

PS650 Protocol

History

No	Issue Date	Version	Description	Apply Firmware
1	2010/01/14	1.0	First version.	TBD

**** Notice: Only for PS650 use**

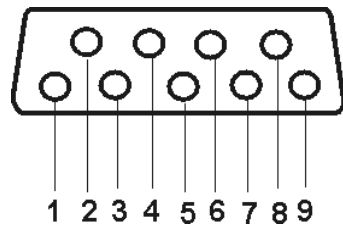
2. Communication Protocol

Transmit Method : Asynchronous Interface Half Duplex Serial Communication.

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

1. The wire diagram

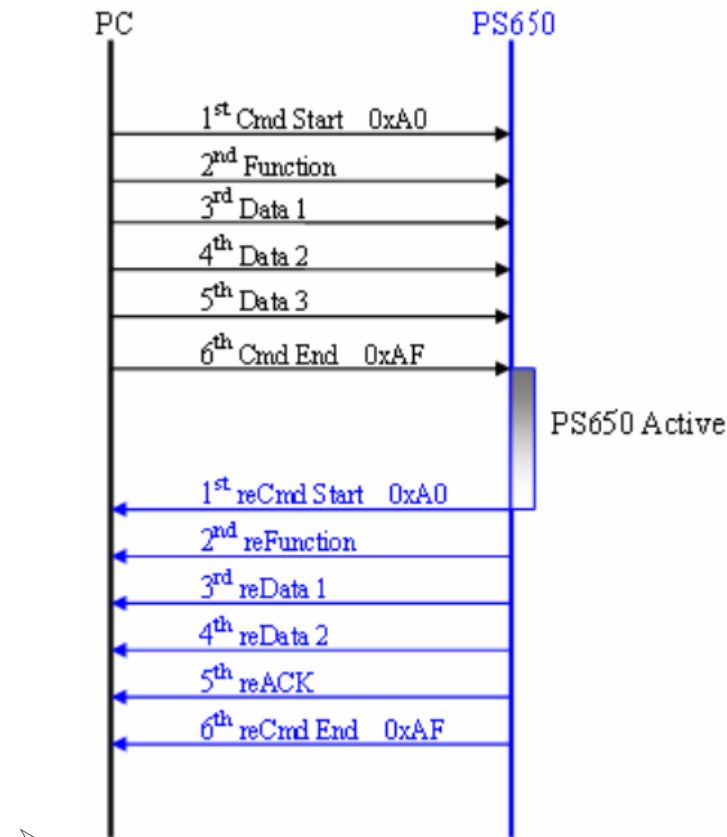
The RS232 wire diagram between presenter and remote controller as below



Female

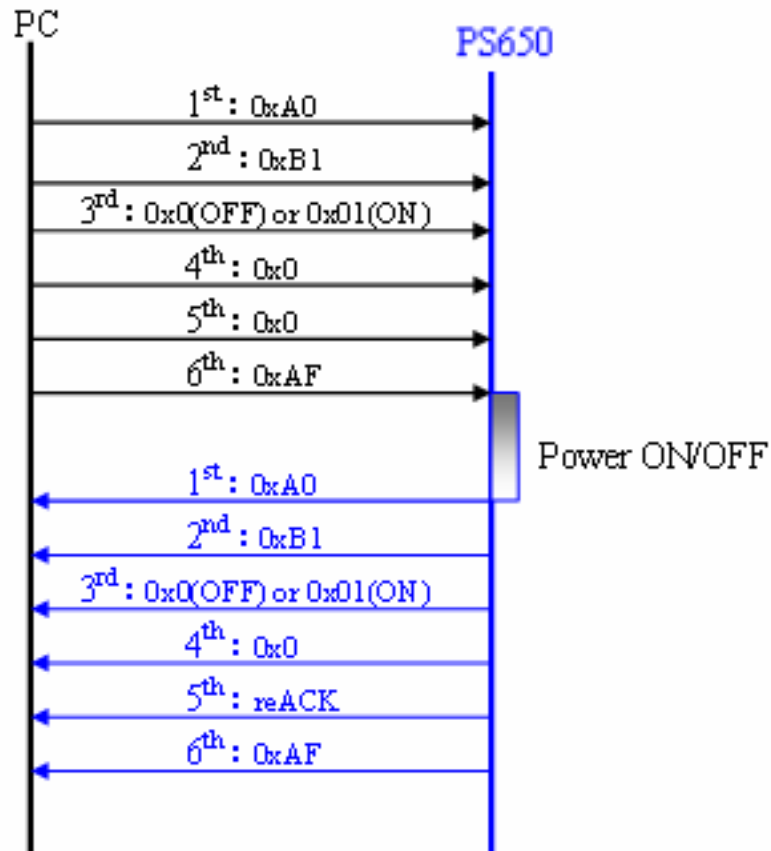
CONNECTIONS		
DB 9F	COLOUR	DB 9F
2	-	3
3	-	2
5	-	5
SHELL	DRAIN	SHELL

3. Command Transfer



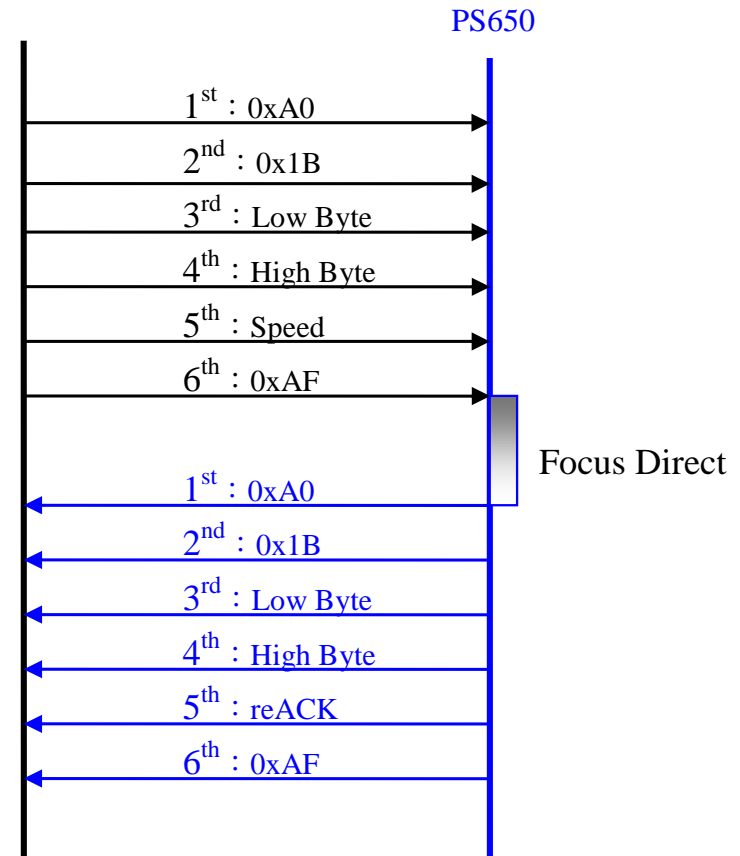
4. Example

Example 1 : (Power ON/OFF)



A0h△B1h△01h (Power ON)△00h△00h△AFh ← (PC send Command to PS650) → A0h△B1h△01h△00h△00h△AFh ← (PS650 Return Command to PC)

Example 2 : (Focus Direct (No Limit))



A0h△1Bh△01h△01h△01h△AFh ← (PC send Command to PS650) → A0h△1Bh△01h△01h△00h△AFh ← (PS650 Return Command to PC)

5. Command Packet

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
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	Image/Record Quality	A0h	07h	P1	00h	00h	AFh	P1=00/01/02:High/Medium/Low
6	Copy To SD Card	A0h	08h	00h	00h	00h	AFh	
7	Zoom Stop	A0h	10h	00h	00h	00h	AFh	
8	Zoom Start (No AF)	A0h	11h	P1	00h	00h	AFh	P1=00/01:Tele/Wide
9	Zoom Direct (Straight, No AF)	A0h	13h	P1	P2	00h	AFh	P1(LowByte) , P2(HighByte)=SXGA:0~33 、 720P:0~35 、 XGA:0~43(Dec):Zoom Position
10	Auto Erase	A0h	14h	P1	00h	00h	AFh	P1=00/01:Auto Erase off/on
11	Digital Zoom Direct	A0h	18h	P1	00h	00h	AFh	P1=XGA:0~47(Dec) 720P:0~55(Dec) SXGA:0~57(Dec) Digital Zoom Position
12	Focus Stop	A0h	19h	00h	00h	00h	AFh	
13	Focus Start	A0h	1Ah	P1	P2	00h	AFh	P1=00/01:Near/Far P2=01~05:Speed
14	Focus Direct (No Limit)	A0h	1Bh	P1	P2	P3	AFh	P1(LowByte)P2(HighByte)=0~258(Dec):Focus Position P3=01~05:Speed
15	Zoom Start (with AF)	A0h	1Dh	P1	00h	00h	AFh	P1=00/01:Tele/Wide
16	Zoom Direct (Straight) (with AF)	A0h	1Fh	P1	P2	P3	AFh	P1(LowByte) , P2(HighByte)=SXGA:0~33 、 720P:0~35 、 XGA:0~43(Dec):Zoom Position

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
17	White Balance (AWB, Auto Tune)	A0h	22h	P1	00h	00h	AFh	P1=00/01:Auto Tune/AWB
18	White Balance Manual	A0h	23h	P1	P2	00h	AFh	P1=01/02 : +1/-1(Red Gain) P2=01/02 : +1/-1(Blue Gain)
19	Pan PBP	A0h	25h	P1	P2	00h	AFh	P2=00/01:Still/Preview P1= XGA:0~32(Dec)Step SXGA、720P:0~40(Dec)Step
20	Set Pan Mode	A0h	26h	P1	00h	00h	AFh	P1=00:Normal =01~04:Pan
21	Call DIP Switch Value	A0h	29h	00h	00h	00h	AFh	P1:DIP Switch Value
22	Freeze	A0h	2Ch	P1	00h	00h	AFh	P1=00/01:Off/On
23	Iris	A0h	30h	P1	P2	00h	AFh	P1=00/01/02:Auto/Manual/Stop (Norma AC 50/60Hz)P2=00~86(Dec):Brightness (Microscope AC 50Hz)P2=00~69(Dec):Brightness (Microscope AC 60Hz)P2=00~75(Dec):Brightness
24	Switch USB Transfer	A0h	32h	P1	00h	00h	AFh	P1=00/01:Mass Storage/USB Camera
25	LogoDelay	A0h	34h	P1	00h	00h	AFh	P1=0~30 (sec)
26	Negative (film)	A0h	36h	P1	00h	00h	AFh	P1=00/01:Off/On
27	Color (gray)	A0h	37h	P1	00h	00h	AFh	P1=00/01:Photo/Gray
28	Language Select	A0h	38h	P1	00h	00h	AFh	P1=0~12(Dec): English/Traditional Chinese/German/French/Spanish/Russian/Dutch/Finnish /Polish/Italian/Portuguese/Swedish/Czech
29	Brightness Control	A0h	39h	P1	00h	00h	AFh	P1=00/01:-1/+1
30	Source live/PC	A0h	3Ah	P1	00h	00h	AFh	P1=00/01:PC/DM350(no PC auto switch)
31	Source Monitor	A0h	3Ch	P1	00h	00h	AFh	p1= 00/01 VGA1,VGA2

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
32	Disable Digital Zoom After Optical Zoom	A0h	40h	P1	00h	00h	AFh	P1=00/01:Disable/Enable
33	Call Master Version	A0h	45h	00h	00h	00h	AFh	PIAxxx = PIA P1 P2 P3(ASCII)
34	Call AE Status	A0h	46h	00h	00h	00h	AFh	P1=00/01:Off/On
34	Enable/Disable LOGO Image	A0h	47h	P1	00h	00h	AFh	P1=00/01:Off/On
36	Playback Image Index Change Page	A0h	4Ah	P1	00h	00h	AFh	P1=00/01:Page Up/Page Down
37	Call Slave Version	A0h	4Dh	00h	00h	00h	AFh	PIBxxx = PIB P1 P2 P3(ASCII)
38	Frame Average	A0h	4Eh	P1	00h	00h	AFh	P1=00/01:Off/On
39	Call lamp Status	A0h	50h	00h	00h	00h	AFh	P1=00/01/02:Off/Arm Light/Back Light
40	Call Text/Photo Status	A0h	51h	00h	00h	00h	AFh	P1=00/01/02:Photo/Text/Gray
41	reg1	A0h	52h	P1	P2	00h	AFh	P1=00/01:Read/Write P2=0x00~0xff
42	reg2	A0h	53h	P1	P2	00h	AFh	
43	reg3	A0h	54h	P1	P2	00h	AFh	
44	Call Zoom Position	A0h	60h	00h	00h	00h	AFh	P1(LowByte) , P2(HighByte)=SXGA:0~33 、 720P:0~35 、 XGA:0~43(Dec):Zoom Position
45	Call Digital Zoom Position	A0h	62h	00h	00h	00h	AFh	P1=XGA:0~47(Dec) 720P:0~55(Dec) SXGA:0~57(Dec) Digital Zoom Position
46	Call Focus Position	A0h	64h	00h	00h	00h	AFh	P1(LowByte)P2(HighByte)=0~258(Dec):Focus Position
47	Call Freeze Status	A0h	78h	00h	00h	00h	AFh	P1=00/01:Off/On
48	Call Iris Status	A0h	7Ah	00h	00h	00h	AFh	P1=00/01:Auto/Manual 、 Stop

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
								(Norma AC 50/60Hz)P2=00~86(Dec):Brightness (Microscope AC 50Hz)P2=00~69(Dec):Brightness (Microscope AC 60Hz)P2=00~75(Dec):Brightness
49	Call Negative	A0h	87h	00h	00h	00h	AFh	P1=00/01:Off/On
50	Call Color	A0h	88h	00h	00h	00h	AFh	P1=00/01:Photo/Gray
51	Call Brightness Position	A0h	89h	00h	00h	00h	AFh	(Norma AC 50/60Hz)P1=00~86(Dec):Brightness (Microscope AC 50Hz)P1=00~88(Dec):Brightness (Microscope AC 60Hz)P1=00~94(Dec):Brightness
52	Call Mix Zoom Position	A0h	8Ah	00h	00h	00h	AFh	P1(LowByte)P2(HighByte)=0~90(Dec):Mix Zoom Position
53	Call Menu Status	A0h	8Bh	00h	00h	00h	AFh	P1=00/01:Off/On
54	Capture type	A0h	96h	P1	00h	00h	AFh	P1=00/01/02:Single/Continuous/Disable
55	Capture time	A0h	97h	P1	00h	00h	AFh	P1=00/01/02/03/04:1hr/ 2hr/ 4hr/ 8hr/ 24hr
56	Capture interval	A0h	98h	P1	00h	00h	AFh	P1=00/01/02/03/04/05:5sec /10sec /30sec /1min/ 2min /5min
57	Key Function	A0h	A0h	P1	00h	00h	AFh	P1=01/02/03/04/05/06=Enter/Up/Down/Left/Right/Menu
58	AF One Push Trigger	A0h	A3h	01h	00h	00h	AFh	
59	Set Sharpness (Gamma)	A0h	A7h	P1	00h	00h	AFh	P1=00/01/02:Photo/Text/Gray
60	Set Image Mode	A0h	A9h	P1	00h	00h	AFh	P1=00/01/02/03:Normal/Slide/Film/Microscope
61	Night Vision	A0h	ABh	P1	00h	00h	AFh	P1=00/01:Off/On
62	System ON/OFF	A0h	B0h	P1	00h	00h	AFh	P1=00/01:Off/On
63	Power	A0h	B1h	P1	00h	00h	AFh	P1=00/01:Off/On
64	Capture	A0h	B2h	P1	00h	00h	AFh	P1=00/01:Capture/Record

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
65	Playback thumbnail	A0h	B3h	P1	00h	00h	AFh	P1=00/01:Thumbnail/PBP Thumbnail
66	Preview rotation	A0h	B4h	P1	00h	00h	AFh	P1=00/01/02/03:Rotate 0/90/180/270
67	Delete	A0h	B6h	P1	P2	00h	AFh	P1=00/01/02: Delete one/Delete all/Format Format: P2=00/01 Format Nan B\External
68	call system status	A0h	B7h	00h	00h	00h	AFh	P1(system situation)=00/01: not ready/ Ready to accept commend P2(Power Status)=00/01:Off/On
69	Lamp On/Off	A0h	C1h	P1	00h	00h	AFh	P1=00/01:Disable/Arm Light/Back Light
70	Firmware Upgrade	A0h	CBh	P1	00h	00h	AFh	P1=00/01:External/Internal
71	Set Audio Volume	A0h	D6h	P1	00h	00h	AFh	P1=0~15(Dec):Volume
72	Call Audio Volume	A0h	D7h	00h	00h	00h	AFh	P1(LowByte)P2(HighByte) val=(0~15)
73	ServcieMenu	A0h	DCh	P1	00h	00h	AFh	P1=00/01:ServiecMenu1/ServiecMenu2

6. Return Packet

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
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	Image/Record Quality	A0h	07h	P1	00h	St.	AFh	P1=00/01/02:High/Medium/Low
6	Copy To SD Card	A0h	08h	00h	00h	St.	AFh	
7	Zoom Stop	A0h	10h	00h	00h	St.	AFh	
8	Zoom Start (No AF)	A0h	11h	P1	00h	St.	AFh	P1=00/01:Tele/Wide
9	Zoom Direct (Straight, No AF)	A0h	13h	P1	P2	St.	AFh	P1(LowByte) , P2(HighByte)=SXGA:0~33 、 720P:0~35 、 XGA:0~43(Dec):Zoom Position
10	Auto Erase	A0h	13h	P1	00h	St.	AFh	P1=00/01:Auto Erase off/on
11	Digital Zoom Direct	A0h	18h	P1	00h	St.	AFh	P1=XGA:0~47(Dec) 720P:0~55(Dec) SXGA:0~57(Dec) Digital Zoom Position
12	Focus Stop	A0h	19h	00h	00h	St.	AFh	
13	Focus Start	A0h	1Ah	P1	P2	St.	AFh	P1=00/01:Near/Far P2=01~05:Speed
14	Focus Direct (No Limit)	A0h	1Bh	P1	P2	St.	AFh	P1(LowByte)P2(HighByte)=0~258(Dec):Focus Position P3=01~05:Speed
15	Zoom Start (with AF)	A0h	1Dh	P1	00h	St.	AFh	P1=00/01:Tele/Wide
16	Zoom Direct (Straight) (with AF)	A0h	1Fh	P1	P2	St.	AFh	P1(LowByte) , P2(HighByte)=SXGA:0~33 、 720P:0~35 、

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
								XGA:0~43(Dec):Zoom Position
17	White Balance (AWB, Auto Tune)	A0h	22h	P1	00h	St.	AFh	P1=00/01:Auto Tune/AWB
18	White Balance Manual	A0h	23h	P1	P2	St.	AFh	P1=01/02 : +1/-1(Red Gain) P2=01/02 : +1/-1(Blue Gain)
19	Pan PBP	A0h	25h	P1	P2	St.	AFh	P2=00/01:Still/Preview P1= XGA:0~32(Dec)Step SXGA、720P:0~40(Dec)Step
20	Set Pan Mode	A0h	26h	P1	00h	St.	AFh	P1=00:Normal =01~04:Pan
21	Call DIP Switch Value	A0h	29h	P1	00h	St.	AFh	P1:DIP Switch Value
22	Freeze	A0h	2Ch	P1	00h	St.	AFh	P1=00/01:Off/On
23	Iris	A0h	30h	P1	P2	St.	AFh	P1=00/01/02:Auto/Manual/Stop (Norma AC 50/60Hz)P2=00~86(Dec):Brightness (Microscope AC 50Hz)P2=00~69(Dec):Brightness (Microscope AC 60Hz)P2=00~75(Dec):Brightness
24	Switch USB Transfer	A0h	32h	P1	00h	St.	AFh	P1=00/01:Mass Storage/USB Camera
25	LogoDelay	A0h	32h	P1	00h	St.	AFh	P1=0~30 (sec)
26	Negative (film)	A0h	36h	P1	00h	St.	AFh	P1=00/01:Off/On
27	Color (gray)	A0h	37h	P1	00h	St.	AFh	P1=00/01:Photo/Gray
28	Language Select	A0h	38h	P1	00h	St.	AFh	P1=0~12(Dec): English/Traditional Chinese/German/French/Spanish/Russian/Dutch/Finnish /Polish/Italian/Portuguese/Swedish/Czech
29	Brightness Control	A0h	39h	P1	00h	St.	AFh	P1=00/01:-1/+1
30	Source live/PC	A0h	3Ah	P1	00h	St.	AFh	P1=00/01:PC/DM350(no PC auto switch)

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
31	Source Monitor	A0h	3Ch	P1	00h	St.	AFh	p1= 00/01 VGA1,VGA2
32	Disable Digital Zoom After Optical Zoom	A0h	40h	P1	00h	St.	AFh	P1=00/01:Disable/Enable
33	Call Master Version	A0h	45h	P1	P2	P3	AFh	PIAxxx = PIA P1 P2 P3(ASCII)
34	Call AE Status	A0h	46h	P1	00h	St.	AFh	P1=00/01:Off/On
34	Enable/Disable LOGO Image	A0h	47h	P1	00h	St.	AFh	P1=00/01:Off/On
36	Playback Image Index Change Page	A0h	4Ah	P1	00h	St.	AFh	P1=00/01:Page Up/Page Down
37	Call Slave Version	A0h	4Dh	P1	P2	P3	AFh	PIBxxx = PIB P1 P2 P3(ASCII)
38	Frame Average	A0h	4Eh	P1	00h	St.	AFh	P1=00/01:Off/On
39	Call lamp Status	A0h	50h	P1	00h	St.	AFh	P1=00/01/02:Off/Arm Light/Back Light
40	Call Text/Photo Status	A0h	51h	P1	00h	St.	AFh	P1=00/01/02:Photo/Text/Gray
41	reg1	A0h	52h	P1	P2	St.	AFh	P1=00/01:Read/Write P2=0x00~0xff
42	reg2	A0h	53h	P1	P2	St.	AFh	
43	reg3	A0h	54h	P1	P2	St.	AFh	
44	Call Zoom Position	A0h	60h	P1	P2	St.	AFh	P1(LowByte) , P2(HighByte)=SXGA:0~33 , 720P:0~35 , XGA:0~43(Dec):Zoom Position
45	Call Digital Zoom Position	A0h	62h	P1	00h	St.	AFh	P1=XGA:0~47(Dec) 720P:0~55(Dec) SXGA:0~57(Dec) Digital Zoom Position
46	Call Focus Position	A0h	64h	P1	P2	St.	AFh	P1(LowByte)P2(HighByte)=0~258(Dec):Focus Position
47	Call Freeze Status	A0h	78h	P1	00h	St.	AFh	P1=00/01:Off/On

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
48	Call Iris Status	A0h	7Ah	P1	P2	St.	AFh	P1=00/01:Auto/Manual、Stop (Norma AC 50/60Hz)P2=00~86(Dec):Brightness (Microscope AC 50Hz)P2=00~69(Dec):Brightness (Microscope AC 60Hz)P2=00~75(Dec):Brightness
49	Call Negative	A0h	87h	P1	00h	St.	AFh	P1=00/01:Off/On
50	Call Color	A0h	88h	P1	00h	St.	AFh	P1=00/01:Photo/Gray
51	Call Brightness Position	A0h	89h	P1	00h	St.	AFh	(Norma AC 50/60Hz)P1=00~86(Dec):Brightness (Microscope AC 50Hz)P1=00~88(Dec):Brightness (Microscope AC 60Hz)P1=00~94(Dec):Brightness
52	Call Mix Zoom Position	A0h	8Ah	P1	P2	St.	AFh	P1(LowByte)P2(HighByte)=0~90(Dec):Mix Zoom Position
53	Call Menu Status	A0h	8Bh	P1	00h	St.	AFh	P1=00/01:Off/On
54	Capture type	A0h	96h	P1	00h	St.	AFh	P1=00/01/02:Single/Continuous/Disable
55	Capture time	A0h	97h	P1	00h	St.	AFh	P1=00/01/02/03/04:1hr/ 2hr/ 4hr/ 8hr/ 24hr
56	Capture interval	A0h	98h	P1	00h	St.	AFh	P1=00/01/02/03/04/05:5sec /10sec /30sec /1min/ 2min /5min
57	Key Function	A0h	A0h	P1	00h	St.	AFh	P1=01/02/03/04/05/06=Enter/Up/Down/Left/Right/Menu
58	AF One Push Trigger	A0h	A3h	01h	00h	St.	AFh	
59	Set Sharpness (Gamma)	A0h	A7h	P1	00h	St.	AFh	P1=00/01/02:Photo/Text/Gray
60	Set Image Mode	A0h	A9h	P1	00h	St.	AFh	P1=00/01/02/03:Normal/Slide/Film/Microscope
61	Night Vision	A0h	ABh	P1	00h	St.	AFh	P1=00/01:Off/On
62	System ON/OFF	A0h	B0h	P1	00h	St.	AFh	P1=00/01:Off/On
63	Power	A0h	B1h	P1	00h	St.	AFh	P1=00/01:Off/On

Item	Function	PC AP to PS650 Master command format						Comment
		1B	2B	3B	4B	5B	6B	
64	Capture	A0h	B2h	P1	00h	St.	AFh	P1=00/01:Capture/Record
65	Playback thumbnail	A0h	B3h	P1	00h	St.	AFh	P1=00/01:Thumbnail/PBP Thumbnail
66	Preview rotation	A0h	B4h	P1	00h	St.	AFh	P1=00/01/02/03:Rotate 0/90/180/270
67	Delete	A0h	B6h	P1	P2	St.	AFh	P1=00/01/02: Delete one/Delete all/Format Format: P2=00/01 Format Nan B\External
68	call system status	A0h	B7h	P1	P2	St.	AFh	P1(system situation)=00/01: not ready/ Ready to accept commend P2(Power Status)=00/01:Off/On
69	Lamp On/Off	A0h	C1h	P1	00h	St.	AFh	P1=00/01:Disable/Arm Light/Back Light
70	Firmware Upgrade	A0h	CBh	P1	00h	St.	AFh	P1=00/01:External/Internal
71	Set Audio Volume	A0h	D6h	P1	00h	St.	AFh	P1=0~15(Dec):Volume
72	Call Audio Volume	A0h	D7h	P1	P2	St.	AFh	P1(LowByte)P2(HighByte) val=(0~15)
73	ServcieMenu	A0h	DAh	P1	P2	St.	AFh	P1=00/01:ServiecMenu1/ServiecMenu2

** St : 0 =Action Succeed, 1= NAK (No Action), 2 = Ignore (Command is not in the command list.)