

# RobotChallenge – Robo Sumo Rules

Revised on September 15, 2025

**Introduction:** Two robots, like in traditional Japanese sumo, attempt to push the opponent out of the circular ring by any means. The first to touch the ground outside the ring loses. Also, losing any parts during the Match results in a loss.

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## 1 Lego Sumo

### 1.1. Group

- A. Junior
- B. Senior

### 1.2. Robot Equipment Requirements

- A. All robot equipment must be original LEGO components. No structural alterations are allowed. Similarly, no modifications are permitted to motors, tires, data cables, etc.
- B. Only rubber bands for bundling robot cables may be third-party products, but they are only allowed for cable bundling and fixation purposes and must not serve any structural function.
- C. LEGO controllers may be powered by standard AA alkaline batteries or original LEGO lithium batteries. Modifying the power supply structure is not allowed. The use of special batteries such as 14500 lithium batteries is prohibited.
- D. Altering the original structural form of any LEGO component from the factory is prohibited for use in robot parts.
- E. Modifying original LEGO cables or tires is not allowed. Applying glue or other prohibited substances to tires is prohibited. Deforming any LEGO structural parts is not allowed.
- F. **The use of LEGO string/thread type parts is prohibited.**
- G. **If parts without the LEGO logo or markings are used in the robot design, proof of original LEGO manufacture must be carried.**
- H. The referee has the final authority to decide whether the components used are permitted in the competition.

### 1.3. Robot Specifications and Requirements

- A. Robot width < 15cm, robot length < 15cm, **robot height < 32cm**. The robot must be able to be placed unobstructed into the square inspection gauge (Hint: robot length/width less than or equal to 18.5 LEGO units; 19 LEGO units will exceed the limit and the robot will be unable to compete).
- B. Robot weight < 1KG. If a robot that passed weight inspection is found to have added ballast without authorization during the competition, it will be judged as losing the concluded Match. The robot will be re-inspected after each Match.
- C. If the robot exceeds inspection requirements during inspection, the team will be given a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.
- D. The robot may expand after the Match starts but must not separate into different parts

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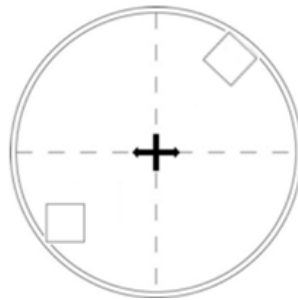
and must always remain one compact robot entity. The robot's feet cannot expand during the Match. The robot is not allowed to expand before it begins moving after the start signal, so the robot's dimensions during inspection are measured in its non-expanded state.

- E. All robots must be autonomous. Any model of LEGO controller and components may be used, but remote control of the robot by humans during the Match is not allowed.
- F. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot controller. Changing robots during the competition is not allowed.
- G. Before the Match starts, the referee will inspect the robot and ensure the Bluetooth system is turned off.
- H. Applying glue or installing any non-LEGO ballast items on the robot is not allowed.

### 1.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.

Item	Ring Diameter	White Border Width	Material	Min. External Space
Lego Sumo	77cm	2.5cm	Wood	50cm



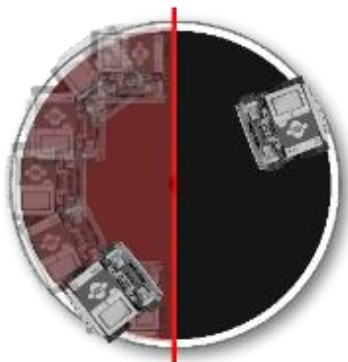
- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.
- C. During Lego Sumo Matches, at least 50cm of space must be guaranteed outside the sumo ring. The Lego Sumo platform is approximately 10cm high. To prevent robots from falling, a 2cm high barrier will be placed 20-30cm away from the circular platform.



## 1.5. How the Match Starts

### 1.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena to prepare to place their robots. A cross at the center divides the platform into two semicircles.
- B. The referee will place a divider board perpendicular to the direction of the arrows. Upon the referee's command, both teams simultaneously place their robots. The robot can be placed anywhere on either side of the divider but must have at least one wheel in contact with the white border of the ring. The referee will confirm if the robot's placement is compliant. The position cannot be changed after this point (if the wheel is not pressing on the white border, the robot needs to be moved back to ensure one wheel is on the white border).
- C. The placed robot must be in the same structural state as during inspection; its size cannot be extended.
- D. The referee will remove the central cross and arrows after the robots are placed.



### 1.5.2. Starting the Match

- A. Before the referee blows the whistle to start the Match, only one team member per team is allowed to touch the robot's start button to prepare to start the robot. Program selection is not allowed currently.
- B. When the referee blows the whistle to start the Match, both team members simultaneously press their robot's start button. A 5-second timer starts. After 5 seconds, the robots activate and the Match begins. If a robot starts significantly before 5 seconds, it will be considered a foul, and that robot will lose the round.
- C. After 5 seconds, the robot may officially activate and expand its size.
- D. Robots are allowed to start after 5 seconds but are not allowed to start early.
- E. The ability to start precisely after 5 seconds will also be checked during inspection.

### 1.5.3. Match Time

- A. Each round lasts 3 minutes. If no winner is determined after 3 minutes, the round is a draw.
- B. A Match between two teams consists of up to 3 rounds. If a team wins the first two

rounds, the Match ends early.

- C. During the round, if the referee judges that the round will end in a draw before the 3-minute time limit is reached, the referee has the authority to seek the opinions of both teams. If both teams agree to a draw, the round may end early.

## **1.6. Match Outcome Explanation**

### **1.6.1. What Constitutes a Win**

- A. If a robot clearly starts before the 5-second delay after the start signal, the opponent wins the round.
- B. During the Match, if a robot is pushed off the platform by the opponent and is the first to touch the ground outside the platform, the opponent wins the round. The winning robot does not need to remain on the platform. If the winning robot pushes the opponent off but also falls off, it still wins if it falls off after the opponent.
- C. If a robot loses parts weighing more than 5g during the Match, the opponent wins the round. If both robots lose parts weighing more than 5g in the same round, the round is a draw.
- D. After the Match starts, if one's own robot does not perform any action and the opponent's robot falls off, one's own robot wins.
- E. During the round, if the referee judges that the round will end in a draw before the 3-minute time limit is reached, the referee has the authority to seek the opinions of both teams. If both teams agree to a draw, the round may end early.

### **1.6.2. Competition Points Ranking**

- A. In RobotChallenge Sumo competitions, registered teams are divided into several groups based on the number of teams. A round-robin format within groups is used, and the top 2 teams from each group based on points advance to the knockout stage.
- B. For each sumo Match, the winning team receives 3 points, a draw gives each team 1 point, and the losing team receives 0 points.
- C. If teams are tied on points for advancement from the group, the team that won the head-to-head Match between the tied teams will be ranked higher. If three or more teams are tied and the head-to-head result cannot determine ranking affecting advancement, the tied teams will have a rematch.

### **1.6.3. Competition Knockout Stage**

- A. In the knockout stage, each Match is a best-of-3 rounds. The first team to win 2 rounds advances to the next round. If no winner is determined after 3 rounds, an additional round will be added until a winner is determined.

## **2 Humanoid Sumo**

### **2.1. Group**

- A. Adult

### **2.2. Robot Equipment Requirements**

- A. No restrictions on robot equipment.
- B. The robot must be a humanoid bipedal robot that relies on two legs for walking and must be able to shift its center of gravity to maintain balance while walking.
- C. While walking, one foot must be lifted off the ground, and the other leg must be used to maintain the robot's balance.
- D. While walking, the leg maintaining balance must have a knee joint bend angle greater than 90 degrees. If this rule is violated at any moment, the robot is not considered to be walking.
- E. The robot's feet can be any shape, provided they meet the following rules:
  - a) The robot's foot is defined as the part that contacts the arena.
  - b) The maximum side length of the foot must be less than 50% of the robot's extended leg length. Leg length is defined as the distance from the foot contacting the ground to the axis connecting the leg to the upper body.
  - c) The maximum side length of the foot must be less than 20cm.
- F. When the robot is standing or walking, the rectangular outlines of the feet must not overlap (i.e., cross feet are not allowed).
- G. The robot must have two arms. The extended length of each arm must not exceed the extended length of the leg.
- H. The robot must have a head.
- I. The robot must be fully autonomous; remote control is not allowed.

### **2.3. Robot Specifications and Requirements**

- A. Robot height limit < 50cm, robot width < 20cm, robot length < 20cm.
- B. Robot weight < 3KG.
- C. If the robot exceeds inspection requirements during inspection, the team will be given a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.
- D. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot. Changing robots during the competition is not allowed.
- E. Jamming devices are not allowed, e.g., using IR LEDs to interfere with the opponent's infrared sensors.
- F. Parts that may damage the arena are not allowed. Parts intended to deliberately

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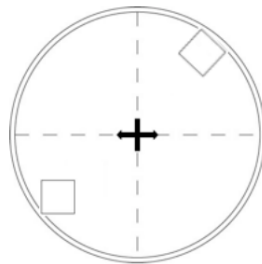
damage the opponent's robot or operator are not allowed. Normal pushing and collisions are not considered deliberate damage.

- G. Storing liquids, powders, gases, or other substances is allowed, but devices intended to throw them at the opponent are not allowed.
- H. Any combustion-based devices are not allowed.
- I. Devices that throw objects at the opponent are not allowed.
- J. Sticky substances to enhance traction are not allowed. Tires and other robot parts contacting the competition arena must not be able to pick up a sheet of A4 paper (80g/m<sup>2</sup>) and hold it for more than 2 seconds.
- K. Pressure-increasing devices, such as vacuum pumps and magnets, are not allowed.

### 2.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.

Item	Ring Diameter	White Border Width	Material	Min. External Space
Humanoid Sumo	154cm	5cm	Iron/Steel	100cm



- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.
- C. During Humanoid Sumo Matches, at least 100cm of space must be guaranteed outside the sumo ring.

### 2.5. How the Match Starts

#### 2.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena and place their robots on the ring. A cross at the center divides the ring into four quadrants. Robots are always placed in opposite quadrants.
- B. Each robot can be placed facing any direction, anywhere within its quadrant, but must have at least one foot in contact with the white border of the ring.
- C. Both teams must place their robots simultaneously upon the referee's command. Once placed, the robots cannot be moved in any way. The referee will remove the central cross and arrows after the robots are placed.

### **2.5.2. Starting the Match**

- A. Before the referee blows the whistle to start the Match, only one team member per team is allowed to touch the robot's start button to prepare to start the robot. Program selection is not allowed currently.
- B. When the referee blows the whistle to start the Match, both team members simultaneously press their robot's start button. A 5-second timer starts. After 5 seconds, the robots activate and the Match begins. If a robot starts significantly before 5 seconds, it will be considered a foul, and that robot will lose the round.
- C. Robots are allowed to start after 5 seconds but are not allowed to start early.
- D. The ability to start precisely after 5 seconds will also be checked during inspection.

### **2.5.3. Match Time**

- A. The Match time for a confrontation between two teams is 3 minutes.
- B. If a Match ends in a draw during the knockout stage, the referee may require the teams to play an overtime period, with a maximum overtime of 3 minutes.

## **2.6. Match Scoring Rules**

### **2.6.1. Knock Down**

- A. When a robot is knocked to the ground by its opponent, it is considered a Knock Down. (Any part of the body other than the soles of the feet touches the ground).
- B. The opponent receives 2 points.

### **2.6.2. Slip Down**

- A. When a robot falls by itself, it is considered a Slip Down. (Any part of the body other than the soles of the feet touches the ground).
- B. The opponent receives 1 point.

### **2.6.3. Push Out**

- A. When a robot makes contact with the ground outside the competition arena, it is considered Pushed Out.
- B. The opponent receives 3 points.
  - C. The team whose robot was pushed out may, with the referee's approval, place their robot face down inside the ring without further penalty and will receive a 10-second countdown to stand up.

### **2.6.4. Elimination**

- A. If a robot fails to stand up within 10 seconds, it will be declared the loser immediately upon expiration of the time.
- B. If, during the Match, or after the mandatory 5-second start delay, a robot is unable to move or walk, the referee will announce a 10-second countdown. If the robot fails to move/walk by the end of the countdown, it will be declared the loser.
- C. When the referee declares one side the loser, the Match ends immediately, and the opponent is announced as the winner.

### **2.6.5. Score Calculation**

- A. The sum of all points scored during a Match constitutes the robot's score.
- B. If the two robots do not make contact for 15 seconds and there is no possibility of contact, the referee will immediately stop the Match. If this happens right after the Match start, the Match will be restarted. If it happens during the Match, the referee stops the Match, and the winner is determined based on the scores. The referee may extend this time limit to 45 seconds to observe if there is fighting intent from both sides.
- C. In the group stage, if the scores are equal at the end of the Match, the Match is a draw.
- D. In the knockout stage, if the scores are equal, the referee may choose to have an overtime Match. If the scores are still tied after 3 minutes of overtime, the referee has the right to decide the winner based on tactics, aggressiveness, and activity level. If both teams still have 0 points after overtime, the referee may declare the Match has no winner, and both teams are eliminated from the next round, resulting in a bye for the next opponent.

### **3 Remote Humanoid Sumo**

#### **3.1. Group**

- A. Adult

#### **3.2. Robot Equipment Requirements**

- A. No restrictions on robot equipment.
- B. The robot must be a humanoid bipedal robot that relies on two legs for walking and must be able to shift its center of gravity to maintain balance while walking.
- C. While walking, one foot must be lifted off the ground, and the other leg must be used to maintain the robot's balance.
- D. While walking, the leg maintaining balance must have a knee joint bend angle greater than 90 degrees. If this rule is violated at any moment, the robot is not considered to be walking.
- E. The robot's feet can be any shape, provided they meet the following rules:
  - a) The robot's foot is defined as the part that contacts the arena.
  - b) The maximum side length of the foot must be less than 50% of the robot's extended leg length. Leg length is defined as the distance from the foot contacting the ground to the axis connecting the leg to the upper body.
  - c) The maximum side length of the foot must be less than 20cm.
- F. When the robot is standing or walking, the rectangular outlines of the feet must not overlap (i.e., cross feet are not allowed).
- G. The robot must have two arms. The extended length of each arm must not exceed the extended length of the leg.
- H. The robot must have a head.
- I. The robot must be remote-controlled. The remote controller is not restricted. Teams must pair their controllers themselves before the Match.
- J. The robot must be primarily controlled in real-time by the operator via the remote controller. The use of autonomous programs to assist operation is allowed, but the primary movement decisions of the robot must be triggered and executed in real-time by operator input via the remote controller. The robot must not operate fully autonomously after start, meaning it must not perform Match actions independently without requiring remote control input. Robots violating this rule will be disqualified.

#### **3.3. Robot Specifications and Requirements**

- A. Robot height limit < 50cm, robot width < 20cm, robot length < 20cm.
- B. Robot weight < 3KG.
- C. If the robot exceeds inspection requirements during inspection, the team will be given

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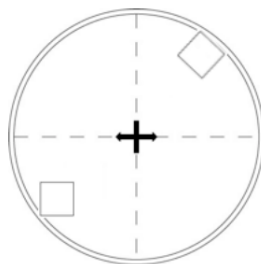
a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.

- D. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot. Changing robots during the competition is not allowed.
- E. Jamming devices are not allowed, e.g., using IR LEDs to interfere with the opponent's infrared sensors.
- F. Parts that may damage the arena are not allowed. Parts intended to deliberately damage the opponent's robot or operator are not allowed. Normal pushing and collisions are not considered deliberate damage.
- G. Storing liquids, powders, gases, or other substances is allowed, but devices intended to throw them at the opponent are not allowed.
- H. Any combustion-based devices are not allowed.
- I. Devices that throw objects at the opponent are not allowed.
- J. Sticky substances to enhance traction are not allowed. Tires and other robot parts contacting the competition arena must not be able to pick up a sheet of A4 paper (80g/m<sup>2</sup>) and hold it for more than 2 seconds.
- K. Pressure-increasing devices, such as vacuum pumps and magnets, are not allowed.

### 3.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.

Item	Ring Diameter	White Border Width	Material	Min. External Space
Remote Humanoid Sumo	154cm	5cm	Iron/Steel	100cm



- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.
- C. During Humanoid Sumo Matches, at least 100cm of space must be guaranteed outside the sumo ring.

### 3.5. How the Match Starts

#### 3.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena and place their

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robots on the ring. A cross at the center divides the ring into four quadrants. Robots are always placed in opposite quadrants.

- B. Each robot can be placed facing any direction, anywhere within its quadrant, but must have at least one foot in contact with the white border of the ring.
- C. Both teams must place their robots simultaneously upon the referee's command. Once placed, the robots cannot be moved in any way.
- D. The referee will remove the central cross and arrows after the robots are placed.

### **3.5.2. Starting the Match**

- A. Before the referee blows the whistle to start the Match, the operating team member prepares to start the robot. The robot must not move at this time.
- B. When the referee blows the whistle to start the Match, both operators simultaneously begin controlling their robots to start.

### **3.5.3. Match Time**

- A. The Match time for a confrontation between two teams is 3 minutes.
- B. If a Match ends in a draw during the knockout stage, the referee may require the teams to play an overtime period, with a maximum overtime of 3 minutes.

## **3.6. Match Scoring Rules**

### **3.6.1. Knock Down**

- A. When a robot is knocked to the ground by its opponent, it is considered a Knock Down. (Any part of the body other than the soles of the feet touches the ground).
- B. The opponent receives 2 points.

### **3.6.2. Slip Down**

- A. When a robot falls by itself, it is considered a Slip Down. (Any part of the body other than the soles of the feet touches the ground).
- B. The opponent receives 1 point.

### **3.6.3. Push Out**

- A. When a robot makes contact with the ground outside the competition arena, it is considered Pushed Out.
- B. The opponent receives 3 points.
- C. The team whose robot was pushed out may, with the referee's approval, place their robot face down inside the ring without further penalty and will receive a 10-second countdown to stand up.

### **3.6.4. Elimination**

- A. If a robot fails to stand up within 10 seconds, it will be declared the loser immediately upon expiration of the time.
- B. When the referee declares one side the loser, the Match ends immediately, and the opponent is announced as the winner.

### 3.6.5. Score Calculation

- A. The sum of all points scored during a Match constitutes the robot's score.
- B. If the two robots do not make contact for 15 seconds and there is no possibility of contact, the referee will immediately stop the Match. If this happens right after the Match start, the Match will be restarted. If it happens during the Match, the referee stops the Match, and the winner is determined based on the scores. The referee may extend this time limit to 45 seconds to observe if there is fighting intent from both sides.
- C. In the group stage, if the scores are equal at the end of the Match, the Match is a draw.
- D. In the knockout stage, if the scores are equal, the referee may choose to have an overtime Match. If the scores are still tied after 3 minutes of overtime, the referee has the right to decide the winner based on tactics, aggressiveness, and activity level. If both teams still have 0 points after overtime, the referee may declare the Match has no winner, and both teams are eliminated from the next round, resulting in a bye for the next opponent.

## **4 Mega Sumo**

### **4.1. Group**

- A. Adult

### **4.2. Robot Equipment Requirements**

- A. No restrictions on robot equipment.
- B. The robot's power supply does not need to have specific standard parameters, but the robot's battery will be checked before the competition and must have a production qualification mark, otherwise it cannot compete.
- C. The robot must be equipped with the official RobotChallenge starter control chip, otherwise it cannot compete. The chip must be purchased in the merchandise section of the registration system. Chips purchased in previous competitions can continue to be used.
- D. The referee has the final authority to decide whether the components used are permitted in the competition.

### **4.3. Robot Specifications and Requirements**

- A. Robot height is not restricted. Robot width < 20cm, robot length < 20cm. The robot must be able to be placed unobstructed into the organizer's square inspection gauge.
- B. Robot weight < 3KG.
- C. If the robot exceeds inspection requirements during inspection, the team will be given a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.
- D. The robot may expand after the Match starts but must not separate into different parts and must always remain one compact robot entity. The robot is not allowed to expand before it begins moving after the start signal, so the robot's dimensions during inspection are measured in its non-expanded state.
- E. The robot must be fully autonomous.
- F. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot controller. Changing robots during the competition is not allowed.
- G. Jamming devices are not allowed, e.g., using IR LEDs to interfere with the opponent's infrared sensors.
- H. Parts that may damage the arena are not allowed. Parts intended to deliberately damage the opponent's robot or operator are not allowed. Normal pushing and collisions are not considered deliberate damage.
- I. Storing liquids, powders, gases, or other substances is allowed, but devices intended to throw them at the opponent are not allowed.

## RobotChallenge – RoboSumo Rules

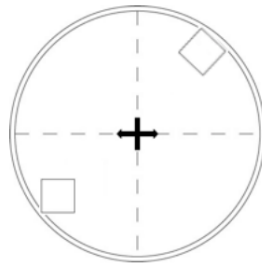
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- J. Any combustion-based devices are not allowed.
- K. Devices that throw objects at the opponent are not allowed.
- L. Sticky substances to enhance traction are not allowed. Tires and other robot parts contacting the competition arena must not be able to pick up a sheet of A4 paper (80g/m<sup>2</sup>) and hold it for more than 2 seconds.
- M. Pressure-increasing devices, such as vacuum pumps and magnets, are allowed only in the Mega Sumo category.
- N. It is prohibited to use mini, micro, and nano sumo robots in giant sumo competitions.

### 4.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.

Item	Ring Diameter	White Border Width	Material	Min. External Space
Mega Sumo	154cm	5cm	Iron/Steel	100cm



- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.
- C. During Matches, at least 100cm of space must be guaranteed outside the sumo ring.

### 4.5. How the Match Starts

#### 4.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena and place their robots on the ring. A cross at the center divides the ring into four quadrants. Robots are always placed in opposite quadrants.
- B. Each robot can be placed facing any direction, anywhere within its quadrant, but must have at least part of its projection in contact with the white border of the ring.
- C. Both teams must place their robots simultaneously upon the referee's command. Once placed, the robots cannot be moved in any way.
- D. The placed robot must be in the same structural state as during inspection; its size cannot be extended.
- E. The referee will remove the central cross and arrows after the robots are placed.

#### 4.5.2. Starting the Match

- A. After both robots are placed on the platform simultaneously, their positions cannot be

## **RobotChallenge – RoboSumo Rules**

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changed. Only one team member per team is allowed to touch the robot's start button to prepare the robot. Program selection is allowed at this time. After preparation is complete, team members leave the arena area.

- B. The referee sends the start signal using an infrared transmitter. The robots receive the signal and start simultaneously. Competing teams must use the designated infrared receiver (Start Module) provided by the organizers.

### **4.5.3. Match Time**

- A. Each round lasts 3 minutes. If no winner is determined after 3 minutes, the round is a draw.
- B. A Match between two teams consists of up to 3 rounds. If a team wins the first two rounds, the Match ends early.
- C. During the round, if the referee judges that the round will end in a draw before the 3-minute time limit is reached, the referee has the authority to seek the opinions of both teams. If both teams agree to a draw, the round may end early.

## **4.6. Match Outcome Explanation**

### **4.6.1. What Constitutes a Win**

- A. During the Match, if a robot is pushed off the platform by the opponent and is the first to touch the ground outside the platform, the opponent wins the round. The winning robot does not need to remain on the platform. If the winning robot pushes the opponent off but also falls off, it still wins as long as it falls off after the opponent.
- B. If a robot loses parts weighing more than 5g during the Match, the opponent wins the round. If both robots lose parts weighing more than 5g in the same round, the round is a draw.
- C. If a robot causes severe damage to the arena, the referee has the right to disqualify that robot from the competition depending on the circumstances.
- D. If a robot cannot move due to an irreparable malfunction, the referee has the right to rule that the team cannot participate in subsequent Matches.
- E. If the two robots do not make contact for 15 seconds and there is no possibility of contact, the referee will immediately stop the round and declare it a draw. If this situation occurs during a tiebreaker round in the group stage or knockout stage, the referee has the right to decide the winner based on tactics, aggressiveness, and activity level.

### **4.6.2. Competition Points Ranking**

- A. In RobotChallenge Sumo competitions, registered teams are divided into several groups based on the number of teams. A round-robin format within groups is used, and the top 2 teams from each group based on points advance to the knockout stage.
- B. For each sumo Match, the winning team receives 3 points, a draw gives each team 1 point, and the losing team receives 0 points.

## **RobotChallenge – RoboSumo Rules**

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- C. If teams are tied on points for advancement from the group, the team that won the head-to-head Match between the tied teams will be ranked higher. If three or more teams are tied and the head-to-head result cannot determine ranking affecting advancement, the tied teams will have a rematch.

### **4.6.3. Competition Knockout Stage**

- A. In the knockout stage, each Match is a best-of-3 rounds. The first team to win 2 rounds advances to the next round. If no winner is determined after 3 rounds, an additional round will be added until a winner is determined.

## **5 Remote Mega Sumo**

### **5.1. Group**

- A. Senior
- B. Adult

### **5.2. Robot Equipment Requirements**

- A. No restrictions on robot equipment or remote controllers.
- B. The robot's power supply does not need to have specific standard parameters, but the robot's battery will be checked before the competition and must have a production qualification mark, otherwise it cannot compete.
- C. The referee has the final authority to decide whether the components used are permitted in the competition.

### **5.3. Robot Specifications and Requirements**

- A. Robot height is not restricted. Robot width < 20cm, robot length < 20cm. The robot must be able to be placed unobstructed into the square inspection gauge.
- B. Robot weight < 3KG (the weight of the remote controller is not included in the robot's weight).
- C. If the robot exceeds inspection requirements during inspection, the team will be given a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.
- D. The robot may expand after the Match starts but must not separate into different parts and must always remain one compact robot entity. The robot is not allowed to expand before it begins moving after the start signal, so the robot's dimensions during inspection are measured in its non-expanded state.
- E. All robots are remote-controlled robots.
- F. The robot must be primarily controlled in real-time by the operator via the remote controller. The use of autonomous programs to assist operation is allowed, but the primary movement decisions of the robot must be triggered and executed in real-time by operator input via the remote controller. The robot must not operate fully autonomously after start, meaning it must not perform Match actions independently without requiring remote control input. Robots violating this rule will be disqualified.
- G. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot controller. Changing robots during the competition is not allowed.
- H. Parts that may damage the arena are not allowed. Parts intended to deliberately damage the opponent's robot or operator are not allowed. Normal pushing and collisions are not considered deliberate damage.

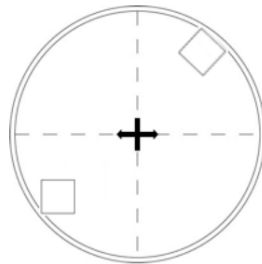
## RobotChallenge – RoboSumo Rules

- I. Storing liquids, powders, gases, or other substances is allowed, but devices intended to throw them at the opponent are not allowed.
- J. Any combustion-based devices are not allowed.
- K. Devices that throw objects at the opponent are not allowed.
- L. Sticky substances to enhance traction are not allowed. Tires and other robot parts contacting the competition arena must not be able to pick up a sheet of A4 paper (80g/m<sup>2</sup>) and hold it for more than 2 seconds.
- M. Pressure-increasing devices, such as vacuum pumps and magnets, are allowed only in the Mega Sumo category.
- N. It is prohibited to use mini, micro, and nano sumo robots in giant sumo competitions.

### 5.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.

Item	Ring Diameter	White Border Width	Material	Min. External Space
Remote Mega Sumo	154cm	5cm	Iron/Steel	100cm



- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.
- C. During Mega Sumo RC Matches, at least 100cm of space must be guaranteed outside the sumo ring.

### 5.5. How the Match Starts

#### 5.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena and place their robots on the ring. A cross at the center divides the ring into four quadrants. Robots are always placed in opposite quadrants.
- B. Each robot can be placed facing any direction, anywhere within its quadrant, but must have at least part of its projection in contact with the white border of the ring.
- C. Both teams must place their robots simultaneously upon the referee's command. Once placed, the robots cannot be moved in any way.
- D. The placed robot must be in the same structural state as during inspection; its size

cannot be extended.

- E. The referee will remove the central cross and arrows after the robots are placed.

### **5.5.2. Starting the Match**

- A. After both robots are placed on the platform simultaneously, their positions cannot be changed. Only one team member per team is allowed to touch the robot's start button/prepare the robot. Program selection is allowed at this time. After preparation is complete, team members leave the arena area.
- B. The referee blows the whistle to start the Match, and both teams begin remotely controlling their respective robots.

### **5.5.3. Match Time**

- A. Each round lasts 3 minutes. If no winner is determined after 3 minutes, the round is a draw.
- B. A Match between two teams consists of up to 3 rounds. If a team wins the first two rounds, the Match ends early.
- C. During the round, if the referee judges that the round will end in a draw before the 3-minute time limit is reached, the referee has the authority to seek the opinions of both teams. If both teams agree to a draw, the round may end early.

## **5.6. Match Outcome Explanation**

### **5.6.1. What Constitutes a Win**

- A. During the Match, if a robot is pushed off the platform by the opponent and is the first to touch the ground outside the platform, the opponent wins the round. The winning robot does not need to remain on the platform. If the winning robot pushes the opponent off but also falls off, it still wins as long as it falls off after the opponent.
- B. If a robot loses parts weighing more than 5g during the Match, the opponent wins the round. If both robots lose parts weighing more than 5g in the same round, the round is a draw.
- C. If a robot causes severe damage to the arena, the referee has the right to disqualify that robot from the competition depending on the circumstances.

### **5.6.2. Competition Points Ranking**

- A. In RobotChallenge Sumo competitions, registered teams are divided into several groups based on the number of teams. A round-robin format within groups is used, and the top 2 teams from each group based on points advance to the knockout stage.
- B. For each sumo Match, the winning team receives 3 points, a draw gives each team 1 point, and the losing team receives 0 points.
- C. If teams are tied on points for advancement from the group, the team that won the head-to-head Match between the tied teams will be ranked higher. If three or more teams are tied and the head-to-head result cannot determine ranking affecting advancement, the tied teams will have a rematch.

**5.6.3. Competition Knockout Stage**

- A. In the knockout stage, each Match is a best-of-3 rounds. The first team to win 2 rounds advances to the next round. If no winner is determined after 3 rounds, an additional round will be added until a winner is determined.

## 6 Mini Sumo

### 6.1. Group

- A. Senior
- B. Adult

### 6.2. Robot Equipment Requirements

- A. No restrictions on robot equipment.
- B. The robot's power supply must have clearly defined standard power parameters.
- C. The robot must be equipped with the official RobotChallenge starter control chip, otherwise it cannot compete. The chip must be purchased in the merchandise section of the registration system. Chips purchased in previous competitions can continue to be used.
- D. The referee has the final authority to decide whether the components used are permitted in the competition.

### 6.3. Robot Specifications and Requirements

- A. The robot must be able to be placed unobstructed into the square inspection gauge.

Competition	Height	Width	Length	Weight
Mini Sumo	Unlimited	10cm	10cm	500g

- B. If the robot exceeds inspection requirements during inspection, the team will be given a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.
- C. The robot may expand after the Match starts but must not separate into different parts and must always remain one compact robot entity. The robot is not allowed to expand before it begins moving after the start signal, so the robot's dimensions during inspection are measured in its non-expanded state.
- D. All robots are autonomous robots.
- E. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot controller. Changing robots during the competition is not allowed.
- F. Parts that may damage the arena are not allowed. Parts intended to deliberately damage the opponent's robot or operator are not allowed. Normal pushing and collisions are not considered deliberate damage.
- G. Storing liquids, powders, gases, or other substances is allowed, but devices intended to throw them at the opponent are not allowed.
- H. Any combustion-based devices are not allowed.
- I. Devices that throw objects at the opponent are not allowed.
- J. Sticky substances to enhance traction are not allowed. Tires and other robot parts contacting the competition arena must not be able to pick up a sheet of A4 paper

## RobotChallenge – RoboSumo Rules

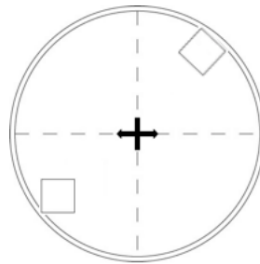
(80g/m<sup>2</sup>) and hold it for more than 2 seconds.

- K. Pressure-increasing devices, such as vacuum pumps and magnets, are not allowed.
- L. Robots must not have any sharp parts.

### 6.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.
- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.

Item	Ring Diameter	White Border Width	Material	Min. External Space
Mini Sumo	77cm	2.5cm	Wood	50cm



### 6.5. How the Match Starts

#### 6.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena and place their robots on the ring. A cross at the center divides the ring into four quadrants. Robots are always placed in opposite quadrants.
- B. Each robot can be placed facing any direction, anywhere within its quadrant, but must have at least part of its projection in contact with the white border of the ring.
- C. Both teams must place their robots simultaneously upon the referee's command. Once placed, the robots cannot be moved in any way.
- D. The placed robot must be in the same structural state as during inspection; its size cannot be extended.
- E. The referee will remove the central cross and arrows after the robots are placed.

#### 6.5.2. Starting the Match

- A. After both robots are placed on the platform simultaneously, their positions cannot be changed. Only one team member per team is allowed to touch the robot's start button to prepare the robot. Program selection is allowed at this time. After preparation is complete, team members leave the arena area.
- B. The referee sends the start signal using an infrared transmitter. The robots receive the signal and start simultaneously. Competing teams must use the designated infrared receiver (Start Module) provided by the organizers.

#### 6.5.3. Match Time

## **RobotChallenge – RoboSumo Rules**

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- A. Each round lasts 3 minutes. If no winner is determined after 3 minutes, the round is a draw.
- B. A Match between two teams consists of up to 3 rounds. If a team wins the first two rounds, the Match ends early.
- C. During the round, if the referee judges that the round will end in a draw before the 3-minute time limit is reached, the referee has the authority to seek the opinions of both teams. If both teams agree to a draw, the round may end early.

### **6.6. Match Outcome Explanation**

#### **6.6.1. What Constitutes a Win**

- A. During the Match, if a robot is pushed off the platform by the opponent and is the first to touch the ground outside the platform, the opponent wins the round. The winning robot does not need to remain on the platform. If the winning robot pushes the opponent off but also falls off, it still wins if it falls off after the opponent.
- B. If a robot loses parts weighing more than 5g during the Match, the opponent wins the round. If both robots lose parts weighing more than 5g in the same round, the round is a draw.
- C. If a robot causes severe damage to the arena, the referee has the right to disqualify that robot from the competition depending on the circumstances.
- D. If a robot cannot move due to an irreparable malfunction, the referee has the right to rule that the team cannot participate in subsequent Matches.
- E. If the two robots do not make contact for 15 seconds and there is no possibility of contact, the referee will immediately stop the round and declare it a draw. If this situation occurs during a tiebreaker round in the group stage or knockout stage, the referee has the right to decide the winner based on tactics, aggressiveness, and activity level.

#### **6.6.2. Competition Points Ranking**

- A. In RobotChallenge Sumo competitions, registered teams are divided into several groups based on the number of teams. A round-robin format within groups is used, and the top 2 teams from each group based on points advance to the knockout stage.
- B. For each sumo Match, the winning team receives 3 points, a draw gives each team 1 point, and the losing team receives 0 points.
- C. If teams are tied on points for advancement from the group, the team that won the head-to-head Match between the tied teams will be ranked higher. If three or more teams are tied and the head-to-head result cannot determine ranking affecting advancement, the tied teams will have a rematch.

#### **6.6.3. Competition Knockout Stage**

- A. In the knockout stage, each Match is a best-of-3 rounds. The first team to win 2 rounds advances to the next round. If no winner is determined after 3 rounds, an additional

round will be added until a winner is determined.

## **7 Remote Mini Sumo**

### **7.1. Group**

- A. Senior
- B. Adult

### **7.2. Robot Equipment Requirements**

- A. No restrictions on robot equipment or remote controllers.
- B. The robot's power supply does not need to have specific standard parameters, but the robot's battery will be checked before the competition and must have a production qualification mark, otherwise it cannot compete.
- C. The referee has the final authority to decide whether the components used are permitted in the competition.

### **7.3. Robot Specifications and Requirements**

- A. Robot height is not restricted. Robot width < 10cm, robot length < 10cm. The robot must be able to be placed unobstructed into the square inspection gauge.
- B. Robot weight < 500g (the weight of the remote controller is not included in the robot's weight).
- C. If the robot exceeds inspection requirements during inspection, the team will be given a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.
- D. The robot may expand after the Match starts but must not separate into different parts and must always remain one compact robot entity. The robot is not allowed to expand before it begins moving after the start signal, so the robot's dimensions during inspection are measured in its non-expanded state.
- E. All robots are remote-controlled robots. The usable radio frequency for the remote controller should be 2.4 GHz.
- F. The robot must be primarily controlled in real-time by the operator via the remote controller. The use of autonomous programs to assist operation is allowed, but the primary movement decisions of the robot must be triggered and executed in real-time by operator input via the remote controller. The robot must not operate fully autonomously after start, meaning it must not perform Match actions independently without requiring remote control input. Robots violating this rule will be disqualified.
- G. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot controller. Changing robots during the competition is not allowed.
- H. Parts that may damage the arena are not allowed. Parts intended to deliberately damage the opponent's robot or operator are not allowed. Normal pushing and hitting are not considered deliberate damage.

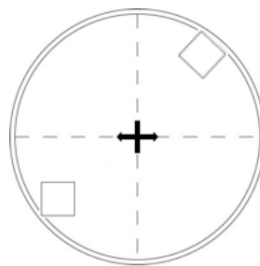
## RobotChallenge – RoboSumo Rules

- I. Storing liquids, powders, gases, or other substances is allowed, but devices intended to throw them at the opponent are not allowed.
- J. Any combustion-based devices are not allowed.
- K. Devices that throw objects at the opponent are not allowed.
- L. Sticky substances to enhance traction are not allowed. Tires and other robot parts contacting the competition arena must not be able to pick up a sheet of A4 paper (80g/m<sup>2</sup>) and hold it for more than 2 seconds.
- M. Pressure-increasing devices, such as vacuum pumps and magnets, are not allowed.
- N. Robots must not have any sharp parts.

### 7.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.

Item	Ring Diameter	White Border Width	Material	Min. External Space
Remote Mini Sumo	77cm	2.5cm	Wood	50cm



- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.
- C. During Mini Sumo RC Matches, at least 50cm of space must be guaranteed outside the sumo ring.

### 7.5. How the Match Starts

#### 7.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena and place their robots on the ring. A cross at the center divides the ring into four quadrants. Robots are always placed in opposite quadrants.
- B. Each robot can be placed facing any direction, anywhere within its quadrant, but must have at least part of its projection in contact with the white border of the ring.
- C. Both teams must place their robots simultaneously upon the referee's command. Once placed, the robots cannot be moved in any way.
- D. The placed robot must be in the same structural state as during inspection; its size cannot be extended.
- E. The referee will remove the central cross and arrows after the robots are placed.

### **7.5.2. Starting the Match**

- A. After both robots are placed on the platform simultaneously, their positions cannot be changed. Only one team member per team is allowed to touch the robot's start button/prepare the robot. Program selection is allowed at this time. After preparation is complete, team members leave the arena area.
- B. The referee blows the whistle to start the Match, and both teams begin remotely controlling their respective robots.

### **7.5.3. Match Time**

- A. Each round lasts 3 minutes. If no winner is determined after 3 minutes, the round is a draw.
- B. A Match between two teams consists of up to 3 rounds. If a team wins the first two rounds, the Match ends early.
- C. During the round, if the referee judges that the round will end in a draw before the 3-minute time limit is reached, the referee has the authority to seek the opinions of both teams. If both teams agree to a draw, the round may end early.

## **7.6. Match Outcome Explanation**

### **7.6.1. What Constitutes a Win**

- A. During the Match, if a robot is pushed off the platform by the opponent and is the first to touch the ground outside the platform, the opponent wins the round. The winning robot does not need to remain on the platform. If the winning robot pushes the opponent off but also falls off, it still wins as long as it falls off after the opponent.
- B. If a robot loses parts weighing more than 5g during the Match, the opponent wins the round. If both robots lose parts weighing more than 5g in the same round, the round is a draw.
- C. If a robot causes severe damage to the arena, the referee has the right to disqualify that robot from the competition depending on the circumstances.

### **7.6.2. Competition Points Ranking**

- A. In RobotChallenge Sumo competitions, registered teams are divided into several groups based on the number of teams. A round-robin format within groups is used, and the top 2 teams from each group based on points advance to the knockout stage.
- B. For each sumo Match, the winning team receives 3 points, a draw gives each team 1 point, and the losing team receives 0 points.
- C. If teams are tied on points for advancement from the group, the team that won the head-to-head Match between the tied teams will be ranked higher. If three or more teams are tied and the head-to-head result cannot determine ranking affecting advancement, the tied teams will have a rematch.

### **7.6.3. Competition Knockout Stage**

- A. In the knockout stage, each Match is a best-of-3 rounds. The first team to win 2 rounds

advances to the next round. If no winner is determined after 3 rounds, an additional round will be added until a winner is determined.

## 8 Micro Sumo / Nano Sumo

### 8.1. Group

- A. Adult

### 8.2. Robot Equipment Requirements

- A. No restrictions on robot equipment.
- B. The robot's power supply does not need to have specific standard parameters.
- C. The robot must be equipped with the official RobotChallenge starter control chip, otherwise it cannot compete. The chip must be purchased in the merchandise section of the registration system. Chips purchased in previous competitions can continue to be used.
- D. The referee has the final authority to decide whether the components used are permitted in the competition.

### 8.3. Robot Specifications and Requirements

- A. The robot must be able to be placed unobstructed into the square inspection gauge.

Competition	Height	Width	Length	Weight
Micro Sumo	5cm	5cm	5cm	100g
Nano Sumo	2.5cm	2.5cm	2.5cm	25g

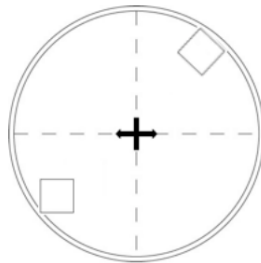
- B. If the robot exceeds inspection requirements during inspection, the team will be given a maximum of 5 minutes for structural adjustments. If it still fails to meet standards after 5 minutes, the team will be disqualified.
- C. The robot may expand after the Match starts but must not separate into different parts and must always remain one compact robot entity. The robot's feet cannot expand during the Match. The robot is not allowed to expand before it begins moving after the start signal, so the robot's dimensions during inspection are measured in its non-expanded state.
- D. All robots are autonomous robots.
- E. Before the competition, each team will receive one robot ID, which must be firmly attached to the robot controller. Changing robots during the competition is not allowed.
- F. Parts that may damage the arena are not allowed. Parts intended to deliberately damage the opponent's robot or operator are not allowed. Normal pushing and collisions are not considered deliberate damage.

- G. Storing liquids, powders, gases, or other substances is allowed, but devices intended to throw them at the opponent are not allowed.
- H. Any combustion-based devices are not allowed.
- I. Devices that throw objects at the opponent are not allowed.
- J. Sticky substances to enhance traction are not allowed. Tires and other robot parts contacting the competition arena must not be able to pick up a sheet of A4 paper (80g/m<sup>2</sup>) and hold it for more than 2 seconds.
- K. Pressure-increasing devices, such as vacuum pumps and magnets, are not allowed.

#### 8.4. Competition Arena Description

- A. The sumo ring is circular, with a boundary line forming a ring of specified dimensions.
- B. As shown in the figure, the area inside the crosshair dashed lines is the competition area, which is black. The area between the two concentric circles outside the crosshair is the white border. The sumo ring is elevated.

Competition	Ring Diameter	White Border Width	Material	Min. External Space
Micro Sumo	38.5cm	1.25cm	Acrylic-based	25cm
Nano Sumo	19.25cm	0.625cm	Acrylic-based	25cm



#### 8.5. How the Match Starts

##### 8.5.1. Placing the Robot

- A. Following the referee's instructions, both teams approach the arena and place their robots on the ring. A cross at the center divides the ring into four quadrants. Robots are always placed in opposite quadrants.
- B. Each robot can be placed facing any direction, anywhere within its quadrant, but must have at least part of its projection in contact with the ring surface (Note: specific mention of white border might be omitted due to scale, but contact with the ring is required).
- C. Both teams must place their robots simultaneously upon the referee's command. Once placed, the robots cannot be moved in any way.
- D. The placed robot must be in the same structural state as during inspection; its size cannot be extended.

## **RobotChallenge – RoboSumo Rules**

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E. The referee will remove the central cross and arrows after the robots are placed.

### **8.5.2. Starting the Match**

- A. After both robots are placed on the platform simultaneously, their positions cannot be changed. Only one team member per team is allowed to touch the robot's start button to prepare the robot. Program selection is allowed at this time. After preparation is complete, team members leave the arena area.
- B. The referee sends the start signal using an infrared transmitter. The robots receive the signal and start simultaneously. Competing teams must use the designated infrared receiver (Start Module) provided by the organizers.

### **8.5.3. Match Time**

- A. Each round lasts 3 minutes. If no winner is determined after 3 minutes, the round is a draw.
- B. A Match between two teams consists of up to 3 rounds. If a team wins the first two rounds, the Match ends early.
- C. During the round, if the referee judges that the round will end in a draw before the 3-minute time limit is reached, the referee has the authority to seek the opinions of both teams. If both teams agree to a draw, the round may end early.

## **8.6. Match Outcome Explanation**

### **8.6.1. What Constitutes a Win**

- A. During the Match, if a robot is pushed off the platform by the opponent and is the first to touch the ground outside the platform, the opponent wins the round. The winning robot does not need to remain on the platform. If the winning robot pushes the opponent off but also falls off, it still wins as long as it falls off after the opponent.
- B. If a robot loses parts weighing more than 5g during the Match, the opponent wins the round. If both robots lose parts weighing more than 5g in the same round, the round is a draw.
- C. If a robot causes severe damage to the arena, the referee has the right to disqualify that robot from the competition depending on the circumstances.
- D. If a robot cannot move due to an irreparable malfunction, the referee has the right to rule that the team cannot participate in subsequent Matches.
- E. If the two robots do not make contact for 15 seconds and there is no possibility of contact, the referee will immediately stop the round and declare it a draw. If this situation occurs during a tiebreaker round in the group stage or knockout stage, the referee has the right to decide the winner based on tactics, aggressiveness, and activity level.

### **8.6.2. Competition Points Ranking**

- A. In RobotChallenge Sumo competitions, registered teams are divided into several groups based on the number of teams. A round-robin format within groups is used, and

## **RobotChallenge – RoboSumo Rules**

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the top 2 teams from each group based on points advance to the knockout stage.

- B. For each sumo Match, the winning team receives 3 points, a draw gives each team 1 point, and the losing team receives 0 points.
- C. If teams are tied on points for advancement from the group, the team that won the head-to-head Match between the tied teams will be ranked higher. If three or more teams are tied and the head-to-head result cannot determine ranking affecting advancement, the tied teams will have a rematch.

### **8.6.3. Competition Knockout Stage**

- A. In the knockout stage, each Match is a best-of-3 rounds. The first team to win 2 rounds advances to the next round. If no winner is determined after 3 rounds, an additional round will be added until a winner is determined.

## **9 Violations**

### **9.1. General Violation Rules**

- A. Robots exceeding competition specifications and restrictions, and causing damage to the arena or damaging the opponent's robot in ways not permitted by the rules.
- B. Insulting opponents will be considered a serious violation, as will posting insulting language on the robot's body, or deliberately damaging other teams' robots or programs.

### **9.2. Minor Violations**

- A. Entering the competition arena without the referee's permission.
- B. Actions or statements detrimental to the fairness of the competition.

## **10 Injuries and Accidents During Competition**

### **10.1. Request to Stop the Match**

- A. When a participant is injured, or their robot has an accident that prevents the Match from continuing, they may request to stop the Match.

### **10.2. Unable to Continue the Match**

- A. When a Match cannot continue due to a participant's injury or a robot accident, the participant who caused the injury or accident loses the Match. When it is unclear which team caused it, the participant who is unable to continue, or who requested the stop, will be declared the loser.

### **10.3. Time Required to Resolve Injury or Accident**

- A. The referee and the organizing committee will decide whether to continue a Match suspended due to injury or accident. This decision process should not exceed 5 minutes.

## **11 Raising Objections**

### **11.1. Raising Objections**

- A. There are no objections allowed against the referee's decisions.
- B. If there is any lack of understanding in the application of these rules, the team captain may raise an objection to the referee.

## **12 Rule Flexibility**

- A. As long as the concept and foundation of the rules are respected, these rules should be flexible enough to adapt to changes in the number of participants and the content

of the competition.

## 13 Liability

- A. Participating teams are always responsible for the safety of their robots and any accidents caused by their team members or machines.
- B. The RobotChallenge organizing committee and its personnel cannot be held liable for any accidents caused by participating teams or their equipment.

## 14 Sumo Competition Remote Control Module Explanation

### 14.1. Remote Start and Kill Switch

In the Mega, Mini, Micro, and Nano Sumo categories, each round starts when the referee sends a start signal via an infrared transmitter. When the robot receives the signal, the Match begins. (This method makes the Match fairer by eliminating false starts and saves time by reducing restarts.) Participants must use the module designated by the organizers.

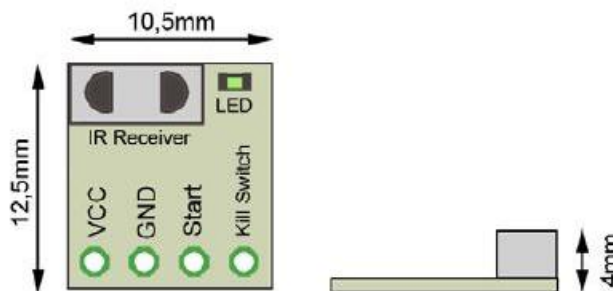
### 14.2. Kill Switch

The kill switch is used to cut power to the robot's motors. This is a safety precaution and is used only in the Mega Sumo category. The motor power must be cut after the referee sends the stop command. The machine's builder is responsible for adding such a kill switch to their machine. Pre-made templates can provide the signal to activate the kill switch.

### 14.3. Start Module

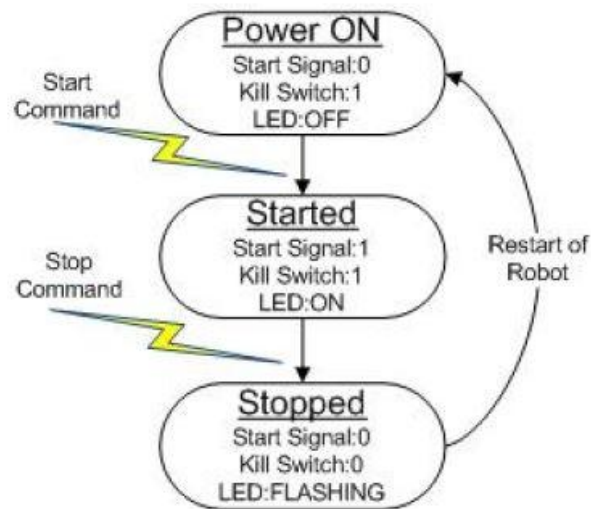
The module already contains all the functions and is very easy to use. The robot simply needs to wait for the 'Start' pin on the module to go high, then it can start. The module can accept a voltage (VCC) of 3.3-5V. VCC, GND, and Start use a standard 2.54mm pitch.

The module must be ordered from the organizing committee.



### 14.4. Operation Mode

The following image illustrates the module's operation mode. To be less sensitive to noise and interference, the module reduces its current state count into non-volatile memory storage. If it is reset, it reverts to the last known state. This means every Match ends with the referee's stop signal.



Note: If the LED on the board is on before the referee sends the start signal, this indicates the module is in the "ON" state. Then a stop signal needs to be sent, and the module needs to be restarted to return to the "Power ON" state.

For multiple adjacent Matches to function correctly, each ring has its own unique identifier. The module can be reprogrammed to accept a new identifier. This process is done by the referee sending a special programming instruction to update this identifier.

The competition uses transmitters based on 38kHz to minimize the risk of interference.

## 14.5. Usage Instructions

You can find detailed information on how to use the start module at:

<http://www.startmodule.com>

## 14.6. Recommended Kill Switch Start

How to implement a kill switch circuit using a relay:

<http://www.startmodule.com/kill-switch-relay/>

How to implement a kill switch circuit using an optocoupler:

<http://www.startmodule.com/kill-switch-oc/>

## 14.7. Frequently Asked Questions

Answers to frequently asked questions about the start system:

<http://www.startmodule.com/faq/>