

# SAMSUNG Protocol

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Ver. 2.2

## History

Date	Version	Comment
2001.01	1.0	First Edition
2002.10	2.0	Adding Position Control/Reporting Command
2004.06	2.1	Changing Position Control/Reporting Command Adding Menu Mode status in ACK format
<b>2005.02</b>	<b>2.2</b>	<b>Extending a number of SCAN and AUTO-PAN (4 per each function) Adding Function Key(Hot Key) protocol</b>

2005.07.20

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## **1. Communication Protocol**

Communication between the microcomputer of the camera and the controlling device(includig PC, Controller, etc..) is available by using the RS-485 protocol. The microcomputer receives each control command and echoes it back.

## **2. Connect condition**

Data Communication : RS-485, Start-Stop Synchronized serial interface

Data length : 8bit data

Stop bit : 1 bit

Parity : None

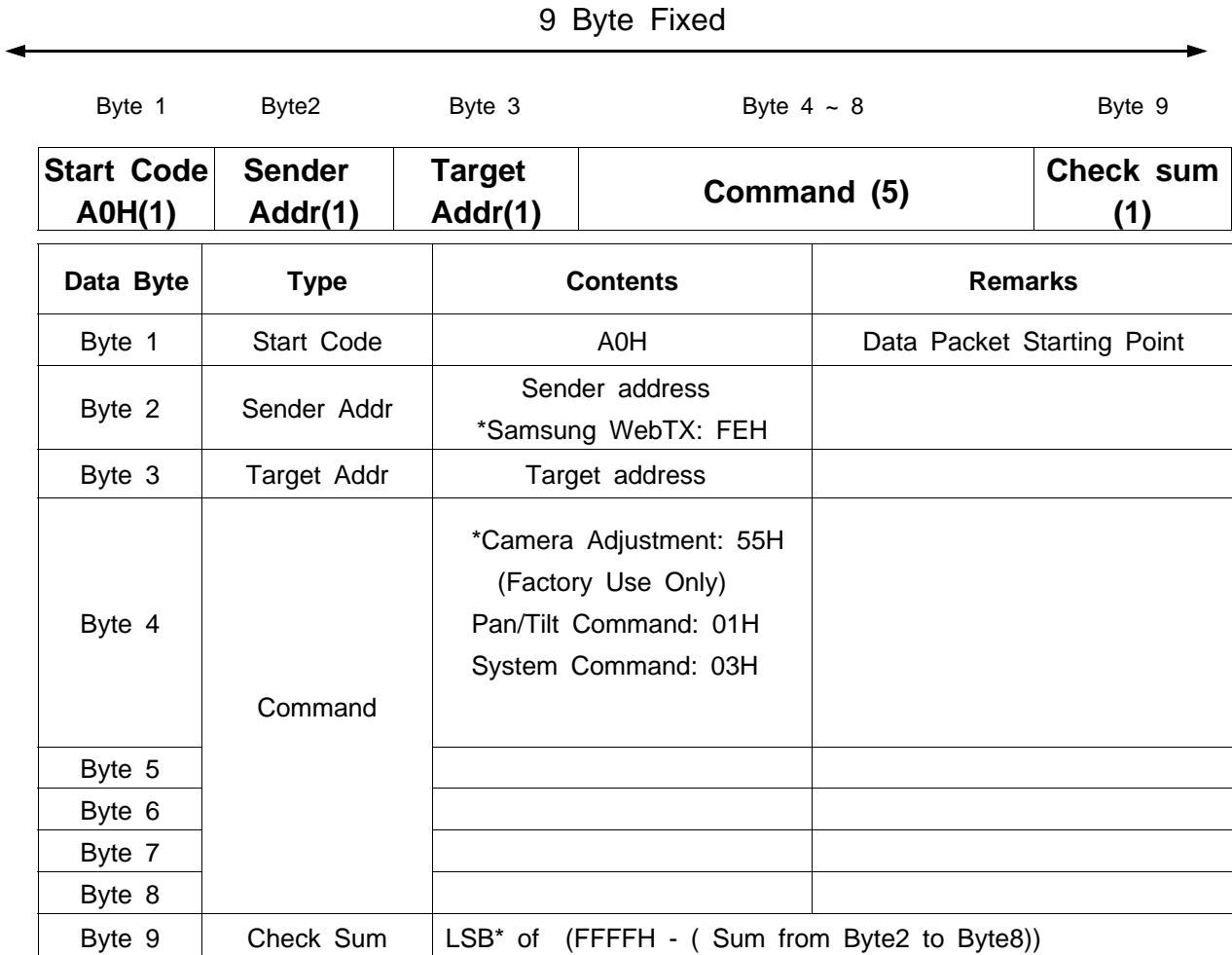
Baudrate : 4800, 9600, 19200, 38400 bps

### 3. Camera Control Command

All communication data consist of nine bytes.

Communication data start with A0(h).

The format of the communication data is shown below.



Ex) Example of Pan(Left) command with motor speed 20H.

In this example, camera's address is 01H.

Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9
00H	01H	01H	00H	01H	20H	00H	DCH

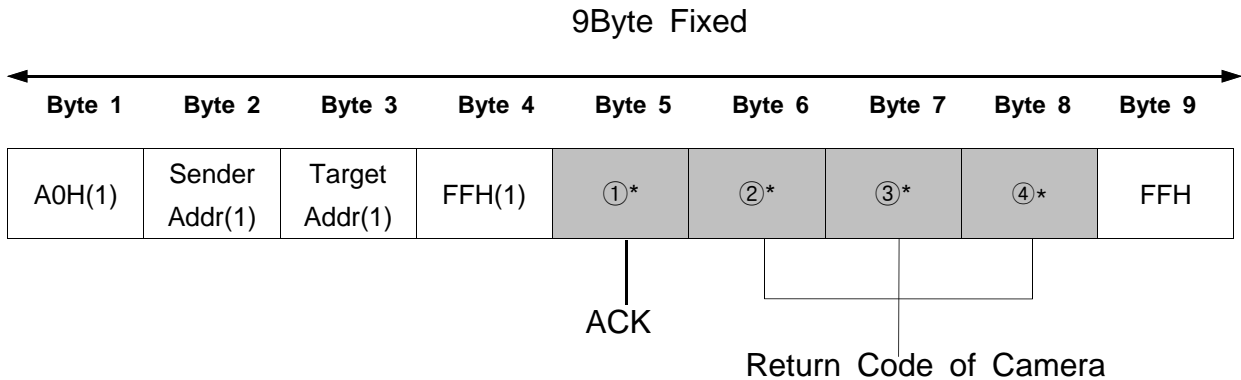
Sum from Byte2 to Byte8 = 23H

∴ FFFFH - 23H = FFDCH ; LSB of FFDCH=DCH

∴ Check Sum : DCH

#### 4. ACK Format

Samsung RS-485 communication utilizes ACK codes. When controller sends a command, the camera sends back an ACK. This is our basic procedure to make sure that the communication and the camera function are properly executed.



- ACK is applicable only in case that Byte4 of the command is 03H(.

Byte5, Byte6, and Byte7 of the ACK data means as follows.

- ①\* Byte5 of the ACK data indicates whether the camera received command successfully.  
00H : OK  
01H : Error (Request Re-transmission)
- ②\* Byte6 of the ACK data indicates the mode in which camera is working.
- ③\* In case of Pattern, Scan, Auto Pan Mode(Byte6=02~04H), Byte7 means Play Number(1~4) of each relevant mode.

Camera Mode	Byte6	Byte7
Manual	00H	00H
<b>Menu</b>	<b>01H</b>	<b>Don't care</b>
Pattern	02H	01~03H
Scan	03H	01~04H
Auto-Pan	04H	01~04H

- ④\* **Byte8 means type of camera.**  
**AAH : SCC-C6405/SCC-C6475 Series**  
**AFH : SCC-C4205(C4305) Series**

## 5. Camera Adjustment Command (Factory Use Only)

When Byte4 of the command is set to 55H, camera can be adjusted.

※ Caution : It can affects camera's initial data.

Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Target Address (*ID set-up in menu)	55H				

## 6. Focus/Pan/Tilt/Iris/Zoom Control Command

When Byte4 of the command is set to 01H, you can control Focus/Pan/Tilt/Iris/Zoom movement of the camera as follows.

	Byte4	Byte5	Byte6	Byte7	Byte8
Bit0	01H	Focus Far	Pan Left※0	Pan Motor Speed※1 00H~40H	Tilt Motor Speed※1 00H~40H
Bit1		Focus Near	Pan Right※0		
Bit2		One AF	Tilt Up※0		
Bit3		Iris Open	Tilt Down※0		
Bit4		Iris Close			
Bit5		Zoom Tele			
Bit6		Zoom Wide			
Bit7					

※0 These commands are only applicable in case of Dome Camera(SCC-641(P)/SCC-643(P)).

### Focus/Pan/Tilt/Iris/Zoom Command

Focus(Far-Near)/Pan(Left-Right)/Tilt(Up-Down)/Iris(Open-Close)/Zoom(Tele-Wide) control bits are made up as pairs.

Focus (Far) Pan (Left) Tilt (Up) Iris(Open) Zoom (Tele)	Focus (Near) Pan (Right) Tilt (Down) Iris(Close) Zoom (Wide)	Function
0	0	Stop
1	0	Motion of value "1"
0	1	Motion of value "1"
1	1	Keep the Current Motion

Ex)

Step 1) Select "Focus Far"

**Byte 5**      Bit 7 Bit 0

0	0	0	0	0	0	0	1
---	---	---	---	---	---	---	---

Step 2) "Focus Far" Continued

**Byte 5**      Bit 7 Bit 0

0	0	0	0	0	0	1	1
---	---	---	---	---	---	---	---

Step 3) "Stop Focus Far" Command

**Byte 5**      Bit 7 Bit 0

0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---

Step 4) "Focus Near" Command

**Byte 5**      Bit 7 Bit 0

0	0	0	0	0	0	1	0
---	---	---	---	---	---	---	---

Step 5) "Zoom Tele" Command

**Byte 5**      Bit 7 Bit 0

0	0	1	0	0	0	0	0
---	---	---	---	---	---	---	---

Step 6) "Stop Zoom Tele" Command

**Byte 5**      Bit 7 Bit 0

0	0	0	0	0	0	0	0
---	---	---	---	---	---	---	---

Step 7) "Zoom Wide" Command

**Byte 5**      Bit 7 Bit 0

0	1	0	0	0	0	0	0
---	---	---	---	---	---	---	---

## 7. System Command

When Byte4 of the command is set to 03H, you can control detail behavior of the camera as follows.  
In case of Zoom Camera, only "preset move" and "menu on" commands are available.

No.	Category	Items	Byte4	Byte5	Byte6	Byte7	Byte8	Note
1	NUMERIC KEY	0 KEY	03H	00H	FFH	FFH	FFH	
2		1 KEY	03H	02H	FFH	FFH	FFH	
3		2 KEY(↑)※1,※2	03H	03H	FFH	FFH	FFH	
4		3 KEY	03H	04H	FFH	FFH	FFH	
5		4 KEY(←)※1,※2	03H	05H	FFH	FFH	FFH	
6		5 KEY	03H	06H	FFH	FFH	FFH	
7		6 KEY(→)※1,※2	03H	07H	FFH	FFH	FFH	
8		7 KEY	03H	08H	FFH	FFH	FFH	
9		8 KEY(↓)※1,※2	03H	09H	FFH	FFH	FFH	
10		9 KEY	03H	0AH	FFH	FFH	FFH	
11		CAM※1,※2	03H	12H	XX	FFH	FFH	XX : CAM NUMBER
12		SCAN	03H	13H	XX	YY	FFH	XX : 01H: START 00H: STOP YY : 1~4
13		MENU※1,※2	03H	17H	XX	FFH	FFH	XX : 01H: MENU ON 00H: MENU OFF
14		ENTER※1,※2	03H	18H	FFH	FFH	FFH	

No.	Category	Items	Byte4	Byte5	Byte6	Byte7	Byte8	Note
15		PRESET MOVE※1	03H	19H	XX	FFH	FFH	XX : PRESET NUMBER (0 ~ 127)
16		AUTO PAN	03H	1AH	XX	YY	FFH	XX : 01H: START 00H: STOP YY : 1~4
17		PATTERN	03H	1BH	XX	YY	FFH	XX : PATTERN NUMBER(1~3) YY : 01H: START 00H: STOP
18		RESET	03H	1EH	FFH	FFH	FFH	
19		DOWNLOAD START	03H	30H	FFH	FFH	FFH	
20		DOWNLOAD END	03H	31H	FFH	FFH	FFH	
21		UPLOAD START	03H	32H	FFH	FFH	FFH	
22		UPLOAD END	03H	33H	FFH	FFH	FFH	
23		FACTORY RESET	03H	40H	FFH	FFH	FFH	
24		PRESET SAVE	03H	50H	XX	FFH	FFH	XX : PRESET NUMBER (0 ~ 127)
25		PRESET DELETE	03H	51H	XX	FFH	FFH	XX : PRESET NUMBER (0 ~ 127)
26		FUNCTION※3	03H	19H	XX	FFH	FFH	XX : FUNCTION NUMBER + 128 (128 ~ 255)

※1 In case of Zoom Camera(SCC-421(P)/SCC-931T(P)/SCC-C4201(P)/4203(P)/4301(P)/4303(P)), only these commands are applicable.

※2 In case of Day/Night Camera(SCC-B2303(P),B2003P,B2307P,B2007P) and WDR Camera(SCC-B2305(P),B2005P), only these commands are applicable.

※3 Function Key works only in SCC-C6405(P)/C6475(P). Each function which is correspond to the function number is explained in I/B.

Ex)

Step 1) Start "Auto Pan"

Byte4	Byte5	Byte6	Byte7	Byte8
03H	1AH	01H	FFH	FFH

Step 2) Stop "Auto Pan"

Byte4	Byte5	Byte6	Byte7	Byte8
03H	1AH	00H	FFH	FFH

## 8. Position Control/Reporting Command

When Byte4 of the command is set as follows, it works as a position control/reporting command.

(※ This command is applicable only with SmartDome Camera)

No.1~4 are commands which control the Pan/Tilt/Zoom movement of the camera.

When Byte4 is set to 10H, Pan/Tilt/Zoom movement is executed on the basis of the sensor's absolute location.

When Byte4 is set to 20H, 30H or 40H, camera moves on the basis of current position.

No.5 and No.6 work in pairs. If you send the command in the form of No.5, the camera answers the current position in the form of No.6.

No.	Bit	Items	Byte4	Byte5	Byte6	Byte7	Byte8	Note
1	1	Absolute Position Movement (PC→SmartDome Camera)	10H	pan_h (bit 4~11) ※2	tilt_h (bit 5~9) ※2	zoom_h (bit 9~12) ※3	zoom_l (bit 1~8) ※3	
	2							
	3							
	4							
	5				pan_l (bit 1~3) ※2	tilt_l (bit 1~4) ※2		
	6							
	7							
	8							
2		Relative Position Movement(pan) (PC→SmartDome Camera)	20H	right:0 left: 1	pan_h※2 (bit9~11)	pan_l※2 (bit1~8)	FFH	

No.	Bit	Items	Byte4	Byte5	Byte6	Byte7	Byte8	Note
3		Relative Position Movement(tilt) (PC→SmartDome Camera)	30H	up:0 down:1	tilt_h※2 (bit9)	tilt_l※2 (bit1~8)	FFH	
4		Relative Position Movement(Zoom) (PC→SmartDome Camera)	40H	tele:0 wide:1	zoom_h※3 (bit9~12)	zoom_l※3 (bit1~8)	FFH	
5		Request Current Position (PC→SmartDome Camera)	50H	FFH	FFH	FFH	FFH	
6	1	Transmit Current Position (SmartDome Camera → PC)	70H	pan_h (bit 4~11) ※2	tilt_h (bit 5~9) ※2	zoom_h (bit9~12) ※3	zoom_l (bit1~8) ※3	
	2							
	3							
	4							
	5				pan_l (bit 1~3) ※2	tilt_l (bit 1~4) ※2		
	6							
	7							
	8							

※2 Pan input range is 0~1800 step, and Tilt input range is 0~450 step.(resolution 0.2°) Both are transmitted in the form of hexadecimal.

ex) 1800 (Decimal) → 708H (Hexadecimal)

※3 Zoom input range is 8H(x1) ~ E44H(x22), and transmitted in the form of hexadecimal. The followings are zoom input depending on ratio.

x1 : 008H	x2 : 574H	x3 : 7B8H	x4 : 90CH	x5 : 9F4H
x6 : AA0H	x7 : B2CH	x8 : BA0H	x9 : C04H	x10 : C58H
x11 : CA4H	x12 : CECH	x13 : D28H	x14 : D5CH	x15 : D8CH
x16 : DB4H	x17 : DD8H	x18 : DF8H	x19 : E10H	x20 : E28H
x21 : E38H	x22 : E44H			