

Packet Types OverView

Type ID	Type Name	From	To	Type Description
0	Scene Packet	brachIOplexus	Unity	Contains the scene index, frame rate, and initial camera positions and joint limits for scene initialization in Unity
1	Control Packet	brachIOplexus	Unity	Contains the ID, motor state and velocity of each joint in brachIOplexus
2	Update Packet	brachIOplexus	Unity	Contains the updated camera positions and joint limits for a running scene
3	Camera Request Packet	brachIOplexus	Unity	An empty packet that acts as a request to retrieve current camera positions from Unity
4	Feedback Packet	Unity	brachIOplexus	Contains the ID, current position and current velocity of each joint in Unity
5	Camera Position Packet	Unity	brachIOplexus	Contains the current camera positions in Unity

Scene Packet (Type 0) Structure

Byte Number	Info	Value
0	HEADER	255
1	HEADER	255
2	Packet Type ID	0
3	Length of Data	40
4	Scene Index	1 to the number of total scenes
5	Frame Rate	Any positive integer
6	Camera Position X - low byte	
7	Camera Position X - high byte	
8	Camera Position X - sign indicator	1 if position x is positive, 0 if position x is negative
9	Camera Position Y - low byte	
10	Camera Position Y - high byte	
11	Camera Position Y - sign indicator	1 if position y is positive, 0 if position y is negative
12	Camera Position Z - low byte	
13	Camera Position Z - high byte	
14	Camera Position Z - sign indicator	1 if position z is positive, 0 if position z is negative
15	Camera Rotation X - low byte	
16	Camera Rotation X - high byte	
17	Camera Rotation X - sign indicator	1 if rotation x is positive, 0 if rotation x is negative
18	Camera Rotation Y - low byte	
19	Camera Rotation Y - high byte	
20	Camera Rotation Y - sign indicator	1 if rotation y is positive, 0 if rotation y is negative
21	Camera Rotation Z - low byte	
22	Camera Rotation Z - high byte	
23	Camera Rotation Z - sign indicator	1 if rotation z is positive, 0 if rotation z is negative
24	Shoulder Minimum Position - low byte	
25	Shoulder Minimum Position - high byte	
26	Shoulder Maximum Position - low byte	
27	Shoulder Maximum Position - high byte	
28	Elbow Minimum Position - low byte	
29	Elbow Minimum Position - high byte	
30	Elbow Maximum Position - low byte	
31	Elbow Maximum Position - high byte	
32	Wrist Rotate Minimum Position - low byte	
33	Wrist Rotate Minimum Position - high byte	
34	Wrist Rotate Maximum Position - low byte	
35	Wrist Rotate Maximum Position - high byte	
36	Wrist Flex Minimum Position - low byte	
37	Wrist Flex Minimum Position - high byte	
38	Wrist Flex Maximum Position - low byte	
39	Wrist Flex Maximum Position - high byte	
40	Hand Minimum Position - low byte	
41	Hand Minimum Position - high byte	
42	Hand Maximum Position - low byte	
43	Hand Maximum Position - high byte	
44	Checksum	

Control Packet (Type 1) Structure

Byte Number	Info	Value
0	HEADER	255
1	HEADER	255
2	Packet Type ID	1
3	Length of Data	20
4	Shoulder Joint ID	0
5	Shoulder Joint Velocity - low byte	
6	Shoulder Joint Velocity - high byte	
7	Shoulder Joint Motor State	0~3
8	Elbow Joint ID	1
9	Elbow Joint Velocity - low byte	
10	Elbow Joint Velocity - high byte	
11	Elbow Joint Motor State	0~3
12	Wrist Rotate Joint ID	2
13	Wrist Rotate Joint Velocity - low byte	
14	Wrist Rotate Joint Velocity - high byte	
15	Wrist Rotate Joint Motor State	0~3
16	Wrist Flex Joint ID	3
17	Wrist Flex Joint Velocity - low byte	
18	Wrist Flex Joint Velocity - high byte	
19	Wrist Flex Joint Motor State	0~3
20	Hand Joint ID	4
21	Hand Joint Velocity - low byte	
22	Hand Joint Velocity - high byte	
23	Hand Joint Motor State	0~3
24	Checksum	

Update Packet (Type 2) Structure

Byte Number	Info	Value
0	HEADER	255
1	HEADER	255
2	Packet Type ID	2
3	Length of Data	38
4	Camera Position X - low byte	
5	Camera Position X - high byte	
6	Camera Position X - sign indicator	1 if position x is positive, 0 if position x is negative
7	Camera Position Y - low byte	
8	Camera Position Y - high byte	
9	Camera Position Y - sign indicator	1 if position y is positive, 0 if position y is negative
10	Camera Position Z - low byte	
11	Camera Position Z - high byte	
12	Camera Position Z - sign indicator	1 if position z is positive, 0 if position z is negative
13	Camera Rotation X - low byte	
14	Camera Rotation X - high byte	
15	Camera Rotation X - sign indicator	1 if rotation x is positive, 0 if rotation x is negative
16	Camera Rotation Y - low byte	
17	Camera Rotation Y - high byte	
18	Camera Rotation Y - sign indicator	1 if rotation y is positive, 0 if rotation y is negative
19	Camera Rotation Z - low byte	
20	Camera Rotation Z - high byte	
21	Camera Rotation Z - sign indicator	1 if rotation z is positive, 0 if rotation z is negative
22	Shoulder Minimum Position - low byte	
23	Shoulder Minimum Position - high byte	
24	Shoulder Maximum Position - low byte	
25	Shoulder Maximum Position - high byte	
26	Elbow Minimum Position - low byte	
27	Elbow Minimum Position - high byte	
28	Elbow Maximum Position - low byte	
29	Elbow Maximum Position - high byte	
30	Wrist Rotate Minimum Position - low byte	
31	Wrist Rotate Minimum Position - high byte	
32	Wrist Rotate Maximum Position - low byte	
33	Wrist Rotate Maximum Position - high byte	
34	Wrist Flex Minimum Position - low byte	
35	Wrist Flex Minimum Position - high byte	
36	Wrist Flex Maximum Position - low byte	
37	Wrist Flex Maximum Position - high byte	
38	Hand Minimum Position - low byte	
39	Hand Minimum Position - high byte	
40	Hand Maximum Position - low byte	
41	Hand Maximum Position - high byte	
42	Checksum	

Camera Request Packet (Type 3) Structure

Byte Number	Info	Value
0	HEADER	255
1	HEADER	255
2	Packet Type ID	3
3	Checksum	

Feedback Packet (Type 4) Structure

Byte Number	Info	Value
0	HEADER	255
1	HEADER	255
2	Packet Type ID	4
3	Length of Data	30
4	Shoulder Joint ID	0
5	Shoulder Joint Position - low byte	
6	Shoulder Joint Position - high byte	
7	Shoulder Joint Position - sign indicator	1 if joint position is positive, 0 if joint position is negative
8	Shoulder Joint Velocity - low byte	
9	Shoulder Joint Velocity - high byte	
10	Elbow Joint ID	1
11	Elbow Joint Position - low byte	
12	Elbow Joint Position - high byte	
13	Elbow Joint Position - sign indicator	1 if joint position is positive, 0 if joint position is negative
14	Elbow Joint Velocity - low byte	
15	Elbow Joint Velocity - high byte	
16	Wrist Rotate Joint ID	2
17	Wrist Rotate Joint Position - low byte	
18	Wrist Rotate Joint Position - high byte	
19	Wrist Rotate Joint Position - sign indicator	1 if joint position is positive, 0 if joint position is negative
20	Wrist Rotate Joint Velocity - low byte	
21	Wrist Rotate Joint Velocity - high byte	
22	Wrist Flex Joint ID	3
23	Wrist Flex Joint Position - low byte	
24	Wrist Flex Joint Position - high byte	
25	Wrist Flex Joint Position - sign indicator	1 if joint position is positive, 0 if joint position is negative
26	Wrist Flex Joint Velocity - low byte	
27	Wrist Flex Joint Velocity - high byte	
28	Hand Joint ID	4
29	Hand Joint Position - low byte	
30	Hand Joint Position - high byte	
31	Hand Joint Position - sign indicator	1 if joint position is positive, 0 if joint position is negative
32	Hand Joint Velocity - low byte	
33	Hand Joint Velocity - high byte	
34	Checksum	

Camera Position Packet (Type 5) Structure

Byte Number	Info	Value
0	HEADER	255
1	HEADER	255
2	Packet Type ID	5
3	Length of Data	18
4	Camera Position X - low byte	
5	Camera Position X - high byte	
6	Camera Position X - sign indicator	1 if position x is positive, 0 if position x is negative
7	Camera Position Y - low byte	
8	Camera Position Y - high byte	
9	Camera Position Y - sign indicator	1 if position y is positive, 0 if position y is negative
10	Camera Position Z - low byte	
11	Camera Position Z - high byte	
12	Camera Position Z - sign indicator	1 if position z is positive, 0 if position z is negative
13	Camera Rotation X - low byte	
14	Camera Rotation X - high byte	
15	Camera Rotation X - sign indicator	1 if rotation x is positive, 0 if rotation x is negative
16	Camera Rotation Y - low byte	
17	Camera Rotation Y - high byte	
18	Camera Rotation Y - sign indicator	1 if rotation y is positive, 0 if rotation y is negative
19	Camera Rotation Z - low byte	
20	Camera Rotation Z - high byte	
21	Camera Rotation Z - sign indicator	1 if rotation z is positive, 0 if rotation z is negative
22	Checksum	