STX to DC211)
 → AAh ← (DC211 Return ACK to PC)

A0h△B1h△01h (Power ON)△00h△00h△AFh ← (PC send Command to DC211)
 → A0h△B1h△01h△00h△00h (ACK)△AFh ← (DC211 Return Command to PC)

Example 2: Set Photo/Text



's' ← (PC send STX to DC211)
 → AAh ← (DC211 Return ACK to PC)

A0h△A7h△01h (Set Text)△00h△00h△AFh ← (PC send Command to DC211)
 → A0h△A7h△01h△00h△00h (ACK)△AFh ← (DC211 Return Command to PC)

5. Control Command

Item	Function	PC AP to DC 210 Master command format						Comment
		1st	2nd	3rd	4th	5th	6th	
1	Preset/Factory Reset	A0h	03h	P1	P2	00h	AFh	P1=0, P2=00/01:Preset Load/Save P1=1:Factory Reset
2	Slide show On/Off	A0h	04h	P1	00h	00h	AFh	P1=00/01:Off/On
3	Slide show Effect	A0h	05h	P1	00h	00h	AFh	P1=0~5:Off/Shutter/Right/Down/Side/Open
4	Slide show Delay	A0h	06h	P1	00h	00h	AFh	P1=0~4:1sec/3sec/5sec/10sec/Manual
5	Digital Zoom Limit	A0h	15h	P1	00h	00h	AFh	P1=SXGA、720P、XGA：01x~06x
6	Digital Zoom Direct	A0h	18h	P1	00h	00h	AFh	P1=SXGA、720P、XGA：0~46(Dec) :Digital Zoom Position
7	Focus Stop	A0h	19h	00h	00h	00h	AFh	
8	Focus Start	A0h	1Ah	P1	P2	00h	AFh	P1=00/01:Near/Far P2=01~05:Speed
9	Focus Direct (No Limit)	A0h	1Bh	P1	P2	P3	AFh	P1(LowByte)P2(HighByte)=0~200(Dec):Focus Position P3=01~05:Speed
10	White Balance (AWB, Auto Tune)	A0h	22h	P1	00h	00h	AFh	P1=00/01:Auto Tune/AWB
11	White Balance Manual	A0h	23h	P1	P2	00h	AFh	P1=01/02：+1/-1(Red Gain) P2=01/02：+1/-1(Blue Gain)
12	Pan PBP	A0h	25h	P1	00h	00h	AFh	P2=00/01:Still/Preview P1= XGA:0~32(Dec)Step SXGA、WXGA:0~40(Dec)Step
13	Set Pan Mode	A0h	26h	P1	00h	00h	AFh	P1=00/01/:Normal/Pan mode
14	Set Pan Move	A0h	27h	P1	00h	00h	AFh	P1=01/02/03/04:Up/Down/Left/Right
15	Call DIP Switch Value	A0h	29h	00h	00h	00h	AFh	P1:DIP Switch Value

Item	Function	PC AP to DC 210 Master command format						Comment
		1st	2nd	3rd	4th	5th	6th	
16	Freeze	A0h	2Ch	P1	00h	00h	AFh	P1=00/01:Off/On
17	Iris	A0h	30h	P1	P2	00h	AFh	P1=00/01/02:Auto/Manual/Stop (AC 50Hz)P2=00~126(Dec):Brightness (AC 60Hz)P2=00~134(Dec):Brightness
18	Switch USB Transfer	A0h	32h	P1	00h	00h	AFh	P1=00/01:Mass Storage/USB Camera
19	Negative (film)	A0h	36h	P1	00h	00h	AFh	P1=00/01:Off/On
20	Color (gray)	A0h	37h	P1	00h	00h	AFh	P1=00/01:Photo/Gray
21	Language Select	A0h	38h	P1	00h	00h	AFh	P1=0~12(Dec):English/Traditional Chinese/German/French/Spanish/Russian/Dutch/Finland/Polish/Italian/ Portuguese/Sweden/Czech
22	Brightness Control	A0h	39h	P1	00h	00h	AFh	P1=00/01:-1/+1
23	Source live/PC	A0h	3Ah	P1	00h	00h	AFh	P1=00/01:PC/DM350(no PC auto switch to Memory)
24	Call Master Version	A0h	45h	00h	00h	00h	AFh	DHAxxx = DHA P1 P2 P3(ASCII)
25	Call AE Status	A0h	46h	00h	00h	00h	AFh	P1=00/01:Off/On
26	Enable/Disable LOGO Image	A0h	47h	P1	00h	00h	AFh	P1=00/01:Off/On
27	Playback Image Index Change Page	A0h	4Ah	P1	00h	00h	AFh	P1=00/01:Page Up/Page Down
28	All OSD On/Off	A0h	4Bh	P1	00h	00h	AFh	P1=00/01:Off/On
29	Call Slave Version	A0h	4Dh	00h	00h	00h	AFh	DHBxxx = DHB P1 P2 P3(ASCII)
30	Call lamp Status	A0h	50h	00h	00h	00h	AFh	P1=00/01:Off/On
31	Call Text/Photo Status	A0h	51h	00h	00h	00h	AFh	P1=00/01/02:Photo/Text/Gray
32	reg1	A0h	52h	P1	P2	00h	AFh	P1=00/01:Read/Write P2=0x00~0xff

Item	Function	PC AP to DC 210 Master command format						Comment
		1st	2nd	3rd	4th	5th	6th	
33	reg2	A0h	53h	P1	P2	00h	AFh	
34	reg3	A0h	54h	P1	P2	00h	AFh	
35	Erroe Code	A0h	55h	P1	00h	00h	AFh	p1=00/01:Show Error Code/Clear Error Code
36	Bad pixel fix	A0h	57h	P1	P2	P3	AFh	p1:00/01/02:bad pixel fix/bad pixel numbers/badpixel correction number p1=2,p2=00/01:Read/Set bad pixel correction number.p3:Set number.p2:Read number.
37	Call Digital Zoom Position	A0h	62h	00h	00h	00h	AFh	P1= SXGA、720P、XGA : 0~46(Dec) :Digital Zoom Position
38	Call Focus Position	A0h	64h	00h	00h	00h	AFh	P1(LowByte)P2(HighByte)=0~200(Dec):Focus Position
39	Call Freeze Status	A0h	78h	00h	00h	00h	AFh	P1=00/01:Off/On
40	Call Iris Status	A0h	7Ah	00h	00h	00h	AFh	P1=00/01:Auto/Manual、Stop (AC 50Hz)P2=00~126(Dec):Brightness (AC 60Hz)P2=00~134(Dec):Brightness
41	Call Negative	A0h	87h	00h	00h	00h	AFh	P1=00/01:Off/On
42	Call Color	A0h	88h	00h	00h	00h	AFh	P1=00/01:Photo/Gray
43	Call Brightness Position	A0h	89h	00h	00h	00h	AFh	P1=00~134(Dec):Brightnes
44	Call Mix Zoom Position	A0h	8Ah	00h	00h	00h	AFh	P1(LowByte)P2(HighByte)=0~46(Dec):Mix Zoom Position
45	Call Menu Status	A0h	8Bh	00h	00h	00h	AFh	P1=00/01:Off/On
46	Key Function	A0h	A0h	P1	00h	00h	AFh	P1=01/02/03/04/05/06=Enter/Up/Down/Left/Right/Menu
47	Set R/B Gain	A0h	A1h	P1	P2	P3	AFh	P1=01/02:Red Gain/Blue Gain P2(LowByte)P3(HighByte)=0~1023(Dec):Gain
48	Call R/B Gain	A0h	A2h	P1	00h	00h	AFh	Send : P1=01/02:Red Gain/Blue Gain

Item	Function	PC AP to DC 210 Master command format						Comment
		1st	2nd	3rd	4th	5th	6th	
								Return : P1(LowByte)P2(HighByte)=0~1023(Dec):Gain
49	AF One Push Trigger	A0h	A3h	01h	00h	00h	AFh	
50	Set Sharpness (Gamma)	A0h	A7h	P1	00h	00h	AFh	P1=00/01/02:Photo/Text/Gray
51	Set Image Mode	A0h	A9h	P1	00h	00h	AFh	P1=00/01/02/03:Normal/Slide/Film/Microscope
52	Night Vision	A0h	ABh	P1	00h	00h	AFh	P1=00/01:Off/On
53	Set DIP Switch(With Power On)	A0h	AFh	P1	P2	P3	AFh	P1=00/01:C-Video Off/On (Pin 1) P2=00/01/02/03:XGA/SXGA/720P-50Hz/720P-60Hz (Pin 2,3) P3=00/01:NTSC/PAL (Pin 4)
54	System ON/OFF	A0h	B0h	P1	00h	00h	AFh	P1=00/01:Off/On
55	Power	A0h	B1h	P1	00h	00h	AFh	P1=00/01:Off/On
56	Capture	A0h	B2h	P1	00h	00h	AFh	P1=00:Capture
57	Playback thumbnail	A0h	B3h	P1	00h	00h	AFh	P1=00/01:Thumbnail/PBP Thumbnail
58	Preview rotation	A0h	B4h	P1	00h	00h	AFh	P1=00/01/02/03:Rotate 0/90/180/270
59	Delete	A0h	B6h	P1	P2	P3	AFh	P1=00/01/02: Delete one/Delete all/Format Format: P2=0, P3=00/01: Format Nan B/C P2=1: Format External P2=2: Nan Create Partition and Format
60	Delete	A0h	B6h	P1	P2	00h	AFh	P1=00/01/02: Delete one/Delete all/Format Format: P2=00/01 Format Nan B\External
61	call system status	A0h	B7h	00h	00h	00h	AFh	P1(System Status)=00/01:not ready/ ready to accept commands P2(Power Status)=00/01:Off/On
62	AC Frequency Select	A0h	B8h	P1	00h	00h	AFh	P1=00/01:50 Hz/60 Hz
63	Lamp On/Off	A0h	C1h	P1	00h	00h	AFh	P1=00/01:Off/On

Item	Function	PC AP to DC 210 Master command format						Comment
		1st	2nd	3rd	4th	5th	6th	
64	USB Camera	A0h	C9h	P1	00h	00h	AFh	P1=00/01:Disable/Enable
65	Debug Message	A0h	CAh	P1	00h	00h	AFh	P1=00/01:External/Internal
66	Firmware Upgrade	A0h	CBh	P1	00h	00h	AFh	P1=00/01:External/Internal; P1=1 and p2:00/01 Manual Run/Auto Run
67	I2C Write	A0h	D9h	P1	P2	P3	AFh	P1=0x00~0xff:Slave Address P2=0x00~0xff:Register P3=0x00~0xff:Data
68	I2C Read	A0h	DAh	P1	P2	P3	AFh	
69	ServcieMenu	A0h	DCh	P1	00h	00h	AFh	P1=00/01:ServiecMenu1/ServiecMenu2
70	PE Storage Test Data(Save)	A0h	E8h	P1	P2	00h	AFh	P1=0~7:Address P2=0x00~0xff:DATA
71	PE Storage Test Data(Load)	A0h	E9h	P1	P2	00h	AFh	P1=0~7:Address P2=0x00~0xff:DATA
72	Debug0	A0h	F3h				AFh	
73	Debug1	A0h	F4h				AFh	
74	Debug2	A0h	F5h				AFh	
75	Debug3	A0h	F6h				AFh	

5. Return value

Item	Function	DC211 feedback to PC value format						Comment
		1st	2nd	3 rd	4 th	5th	6th	

Item	Function	DC211 feedback to PC value format						Comment
		1st	2nd	3 rd	4 th	5th	6th	
1	Preset/Factory Reset	A0h	03h	P1	P2	St.	AFh	P1=0, P2=00/01:Preset Load/Save P1=1:Factory Reset
2	Slide show On/Off	A0h	04h	P1	00h	St.	AFh	P1=00/01:Off/On
3	Slide show Effect	A0h	05h	P1	00h	St.	AFh	P1=0~5:Off/Shutter/Right/Down/Side/Open
4	Slide show Delay	A0h	06h	P1	00h	St.	AFh	P1=0~4:1sec/3sec/5sec/10sec/Manual
5	Digital Zoom Limit	A0h	15h	P1	00h	St.	AFh	P1= SXGA、720P、XGA : 01x~06x
6	Digital Zoom Direct	A0h	18h	P1	00h	St.	AFh	P1= SXGA、720P、XGA : 0~46(Dec) :Digital Zoom Position
7	Focus Stop	A0h	19h	00h	00h	St.	AFh	
8	Focus Start	A0h	1Ah	P1	P2	St.	AFh	P1=00/01:Near/Far P2=01~05:Speed
9	Focus Direct (No Limit)	A0h	1Bh	P1	P2	St.	AFh	P1(LowByte)P2(HighByte)=0~200(Dec):Focus Position P3=01~05:Speed
10	White Balance (AWB, Auto Tune)	A0h	22h	P1	00h	St.	AFh	P1=00/01:Auto Tune/AWB
11	White Balance Manual	A0h	23h	P1	P2	St.	AFh	P1=01/02 : +1/-1(Red Gain) P2=01/02 : +1/-1(Blue Gain)
12	Pan PBP	A0h	25h	P1	00h	St.	AFh	P2=00/01:Still/Preview P1= XGA:0~32(Dec)Step SXGA、WXGA:0~40(Dec)Step
13	Set Pan Mode	A0h	26h	P1	00h	St.	AFh	P1=00/01:Normal/Pan mode
14	Set Pan Move	A0h	27h	P1	00h	St.	AFh	P1=01/02/03/04:Up/Down/Left/Right
15	Call DIP Switch Value	A0h	29h	P1	00h	St.	AFh	P1:DIP Switch Value
16	Freeze	A0h	2Ch	P1	00h	St.	AFh	P1=00/01:Off/On

Item	Function	DC211 feedback to PC value format						Comment
		1st	2nd	3 rd	4 th	5th	6th	
17	Iris	A0h	30h	P1	P2	St.	AFh	P1=00/01/02:Auto/Manual/Stop (AC 50Hz)P2=00~126(Dec):Brightness (AC 60Hz)P2=00~134(Dec):Brightness
18	Switch USB Transfer	A0h	32h	P1	00h	St.	AFh	P1=00/01:Mass Storage/USB Camera
19	Negative (film)	A0h	36h	P1	00h	St.	AFh	P1=00/01:Off/On
20	Color (gray)	A0h	37h	P1	00h	St.	AFh	P1=00/01:Photo/Gray
21	Language Select	A0h	38h	P1	00h	St.	AFh	P1=0~12(Dec): English/Traditional Chinese/German/French/Spanish/Russian/Dutch/Finland/Polish/Italian/ Portuguese/Sweden/Czech
22	Brightness Control	A0h	39h	P1	00h	St.	AFh	P1=00/01:-1/+1
23	Source live/PC	A0h	3Ah	P1	00h	St.	AFh	P1=00/01:PC/DM350(no PC auto switch to Memory)
24	Call Master Version	A0h	45h	P1	P2	P3	AFh	DHAxxx = DHA P1 P2 P3(ASCII)
25	Call AE Status	A0h	46h	P1	00h	St.	AFh	P1=00/01:Off/On
26	Enable/Disable LOGO Image	A0h	47h	P1	00h	St.	AFh	P1=00/01:Off/On
27	Playback Image Index Change Page	A0h	4Ah	P1	00h	St.	AFh	P1=00/01:Page Up/Page Down
28	All OSD On/Off	A0h	4Bh	P1	00h	St.	AFh	P1=00/01:Off/On
29	Call Slave Version	A0h	4Dh	P1	P2	P3	AFh	DHBxxx = DHB P1 P2 P3(ASCII)
30	Call lamp Status	A0h	50h	P1	00h	St.	AFh	P1=00/01:Off/On
31	Call Text/Photo Status	A0h	51h	P1	00h	St.	AFh	P1=00/01/02:Photo/Text/Gray
32	reg1	A0h	52h	P1	P2	St.	AFh	P1=00/01:Read/Write P2=0x00~0xff
33	reg2	A0h	53h	P1	P2	St.	AFh	

Item	Function	DC211 feedback to PC value format						Comment
		1st	2nd	3 rd	4 th	5th	6th	
34	reg3	A0h	54h	P1	P2	St.	AFh	
35	Erroe Code	A0h	55h	00h	00h	St.	AFh	p1=00/01:Show Error Code/Clear Error Code
36	Bad pixel fix	A0h	57h	P1	P2	St.	AFh	p1:00/01/02:bad pixel fix/bad pixel numbers/badpixel correction number p1=2,p2=00/01:Read/Set bad pixel correction number.p3:Set number.p2:Read number.
37	Call Digital Zoom Position	A0h	62h	P1	00h	St.	AFh	P1=SXGA、720P、XGA：0~46(Dec) :Digital Zoom Position
38	Call Focus Position	A0h	64h	P1	P2	St.	AFh	P1(LowByte)P2(HighByte)=0~200(Dec):Focus Position
39	Call Freeze Status	A0h	78h	P1	00h	St.	AFh	P1=00/01:Off/On
40	Call Iris Status	A0h	7Ah	P1	P2	St.	AFh	P1=00/01:Auto/Manual、Stop (AC 50Hz)P2=00~126(Dec):Brightness (AC 60Hz)P2=00~134(Dec):Brightness
41	Call Negative	A0h	87h	P1	00h	St.	AFh	P1=00/01:Off/On
42	Call Color	A0h	88h	P1	00h	St.	AFh	P1=00/01:Photo/Gray
43	Call Brightness Position	A0h	89h	P1	00h	St.	AFh	P1=00~134(Dec):Brightnes
44	Call Mix Zoom Position	A0h	8Ah	P1	P2	St.	AFh	P1(LowByte)P2(HighByte)=0~46(Dec):Mix Zoom Position
45	Call Menu Status	A0h	8Bh	P1	00h	St.	AFh	P1=00/01:Off/On
46	Key Function	A0h	A0h	P1	00h	St.	AFh	P1=01/02/03/04/05/06=Enter/Up/Down/Left/Right/Menu
47	Set R/B Gain	A0h	A1h	P1	P2	St.	AFh	P1=01/02:Red Gain/Blue Gain P2(LowByte)P3(HighByte)=0~1023(Dec):Gain
48	Call R/B Gain	A0h	A2h	P1	P2	St.	AFh	Send : P1=01/02:Red Gain/Blue Gain Return : P1(LowByte)P2(HighByte)=0~1023(Dec):Gain

Item	Function	DC211 feedback to PC value format						Comment
		1st	2nd	3 rd	4 th	5th	6th	
49	AF One Push Trigger	A0h	A3h	01h	00h	St.	AFh	
50	Set Sharpness (Gamma)	A0h	A7h	P1	00h	St.	AFh	P1=00/01/02:Photo/Text/Gray
51	Set Image Mode	A0h	A9h	P1	00h	St.	AFh	P1=00/01/02/03:Normal/Slide/Film/Microscope
52	Night Vision	A0h	ABh	P1	00h	St.	AFh	P1=00/01:Off/On
53	Set DIP Switch(With Power On)	A0h	AFh	P1	P2	St.	AFh	P1=00/01:C-Video Off/On (Pin 1) P2=00/01/02/03:XGA/SXGA/720P-50Hz/720P-60Hz (Pin 2,3) P3=00/01:NTSC/PAL (Pin 4)
54	System ON/OFF	A0h	B0h	P1	00h	St.	AFh	P1=00/01:Off/On
55	Power	A0h	B1h	P1	00h	St.	AFh	P1=00/01:Off/On
56	Capture	A0h	B2h	P1	00h	St.	AFh	P1=00:Capture
57	Playback thumbnail	A0h	B3h	P1	00h	St.	AFh	P1=00/01:Thumbnail/PBP Thumbnail
58	Preview rotation	A0h	B4h	P1	00h	St.	AFh	P1=00/01/02/03:Rotate 0/90/180/270
59	Delete	A0h	B6h	P1	P2	St.	AFh	P1=00/01/02: Delete one/Delete all/Format Format: P2=0, P3=00/01: Format Nan B/C P2=1: Format External P2=2: Nan Create Partition and Format
60	Delete	A0h	B6h	P1	P2	St.	AFh	P1=00/01/02: Delete one/Delete all/Format Format: P2=00/01 Format Nan B\External
61	call system status	A0h	B7h	P1	P2	St.	AFh	P1(System status)=00/01:not ready/ ready to accept commands P2(Power Status)=00/01:Off/On
62	AC Frequency Select	A0h	B8h	P1	00h	St.	AFh	P1=00/01:50 Hz/60 Hz
63	Lamp On/Off	A0h	C1h	P1	00h	St.	AFh	P1=00/01:Off/On
64	USB Camera	A0h	C9h	P1	00h	St.	AFh	P1=00/01:Disable/Enable

Item	Function	DC211 feedback to PC value format						Comment
		1st	2nd	3 rd	4 th	5th	6th	
65	Debug Message	A0h	CAh	P1	00h	St.	AFh	P1=00/01:External/Internal
66	Firmware Upgrade	A0h	CBh	P1	00h	St.	AFh	P1=00/01:External/Internal; P1=1 and p2:00/01 Manual Run/Auto Run
67	I2C Write	A0h	D9h	P1	P2	P3	AFh	P1=0x00~0xff:Slave Address P2=0x00~0xff:Register P3=0x00~0xff:Data
68	I2C Read	A0h	DAh	P1	P2	P3	AFh	
69	ServcieMenu	A0h	DAh	P1	P2	St.	AFh	P1=00/01:ServiecMenu1/ServiecMenu2
70	PE Storage Test Data(Save)	A0h	E8h	P1	P2	St.	AFh	P1=0~7:Address P2=0x00~0xff:DATA
71	PE Storage Test Data(Load)	A0h	E9h	P1	P2	St.	AFh	P1=0~7:Address P2=0x00~0xff:DATA
72	Debug0	A0h	F3h			St.	AFh	
73	Debug1	A0h	F4h			St.	AFh	
74	Debug2	A0h	F5h			St.	AFh	
75	Debug3	A0h	F6h			St.	AFh	

*St : 0 =Action Succeed, 1= NAK (No Action)