UXA-90 Light

Multipurpose Humanoid Robot

Maintenance Manual

ROBO BUILDER ROBOBUILDER

(1) PROBLEMS

<table>
<tr><th>No</th><th colspan="4">Details of problems</th><th>Code</th><th>Solution Code</th></tr>
<tr><td>1</td><td rowspan="5">When UXA-90 does not move</td><td rowspan="3">Press "C" on the controller, or give the same order in other ways, but the robot does not move</td><td colspan="2">Beep sound from the robot</td><td>1110</td><td>④⑤</td></tr>
<tr><td>2</td><td rowspan="2">No beep sound from the robot</td><td>Operated by the remote controller</td><td>1121</td><td>③</td></tr>
<tr><td>3</td><td>Operated by a PC</td><td>1122</td><td>②</td></tr>
<tr><td>4</td><td colspan="4">The robot does not move and no response while standing</td><td>1200</td><td>③</td></tr>
<tr><td>5</td><td colspan="4">The robot stops suddenly while playing motions</td><td>1300</td><td>⑦⑧</td></tr>
<tr><td>6</td><td rowspan="10">When UXA-90 has malfunction</td><td colspan="4">The robot moves suddenly when power is ON</td><td>2100</td><td>⑤</td></tr>
<tr><td>7</td><td colspan="4">The robot cannot stand up but moves only one leg when pressing "C" button</td><td>2200</td><td>①</td></tr>
<tr><td>8</td><td rowspan="2">The robot can stand up but the upper body part does not move</td><td rowspan="2">After rebooting of the robot</td><td>All LEDs on the motors are blinking.</td><td>2301</td><td>⑤</td></tr>
<tr><td>9</td><td>At least one LED is not blinking</td><td>2302</td><td>①</td></tr>
<tr><td>10</td><td rowspan="3">The robot is in standing position</td><td rowspan="2">Falls down suddenly</td><td>Falls down with lifting a leg</td><td>2411</td><td>④</td></tr>
<tr><td>11</td><td>Falls down without lifting a leg</td><td>2412</td><td>⑥</td></tr>
<tr><td>12</td><td colspan="2">An arm moves suddenly</td><td>2420</td><td>①</td></tr>
<tr><td>13</td><td rowspan="3">While playing motions</td><td colspan="2">Abnormal movements</td><td>2510</td><td>①</td></tr>
<tr><td>14</td><td colspan="2">Motors are shaking while playing motions</td><td>2520</td><td>⑥</td></tr>
<tr><td>15</td><td colspan="2"></td><td>2530</td><td>⑨</td></tr>
</table>

(2) SOLUTIONS

Code	Name	Solutions	Self-repair
①	Replace cables	Refer to Appendix 1 <Replace cables>	Δ
②	Check connection of PC	Refer to Appendix 2 <Check connection of PC>	O
③	Check connection of RF module	Refer to Appendix 4 <Check motors by SAM Programmer>	O
④	Check motors by SAM Programmer	Refer to Appendix 4 <Check motors by SAM Programmer>	O
⑤	Replace RED Interface board	Replace the RED Interface board in the robot	X
		Remove the chest cover to replace the RED board	
⑥	Replace motors	Replace specific motors having troubles	Δ
⑦	Rebooting	Turn off and on turn on all power of the robot	O
⑧	Re-download of motions	Re-download the robot's motion files by RB Tool	O
⑨	Check power	Check the power cable	O
		Check if the power is ON	

< Appendix 1 – Replace cables >

1. Introduction

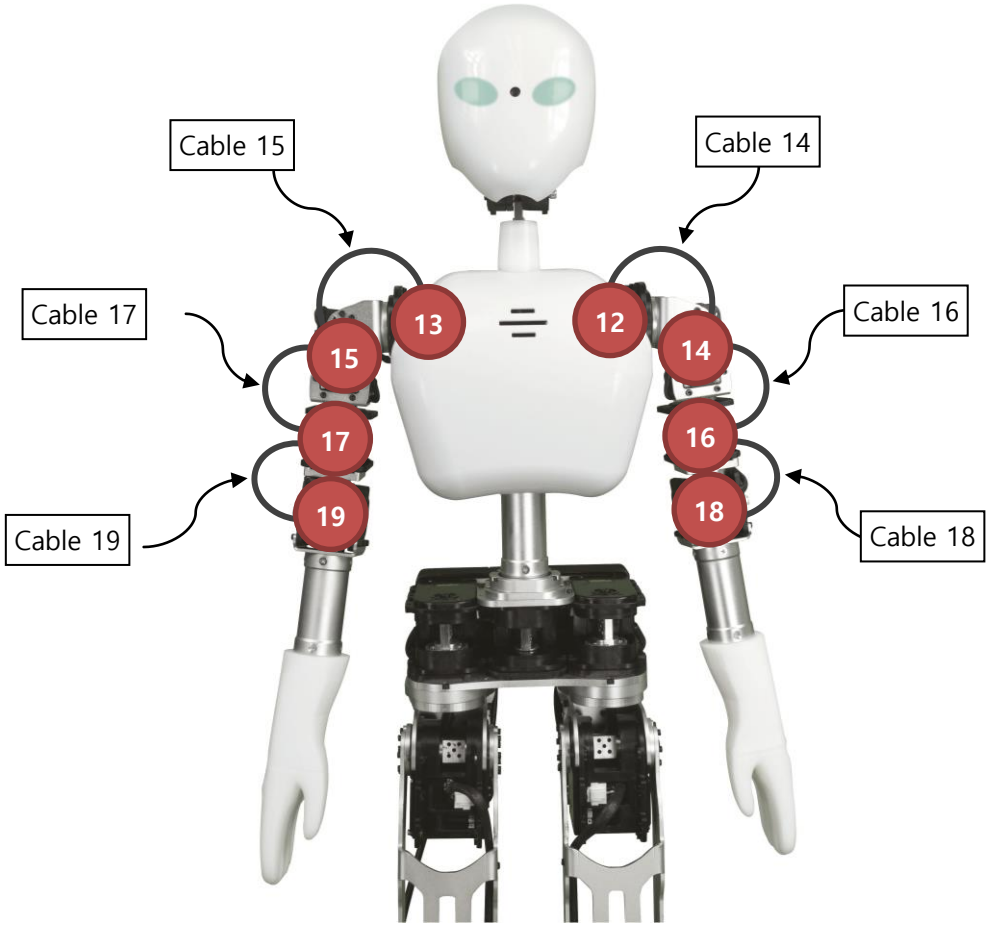
UXA-90 Dance Robot has lots of movements on the both arm, therefore, all the cables on the arm parts need to be changed every 3 months. Total 6 cables are needed (3 cables for each arm).
Parts below are required.

- Cables (6pcs), 2mm hexagonal wrench.

2. Parts

1) SAM Motor: Servo motors using for UXA-90. The numbers in the red circles represent each servo motors.
2) Cable: Cables connecting each motor. The numbers in the white square represent each cable.

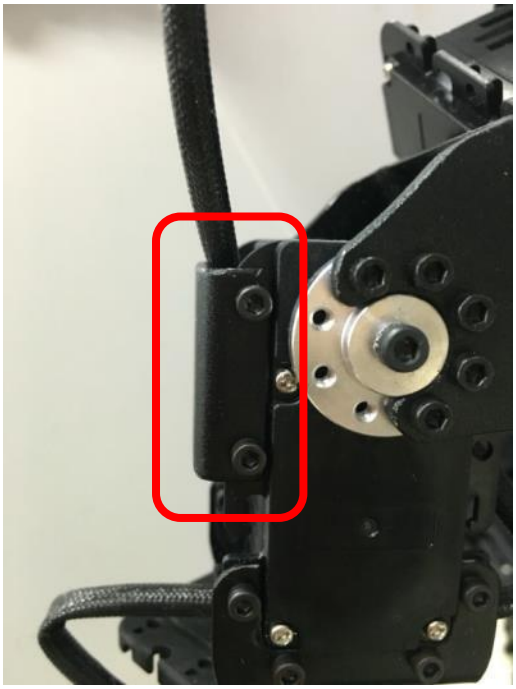
※ Use the thinnest and shortest cable for the arms.



3. How to replace cables (Both arms are symmetric so explain about the right arm only)

3.1. Replace cable 14 & 15

1) Unscrew 4 bolts and take out the frame on motors 13 and 15.



2) Take out cable 15 connecting motors 13 & 15 by hand.

3) Connect a new cable and assemble the frame in reverse order.

3.2. Replace cable 16 & 17

1) Unscrew 8 bolts under motors 15 & 17 to take out the frame.

2) Full down the frame as below.

3) Take out cables 16 & 17 by hand.

4) Connect a new cable and assemble the frame in reverse order.

3.3. Replace cables 18 & 19

1) Take out cables 18 & 19 by hand.

2) Connect a new cable in the same way.

< Appendix 2 – Check connection of PC >

※ Reference – Chapter 6.1 'RB Tool' on 'UXA-90 Operation Manual'

6.1 RB Tool (Robobuilder download tool)

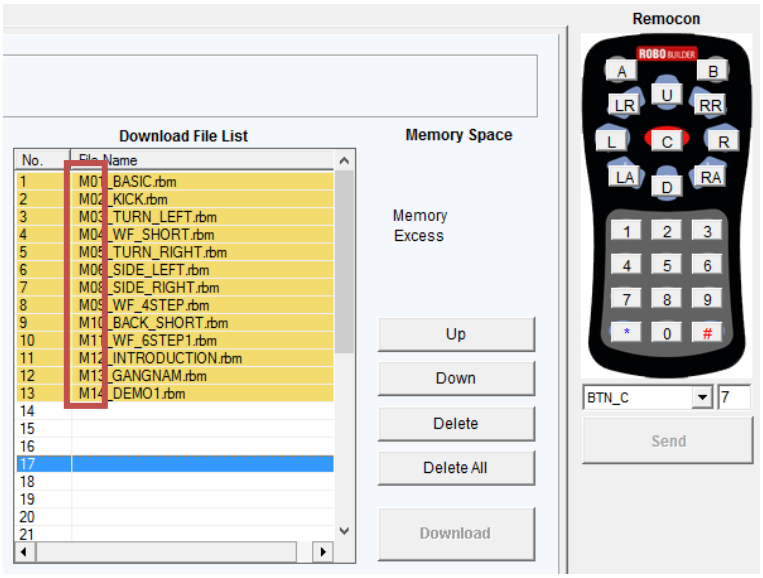
6.1.1 Wired connection by USB cable.

A. Prepare an USB cable.

B. Connect a PC and the robot (SW Board) by the USB cable.

C. Turn on UXA-90 in a sitting position.

D. Run RB Tool software and connect the port. If the connection fails, refer to 2.USB Driver on 'UXA-90 Operation Manual'.

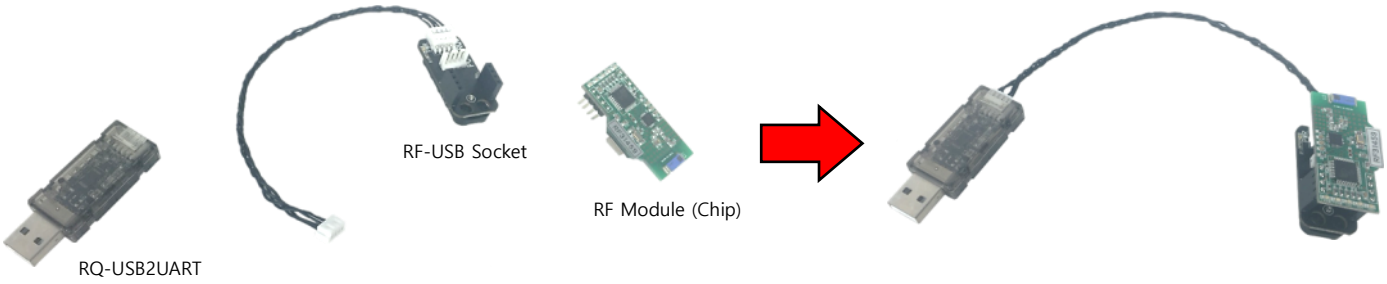


<RB Tool>

E. Press 'C' on the remote controller UI on the SW to make the robot stand up.

F. Press desired motion buttons on the remote controller UI to operate (Reference – 7.1 Remote Controller Key map on 'UXA-90 Operation Manual).

6.1.2 Wireless connection by RF-USB



A. Connect RQ-USB2UART, RF-USB Socket and RF module. Use a twisted cable for this connection.

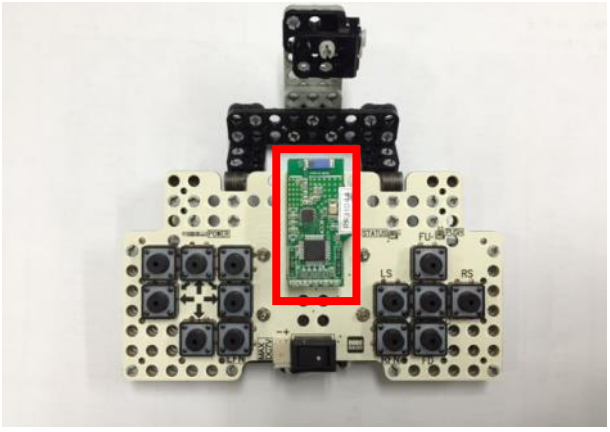
B. Connect A to PC.

C. Follow the same process from 'D' on <6.1.1 Wired connection by USB Cable>.

< Appendix 3 – Check connection of RF module >

※ Reference – 6.2 RF Mini Controller on 'UXA-90 Operation Manual'.

6.2 RF Mini Controller



A. Insert a RF chip in the RF controller.

B. Turn on UXA-90 in a sitting position, and then turn on the controller.

C. Press 'C' button on the controller to make the robot stand up.

※ Press 'A' on the controller will make the robot stand up and pose the initial posture when the power supply is connected.

<Key map of RF controller>

D. Run desired motions by the controller. (Reference – 7.1 Remote Controller Key Map)

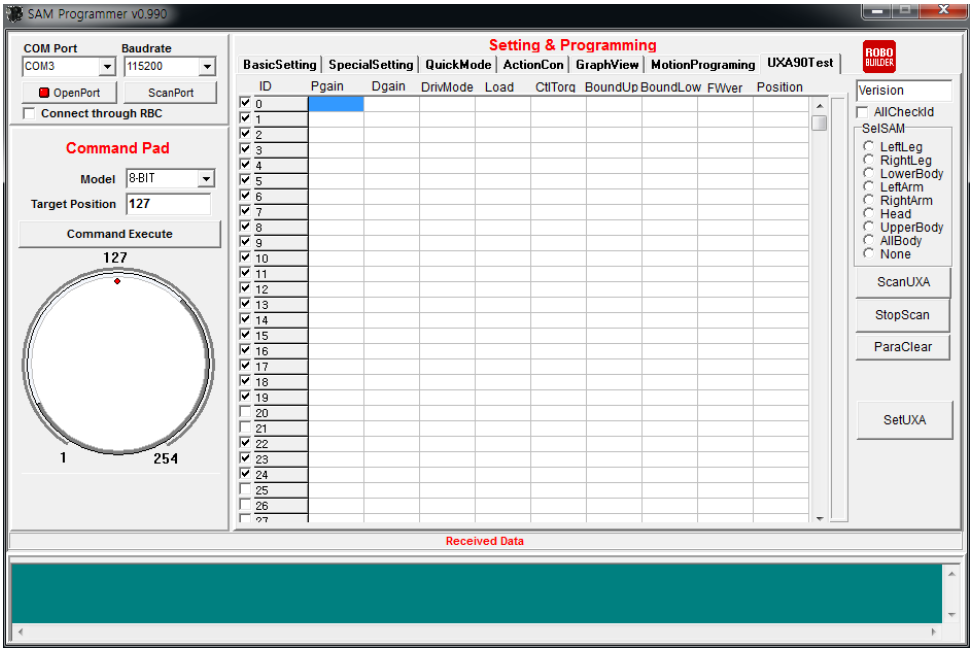
< Appendix 4 – Check motors by SAM Programmer >

Before start

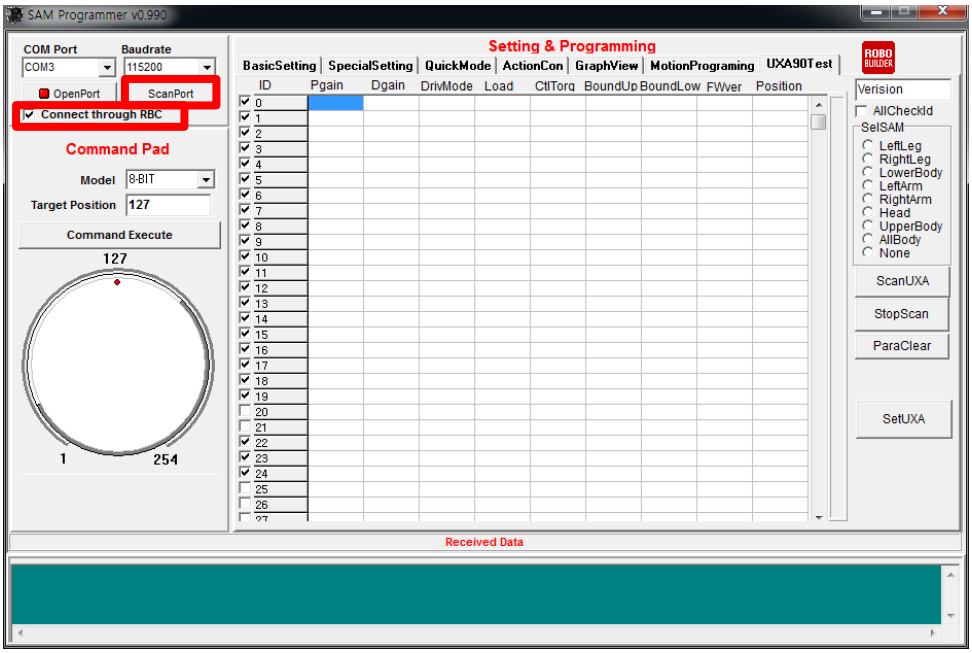
① The robot and PC are connected by USB cable.

② The robot is in a sitting position while power is ON.

1. Run 'SAM Programmer v0.990'.

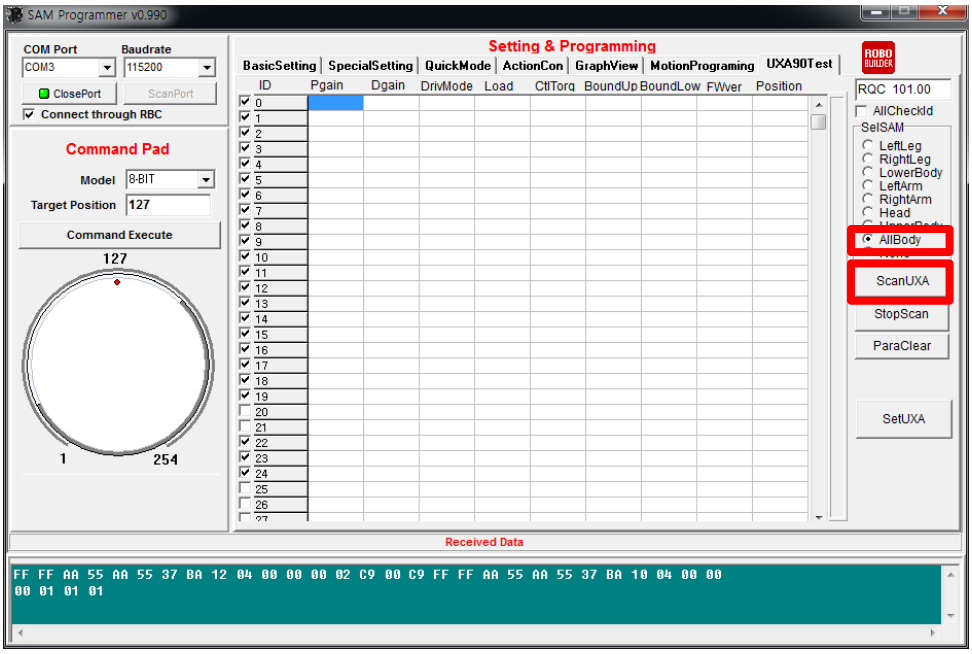


2. Check [Connect through RBC] and then click [ScanPort] to connect to the robot.

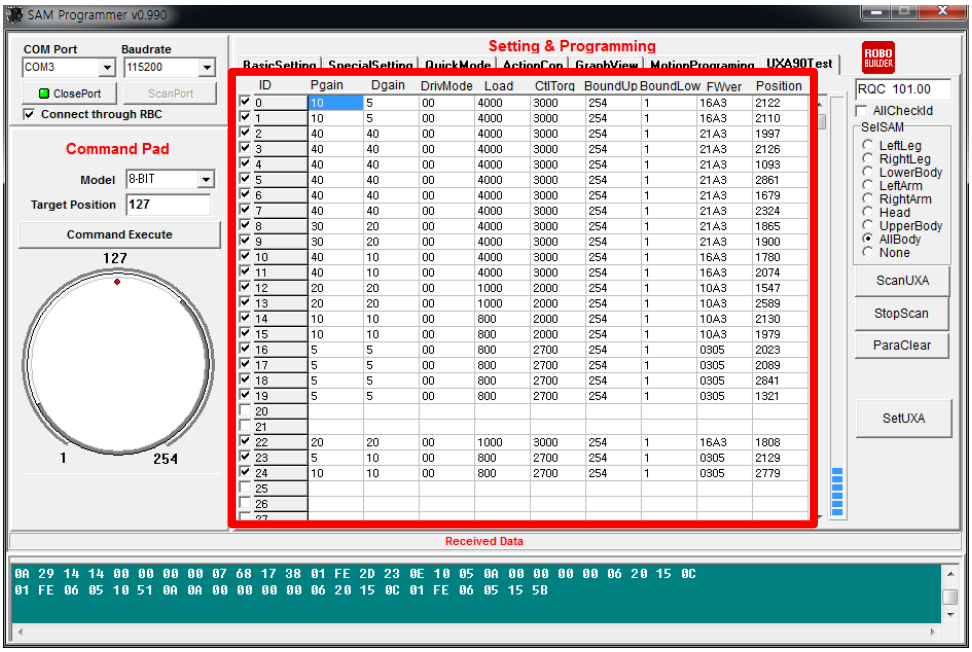


3. [ClosePort] will appear after successful connection.

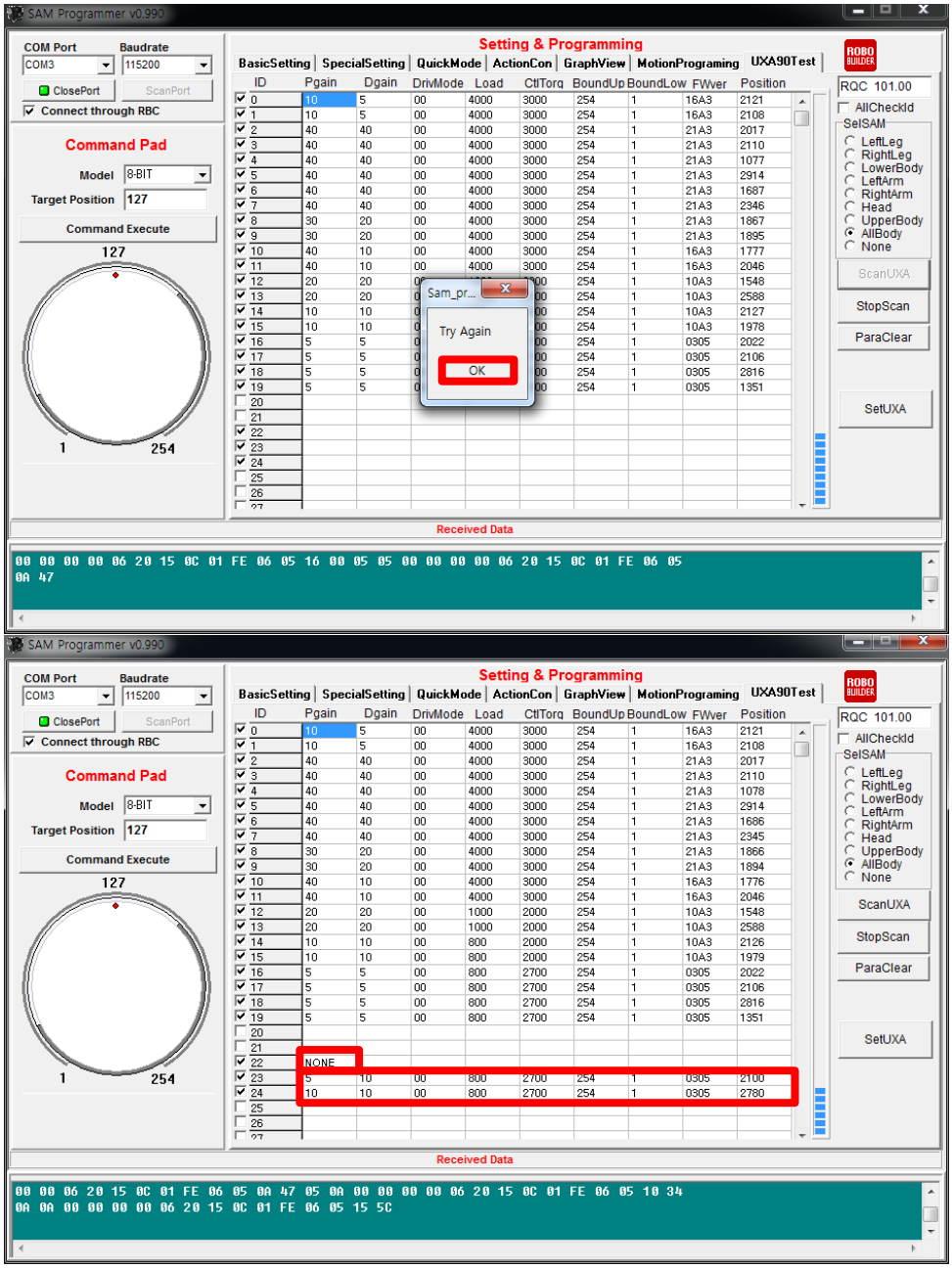
Check [AllBody] and then click [ScanUXA] to scan data of UXA-90.



4. Data of all the motors will be scanned if the robot is in a steady state. (Send a captured image as below to Robobuilder for analysis.)



5. If the robot has problems, a pop-up window will be shown as below. Press [OK] to procced checking to find defective motors.


SAM Programmer v0.990
COM Port
COM3
Baudrate
115200
ClosePort
ScanPort
Connect through RBC
Command Pad
Model
8-BIT
Target Position
127
Command Execute
127
1
254
Setting & Programming
BasicSetting
SpecialSetting
QuickMode
ActionCon
GraphView
MotionPrograming
UXA90Test
ID Pgain Dgain DrivMode Load CtlTorq BoundUp BoundLow FWver Position
Sam_pr...
Try Again
OK
RQC 101.00
AllCheckId
SelSAM
LeftLeg
RightLeg
LowerBody
LeftArm
RightArm
Head
UpperBody
AllBody
None
ScanUXA
StopScan
ParaClear
SetUXA
Received Data
00 00 00 00 06 20 15 0C 01 FE 06 05 16 00 05 05 00 00 00 00 06 20 15 0C 01 FE 06 05
0A 47

SAM Programmer v0.990
COM Port
COM3
Baudrate
115200
ClosePort
ScanPort
Connect through RBC
Command Pad
Model
8-BIT
Target Position
127
Command Execute
127
1
254
Setting & Programming
BasicSetting
SpecialSetting
QuickMode
ActionCon
GraphView
MotionPrograming
UXA90Test
ID Pgain Dgain DrivMode Load CtlTorq BoundUp BoundLow FWver Position
NONE
RQC 101.00
AllCheckId
SelSAM
LeftLeg
RightLeg
LowerBody
LeftArm
RightArm
Head
UpperBody
AllBody
None
ScanUXA
StopScan
ParaClear
SetUXA
Received Data
00 00 06 20 15 0C 01 FE 06 05 0A 47 05 0A 00 00 00 00 06 20 15 0C 01 FE 06 05 10 34
0A 0A 00 00 00 00 06 20 15 0C 01 FE 06 05 15 5C