IEEE Ottawa Section

IEEE Ottawa Robotics Competition
Compétition de robotique d'Ottawa d'IEEE

Project BLU Challenge

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ONLY TEAMS WITH EV3 KITS CAN PARTICIPATE IN THIS CHALLENGE

Disclaimer

It is your responsibility to read and understand this document on a regular basis because we may update it from time to time.

We will likely make minor revisions to these rules since it is a new challenge.

Project BLU Challenge

The objective of the new Project BLU (Bluetooth Logistical Unit) Challenge is to use Bluetooth technology to communicate between two LEGO Mindstorms EV3 robots. Our aim is to allow students to use this previously unexplored feature and integrate it into their programming.

Challenge Rules

1. At the start of the challenge all teams will gather at the contest area and no further adjustments to the robot program will be allowed for the duration of the challenge.

2. Each robot will be placed in a designated START area in a designated orientation.

3. Each robot will be Bluetooth paired with the ORC Gatekeeper Robot. In order to be paired successfully, each team must name their LEGO Mindstorms brick "EV3" (this is case sensitive).

4. Time will start when the designated team captain initiates the robot program.

5. Each robot will first follow the black line all the way to the ORC Gatekeeper Robot.

6. Each robot will then send the message "OPENSESAME" via Bluetooth to the ORC Gatekeeper Robot. All Bluetooth messages are case and space sensitive and must be entered into each team's programming in the exact same format as written in this document.

7. If the ORC Gatekeeper Robot senses each team's robot within 15 cm and receives the "OPENSESAME" message, the ORC Gatekeeper Robot will open the gate and allow each team's robot to pass through.

8. Once each robot passes through the gate, the ORC Gatekeeper Robot will randomly send one of the following messages via Bluetooth: "R", "B", "Y" or "G".

9. Each robot must then locate and stop in one of the four coloured boxes that matches to the received message. There is a time limit of 5 minutes to complete this objective.
    a. R = Red
    b. B = Blue
    c. Y = Yellow
    d. G= Green

10. The use of Bluetooth technology within each team's programming is strictly restricted to the rules set out above in order to ensure that each robot remains autonomous.

11. Your brick must be a Lego Mindstorms EV3 brick and you are allowed to use the gyro sensor for this challenge. Robots using any other brick will not be permitted to participate in the challenge.

12. All robots must be less than 7" wide and 8" high.

13. Judges will score and time each run.

14. The decision of judges is final.

ORC Gatekeeper Robot Description

The ORC Gatekeeper Robot will feature one ultrasound sensor and one motorized lifting gate. The ORC Gatekeeper Robot will open the gate only when the two following conditions are met:

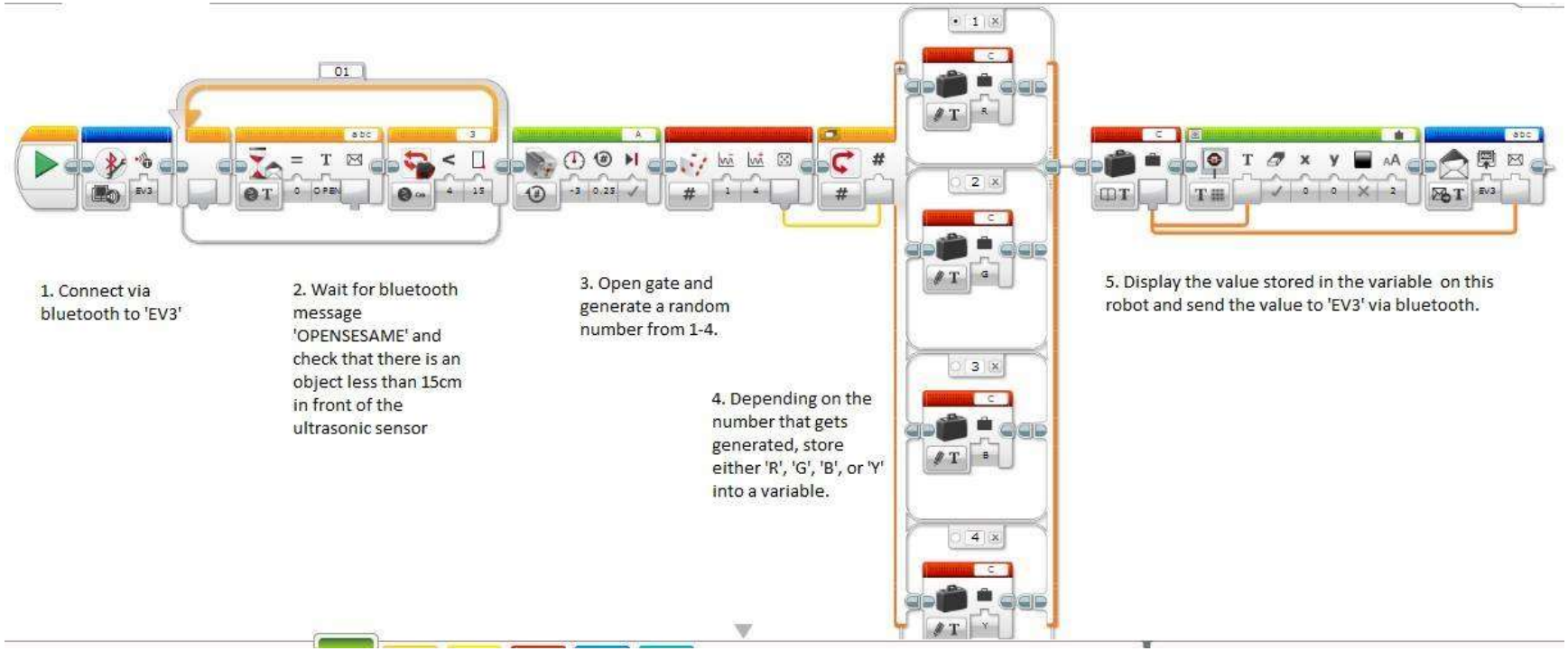
1. The team's robot is within 15 cm of the ORC Gatekeeper Robot as detected by ultrasound sensor AND
2. The ORC Gatekeeper Robot receives the message "OPENSESAME" via Bluetooth from the team's robot.

All Bluetooth messages are case and space sensitive and must be entered into each team's programming in the exact same format as written in this document. Otherwise, the ORC Gatekeeper Robot will not recognize or respond to a team's robot.

When the above two conditions are met, the ORC Gatekeeper Robot will open the gate and allow each team's robot to pass through. At this point, the ORC Gatekeeper Robot will randomly send one of the following messages via Bluetooth to each team's robot: "R", "B", "Y" or "G".

The ORC Gatekeeper Robot is designed to have a width clearance of 7" and a height clearance of 8". Therefore, all robots must be smaller than 7" in width and 8" in height to pass through the gate.

ORC Gatekeeper Annotated Program



Judging and Scoring

Phase 1—Line Following

There will be marked checkpoints along the path. Each team's robot will be awarded 1 point for crossing each checkpoint. If a robot deviates from the line and has all wheels to the left of the green line or to the right of the red line, the judge will move the robot to the next checkpoint. The team will not be awarded a point for that particular checkpoint in this case. After three deviations from the line, the judge will move the robot directly to Phase 2 of the challenge.

Phase 2—OPENSESAME

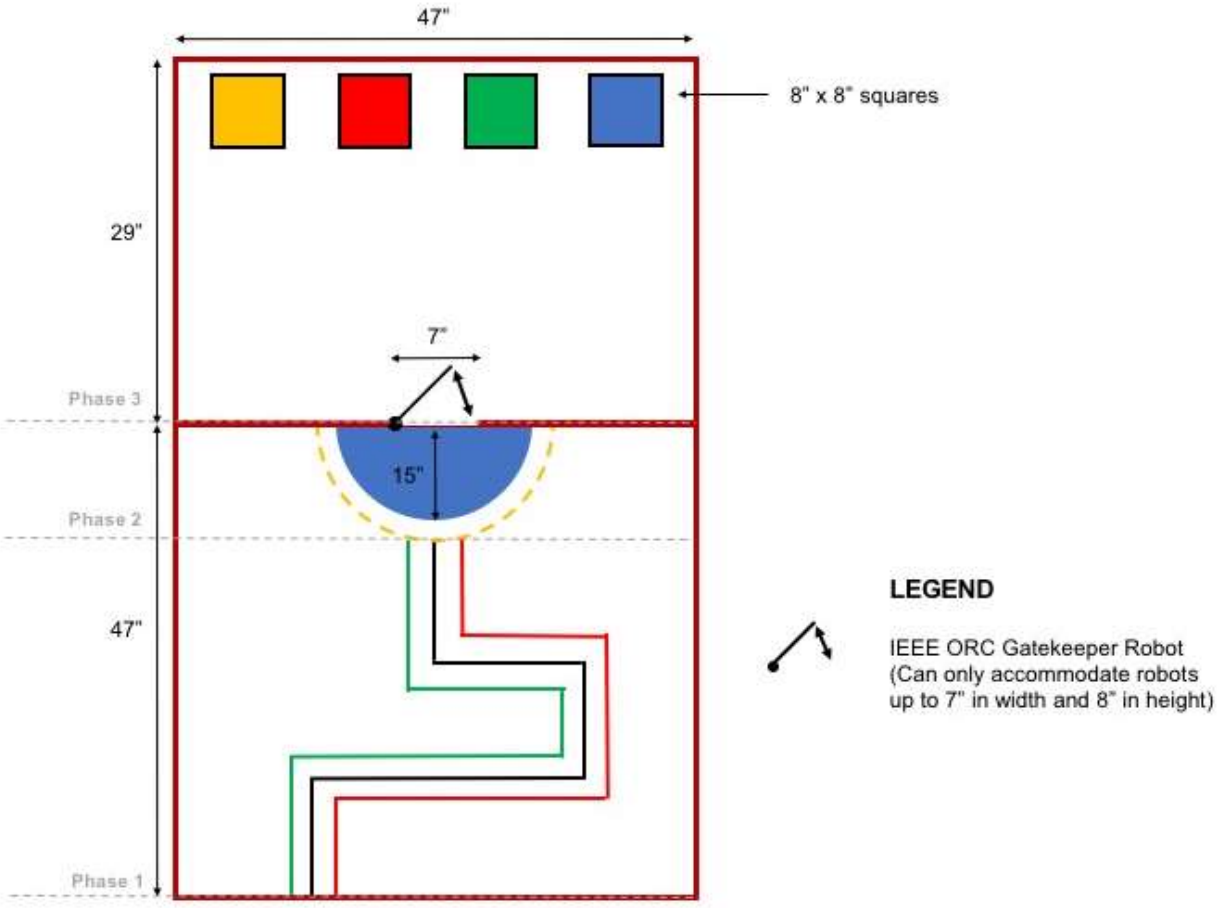
Each team's robot will be awarded one point for communicating with the ORC Gatekeeper Robot successfully, opening the gate, and another point for successfully going through the gate and onto the Phase 3 of the challenge.

Phase 3—Find Your Colour

Once each team's robot has successfully gone through the gate, they will be timed for how long it takes to locate and stop within their assigned colour. All teams will be compared and the fastest team will be awarded top points, with all other teams awarded points corresponding to their rank. If a team's robot has not located or stopped within their assigned colour within 5 minutes, they will be awarded 1 point.

Project BLU Schematic

Throughout this document, inches and feet have been used. One inch = 2.54 cm and one foot = 30.48 cm.



Please note that this schematic represents a model of the challenge and is not to scale. The pathway depicted for Phase 1 of the challenge is not exact and can be subject to change.