

RBC Protocol

Ver 1.13

RoboBuilder Co, Ltd.

<TITLE>

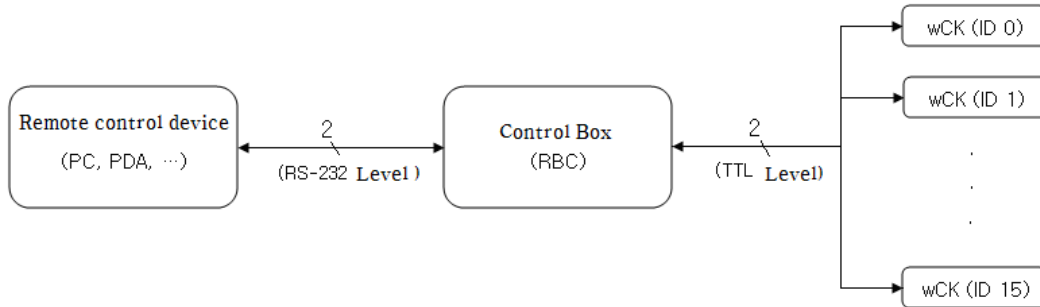
1.	Introduction	2
2.	System Structure and Communication Method	2
3.	Packet Basic Structure	2
4.	Command List	2
4.1.	Direct Control Mode	2
4.2.	Direct Control Mode Release	3
4.3.	Run Motion.....	3
4.4.	Run Sound.....	3
4.5.	Distance Reference	4
4.6.	Sound Input Reference	4
4.7.	Button Input Reference	5
4.8.	Remote Controller Receiving Reference	5
4.9.	Acceleration Reference.....	6
4.10.	Execution Status Reference.....	6
	Appendix 10 – Motion & Sound List	7

1. Introduction

It describes how to communicate "RoboBuilder RBC" with PC, PDA or other remote controller.

2. System Structure and Communication Method

Series asynchronous communication, 115200bps, Data bit 8, Stop bit 1, No parity



3. Packet Basic Structure

Header(8)								Command Type (1)	Platform (1)	Command Size (4)	Command Contents (Size)	Checksum (1)
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA					

- It transmits from MSB, if size is bigger than 2 byte.
- All commands are asked by remote devices first, then, RBC response from this request.
- Some of commands use different structure (ex. Direct Control Mode Cancellation Command)
- CheckSum = Every each byte of [Command Contents] 'Exclusive OR' value.

4. Command List

4.1. Direct Control Mode

Remote control device controls RBC sub devices (wCK, Sound module etc.) directly.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command Size (4)	Command contents (1)	Checksum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	16	don't care	1	1	

RBC → Remote control device : single time

Header(8)								Command Type (1)	Platform (1)	Command Size (4)	Command contents (1)	Checksum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	16	don't care	1	1	

4.2. Direct Control Mode Release

It makes RBC is out of direct control mode.

Remote control mode → RBC : single time

0xFF	0xE0	0xFB	0x01	0x00	0x1A
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RBC → Remote control device : 0 time

4.3. Run Motion

Run Motion that is saved in RBC.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	20	don't care	1	Motion No.	

RBC → Remote control device : single time after motion running is completed

Header(8)								Command Type (1)	Platform (1)	Command Size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	20	don't care	1	Motion No.	

Motion No. : Refer to <Appendix>

4.4. Run Sound

Run Sound that is saved in RBC.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	21	don't care	1	Sound No.	

Sound No. : Refer to <Appendix>

RBC → Remote control device : single time after sound running is completed.

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command Contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	21	don't care	1	Sound No.	

4.5. Distance Reference

Refer RBC distance sensor value.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	22	don't care	1	1	

RBC → Remote control device : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (2)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	22	don't care	2	Distance	

Distance : Distance range 10 ~ 50 cm (longer than 50cm is showed 50cm)

4.6. Sound Input Reference

If Remote control device designate minimum sound level, RBC send the result to Remote control device whenever sound input is over minimum sound level.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents(2)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	23	don't care	2	Minimum sound level	

RBC → Remote control device : If condition is satisfied, it runs. (it runs continuously until it receives other commands.)

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents(2)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	23	don't care	2	Sound level	

Sound Level : Sound Sensor A/D Result

4.7. Button Input Reference

If Remote control device send button reference command, RBC sends the result to Remote control device whenever RBC button is pressed.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	24	don't care	1	1	

RBC → Remote control device : It runs when button is pressed. (it runs continuously until it receives other commands.)

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (2)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	24	don't care	2	Button value	

Button value : 1 (PF1 Button is pressed), 2 (PF2 Button is pressed)

4.8. Remote Controller Receiving Reference

If Remote control device send remote controller receiving commands, RBC sends the result to Remote control device whenever remote controller code receives.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	25	don't care	1	1	

RBC → Remote control device : It runs when remote controller code receiveds.

(it runs continuously until it receives other commands.)

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (2)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	25	don't care	2	Remote controller code	

Remote controller code : Refer to <Appendix>

4.9. Acceleration Reference

Acceleration sensor value reference that is built in RBC.

(RBC firmware 2.17 or above version is required. We will open sooner or later)

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	26	don't care	1	1	

RBC → Remote control device : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (6)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	26	don't care	6	X axis (2), Y axis (2), Z axis (2)	

Accel. Value : Accel. Sensor output value

※ Accel. Value is sent from LSB (Least Significant Bit) - Signed 2 byte type

4.10. Execution Status Reference

If Remote control device refers execution status, RBC sends the execution status (Motion) to Remote control device.

Remote control device → RBC : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (1)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	30	don't care	1	Motion No.	

Motion No. : Refer to <Appendix>

RBC → Remote control device : single time

Header(8)								Command Type (1)	Platform (1)	Command size (4)	Command contents (2)	CheckSum
0xFF	0xFF	0xAA	0x55	0xAA	0x55	0x37	0xBA	30	don't care	2	Execution Status	

Execution status : 0 (Execution finished), 1 (Doing execution)

Appendix 10 – Motion & Sound List

Platform	Creator HUNO	Creator DINO	Creator DOGY
Motion No.	Motion Name	Motion Name	Motion Name
1	Getup A	Getup A	Getup A
2	Getup B	Getup B	Getup B
3	Turn Left	Turn Left	Turn Left
4	Move Forward	Move Forward	Move Forward
5	Turn Right	Turn Right	Turn Right
6	Move Left	Move Left	Move Left
7	Basic Posture	Basic Posture	Basic Posture
8	Move Right	Move Right	Move Right
9	Attack Left	Attack Left	Attack Left
10	Move Backward	Move Backward	Move Backward
11	Attack Right	Attack Right	Attack Right
12*	Download Motion 1 (Button 1)	Download Motion 1 (Button 1)	Download Motion 1 (Button 1)
13*	Download Motion 2 (Button 2)	Download Motion 2 (Button 2)	Download Motion 2 (Button 2)
14*	Download Motion 3 (Button 3)	Download Motion 3 (Button 3)	Download Motion 3 (Button 3)
15*	Download Motion 4 (Button 4)	Download Motion 4 (Button 4)	Download Motion 4 (Button 4)
16*	Download Motion 5 (Button 5)	Download Motion 5 (Button 5)	Download Motion 5 (Button 5)
17*	Download Motion 6 (Button 6)	Download Motion 6 (Button 6)	Download Motion 6 (Button 6)
18*	Download Motion 7 (Button 7)	Download Motion 7 (Button 7)	Download Motion 7 (Button 7)
19*	Download Motion 8 (Button 8)	Download Motion 8 (Button 8)	Download Motion 8 (Button 8)
20*	Download Motion 9 (Button 9)	Download Motion 9 (Button 9)	Download Motion 9 (Button 9)
21*	Download Motion 10 (Button 0)	Download Motion 10 (Button 0)	Download Motion 10 (Button 0)
33*	Download Motion 11 (Button **+1)	Download Motion 11 (Button **+1)	Download Motion 11 (Button **+1)
34*	Download Motion 12 (Button **+2)	Download Motion 12 (Button **+2)	Download Motion 12 (Button **+2)
35*	Download Motion 13 (Button **+3)	Download Motion 13 (Button **+3)	Download Motion 13 (Button **+3)
36*	Download Motion 14 (Button **+4)	Download Motion 14 (Button **+4)	Download Motion 14 (Button **+4)
37*	Download Motion 15 (Button **+5)	Download Motion 15 (Button **+5)	Download Motion 15 (Button **+5)
38*	Download Motion 16 (Button **+6)	Download Motion 16 (Button **+6)	Download Motion 16 (Button **+6)
39*	Download Motion 17 (Button **+7)	Download Motion 17 (Button **+7)	Download Motion 17 (Button **+7)
40*	Download Motion 18 (Button **+8)	Download Motion 18 (Button **+8)	Download Motion 18 (Button **+8)
41*	Download Motion 19 (Button **+9)	Download Motion 19 (Button **+9)	Download Motion 19 (Button **+9)
42*	Download Motion 20 (Button **+0)	Download Motion 20 (Button **+0)	Download Motion 20 (Button **+0)

※ NOTE : Marked “*” is user downloaded motion contents saved No..

Sound List	Sound
1	"Hello, my name is RoboBuilder"
2	"Go Go Go Go~"
3	(HUNO Move Backward)
4	(HUNO Turn)
5	(HUNO Move Side)
6	(HUNO Attach)
7	(HUNO Getup A)
8	(HUNO Getup B)
9	(DOGY Basic Posture)
10	(DOGY Attack)
11	(DOGY Turn)
12	(DOGY Getup)
13	(DINO Getup)
14	(DINO Move Forward)
15	"Zero"
16	"One"
17	"Two"
18	"Three"
19	"Four"
20	"Five"
21	"Six"
22	"Seven"
23	"Eight"
24	"Nine"
25	"Ten"

* Sound output is available in RBC YNN type.