Protocol Information
WV-CS950,CW960,CW970,CS850B, CW860A,CW590,CS580

VER. 4.5

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History

Date	Comment	Page
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
22 Aug. 2001	Ver. 2.2	7. Setup reset commands
31 Oct. 2001	Ver. 3.0	CS850A 256 step PT command, page 21
July 2002	Ver. 3.1	P7 ATW offset, LL phase, P14 QID code
Jan 2003	Ver. 3.2	SD ON Page 6
May 2005	Ver. 4.0	Support CS950 (2.3 2.4 5) 4 Absolute Position Control (Add.)
Nov 2006	Ver. 4.1	Support CW960(No change)
Jan 2007	Ver. 4.2	Support CW970(2.4 6)
April 28, 2011	Ver. 4.3	Support CW590,CS580(No change) 3 New Protocol(Add.) 4 Absolute Position Control (Add.)
April 28, 2011	Ver. 4.4	3 New Protocol(Add.)
June 25, 2013	Ver. 4.5	2.9.3 Communication Configuration（Modify）

Contents

Note: Additional items for CS950 are written in blue.

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 distination, 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 distination, 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 distination, 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

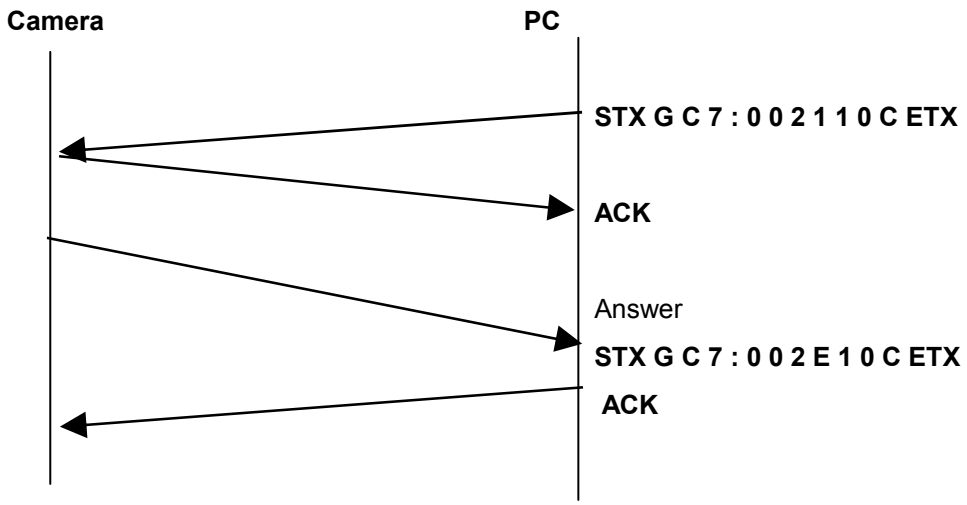
Note : Only address 01 – 96 is available for CSR camera series.

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

ZZ controls all units.

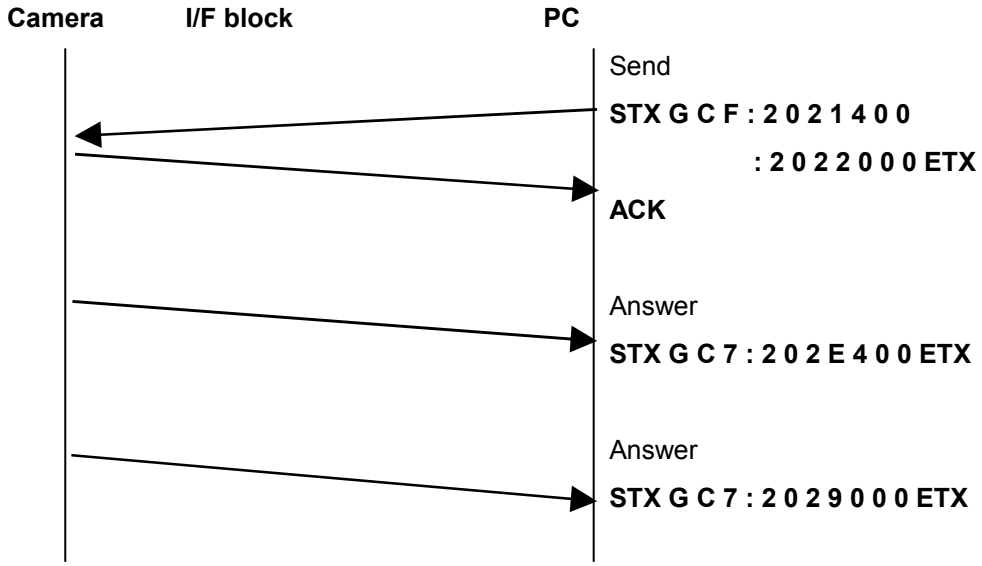
2.2 Communication Procedure

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

CS950:Y : New command for CS950 ,N :no support, no function.

No	Function	Command	CS950	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		
9	BW OFF	0021041		
10	BW AUTO	0021042		
11	BW BURST ON	0021050		
12	BW BURST OFF	0021051		
13	SHUTTER ON	0021100		Need SD2 OFF(BLC MODE OFF)
14	SHUTTER OFF	0021101		
15	SHUTTER INC	0021102		
16	SHUTTER DEC	0021103		
17	SHUTTER AUTO	0021107	Y	
18	SHUTTER 1/100NTSC, 1/120PAL	0021109		
19	SHUTTER 1/250	002110C		
20	SHUTTER 1/500	002110D		
21	SHUTTER 1/1000	002110E		
22	SHUTTER 1/2000	002110F		
23	SHUTTER 1/4000	0021119		
24	SHUTTER 1/10000	002111A		
25	SENS UP AUTO ON	0021120		
26	SENS UP AUTO OFF	0021121		
27	SENS UP AUTO INC	0021122		
28	SENS UP AUTO DEC	0021123		
29	SENS UP MANU ON	0021150		
30	SENS UP MANU OFF	0021151		
31	SENS UP MANU INC	0021152		
32	SENS UP MANU DEC	0021153		
33	AGC ON	0021200		
34	AGC OFF	0021201		
35	AGC GAIN UP LOW	0021208		
36	AGC GAIN UP MID	0021209		
37	AGC GAIN UP HIGH	002120A		
38	MANU GAIN UP LOW	0021228		
39	MANU GAIN UP MID	0021229		
40	MANU GAIN UP HIGH	002122A		
41	BLC MODE AUTO	00212A2		
42	BLC MODE PRESET	00212A3		
43	BLC SET UP [START]	00212B0		
44	BLC SET UP [END]	00212B1		

45	BLC SET UP [MASK ON]	00212C0		
46	BLC SET UP [MASK OFF]	00212C1		
47	BLC SET UP [MASK CLEAR]	00212C2		
48	BLC SET UP [MASK REVERSE]	00212C3		
49	BLC SET UP [Cursor UP]	00212C8		
50	BLC SET UP [Cursor Right]	00212C9		
51	BLC SET UP [Cursor Down]	00212CA		
52	BLC SET UP [Cursor Left]	00212CB		
53	AWC ON	0021300		
54	AWC RESET	0021305		
55	AWC SET UP	0021300:0022306		
56	ATW ON	0021310		
57	R offset up	0021312		Timeout 2.2 sec
58	R offset down	0021313		Timeout 2.2 sec
59	R offset stop	0021314		
60	R offset Reset	0021315		
61	B offset UP	0021316		Timeout 2.2 sec
62	B offset down	0021317		Timeout 2.2 sec
63	B offset stop	0021318		
64	B offset Reset	0021319		
65	BURST PHASE UP (+)	0021382		Timeout 2.2 sec
66	BURST PHASE Down (-)	0021383		Timeout 2.2 sec
67	BURST PHASE STOP	0021384		
68	BURST PHASE RESET	0021385		
69	LINE LOCK ON	0021452		NTSC:60Hz,PAL50Hz AC power
70	LINE LOCK OFF (INT)	0021453		
71	LL Phase UP	0021454		Timeout 2.2 sec
72	LL Phase Down	0021455		Timeout 2.2 sec
73	LL Phase Stop	0021456		
74	EL-Zoom ON	0021560		
75	EL-Zoom OFF	0021561		
76	Privacy zone ON	0021640		
77	Privacy zone OFF	0021641		
78	Privacy zone(2) ON	0021642	Y	
79	MOTION DETECT ON	0021690		
80	MOTION DETECT OFF	0021691		
81	DNR LOW	00216A8	Y	
82	DNR HIGH	00216AA	Y	
83	MOTION DETECT MODE2 ON	0021696	Y	※Scene Change Detection
84	STABILIZER ON	00216F0	Y	
85	STABILIZER OFF	00216F1	Y	
86	D-RANGE ON	00216B0	N	ALWAYS SEND BACK 002D6B0
87	D-RANGE OFF	00216B1	N	ALWAYS SEND BACK 002D6B1
88	ALL RESET	0021760		No need to set the menu cursor.
89	Restart	0021761		Equivalent to power OFF-ON.
90	RESOLUTION NORMAL	00217C0	Y	

91	RESOLUTION HIGH	00217C1	Y	
92	SETUP MENU ON	0021940		
93	SETUP MENU OFF	0021941		
94	SETUP MENU [Cursor STOP]	002194F		
95	SETUP MENU [Cursor UP]	0021942		
96	SETUP MENU [Cursor Right]	0021943		
97	SETUP MENU [Cursor Down]	0021944		
98	SETUP MENU [Cursor Left]	0021945		
99	SETUP MENU SET1	002194A		
100	SETUP MENU SET2	002194B		Equivalent to pressing set button for 2 seconds.
101	Left+Right button pressed (F2).	002194C		For Special menu, Gain reset etc. Need to set the setup menu cursor.
102	Left+Centre+Right button pressed (F3).	002194D		For Camera reset. Need to set the setup menu cursor
103	Digital Flip ON	00219A0		
104	Digital Flip OFF	00219A1		
105	Menu ON	00219C0		
106	Menu OFF	00219C1		
107	Area Title 1 SET	00219C8		
108	Area Title 2 SET	00219C9		
109	Area Title 3 SET	00219CA		
110	Area Title 4 SET	00219CB		
111	Area Title 5 SET	00219CC		
112	Area Title 6 SET	00219CD		
113	Area Title 7 SET	00219CE		
114	Area Title 8 SET	00219CF		
115	Area Title Default ON	00219D0		
116	Area Title OFF	00219D1		
117	Area Title 1 read start	00219E0		
118	Area Title 1 write start	00219E1		
119	Area Title 2 read start	00219E2		
120	Area Title 2 write start	00219E3		
121	Area Title 3 read start	00219E4		
122	Area Title 3 write start	00219E5		
123	Area Title 4 read start	00219E6		
124	Area Title 4 write start	00219E7		
125	Area Title 5 read start	00219E8		
126	Area Title 5 write start	00219E9		
127	Area Title 6 read start	00219EA		
128	Area Title 6 write start	00219EB		
129	Area Title 7 read start	00219EC		
130	Area Title 7 write start	00219ED		
131	Area Title 8 read start	00219EE		
132	Area Title 8 write start	00219EF		

133	Function Request	00219F0		
134	SETUP SPECIAL MENU	002194E		
135	ONE SHOT AUTO FOCUS ON	0021A06		
136	AUTO FOCUS AREA (SMALL)	0021A18		
137	AUTO FOCUS AREA (MIDDLE)	0021A19		
138	AUTO FOCUS AREA (LARGE)	0021A1A		

2.4 Receiver Function Command CS950:Y: New command for CS950

No.	Function	Command	CS950	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	ZOOM LIMIT INC	2021272	Y	
30	ZOOM LIMIT DEC	2021273	Y	
31	AUTO PAN ON	2021300		
32	AUTO PAN OFF	2021301		
33	AUTO PAN REVERSE	2021305		
34	AUTO PAN LEFT END SET	2021306		
35	AUTO PAN RIGHT END SET	2021307		

36	AUTO PAN SPEED INC	2021308		
37	AUTO PAN SPEED DEC	2021309		
38	AUTO PAN ENDLESS ON	202130E		
39	AUTO PAN ENDLESS OFF	202130F		
40	PAN[STOP (F)] & TILT[STOP(F)]	2021324		
41	PAN[LEFT (F)]	2021328		Timeout 2.2sec
42	PAN[LEFT (F)] & TILT[UP (F)]	2021329		Timeout 2.2sec
43	TILT[UP (F)]	202132A		Timeout 2.2sec
44	PAN[RIGHT(F)] & TILT[UP (F)]	202132B		Timeout 2.2sec
45	PAN[RIGHT(F)]	202132C		Timeout 2.2sec
46	PAN[RIGHT(F)] & TILT[DOWN(F)]	202132D		Timeout 2.2sec
47	TILT[DOWN(F)]	202132E		Timeout 2.2sec
48	PAN[LEFT (F)] & TILT[DOWN(F)]	202132F		Timeout 2.2sec
49	PAN[STOP (F)] & TILT[STOP(S)]	2021334		Timeout 2.2sec
50	PAN[LEFT (F)]	2021338		Timeout 2.2sec
51	PAN[LEFT (F)] & TILT[UP (S)]	2021339		Timeout 2.2sec
52	TILT[UP (S)]	202133A		Timeout 2.2sec
53	PAN[RIGHT(F)] & TILT[UP (S)]	202133B		Timeout 2.2sec
54	PAN[RIGHT(F)]	202133C		Timeout 2.2sec
55	PAN[RIGHT(F)] & TILT[DOWN(S)]	202133D		Timeout 2.2sec
56	TILT[DOWN(S)]	202133E		Timeout 2.2sec
57	PAN[LEFT (F)] & TILT[DOWN(S)]	202133F		Timeout 2.2sec
58	PAN[STOP (S)] & TILT[STOP(F)]	2021344		Timeout 2.2sec
59	PAN[LEFT (S)]	2021348		Timeout 2.2sec
60	PAN[LEFT (S)] & TILT[UP (F)]	2021349		Timeout 2.2sec
61	TILT[UP (F)]	202134A		Timeout 2.2sec
62	PAN[RIGHT(S)] & TILT[UP (F)]	202134B		Timeout 2.2sec
63	PAN[RIGHT(S)]	202134C		Timeout 2.2sec
64	PAN[RIGHT(S)] & TILT[DOWN(F)]	202134D		Timeout 2.2sec
65	TILT[DOWN(F)]	202134E		Timeout 2.2sec
66	PAN[LEFT (S)] & TILT[DOWN(F)]	202134F		Timeout 2.2sec
67	PAN[STOP (S)] & TILT[STOP(S)]	2021354		
68	PAN[LEFT (S)]	2021358		Timeout 2.2sec
69	PAN[LEFT (S)] & TILT[UP (S)]	2021359		Timeout 2.2sec
70	TILT[UP (S)]	202135A		Timeout 2.2sec
71	PAN[RIGHT(S)] & TILT[UP (S)]	202135B		Timeout 2.2sec
72	PAN[RIGHT(S)]	202135C		Timeout 2.2sec
73	PAN[RIGHT(S)] & TILT[DOWN(S)]	202135D		Timeout 2.2sec
74	TILT[DOWN(S)]	202135E		Timeout 2.2sec
75	PAN[LEFT (S)] & TILT[DOWN(S)]	202135F		Timeout 2.2sec
76	PAN[STOP (V)] & TILT[STOP(V)]	2021364:2022xx0		
77	PAN[LEFT (V)]	2021368:2022xx0		Timeout 2.2sec
78	PAN[LEFT (V)] & TILT[UP (V)]	2021369:2022xx0		Timeout 2.2sec
79	TILT[UP (V)]	202136A:2022xx0		Timeout 2.2sec
80	PAN[RIGHT(V)] & TILT[UP (V)]	202136B:2022xx0		Timeout 2.2sec
81	PAN[RIGHT(V)]	202136C:2022xx0		Timeout 2.2sec

82	PAN[RIGHT(V)] & TILT[DOWN(V)]	202136D:2022xx0		Timeout 2.2sec
83	TILT[DOWN(V)]	202136E:2022xx0		Timeout 2.2sec
84	PAN[LEFT (V)] & TILT[DOWN(V)]	202136F:2022xx0		Timeout 2.2sec
85	AUTO PAN KEY:AUTO PAN	2021390		
86	AUTO PAN KEY:SEQ	2021391		
87	AUTO PAN KEY:SORT	2021392		
88	AUTO PAN KEY:PATROL1	2021393	Y	
89	AUTO PAN KEY:PATROL2	2021394	Y	
90	AUTO PAN KEY:PATROL3	2021395	Y	
91	AUTO PAN KEY:PATROL4	2021396	Y	
92	AUTO PAN KEY:AUTO TRACKING	2021397	Y	
93	PROPO PAN/TILT ON	20213A0		
94	PROPO PAN/TILT OFF	20213A1		
95	SELF RETURN:ON	20213B0		
96	SELF RETURN:OFF	20213B1		
97	SELF RETURN TIME:INC	20213B2		
98	SELF RETURN TIME:DEC	20213B3		
99	SELF RETURN MODE: AUTO TRACKING	20213B4	Y	
100	SELF RETURN MODE:PATROL2	20213B5	Y	
101	SELF RETURN MODE:PATROL3	20213B6	Y	
102	SELF RETURN MODE:PATROL4	20213B7	Y	
103	SELF RETURN MODE:OFF	20213B8	Y	
104	SELF RETURN MODE:AUTO	20213B9	Y	
105	SELF RETURN MODE:HOME-POSI	20213BA	Y	
106	SELF RETURN MODE:AUTOPAN	20213BB	Y	
107	SELF RETURN MODE:SEQ	20213BC	Y	
108	SELF RETURN MODE:SORT	20213BD	Y	
109	SELF RETURN MODE:PATROL1	20213BE	Y	
110	PAN LIMIT ON	20213C0		
111	PAN LIMIT OFF	20213C1		
112	180 DEG TURN	20213D1		
113	PRESET POSITION CALL	2021400:2022xx0		
114	HOME POSITION CALL	2021410		
115	PRESET SEQ [OFF]	2021431		
116	PRESET MODE [SEQ ON]	2021437		
117	PRESET MODE [SORT ON]	2021438		
118	PATROL SETTING NUMBER:1	2021480	Y	When changing a setting number, implement after erasing memory contents by PATROL DEL 202149B-E.
119	PATROL SETTING NUMBER:2	2021481	Y	
120	PATROL SETTING NUMBER:4	2021482	Y	
121	PATROL1(S) PLAY	2021488	Y	
122	PATROL2(S) PLAY	2021489	Y	
123	PATROL3(S) PLAY	202148A	Y	
124	PATROL4(S) PLAY	202148B	Y	

125	PATROL PLAY	2021490		
126	PATROL STOP	2021491		
127	PATROL LEARN	2021494		
128	PATROL2 PLAY	2021495	Y	To stop PLAY LEARN of PATROL 2-4, implement PATROL STOP 2021491.
129	PATROL3 PLAY	2021496	Y	
130	PATROL4 PLAY	2021497	Y	
131	PATROL2 LEARN	2021498	Y	Y or N depends on the setting number.
132	PATROL3 LEARN	2021499	Y	
133	PATROL4 LEARN	202149A	Y	
134	PATROL1 DEL	202149B	Y	
135	PATROL2 DEL	202149C	Y	
136	PATROL3 DEL	202149D	Y	
137	PATROL4 DEL	202149E	Y	
138	IMAGE HOLD ON	20214E0	Y	
139	IMAGE HOLD OFF	20214E1	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
140	PRESET POSITION ID ALL CLEAR	2021547		
141	Alarm IN 1 OFF	2021600		
142	Alarm IN 1 POSI	2021601		
143	Alarm IN 1 AUTOPAN	2021602	Y	
144	Alarm IN 1 PATROL1	2021603	Y	
145	Alarm IN 1 AUTO TRACKING1	2021604	Y	
146	Alarm IN 2 OFF	2021610		
147	Alarm IN 2 POSI	2021611		
148	Alarm IN 2 SEQ	2021612	Y	
149	Alarm IN 2 PATROL2	2021613	Y	
150	Alarm IN 2 AUTO TRACKING2	2021614	Y	
151	Alarm IN 3 OFF	2021620		
152	Alarm IN 3 POSI	2021621		
153	Alarm IN 3 SORT	2021622	Y	
154	Alarm IN 3 PATROL3	2021623	Y	
155	Alarm IN 3 AUTO TRACKING3	2021624	Y	
156	Alarm IN 4 OFF	2021630		
157	Alarm IN 4 POSI	2021631		
158	Alarm IN 4 BW	2021632		
159	Alarm IN 4 PATROL4	2021633	Y	
160	Alarm IN 4 AUTO TRACKING4	2021634	Y	
161	CONT 1 OFF	2021700		
162	CONT 1 AUX1	2021701		
163	CONT 1 VMD	2021702		
164	CONT 2 OFF	2021710		
165	CONT 2 AUX2	2021711		
166	CONT 2 BW	2021713		

167	CAMERA HEIGHT_INC	2021800		These commands are about auto tracking, only for CW970 model.
168	CAMERA HEIGHT_DEC	2021801		
169	OBJECT SIZE_SMALL	2021810		
170	OBJECT SIZE_MEDIUM	2021811		
171	OBJECT SIZE_LARGE	2021812		
172	SENSITIVITY_LOW	2021820		
173	SENSITIVITY_MID	2021821		
174	SENSITIVITY_HIGH	2021822		
175	TRACKING MODE_LOW	2021830		
176	TRACKING MODE_MID	2021831		
177	TRACKING MODE_HIGH	2021832		
178	ZOOM CONTROL_OFF	2021840		
179	ZOOM CONTROL_INTERMIT	2021841		
180	ZOOM CONTROL_CONTINUOUS	2021842		
181	AUTO RELEASE_INC	2021860		
182	AUTO RELEASE_DEC	2021861		
183	AUTO RELEASE_DEFAULT(OFF)	2021863		
184	LOST MODE_STOP	2021870		
185	LOST MODE_RESEACH	2021871		
186	LOST MODE_ZOOM-OUT	2021872		
187	ALARM_OFF	2021880		
188	ALARM_ON	2021881		
189	INDICATOR_OFF	2021890		
190	INDICATOR_CANDIDATE	2021891		
191	INDICATOR_TARGET	2021892		
192	INDICATOR_ON	2021893		

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 sepalately.

G C	: Command header, GC:Camera Control Command
F	: Number of commands. Refer Fig – 1
2 0 2	: Command distination, 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 distination, 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 sepalately.

G C	: Command header, GC:Camera Control Command
F	: Number of commands. Refer Fig – 1
2 0 2	: Command distination, 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 distination, 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

［Supplement］

Use the direct function command (chapter 4) for preset 65-256.

It is desirable to use the direct function command for preset 1-64, too.

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

［Supplement］

Use the direct function command (chapter 4) for preset 65-256.

It is desirable to use the direct function command for preset 1-64, too.

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
WV-CS570	WV-CS570
WV-CS950	WV-CS950
WV-CW960	WV-CW960
WV-CW970	WV-CW970
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]		**read**
	[:][0][0][2][2][0][0][0]		**id index**
	[:][0][0][2][1][9][3][0]		**id read start**
	[:][0][0][2][0][3][0][8]		**srq3**
	[:][0][0][2][0][3][0][1]		**srq3**
	[:][0][0][2][1][9][3][1]		**id read end**
	[ETX]		
		[STX] [G][C][7][:][0][0][2][E][9][0][0] [ETX]	**read ack**
		[STX] [G][C][7][:][0][0][2][9][0][0][0] [ETX]	**id index ack**
		[STX] [G][C][7][:][0][0][2][E][9][3][0] [ETX]	**id read start ack**
		[STX] [G][C][7][:][0][0][2][3][1][x][8] [ETX]	**id 1x**
		[STX] [G][C][7][:][0][0][2][3][y][z][1] [ETX]	**id yz**
		[STX] [G][C][7][:][0][0][2][E][9][3][1] [ETX]	**read end ack**
		xyz : refer table 2.9.2.2	

Table 2.9.2.2

Answer 1 xyz	Model
07E	WV-CS950,CW960,CW970 series NTSC
07F	WV-CS950,CW960,CW970 series PAL
08E	WV-CS570 series NTSC
08F	WV-CS570 series PAL
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 : Y ETX Y:Refer table 2.9.3	**STX R O N : Y ETX** Y: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

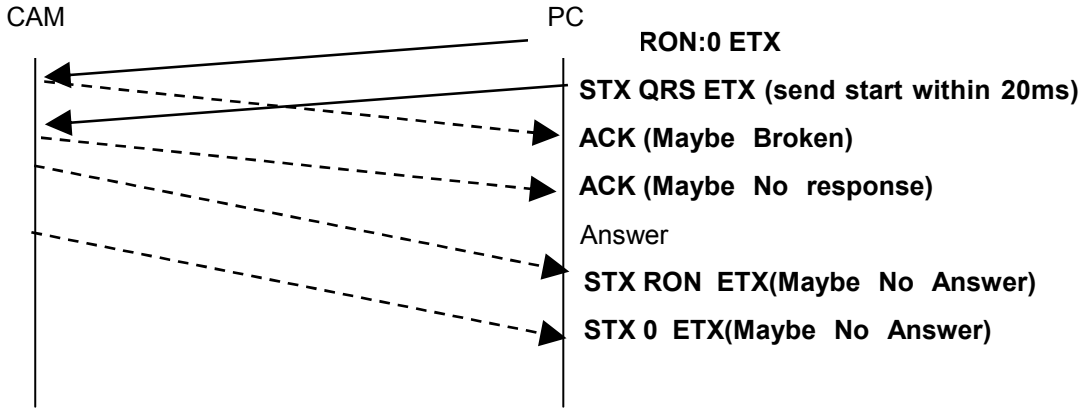
NAK +CODE	Error	comments
(15hex)1	parity error	Detected data parity error (even, odd), it cause camera to clear camera received data
(15hex)2	buffer overflow	Detected camera receive buffer full, cannot receive data
(15hex)3	framing error	Detected data framing error (bad length to stop bit) ,cause camera to clear camera received data
(15hex)4	overrun error	Detected overwrote 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

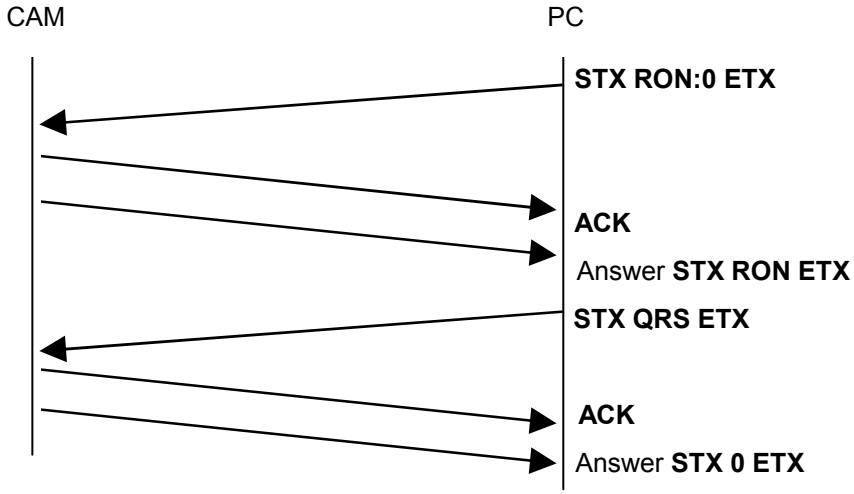
(1) Do not send a command before receiving ACK and Answer of previous command.

If you do so, data may be broken.

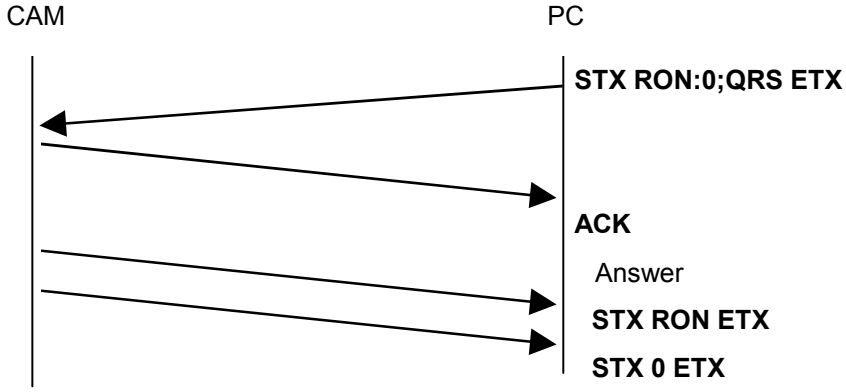
Bad example



Good example



Good example



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

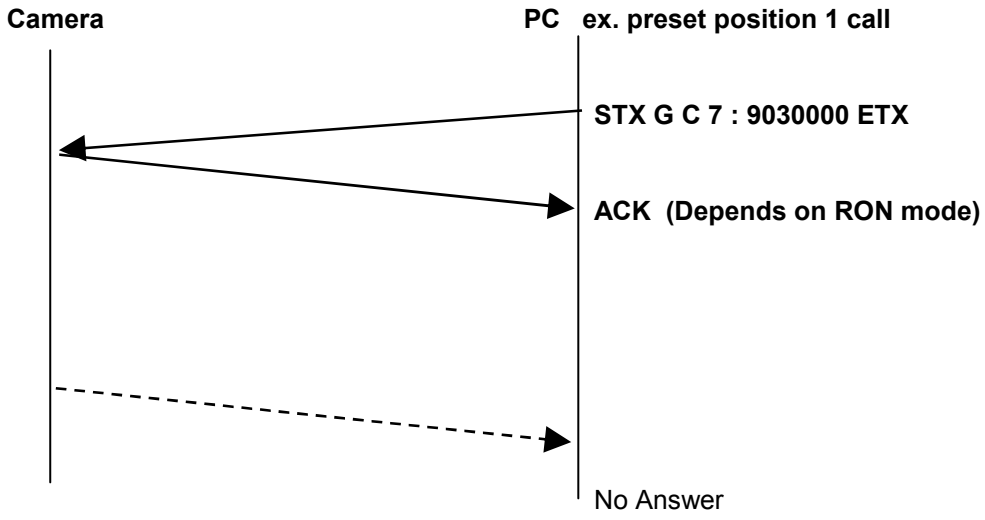
9 : ONE Way New Command

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

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

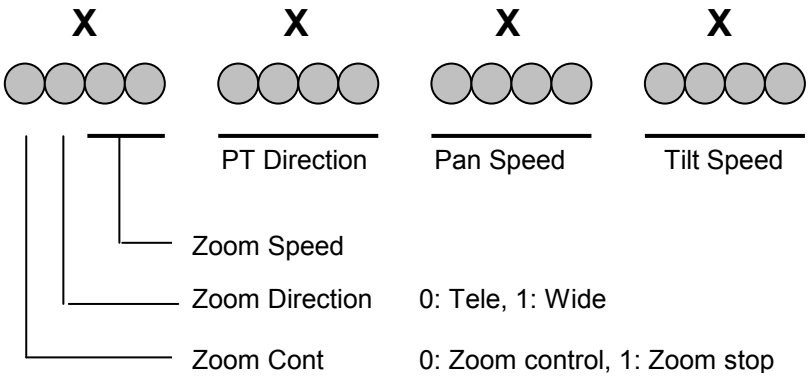
3.1.2 Command Answer

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)

EX2. PAN / TILT Stop : GC7:902X1XX

EX3. Zoom Tele Max speed: GC7:9023000 (Zoom 0011=3hex)

EX4. Zoom STOP: GC7:9028XXX

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)

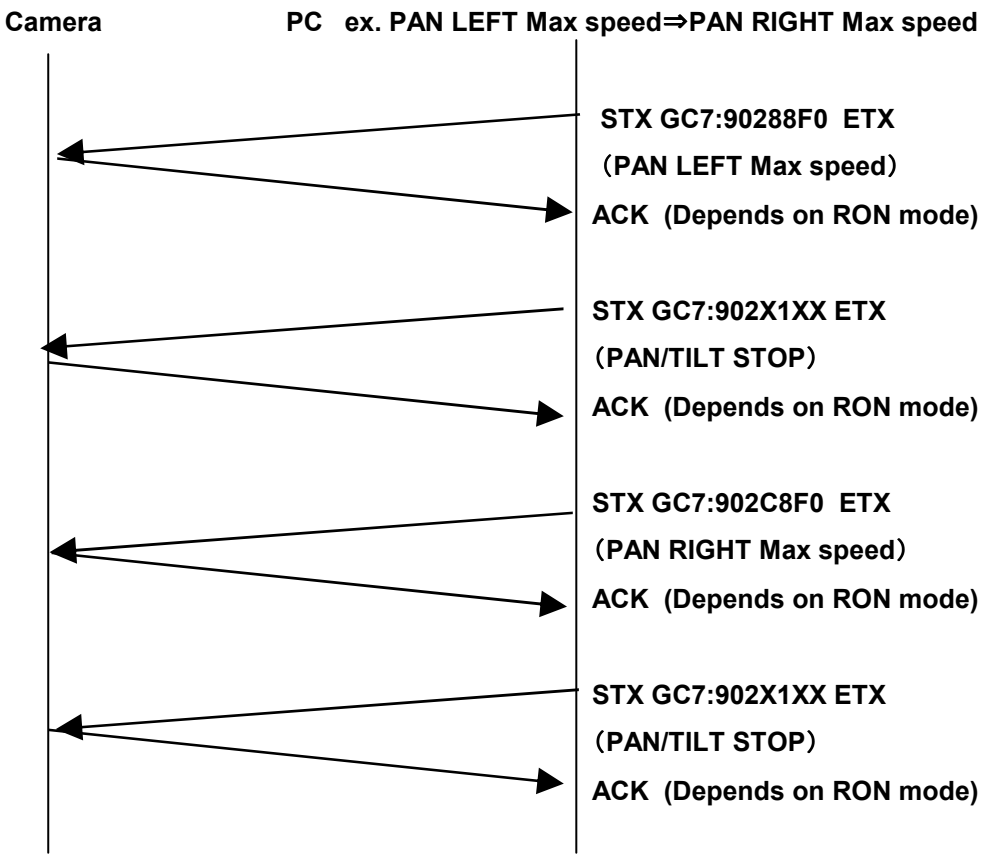
Table 3.1.1 PT Speed

	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

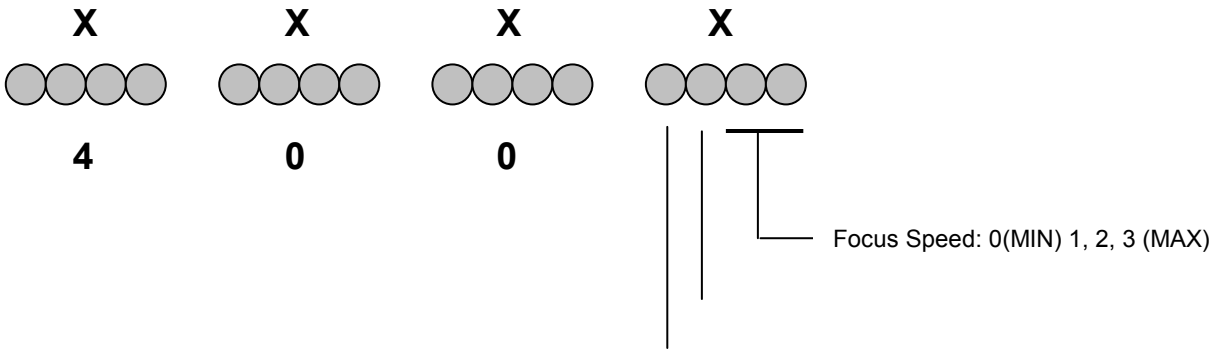
3.2 .1 Pan command example



※Pan/Tilt is Automatic Stop at 2 seconds.

3.3 Focus Command

Fig3.3 Focus Command body structure



0: Near, 1: Far

0: Zoom control, 1: Zoom stop

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 ETX

D : ONE Way 256 steps Command

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

Fig3.5 PTZ Command body structure

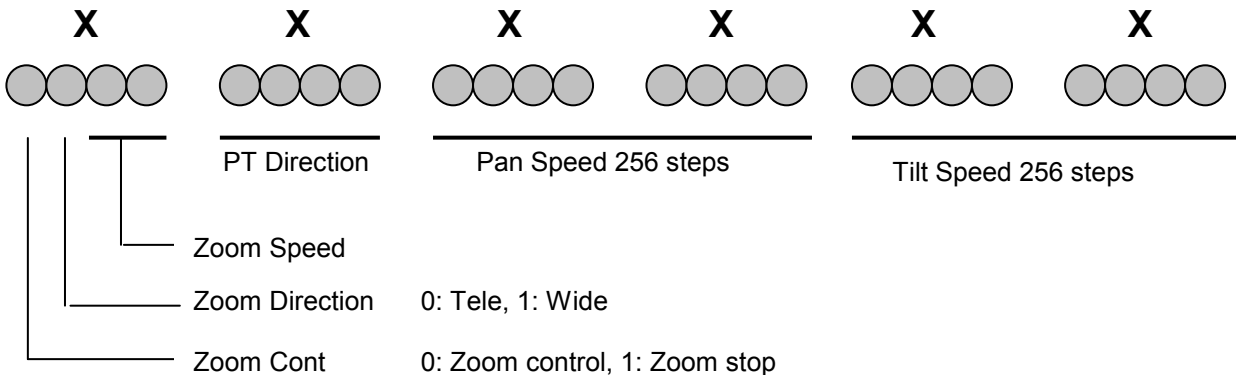


Table 3.5.1 PTZ Speed

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).

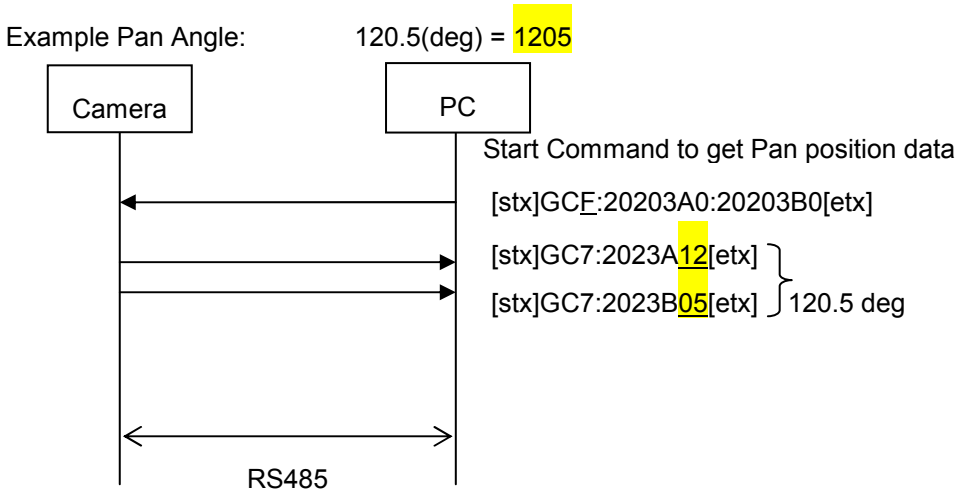
STEP	SPEED	STEP	SPEED	STEP	SPEED	STEP	SPEED	STEP	SPEED	STEP	SPEED
1	0.1	44	0.65	87	3.69	130	12.01	173	30.13	216	69.36
2	0.1	45	0.76	88	3.69	131	12.48	174	30.88	217	70.49
3	0.1	46	0.76	89	3.95	132	12.96	175	31.64	218	71.63
4	0.1	47	0.76	90	3.95	133	13.45	176	32.4	219	72.77
5	0.12	48	0.76	91	4.22	134	13.45	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		

※Please transmit the PTZF command at first, and then transmit the STOP command. Without transmitting the STOP command, PTZF operation may not work.

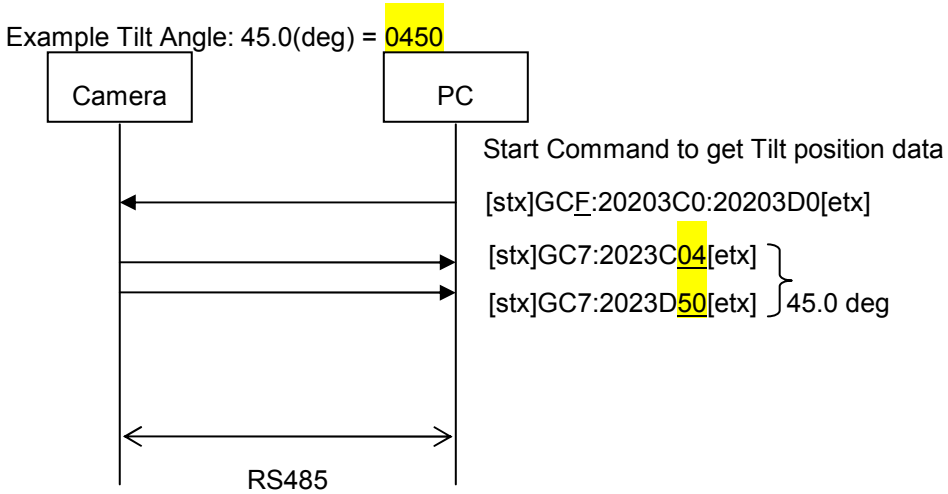
4. Absolute Position Control *compatible in CS850A and later model*

4.1 Get Positioning Data from Dome Camera (PTZ)

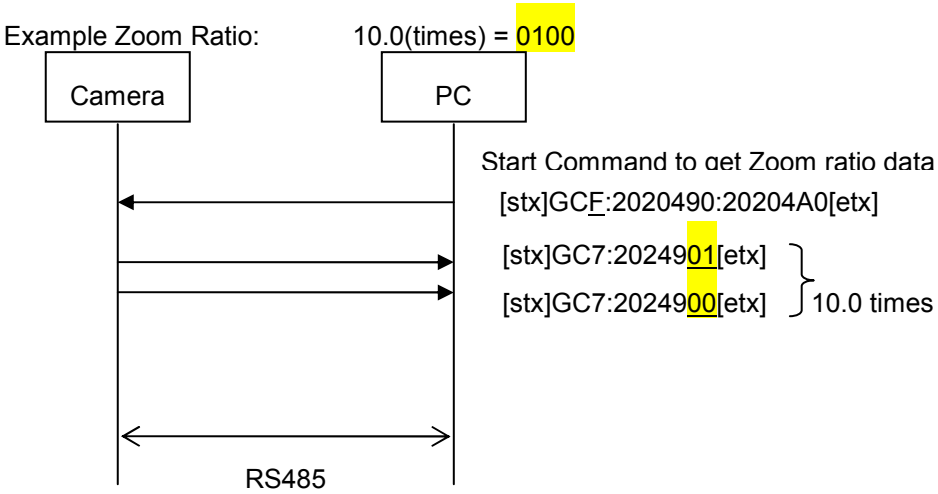
4.1.1 Pan Position



4.1.2 Tilt Position



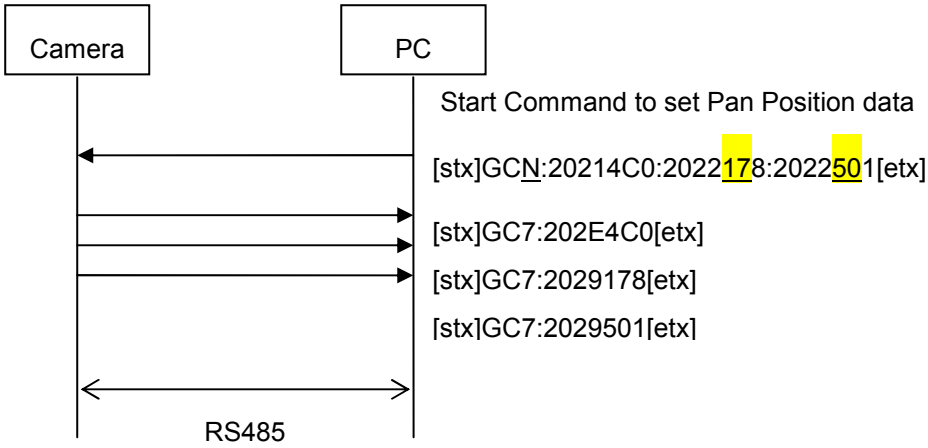
4.1.3 Zoom Ratio



4.2 Set Positioning Data to Dome Camera

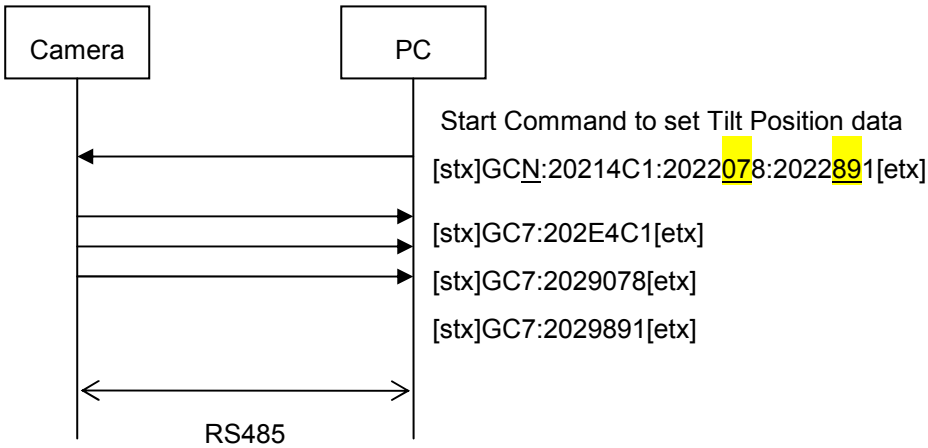
4.2.1 Pan Position

Example Pan Position: 175.0(deg) = 1750
(MIN=000.0, MAX=360.0)

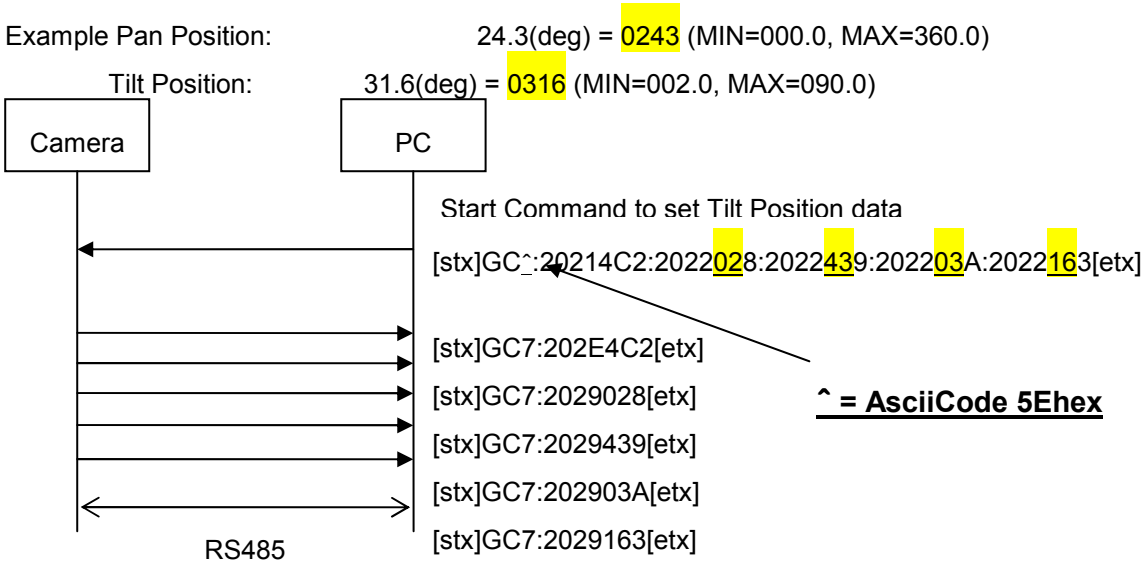


4.2.2 Tilt Position

Example Tilt Position: 78.9(deg) = 0789
(MIN=002.0, MAX=090.0)

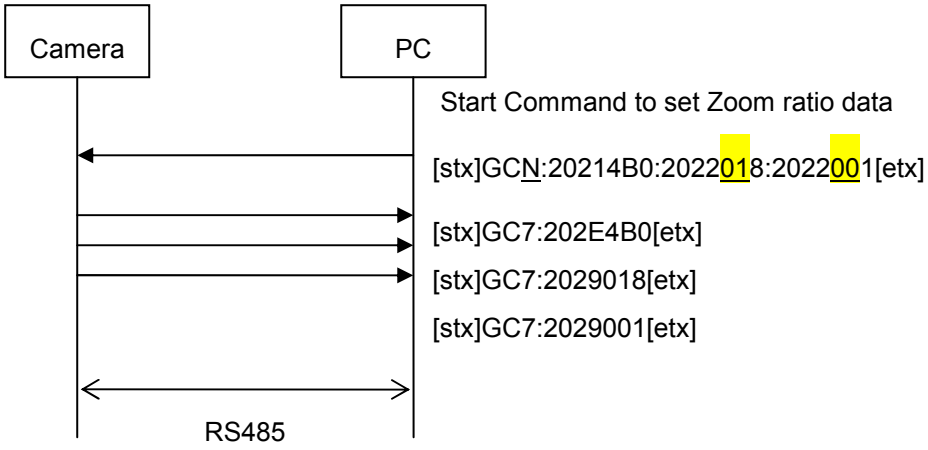


4.2.3 Pan/Tilt Position



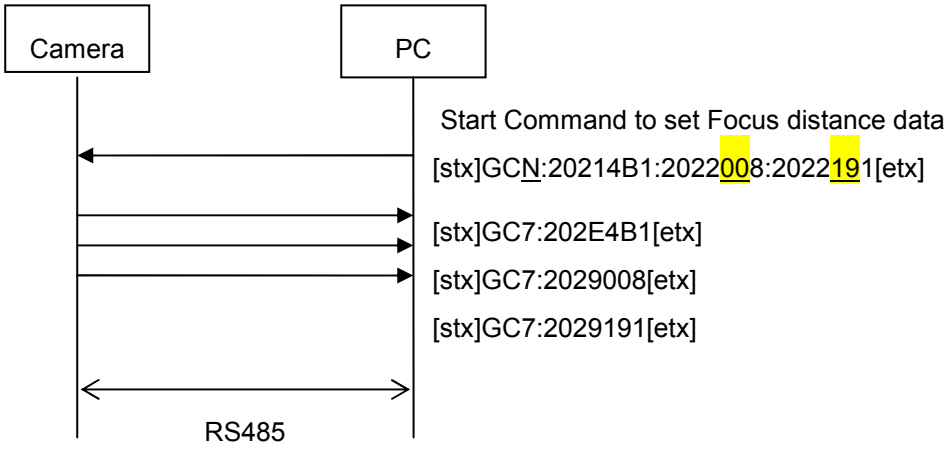
4.2.4 Zoom Ratio

Example Zoom Ratio: 010.0(times) = 0100
(MIN=001.0 , MAX=022.0)



4.2.5 Focus Distance

Example Focus Distance: 001.9(meter) = 0019
(MIN=001.0 , MAX=022.0)



［Supplement］

When using “Absolute Position Control” command, consider the lifetime of the lens part, the slip ring (P/T)

(lens part: 3,700,000 times of operation, slip ring: 2,400,000 times of operation)

As for the slip ring, in case of using 7 years, the operation limit is about 1000 times per day.

※Please transmit the PTZF command at first, and then transmit the STOP command. Without transmitting the STOP command, PTZF operation may not work.

5. Direct Function Command (New and Conventional Protocol)

Table 4

New Protocol	Conventional 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	AUTO MODE OFF
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	CAMERA ID ON
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(1) PLAY
90300A5	00219F0	0022A50		PATROL STOP
90300A6	00219F0	0022A60		PATROL(1) 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

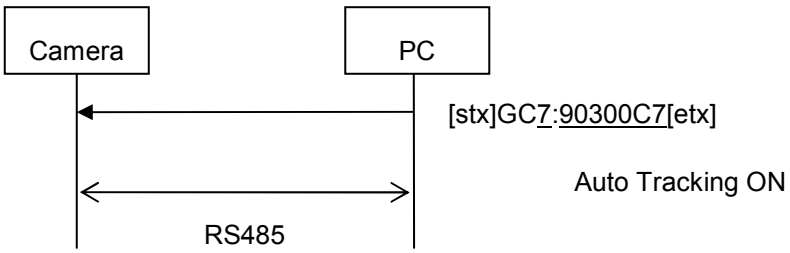
90300AD	00219F0	0022AD0		SHUTTER DEC
90300AE	00219F0	0022AE0	AGC	AGC ON
90300AF	00219F0	0022AF0		AGC OFF
90300B0	00219F0	0022B00	SENS UP FIX	SENS UP FIX ON
90300B1	00219F0	0022B10		SENS UP FIX OFF
90300B2	00219F0	0022B20		SENS UP FIX INC
90300B3	00219F0	0022B30		SENS UP FIX DEC
90300B4	00219F0	0022B40	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	0022BC0		CLEANING OFF (MENU)
90300BD	00219F0	0022BD0	BW DURATION	BW DURATION TIME 10S
90300BE	00219F0	0022BE0	TIME	BW DURATION TIME 30S
90300BF	00219F0	0022BF0		BW DURATION TIME 60S
90300C0	00219F0	0022C00		BW DURATION TIME 300S
90300C1	00219F0	0022C10	PATROL	PATROL2 PLAY (Implement PATROL STOP 90300A5 to stop)
90300C2	00219F0	0022C20		PATROL3 PLAY
90300C3	00219F0	0022C30		PATROL4 PLAY
90300C4	00219F0	0022C40		PATROL2 LEARN
90300C5	00219F0	0022C50		PATROL3 LEARN
90300C6	00219F0	0022C60		PATROL4 LEARN
90300C7	00219F0	0022C70	AUTO TRACKING	AUTO TRACKING (Implement AUTO MODE OFF 9030046 to stop)
90300C8	00219F0	0022C80	STABILIZER	STABILIZER ON
90300C9	00219F0	0022C90		STABILIZER OFF
90300CA	00219F0	0022CA0	OSD	P/T/Z Position Display ON
90300CB	00219F0	0022CB0		P/T/Z Position Display OFF
~				N/A
~				N/A
9031000	---	---	PRESET CALL	PRESET 1 CALL
9031001	---	---		PRESET 2 CALL
~				~
90310FE	---	---		PRESET 255 CALL
90310FF	---	---		PRESET 256 CALL
~				N/A
~				N/A
903112C	---	---	PRESET SET	PRESET 1 SET
903112D	---	---		PRESET 2 SET
~				~
903122A	---	---		PRESET 255 SET
903122B	---	---		PRESET 256 SET

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

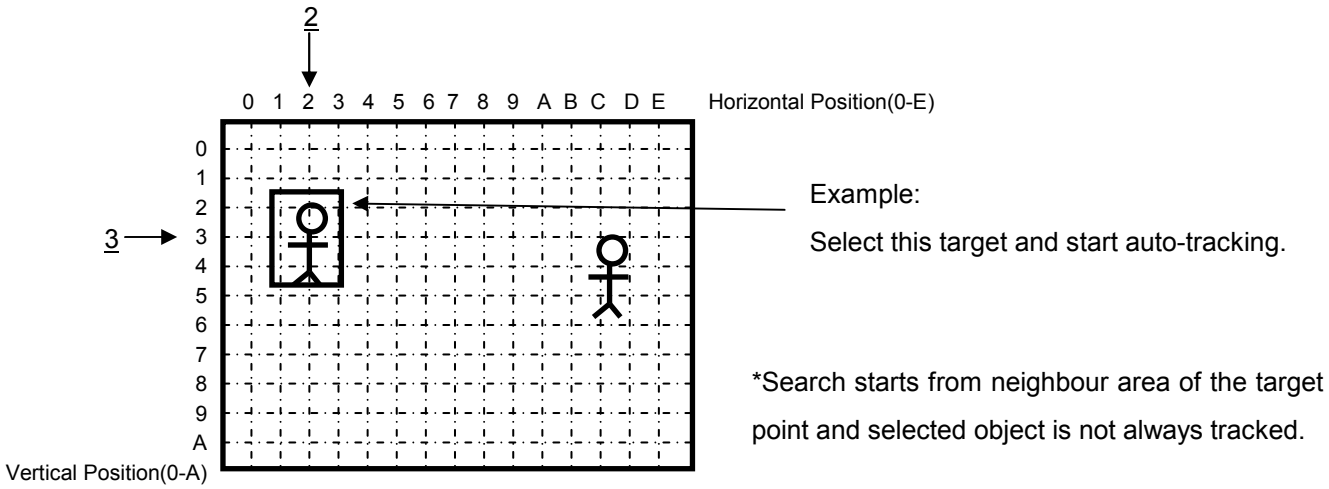
6. Auto Tracking Control *only for CW970 model*

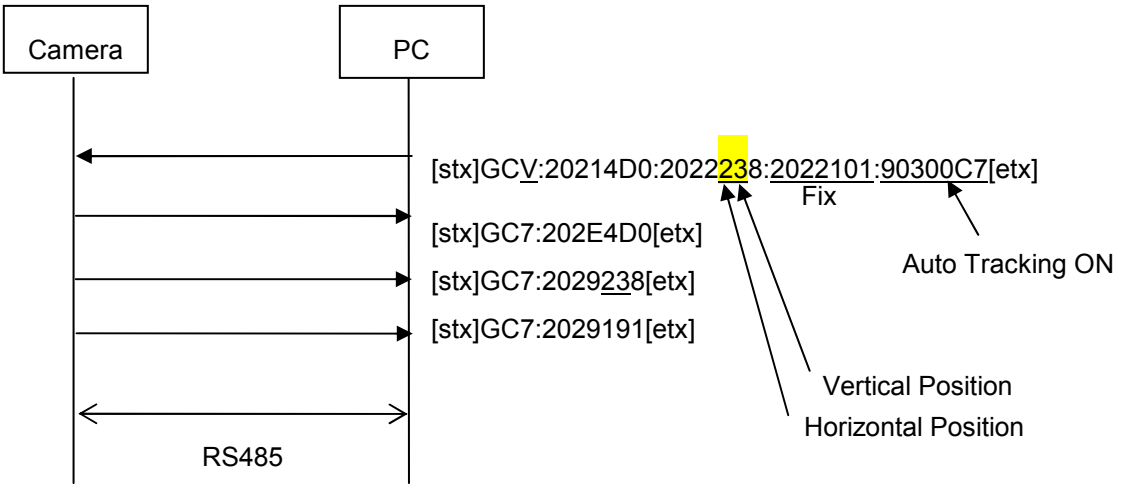
6.1 Control Auto-Tracking

6.1.1 Search in the whole area and start Auto-Tracking

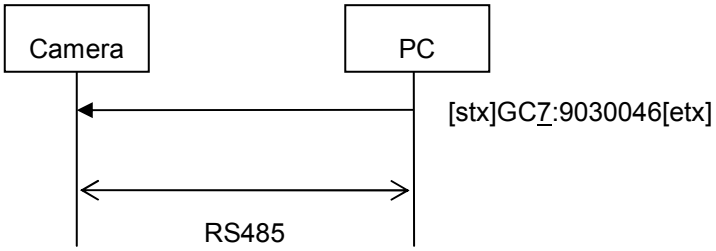


6.1.2 Select the target and start Auto-Tracking



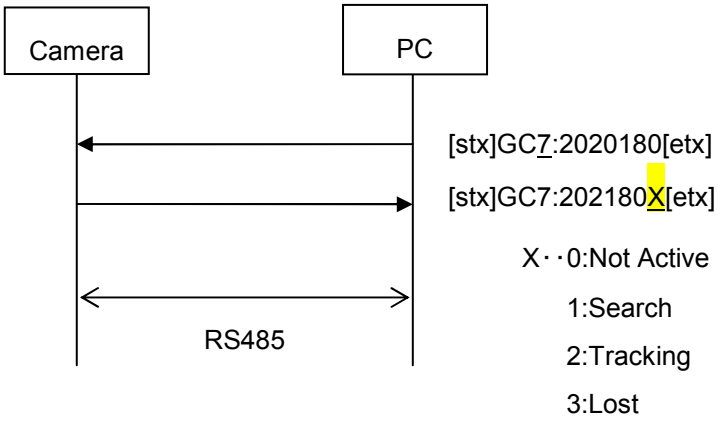


6.1.3 Stop Auto-Tracking

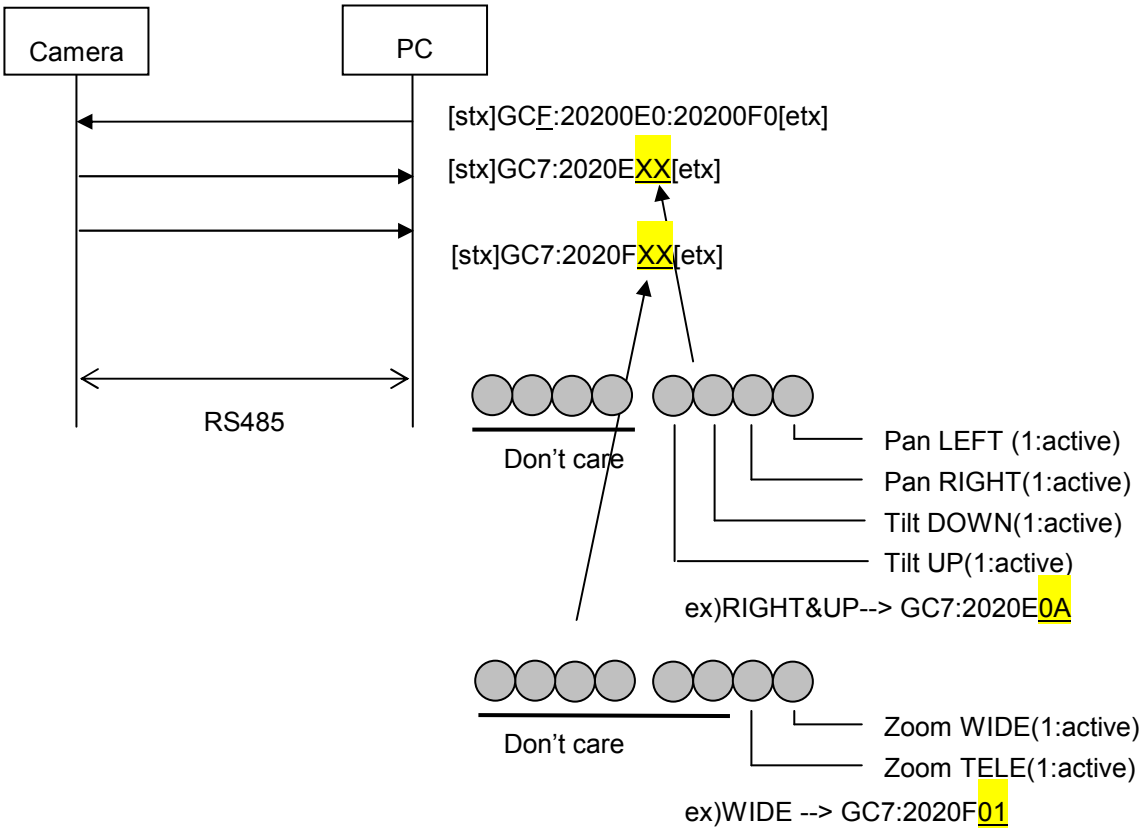


6.2 Get the information of Auto-Tracking

6.2.1 Get the status of Auto-Tracking



6.2.2 Get the information of PTZ movement during Auto-Tracking



7. 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.

8. Wiring

8.1 2Wire Internal Circuit

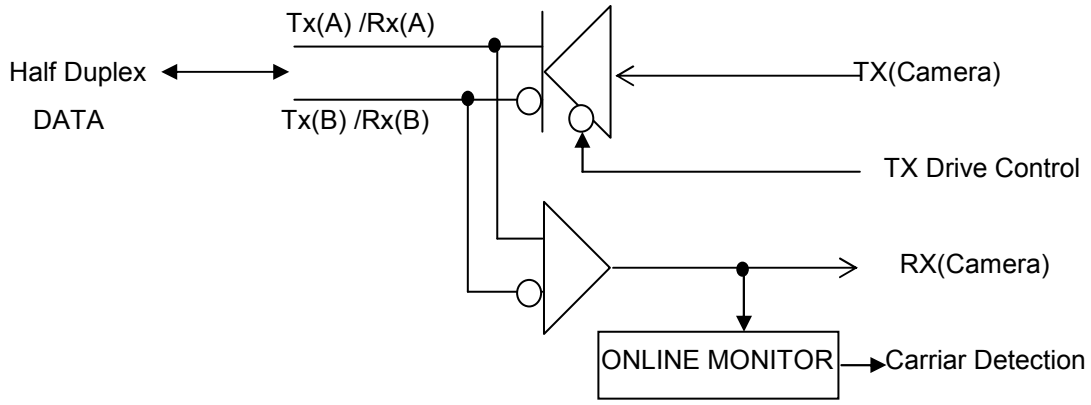
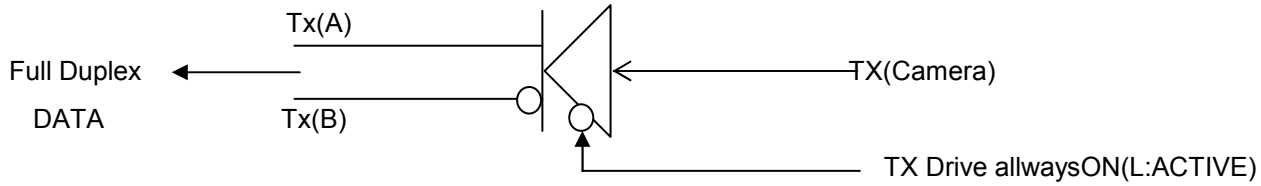


Fig. 8.1

8.2 4Wire Internal Circuit



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

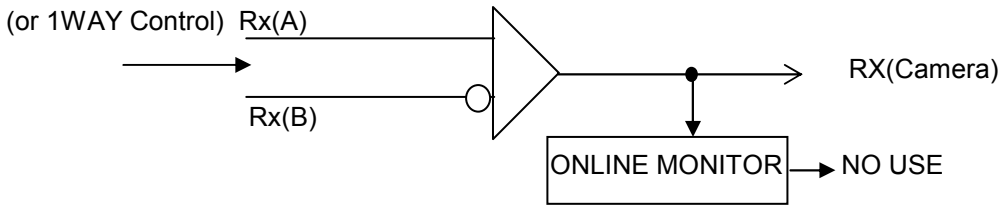


Fig. 8.2