

Protocol Information

WV-CS850(A/AHS), CW860

VER. 3.2

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DRAFT By Software Development section
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History

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15 Feb. 2000	First edition	
15 Nov. 2000	Miner upgrade edition	3(+ascii code) 5(+STOP command ex.)
11 Dec 2000	Ver. 2.0	2.7(Revise) 4,5,6 (Add.)
15 May 2001	Ver. 2.1	3 New protocol revised
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1. Protocol mode

WV-CS850 supports two different protocols. One is Panasonic conventional camera protocol, which is compatible with CS600, CS650 etc. The other is Panasonic new camera protocol, which enables faster PTZF operations. Panasonic new camera protocol is automatically selected when CS850 is connected to a Panasonic controller/switcher, which supports the new protocol such as CU161, MP204 with CU360. Panasonic conventional protocol is applicable for general commands such as AGC, ALC, shutter etc even when connected to CU161 or MP204 with CU360.

2. Conventional Protocol

2.1 Command structure.

2.1.1 Single Command

Ex. Shutter 1/250 ON

STX G C 7 : 0 0 2 1 1 0 C ETX

G C : Command header, GC:Camera Control Command

7 : Number of commands. Refer Fig – 1

0 0 2 : Command destination, 002:Camera functions,202:Receiver functions

1 : Command type, 1:Control command, 0:Status request command, 2:Text data

1 0 C : Function(1/250 ON), Refer table 1 Camera function command.

<Fig-1> When sending two commands, use G C F instead of G C 7.

	Number of Commands		Number of Commands
7 37hex	1(7 bytes)	f 66hex	6(47bytes)
F 46hex	2(15bytes)	n 6Ehex	7(55bytes)
N 4Ehex	3(23bytes)	v 76hex	8(63bytes)
V 56hex	4(31bytes)	~ 7Ehex	9(71bytes)
^ 5Ehex	5(39bytes)	(28hex	10(79bytes)

2.1.2 Single Command (Answer)

After sending a command, following answer will be received.

Ex. Shutter 1/250 ON

STX G C 7 : 0 0 2 E 1 0 C ETX

E : In case Command type = 0, E : OK, D : NG

: In case Command type = 1, E : OK, D : NG

: In case Command type = 2, 9 : OK, D : NG

2.1.3 Multiple Commands

Ex. Preset Position Call

STX G C F : 2 0 2 1 4 0 0 : 2 0 2 2 0 0 0 ETX

STX :02hex of ASCII code table

G C : Command header, GC:Camera Control Command

F : Number of commands. Refer Fig – 1

2 0 2 : Command destination, 002:Camera functions,202:Receiver functions

1 : Command type, 1:Control command, 0:Status request command, 2:Text data

4 0 0 : Function (Preset position call), Refer table 2 Receiver function command.

2 0 2 : Command destination, 002:Camera functions,202:Receiver functions

2 : Command type, 1:Control command, 0:Status request command, 2:Text data

0 0 0 : Text data (Position 1), Refer ??? table.

ETX :03hex of ASCII code table

2.1.4 Multiple Commands (Answer)

Ex. Preset Position Call

Answer 1

STX G C 7 : 2 0 2 E 4 0 0 ETX

Answer 2

STX G C 7 : 2 0 2 9 0 0 0 ETX

2.1.5 Unit Address

When multiple units are daisy chain connected, a command must have unit address as shown bellow.

Ex. Shutter 1/250 ON

STX A D 0 0 ; G C 7 : 0 0 2 1 1 0 C ETX

A D 0 0 : Unit Address 00 – 99, ZZ

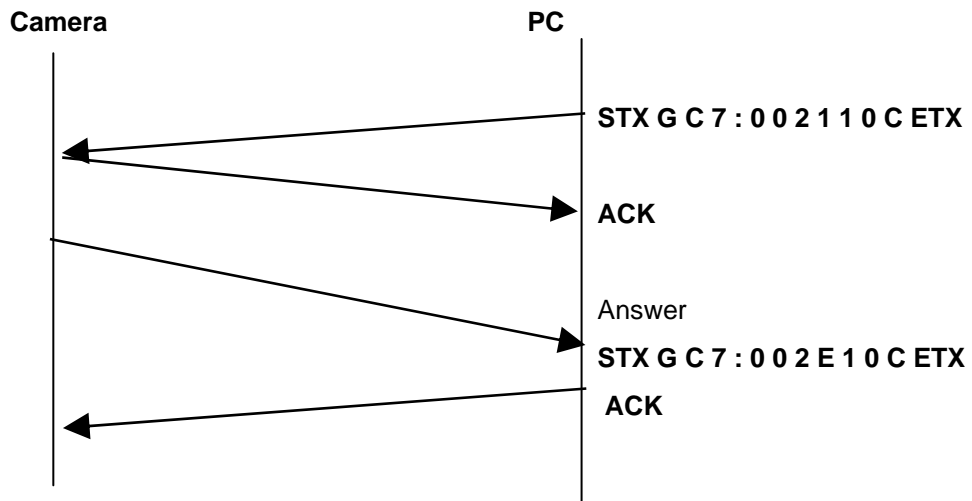
Note : Only address 01 – 96 is available for CSR camera series.

Only address 01 – 16 is available for WV-RM70.

ZZ controls all units.

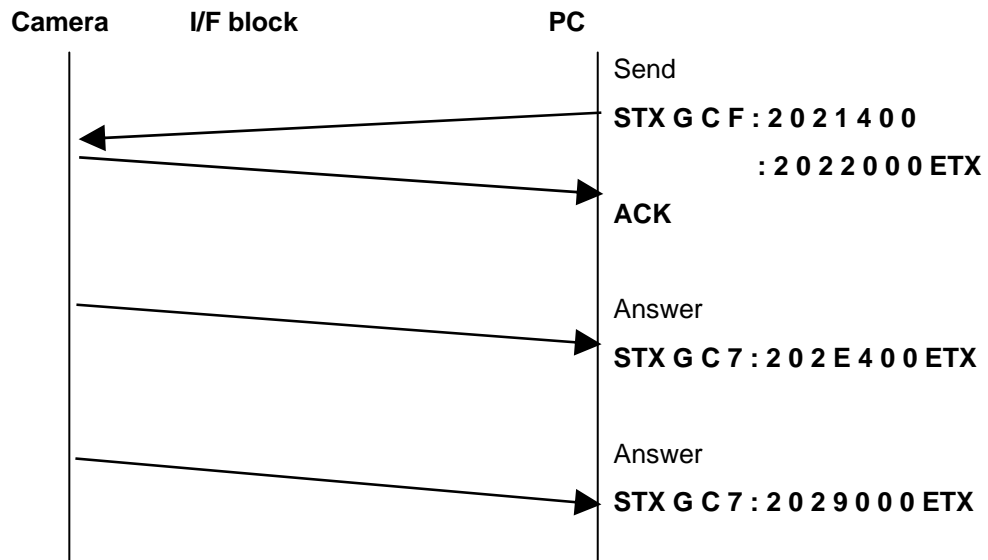
2.2 Communication Procedure

2.2.1 Single Command



If PC does not send ACK after receiving the Answer, the camera repeats sending the Answer up to 4 times (includes first one). Repeat interval is programmable (off, 100ms-1000ms).

2.2.2 Multiple Commands



2.2.3 Command timeout

Some commands have time out which deactivates the command at the specified time after sending. To keep a command valid, repeat the command within the timeout period. Recommended repeat frequency is shown in the command tables. For small amount of adjustment , send STOP command after sending these commands. ex. GCF:0021002:0021004

2.3 Camera Function Command CS850:Y : New command for CS850 ,N :no support, no function.

No	Function	Command	CS850	Remark
1	IRIS(CAMERA) OPEN	0021002		Timeout 2.2sec
2	IRIS(CAMERA) CLOSE	0021003		Timeout 2.2sec
3	IRIS(CAMERA) STOP	0021004		
4	IRIS(CAMERA) RESET	0021005		
5	ALC ON	0021032		
6	ELC ON	0021033	N	ALWAYS SEND BACK 002D033
7	MANU IRIS ON	0021034		
8	BW ON	0021040	Y	
9	BW OFF	0021041	Y	
10	BW AUTO	0021042	Y	
11	BW BURST ON	0021050	Y	
12	BW BURST OFF	0021051	Y	
13	SHUTTER ON	0021100		Need SD2 OFF(BLC MODE OFF)
14	SHUTTER OFF	0021101		
15	SHUTTER INC	0021102		
16	SHUTTER DEC	0021103		
17	SHUTTER 1/100NTSC, 1/120PAL	0021109		
18	SHUTTER 1/250	002110C		
19	SHUTTER 1/500	002110D		
20	SHUTTER 1/1000	002110E		
21	SHUTTER 1/2000	002110F		
22	SHUTTER 1/4000	0021119		
23	SHUTTER 1/10000	002111A		
24	SENS UP AUTO ON	0021120		
25	SENS UP AUTO OFF	0021121		
26	SENS UP AUTO INC	0021122		
27	SENS UP AUTO DEC	0021123		
28	SENS UP MANU ON	0021150		
29	SENS UP MANU OFF	0021151		
30	SENS UP MANU INC	0021152		
31	SENS UP MANU DEC	0021153		
32	AGC ON	0021200		
33	AGC OFF	0021201		
34	AGC GAIN UP LOW	0021208		
35	AGC GAIN UP MID	0021209		
36	AGC GAIN UP HIGH	002120A		
37	MANU GAIN UP LOW	0021228		
38	MANU GAIN UP MID	0021229		
39	MANU GAIN UP HIGH	002122A		
40	BLC MODE AUTO	00212A2		
41	BLC MODE PRESET//SuperD ON	00212A3		
42	BLC SET UP [START]	00212B0		
43	BLC SET UP [END]	00212B1		
44	BLC SET UP [MASK ON]	00212C0		

45	BLC SET UP [MASK OFF]	00212C1		
46	BLC SET UP [MASK CLEAR]	00212C2		
47	BLC SET UP [MASK REVERSE]	00212C3		
48	BLC SET UP [Cursor UP]	00212C8		
49	BLC SET UP [Cursor Right]	00212C9		
50	BLC SET UP [Cursor Down]	00212CA		
51	BLC SET UP [Cursor Left]	00212CB		
52	AWC ON	0021300		
53	AWC RESET	0021305		
54	AWC SET UP	0021300:0022306		
55	ATW ON	0021310		
551	R offset up	0021312		Timeout 2.2 sec
552	R offset down	0021313		Timeout 2.2 sec
553	R offset stop	0021314		
554	R offset Reset	0021315		
555	B offset UP	0021316		Timeout 2.2 sec
556	B offset down	0021317		Timeout 2.2 sec
557	B offset stop	0021318		
558	B offset Reset	0021319		
56	BURST PHASE UP (+)	0021382		Timeout 2.2 sec
57	BURST PHASE Down (-)	0021383		Timeout 2.2 sec
58	BURST PHASE STOP	0021384		
59	BURST PHASE RESET	0021385		
60	LINE LOCK ON	0021452		NTSC:60Hz,PAL50Hz AC power
61	LINE LOCK OFF (INT)	0021453		
601	LL Phase UP	0021454		Timeout 2.2 sec
602	LL Phase Down	0021455		Timeout 2.2 sec
603	LL Phase Stop	0021456		
62	EL-Zoom ON	0021560	Y	
63	EL-Zoom OFF	0021561	Y	
64	Privacy zone ON	0021640	Y	
65	Privacy zone OFF	0021641	Y	
66	MOTION DETECT ON	0021690		
67	MOTION DETECT OFF	0021691		
68	D-RANGE ON	00216B0	N	ALWAYS SEND BACK 002D6B0
69	D-RANGE OFF	00216B1	N	ALWAYS SEND BACK 002D6B1
70	ALL RESET	0021760		No need to set the menu cursor.
71	Restart	0021761		Equivalent to power OFF-ON.
72	SETUP MENU ON	0021940		
73	SETUP MENU OFF	0021941		
74	SETUP MENU [Cursor STOP]	002194F		
75	SETUP MENU [Cursor UP]	0021942		
76	SETUP MENU [Cursor Right]	0021943		
77	SETUP MENU [Cursor Down]	0021944		
78	SETUP MENU [Cursor Left]	0021945		
79	SETUP MENU SET1	002194A		

80	SETUP MENU SET2	002194B		Equivalent to pressing set button for 2 seconds.
81	Left+Right button pressed (F2).	002194C		For Special menu, Gain reset etc. Need to set the setup menu cursor.
82	Left+Centre+Right button pressed(F3).	002194D		For Camera reset. Need to set the setup menu cursor
83	Digital Flip ON	00219A0		
84	Digital Flip OFF	00219A1		
85	Menu ON	00219C0	Y	
86	Menu OFF	00219C1	Y	
87	Area Title 1 SET	00219C8	Y	
88	Area Title 2 SET	00219C9	Y	
89	Area Title 3 SET	00219CA	Y	
90	Area Title 4 SET	00219CB	Y	
91	Area Title 5 SET	00219CC	Y	
92	Area Title 6 SET	00219CD	Y	
93	Area Title 7 SET	00219CE	Y	
94	Area Title 8 SET	00219CF	Y	
95	Area Title Default ON	00219D0	Y	
96	Area Title OFF	00219D1	Y	
97	Area Title 1 read start	00219E0	Y	
98	Area Title 1 write start	00219E1	Y	
99	Area Title 2 read start	00219E2	Y	
100	Area Title 2 write start	00219E3	Y	
101	Area Title 3 read start	00219E4	Y	
102	Area Title 3 write start	00219E5	Y	
103	Area Title 4 read start	00219E6	Y	
104	Area Title 4 write start	00219E7	Y	
105	Area Title 5 read start	00219E8	Y	
106	Area Title 5 write start	00219E9	Y	
107	Area Title 6 read start	00219EA	Y	
108	Area Title 6 write start	00219EB	Y	
109	Area Title 7 read start	00219EC	Y	
110	Area Title 7 write start	00219ED	Y	
111	Area Title 8 read start	00219EE	Y	
112	Area Title 8 write start	00219EF	Y	
113	Function Request	00219F0	Y	Refer page24
114	SETUP SPECIAL MENU	002194E		
115	ONE SHOT AUTO FOCUS ON	0021A06		
116	AUTO FOCUS AREA (SMALL)	0021A18		
117	AUTO FOCUS AREA (MIDDLE)	0021A19		
118	AUTO FOCUS AREA (LARGE)	0021A1A		

2.4 Receiver Function Command CS850: New command for CS850

No.	Function	Command	CS850	Remark
1	AUX ALL ON	2021130		Depends on MENU:CONT 1
2	AUX ALL OFF	2021131		Depends on MENU:CONT 1
3	AUX 1 ON	2021160		Depends on MENU :CONT 1 AUX1
4	AUX 1 OFF	2021161		Depends on MENU :CONT 1 AUX1
5	AUX 2 ON	2021162		Depends on MENU :CONT 2 AUX2
6	AUX 2 OFF	2021163		Depends on MENU :CONT 2 AUX2
7	AUX 1 MOMENTARY	2021180		Depends on MENU :CONT 1 AUX1
8	AUX 1 LATCH	2021181		Depends on MENU :CONT 1 AUX1
9	AUX 2 MOMENTARY	2021182		Depends on MENU :CONT 2 AUX2
10	AUX 2 LATCH	2021183		Depends on MENU :CONT 2 AUX2
11	ZOOM[STOP(F)] & FOCUS[STOP(F)]	2021224		Timeout 2.2sec
12	ZOOM[TELE(F)]	2021228		Timeout 2.2sec
13	ZOOM[TELE(F)] & FOCUS[FAR (F)]	2021229		Timeout 2.2sec
14	FOCUS[FAR (F)]	202122A		Timeout 2.2sec
15	ZOOM[WIDE(F)] & FOCUS[FAR (F)]	202122B		Timeout 2.2sec
16	ZOOM[WIDE(F)]	202122C		Timeout 2.2sec
17	ZOOM[WIDE(F)] & FOCUS[NEAR(F)]	202122D		Timeout 2.2sec
18	FOCUS[NEAR(F)]	202122E		Timeout 2.2sec
19	ZOOM[WIDE(F)] & FOCUS[NEAR(F)]	202122F		Timeout 2.2sec
20	ZOOM[STOP(V)] & FOCUS[STOP(V)]	2021264		Timeout 2.2sec
21	ZOOM[TELE(V)]	2021268		Timeout 2.2sec
22	ZOOM[TELE(V)] & FOCUS[FAR (V)]	2021269		Timeout 2.2sec
23	FOCUS[FAR (V)]	202126A		Timeout 2.2sec
24	ZOOM[WIDE(V)] & FOCUS[FAR (V)]	202126B		Timeout 2.2sec
25	ZOOM[WIDE(V)]	202126C		Timeout 2.2sec
26	ZOOM[WIDE(V)] & FOCUS[NEAR(V)]	202126D		Timeout 2.2sec
27	FOCUS[NEAR(V)]	202126E		Timeout 2.2sec
28	ZOOM[WIDE(V)] & FOCUS[NEAR(V)]	202126F		Timeout 2.2sec
29	AUTO PAN ON	2021300		
30	AUTO PAN OFF	2021301		
31	AUTO PAN REVERSE	2021305	Y	
32	AUTO PAN LEFT END SET	2021306	Y	
33	AUTO PAN RIGHT END SET	2021307	Y	
34	AUTO PAN SPEED INC	2021308		
35	AUTO PAN SPEED DEC	2021309		
36	AUTO PAN ENDLESS ON	202130E		
37	AUTO PAN ENDLESS OFF	202130F		
38	PAN[STOP (F)] & TILT[STOP(F)]	2021324		
39	PAN[LEFT (F)]	2021328		Timeout 2.2sec
40	PAN[LEFT (F)] & TILT[UP (F)]	2021329		Timeout 2.2sec
41	TILT[UP (F)]	202132A		Timeout 2.2sec
42	PAN[RIGHT(F)] & TILT[UP (F)]	202132B		Timeout 2.2sec
43	PAN[RIGHT(F)]	202132C		Timeout 2.2sec
44	PAN[RIGHT(F)] & TILT[DOWN(F)]	202132D		Timeout 2.2sec
45	TILT[DOWN(F)]	202132E		Timeout 2.2sec

46	PAN[LEFT (F)] & TILT[DOWN(F)]	202132F		Timeout 2.2sec
47	PAN[STOP (F)] & TILT[STOP(S)]	2021334		Timeout 2.2sec
48	PAN[LEFT (F)]	2021338		Timeout 2.2sec
49	PAN[LEFT (F)] & TILT[UP (S)]	2021339		Timeout 2.2sec
50	TILT[UP (S)]	202133A		Timeout 2.2sec
51	PAN[RIGHT(F)] & TILT[UP (S)]	202133B		Timeout 2.2sec
52	PAN[RIGHT(F)]	202133C		Timeout 2.2sec
53	PAN[RIGHT(F)] & TILT[DOWN(S)]	202133D		Timeout 2.2sec
54	TILT[DOWN(S)]	202133E		Timeout 2.2sec
55	PAN[LEFT (F)] & TILT[DOWN(S)]	202133F		Timeout 2.2sec
56	PAN[STOP (S)] & TILT[STOP(F)]	2021344		Timeout 2.2sec
57	PAN[LEFT (S)]	2021348		Timeout 2.2sec
58	PAN[LEFT (S)] & TILT[UP (F)]	2021349		Timeout 2.2sec
59	TILT[UP (F)]	202134A		Timeout 2.2sec
60	PAN[RIGHT(S)] & TILT[UP (F)]	202134B		Timeout 2.2sec
61	PAN[RIGHT(S)]	202134C		Timeout 2.2sec
62	PAN[RIGHT(S)] & TILT[DOWN(F)]	202134D		Timeout 2.2sec
63	TILT[DOWN(F)]	202134E		Timeout 2.2sec
64	PAN[LEFT (S)] & TILT[DOWN(F)]	202134F		Timeout 2.2sec
65	PAN[STOP (S)] & TILT[STOP(S)]	2021354		
66	PAN[LEFT (S)]	2021358		Timeout 2.2sec
67	PAN[LEFT (S)] & TILT[UP (S)]	2021359		Timeout 2.2sec
68	TILT[UP (S)]	202135A		Timeout 2.2sec
69	PAN[RIGHT(S)] & TILT[UP (S)]	202135B		Timeout 2.2sec
70	PAN[RIGHT(S)]	202135C		Timeout 2.2sec
71	PAN[RIGHT(S)] & TILT[DOWN(S)]	202135D		Timeout 2.2sec
72	TILT[DOWN(S)]	202135E		Timeout 2.2sec
73	PAN[LEFT (S)] & TILT[DOWN(S)]	202135F		Timeout 2.2sec
74	PAN[STOP (V)] & TILT[STOP(V)]	2021364:2022xx0		
75	PAN[LEFT (V)]	2021368:2022xx0		Timeout 2.2sec
76	PAN[LEFT (V)] & TILT[UP (V)]	2021369:2022xx0		Timeout 2.2sec
77	TILT[UP (V)]	202136A:2022xx0		Timeout 2.2sec
78	PAN[RIGHT(V)] & TILT[UP (V)]	202136B:2022xx0		Timeout 2.2sec
79	PAN[RIGHT(V)]	202136C:2022xx0		Timeout 2.2sec
80	PAN[RIGHT(V)] & TILT[DOWN(V)]	202136D:2022xx0		Timeout 2.2sec
81	TILT[DOWN(V)]	202136E:2022xx0		Timeout 2.2sec
82	PAN[LEFT (V)] & TILT[DOWN(V)]	202136F:2022xx0		Timeout 2.2sec
83	AUTO PAN KEY:AUTO PAN	2021390	Y	
84	AUTO PAN KEY:SEQ	2021391	Y	
85	AUTO PAN KEY:SORT	2021392	Y	
86	PROPO PAN/TILT ON	20213A0	Y	
87	PROPO PAN/TILT OFF	20213A1	Y	
88	PAN LIMIT ON	20213C0	Y	
89	PAN LIMIT OFF	20213C1	Y	
90	180 DEG TURN	20213D1	Y	
91	PRESET POSITION CALL	2021400:2022xx0		

92	HOME POSITION CALL	2021410		
93	PRESET SEQ [OFF]	2021431		
94	PRESET MODE [SEQ ON]	2021437		
95	PRESET MODE [SORT ON]	2021438		
96	PATROL PLAY	2021490	Y	
97	PATROL STOP	2021491	Y	
98	PATROL LEARN	2021494	Y	
99	DIRECT PREPOSITION SET START	2021540:2022**0		Refer 2.7
100	DIRECT PREPOSITION SET	2021542		Refer 2.7
101	DIRECT PREPOSITION SET END	2021543		Refer 2.7
102	PRESET POSITION ID ALL CLEAR	2021547		
103	Alarm IN 1 OFF	2021600	Y	
104	Alarm IN 1 POSI	2021601	Y	
105	Alarm IN 2 OFF	2021610	Y	
106	Alarm IN 2 POSI	2021611	Y	
107	Alarm IN 3 OFF	2021620	Y	
108	Alarm IN 3 POSI	2021621	Y	
109	Alarm IN 4 OFF	2021630	Y	
110	Alarm IN 4 POSI	2021631	Y	
111	Alarm IN 4 BW	2021632	Y	
112	CONT 1 OFF	2021700	Y	
113	CONT 1 AUX1	2021701	Y	
114	CONT 1 VMD	2021702	Y	
115	CONT 2 OFF	2021710	Y	
116	CONT 2 AUX2	2021711	Y	
117	CONT 2 BW	2021713	Y	

2.5 PTZ Control (Conventional Protocol)

2.5.1 Variable Pan/Tilt speed command (Timeout 2.2 sec).

STX G C F : 2 0 2 1 3 6 9 : 2 0 2 2 X Y 0 ETX

Note: Above commands can be sent separately.

G C : Command header, GC:Camera Control Command
 F : Number of commands. Refer Fig – 1
 2 0 2 : Command destination, 002:Camera functions,202:Receiver functions
 1 : Command type, 1:Control command, 0:Status request command, 2:Text data
 3 6 9 : Function(Pan left+tilt up), Refer table 2 Receiver function command.
 2 0 2 : Command destination, 002:Camera functions,202:Receiver functions
 2 : Command type, 1:Control command, 0:Status request command, 2:Text data
 X : Pan Speed, 0: Min to 7: Max.
 Y : Tilt Speed, 0: Min to 7: Max.

2.6 Preset Position Call command.

STX G C F : 2 0 2 1 4 0 0 : 2 0 2 2 X Y 0 ETX

Note: Above commands can be sent separately.

G C : Command header, GC:Camera Control Command
 F : Number of commands. Refer Fig – 1
 2 0 2 : Command destination, 002:Camera functions,202:Receiver functions
 1 : Command type, 1:Control command, 0:Status request command, 2:Text data
 4 0 0 : Function (Preset position call), Refer table 2 Receiver function command.
 2 0 2 : Command destination, 002:Camera functions,202:Receiver functions
 2 : Command type, 1:Control command, 0:Status request command, 2:Text data
 X Y : Preset Position, 0 0:Preset 1 to 3F: Preset 64

2.7 Direct Preset Position SET Command

Replaced by Direct Function Command GCF:00219F0:0022640

Refer 4 Direct Function Command

2.8 Normal Preset Position SET Command

To set a preset position, send Pre Position SET command and set the PTZ to the desired position by using Pan/Tilt and Zoom / focus command.

Fig 2.8.1 Pre Position SET command

Function	Command	Answer	Memo
Setup Start	[G][C][7][:][2][0][2][1][5][4][0]	[G][C][7][:][2][0][2][E][5][4][0]	
Pre Position Number	[G][C][7][:][2][0][2][2][X][Y][0]	[G][C][7][:][2][0][2][9][X][Y][0]	
Positioning	Use Pan/tilt Zoom/Focus Command		
Position set Done	[G][C][7][:][2][0][2][1][5][4][2]	[G][C][7][:][2][0][2][E][5][4][2]	
Setup END	[G][C][7][:][2][0][2][1][5][4][3]	[G][C][7][:][2][0][2][E][5][4][3]	

X Y : Preset Position, 0 0:Preset 1 to 3F: Preset 64

2.9 System command

2.9.1 Alarm

(1) Alarm mode set command

Command	Answer
STX R L M : Fig5.1 ETX	STX R L M ETX

<Fig5.1>

Mode	Function
0	Camera sends alarm log when requested
1	Camera sends alarm log every time an alarm occurs.
2	Camera sends alarm log every 5 seconds

(2) Alarm log mode request command

Command	Answer
STX Q L M ETX	STX Fig5.1 ETX

(3) Alarm log request command

This command is used to ask alarm log when the alarm mode is "0".

Command	Answer
STX Q L D ETX	STX Fig5.2 ETX

<Fig5.2>

Answer	Alarm log
0	No.
1	Yes. There was at least one alarm after previous request.
2	Yes. NOW there is alarm .

(4) Alarm inform command

This command is sent from a camera when the alarm mode is "1".

Command	Answer
STX A D X X ; A L M : X X ETX	-

X X: Camera unit address : 01-96

2.9.2 Device ID request

(1) Device ID request command for a RS-485 camera

Command	Answer
STX Q I D ETX	STX 0 1 0 ETX Refer table 2.9.2.1

Table 2.9.2.1

Answer	Model
WV-CS850	WV-CS850 series NTSC, PAL
WV-CW860	WV-CW860 series NTSC PAL
TBA	WV-CS320 series NTSC PAL
010	WV-CSR600, CS600 series NTSC
011	WV-CSR600, CS600 series PAL
00C	WV-CSR400, CS400 series NTSC
00D	WV-CSR400, CS400 series PAL
00E	WV-BSR300, BS300 series NTSC
00F	WV-BSR300, BS300 series PAL
WV-CLR920	WV-CLR920 series PAL
WV-CPR650	WV-CPR650 series NTSC
WV-CPR650	WV-CPR650 series PAL

(2) Camera ID request command for a standard camera over the coax gateway equipment

Fig 2.9.3 CAMERA ID request command

Function	Command	Answer	Memo
CAMERA ID request	[STX] [G][C][f] [:][0][0][2][1][9][0][0] [:][0][0][2][2][0][0][0] [:][0][0][2][1][9][3][0] [:][0][0][2][0][3][0][8] [:][0][0][2][0][3][0][1] [:][0][0][2][1][9][3][1] [ETX]		read id index id read start srq3 srq3 id read end
		[STX] [G][C][7][:][0][0][2][E][9][0][0] [ETX] [STX] [G][C][7][:][0][0][2][9][0][0][0] [ETX] [STX] [G][C][7][:][0][0][2][E][9][3][0] [ETX] [STX] [G][C][7][:][0][0][2][3][1][x][8] [ETX] [STX] [G][C][7][:][0][0][2][3][y][z][1] [ETX] [STX] [G][C][7][:][0][0][2][E][9][3][1] [ETX]	read ack id index ack id read start ack id 1x id yz read end ack xyz : refer table 2.9.2.2

Table 2.9.2.2

Answer 1 xyz	Model
03E	WV-CS850 series NTSC/PAL (DIPSW1 RS485 and coax setup)
04E	WV-CS550 series NTSC
04D	WV-CS320 series
048	WV-CW464P
049	WV-CW464E
057	WV-CP470CH
052	WV-CP470 NTSC
053	WV-CP470 PAL
010	WV- CS600series NTSC
011	WV- CS600 series PAL
00C	WV- CS400 series NTSC
00D	WV- CS400 series PAL
00E	WV- BS300 series NTSC
00F	WV- BS300 series PAL
01A	WV-CPR650 series NTSC
01B	WV-CPR650 series PAL
006	WV-CP610 series NTSC
007	WV-CP610 series PAL
00A	WV-BP510 series NTSC
00B	WV-BP510 series PAL

2.9.3 Communication Configuration

Panasonic RS485 communication utilizes ACK and ANSWER codes. When PC sends a command, the camera sends back an ACK and an ANSWER codes. This is our basic procedure to make sure that the communication and the camera function are properly executed. But, if the ACK and ANSWER codes are not preferable, these codes can be omitted.

RON:7 mode is recommended in 2 wire connection.

SRQ(request command) and Qxx(ex.QID) requires either RON:0, RON:1, RON:4, or RON:5 mode.

Communication Configuration Commands

Command	Answer
STX R O N : Fig5.4 ETX	STX R O N : 0 ETX Refer table 2.9.3

Table 2.9.3

Code	ACK *3	ANSWER	Error Code *2
0	Yes	Yes *1	Yes
1	Yes	Yes *1	Yes
2	Yes	No	Yes
3	Yes	No	No
4	No	Yes *1	Yes
5	No	Yes *1	No
6	No	No	Yes
7	No	No	No

*1 Exception : GC7:9xxxxxx command is always no answer.

*2 Refer Table 2.9.4

Table 2.9.4

Code	Error	Comments
ER001	Invalid command	
ER002	Invalid parameters	
ER301	Invalid command	Cannot execute depending on camera mode
ER305	Invalid command	Cannot answer for execution waiting
ER306	Invalid command	Cannot execute for execution waiting
ER601	Wrong command	Cannot execute depending on menu setting

*3 Refer Table 2.9.5

Table 2.9.5

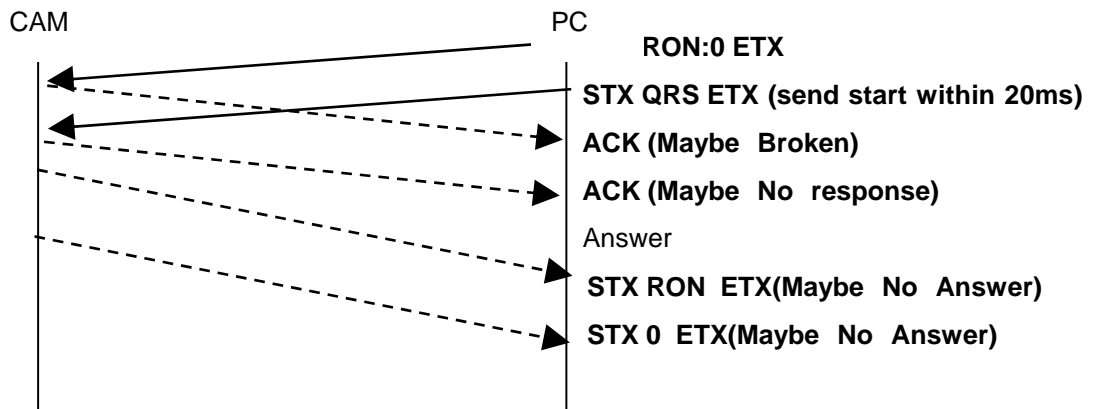
NAK +CODE	Error	comments
(15hex)1	parity error	Detected data parity error (even, odd), it cause camera to clear camera received data
(15hex)2	buffer overflow	Detected camera receive buffer full, cannot receive data
(15hex)3	framing error	Detected data framing error (bad length to stop bit) ,cause camera to clear camera received data
(15hex)4	overrun error	Detected overwrite data buffer in camera communication hardware, cause camera to clear camera received data
(15hex)5	timeout error	No [etx] is received wihtin10 minutes after [stx] received, camera goes to wait for [stx].

Tips for Two wire Communication Configuration

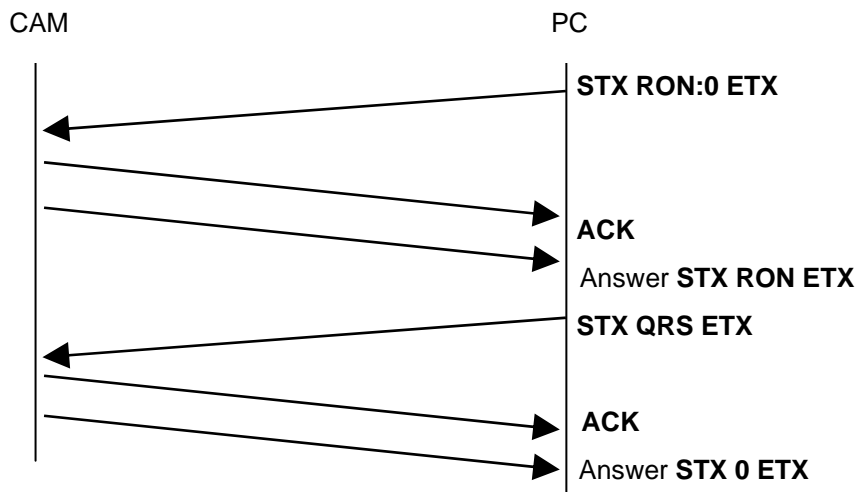
(1) Do not send a command before receiving ACK and Answer of previous command.

If you do so, data may be broken.

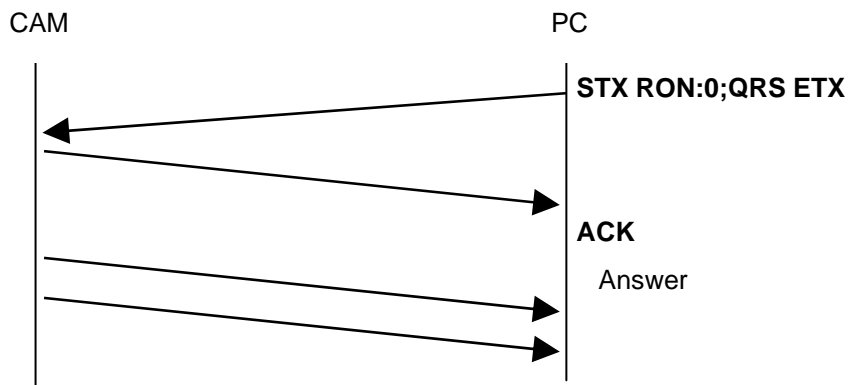
Bad example



Good example



Good example



STX RON ETX

STX 0 ETX

3. Panasonic New Camera Protocol

3.1. One Way Command

New protocol is one way and does not require answer.

3.1.1. Command structure.

STX G C 7 : 9 T T X X X X ETX

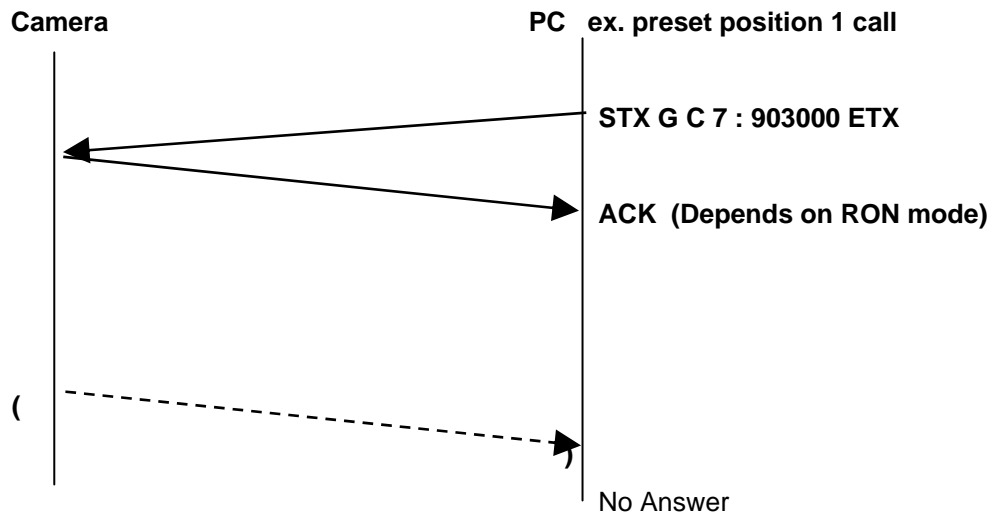
9 : ONE Way New Command

T T : Command type, 02:PTZ command, 03:Focus command, Preset command etc

X X X X : Command body, Refer Fig 1.

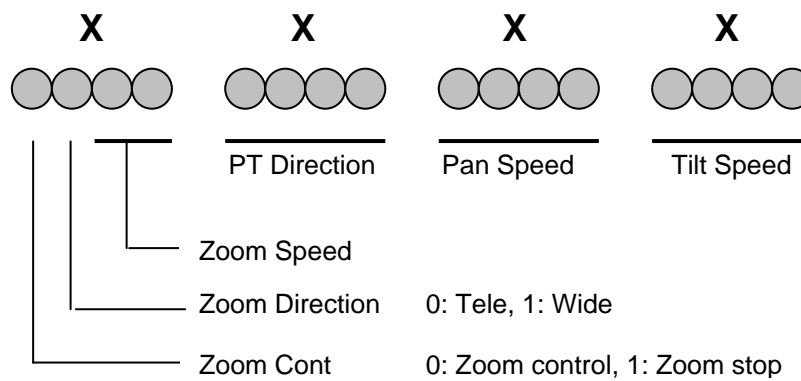
3.1.2 Command Answer

This protocol does not use answer from camera



3.2 Pan/tilt commands

Fig3.2 PTZ Command body structure



EX1. PAN Left Max speed: GC7:90288F0 (Zoom 1000=8hex)

EX1. Zoom Tele Max speed: GC7:9023000 (Zoom 0011=3hex)

Table 3.1 PTZ Speed

Pan Speed	0 (MIN)1, 2.....E, F(MAX)
Tilt Speed	0 (MIN)1, 2.....E, F(MAX)
Zoom Speed	0 (MIN)1, 2, 3 (MAX)

Table 3.1.1 PT Speed

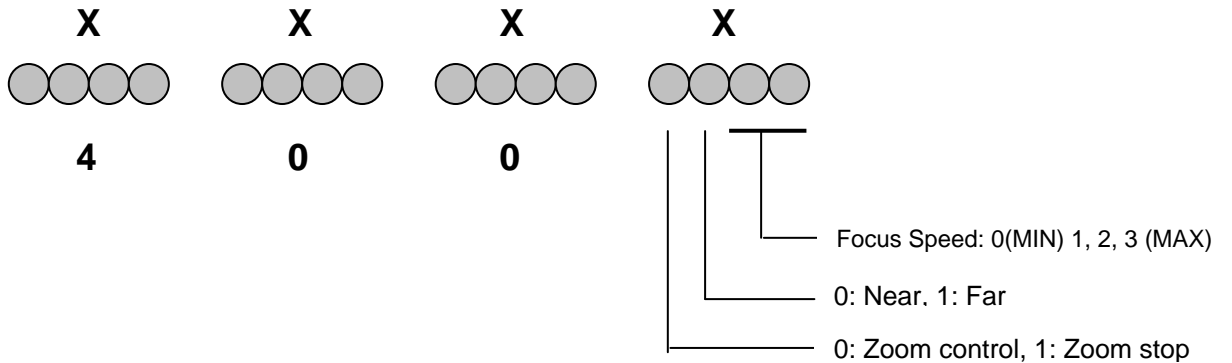
	PAN deg/sec	TILT deg/sec
SPEED 0	0.1	0.1
SPEED 1	0.21	0.21
SPEED 2	0.47	0.47
SPEED 3	1	1
SPEED 4	3.19	3.19
SPEED 5	7.06	7.06
SPEED 6	12.01	12.01
SPEED 7	18.27	18.27
SPEED 8	26.54	26.54
SPEED 9	35.55	35.55
SPEED A	44.97	44.97
SPEED B	57.52	57.52
SPEED C	71.63	71.63
SPEED D	86.02	86.02
SPEED E	103.1	103.1
SPEED F	120.24	120.24

Table 3.2 PT directions

Command	Function
0	Null (when used only fo zoom)
1	STOP
8	Left
9	Left + UP
A	UP
B	Right + UP
C	Right
D	Right + Down
E	Down
F	Left + Down

3.3 Focus Command

Fig3.3 Focus Command body structure



3.4 Preset position set/call Command

Refer Table 4

3.5. 256 steps PTZ commands

This is only for CS850A. Prior to use this command, check the availability by SRQ1 command.

SRQ1 (256 Steps PT check): 2020150, Ans: Yes: 2021500, No: nop.

STX G C 7 : D X X X X X X E T X

D : ONE Way 256 steps Command

X X X X X X X : Command body, Refer Fig 3.5.

Fig3.5 PTZ Command body structure

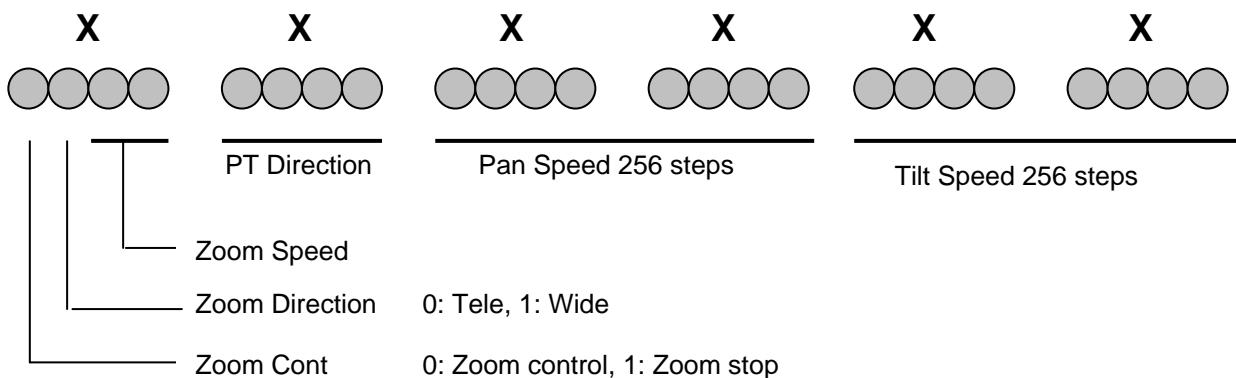


Table 3.5.1 PTZ Speed

Pan Speed 256steps	(min) 00, 01, 02.....FE, FF(max)
Tilt Speed 256 steps	(min) 00, 01, 02.....FE, FF(max)
Zoom Speed 4 steps	(min) 0, 1, 2, 3 (max)

Table 3.5.2 256 Steps PT speed (deg/sec).

STEP	SPEED	STEP	SPEED	STEP	SPEED	STEP	SPEED	STEP	SPEED	STEP	SPEED
1	0.1	44	0.65	87	3.69	130	12.01	173	30.13	216	69.36
2	0.1	45	0.76	88	3.69	131	12.48	174	30.88	217	70.49
3	0.1	46	0.76	89	3.95	132	12.96	175	31.64	218	71.63
4	0.1	47	0.76	90	3.95	133	13.45	176	32.4	219	72.77
5	0.12	48	0.76	91	4.22	134	13.45	177	33.17	220	73.93
6	0.12	49	0.87	92	4.22	135	13.95	178	33.96	221	75.1
7	0.12	50	0.87	93	4.5	136	13.95	179	34.75	222	76.28
8	0.12	51	0.87	94	4.79	137	14.46	180	35.55	223	77.46
9	0.14	52	0.87	95	4.79	138	14.46	181	36.36	224	78.66
10	0.14	53	1	96	5.09	139	14.97	182	37.18	225	79.86
11	0.14	54	1	97	5.39	140	14.97	183	38.01	226	81.07
12	0.14	55	1	98	5.39	141	15.5	184	38.85	227	82.3
13	0.17	56	1	99	5.71	142	15.5	185	39.69	228	83.53
14	0.17	57	1.13	100	5.71	143	16.03	186	40.55	229	84.77
15	0.17	58	1.13	101	6.03	144	16.03	187	41.41	230	86.02
16	0.17	59	1.13	102	6.03	145	16.58	188	42.29	231	88.54
17	0.21	60	1.13	103	6.37	146	17.13	189	43.17	232	89.82
18	0.21	61	1.27	104	6.37	147	17.13	190	44.06	233	91.11
19	0.21	62	1.27	105	6.71	148	17.7	191	44.97	234	93.71
20	0.21	63	1.27	106	6.71	149	18.27	192	45.88	235	95.02
21	0.21	64	1.27	107	7.06	150	18.27	193	46.8	236	97.68
22	0.21	65	1.42	108	7.06	151	18.85	194	47.73	237	100.37
23	0.21	66	1.42	109	7.42	152	18.85	195	48.66	238	103.1
24	0.21	67	1.42	110	7.42	153	19.44	196	49.61	239	105.86
25	0.26	68	1.58	111	7.8	154	19.44	197	50.57	240	108.66
26	0.26	69	1.58	112	7.8	155	20.65	198	51.53	241	110.08
27	0.26	70	1.75	113	8.17	156	20.65	199	52.51	242	112.93
28	0.26	71	1.75	114	8.17	157	21.27	200	53.49	243	115.83
29	0.32	72	1.93	115	8.56	158	21.27	201	54.49	244	118.76
30	0.32	73	1.93	116	8.56	159	21.89	202	54.49	245	120.24
31	0.32	74	2.12	117	8.96	160	22.53	203	55.49	246	120.24
32	0.32	75	2.12	118	8.96	161	23.18	204	56.5	247	120.24
33	0.39	76	2.32	119	9.37	162	23.83	205	57.52	248	120.24
34	0.39	77	2.32	120	9.37	163	24.49	206	58.55	249	120.24
35	0.39	78	2.52	121	9.79	164	25.17	207	59.59	250	120.24
36	0.39	79	2.52	122	9.79	165	25.85	208	60.64	251	120.24
37	0.47	80	2.74	123	10.21	166	25.85	209	61.7	252	120.24
38	0.47	81	2.74	124	10.21	167	26.54	210	61.7	253	120.24
39	0.56	82	2.96	125	10.65	168	26.54	211	62.76	254	120.24
40	0.56	83	2.96	126	10.65	169	27.24	212	63.84	255	120.24
41	0.56	84	3.19	127	11.54	170	27.95	213	64.92	256	120.24
42	0.65	85	3.44	128	11.54	171	28.67	214	66.02		
43	0.65	86	3.44	129	12.01	172	29.4	215	67.12		

4 Direct Function Command (New and Old Protocol)

Table 4

New Protocol	Old Protocol [GCF: CMD : TXT]		Function	Comment
CMD	CMD	TXT		
9030000	00219F0	0022000	PRESET CALL	PRESET 1 CALL
9030001	00219F0	0022010		PRESET 2 CALL
~				~
903003E	00219F0	00223E0		PRESET 63 CALL
903003F	00219F0	00223F0		PRESET 64 CALL
9030040	00219F0	0022400	AUTO PAN	AUTO PAN ON
9030041	00219F0	0022410		AUTO PAN OFF
9030042	00219F0	0022420		AUTO PAN SPEED INC
9030043	00219F0	0022430		AUTO PAN SPEED DEC
9030044	00219F0	0022440		AUTO PAN START POINT SET
9030045	00219F0	0022450		AUTO PAN END POINT SET
9030046	00219F0	0022460		AUTO MODE
9030047	00219F0	0022470	AUTO SEQ ON	
9030048	00219F0	0022480	AUTO SORT ON	
9030049	00219F0	0022490	AUTO PAN SWEEP AREA INVERT	
903004A	00219F0	00224A0		
903004B	00219F0	00224B0	ENDLESS	ENDLESS ON
903004C	00219F0	00224C0		ENDLESS OFF
903004D	00219F0	00224D0	DIGITAL FLIP	DIGITAL FLIP ON
903004E	00219F0	00224E0		DIGITAL FLIP OFF
903004F	00219F0	00224F0	PROPO. P/T	PROPORTIONAL P/T ON
9030050	00219F0	0022500		PROPORTIONAL P/T OFF
9030051	00219F0	0022510		
9030052	00219F0	0022520		
9030053	00219F0	0022530	SUPER D II	SUPER-DII ON
9030054	00219F0	0022540		SUPER-DII OFF
9030055	00219F0	0022550	AF	STOP AF ON (MENU ITEM)
9030056	00219F0	0022560		STOP AF OFF (MENU ITEM)
9030057	00219F0	0022570		1 SHOT AF ON (START)
9030058	00219F0	0022580	HOME POSITION	HOME POSITION MOVE
9030059	00219F0	0022590	BW	BW ON (MENU ITEM)
903005A	00219F0	00225A0		BW OFF (MENU ITEM)
903005B	00219F0	00225B0		BW AUTO (MENU ITEM)
903005C	00219F0	00225C0		CAMERA ID
903005D	00219F0	00225D0	CAMERA ID OFF	
903005E	00219F0	00225E0	AREA TITLE	AREA TITLE NESW ON
903005F	00219F0	00225F0		AREA TITLE USER ON
9030060	00219F0	0022600		AREA TITLE OFF
9030061	00219F0	0022610	EL-ZOOM	EL-ZOOM ON
9030062	00219F0	0022620		EL-ZOOM OFF
9030063	00219F0	0022630	REFRESH	REFRESH
9030064	00219F0	0022640	PRESET STORE	PRESET1 SET
9030065	00219F0	0022650		PRESET2 SET
~				~
90300A2	00219F0	0022A20		PRESET63 SET
90300A3	00219F0	0022A30		PRESET64 SET
90300A4	00219F0	0022A40	PATROL	PATROL PLAY
90300A5	00219F0	0022A50		PATROL STOP
90300A6	00219F0	0022A60		PATROL LEARN
90300A8	00219F0	0022A80	IRIS	IRIS OPEN
90300A9	00219F0	0022A90		IRIS CLOSE
90300AA	00219F0	0022AA0	SHUTTER	SHUTTER ON
90300AB	00219F0	0022AB0		SHUTTER OFF

90300AC	00219F0	0022AC0		SHUTTER INC
90300AD	00219F0	0022AD0		SHUTTER DEC
90300AE	00219F0	0022AE0	AGC	AGC ON
90300AF	00219F0	0022AF0		AGC OFF
90300B0	00219F0	0022B00	SENS UP FIX	SENS UP FIX ON
90300B1	00219F0	0022B10		SENS UP FIX OFF
90300B2	00219F0	0022B20		SENS UP FIX INC
90300B3	00219F0	0022B30		SENS UP FIX DEC
90300B4	00219F0	0022B40	SENS UP AUTO	SENS UP AUTO ON
90300B5	00219F0	0022B50		SENS UP AUTO OFF
90300B6	00219F0	0022B60		SENS UP AUTO INC
90300B7	00219F0	0022B70		SENS UP AUTO DEC
90300B8	00219F0	0022B80	LL phase	LL Phase INC
90300B9	00219F0	0022B90		LL Phase DEC
90300BA	00219F0	0022BA0	180 deg pan turn	180 deg pan turn
90300BB	00219F0	0022BB0	CLEANING	CLEANING ON (MENU)
90300BC	00219F0	022BC0		CLEANING OFF (MENU)

When camera received preset store command : 9030064~90300A3, " MEMORY" is displayed for 3 seconds.

5. Gateway mode

The commands in this document can be sent over the coax via switcher equipment supporting gateway command such as SX550A, FS616, MP204 etc.

New protocol (9xxxxxx code) can be gatewayed by MP204 only.

Refer switcher's protocol document for detail.

6. Wiring

6.1 2Wire Internal Circuit

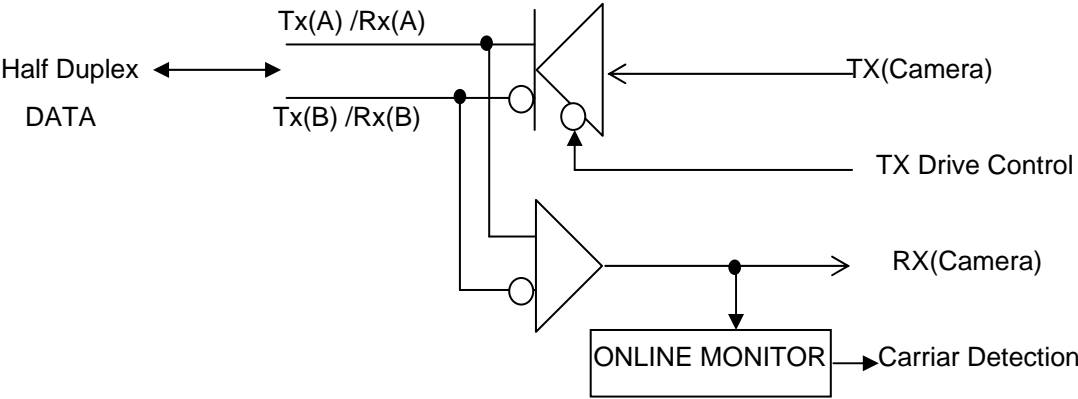
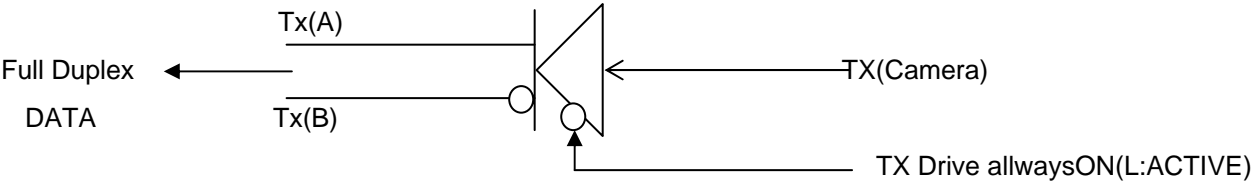


Fig. 6.1

6.2 4Wire Internal Circuit



Note :In 2Wire Multidrop USE(PC HOST), Tx(A),Tx(B) Terminals should be OPEN and 4WIRE DIPSW2 setting.

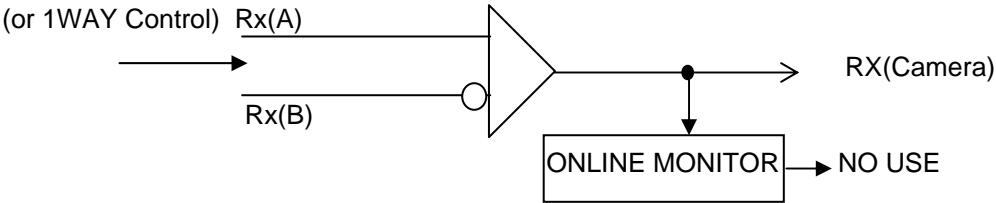


Fig. 6.2