REFBOX V2.0 BETA Version – JSON formatted Commands and Connection Procedure

According to what have been decided during the 2019 MSL workshop, CAMBADA has updated the RefBox to a new version, supporting commands sent to the BaseStations using a JSON format (see below)

1. NEW JSON COMMAND FORMATS

Commands send by the RefBox to the team's Base Stations no longer use the single character format. Instead, a JSON packet is send to both Base Stations for each command (message) delivered by the RefBox.

Two formats are currently used and are the following:

Format 1 (example):

```
{
        "command": "KICKOFF",
        "targetTeam": "224.16.32.127"
}
```

In this example, field "command" describes the command sent by the RefBox (In this case a KICKOFF), while field "targetTeam" indicates the unique ID of the team to which the command is assigned.

It has been decided to use the *IP Multicast Address* as the unique team ID instead of the Team Name. This was mainly due to the fact that, in the past, some of the competing teams have made last minute requests to slightly change the Team Name just before the start of a competition. Since the IP Multicast Address is fixed and defined in the Rules, this option seemed to be the better solution to uniquely identify each team.

In those cases where the command is destinated to both teams (e.g. "STOP", "START", "DROPBALL", …), the "targetTeam" field has an empty string ("").

Format 2 (example):

```
{
        "command": "SUBSTITUTION",
        "targetTeam": "224.16.32.127",
        "robotID": 3
}
```

This format is used for commands that require the identification of a single robot as is the case of the new substitution procedure.

2. NEW CONNECTION PROCEDURE

In 2.0 RefBox version, whenever a Base Station makes a connection, the RefBox assistant is asked to select either “LEFT” or “RIGHT” to indicate the 1st half side of the connecting team.

In the RefereeClient commands assigned to a team, the Team Name will be shown instead of “Cyan” or “Magenta”.

Upon establishing the connection, the following command is sent:

```
{
        “command”: “WELCOME”,
        “targetTeam”: “224.16.32.teamID”
}
```

NOTE: Special case – when the same team connects both as “LEFT” and “RIGHT” for Testing, Demo or Simulation purposes. In this case, the “team” connected as “LEFT” will be assigned, for messages purposes, the IP Multicast Address “224.16.32.teamID:1”

Therefore, the same team will able to recognize commands send to robots with the same IPs but belonging to two “distinct” teams by “224.16.32.teamID” and “224.16.32.teamID:1”.