

# Robots' Intellect 2019

Folkrace

## 1 The task

The aim of the event is to simulate the immersive nature of the rally cross. Like in real-life RX events, up to five robots line up on the track at the same time. In the event, robots compete in a closed track with the goal to do as many laps as possible in a certain amount of time.

## 2 General rules

1. It is strictly forbidden for robots to injure any participants or viewers.
2. It is forbidden for robots to damage the course, obstacles or any other items of organizer's inventory, unless it is explicitly a part of competition.
3. Robots must be autonomous. During the match human input isn't allowed, unless it's specifically allowed by competition.
4. It is forbidden to intentionally cause any harm to other participants or robots.
5. Robots must be registered until organizer's specified date.
6. Robots must pass qualification before participation. Robots that are late for qualification must get competition coordinator's permission to pass qualification after official qualification time.
7. During qualification, each robot will be assigned a unique number, which must be put on the robot, in a clearly visible location.
8. Competition coordinator has final say on all questions and problems during the competition.
9. The organizers keep the right to alter/edit the rules, accordingly informing the participants about it.
10. Violation of the rules above will result in disqualification or criminal liability.

## 3 Competition field and track

1. The field's surface colour is black and the walls are white.
2. The track barrier height is  $12 \pm 1$  cm.
3. Track width varies from 90 to 120 cm.
4. The track may have simple obstacles such as: hills, holes (fig. 2) and post. (fig. 4). Additionally, there may be hindering walls (fig. 3), which are installed in a way that a robot, which moves along the edges of the wall would not be capable to pass the track.
5. The tracks can be on two levels, e.g. the track may have a bridge. (fig. 1)

## 4 Requirements for the robot

1. Maximum robot size:
  - 20 cm length
  - 15 cm width
  - height is not limited
  - mass: 1 kg
2. The robots can't:

- (a) change size;
  - (b) emit gasses, liquids or dust;
  - (c) ram other robots;
  - (d) abuse other robot's movement;
3. Robots are required to have START-STOP button or remote control.

## **5 Competition progress**

1. Robots will compete in groups of up to 5 robots.
2. Each group will have 3 races.
3. Before the race, the direction in which the robots are going to go is told by the referee and the robots are placed at the start.
4. The starting positions will be drawn by lots.
5. The start signal will be given once all of the competitors are ready.
6. A single race is 3 minutes long.
7. Points are counted like this:
  - (a) +1 point for every lap completed in the right direction;
  - (b) -1 point for every lap completed in the wrong direction.
8. If the competition is stopped (for example, all robots are still for 10 seconds), the referee has the right to give an order to the representative of the team to remove the robot that is preventing the movement.
9. The robot which prevents movement, or is stuck itself, is placed in the same place where it was stuck after 10 seconds.
10. If the robot stumbles during the competition and does not prevent other robots from moving, then the representative of the team has the right to decide, whether the robot is left down in the same place or is returned to the starting line. If the robot returns to the starting line, then -1 point is given.
11. If a robot starts moving before start signal, it will be returned to the start line and be given -2 points.
12. Recurring violations of rules will result in the robot being disqualified immediately.

## **6 Deciding the winner**

1. After all of the three races, one robot which scored the most in its sub-group, goes to the final where it will compete for the podium places and the victory of the event.
2. The winner of the event is the robot, which scores the most points in the final race.
3. If the number of points is equal at the end of the races (and after the final race), the ranking will be announced on the basis of an additional race.
4. The winner of the additional race is the robot who which manages to cover one lap in the designated direction first. An additional race is only carried out if the robots have earned an equal amount of points. The starting positions of the additional race will be drawn by lots.

## **7 Possible obstacles**

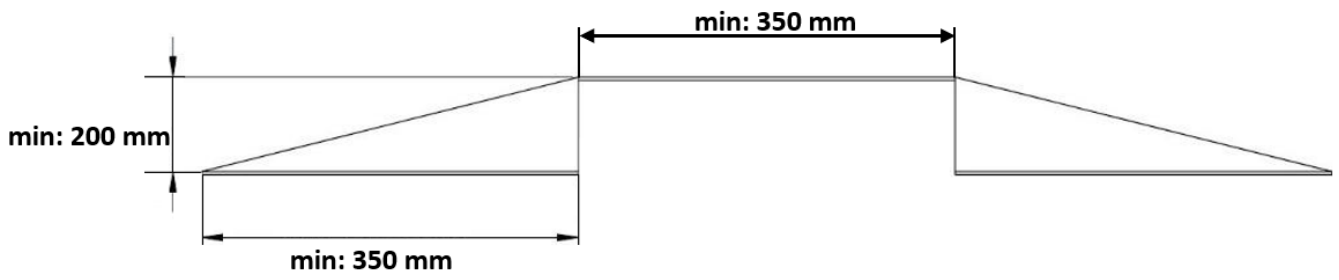


Figure 1: Bridge

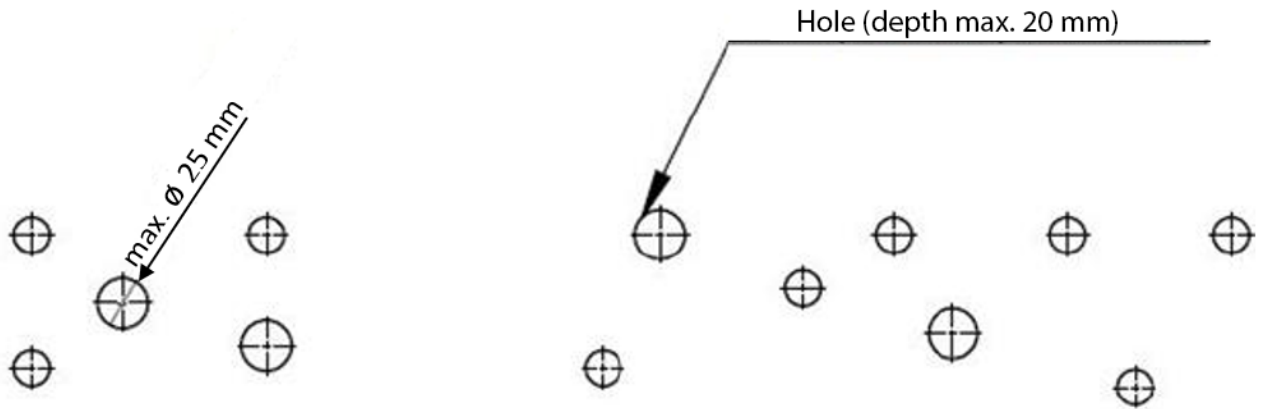


Figure 2: Holes

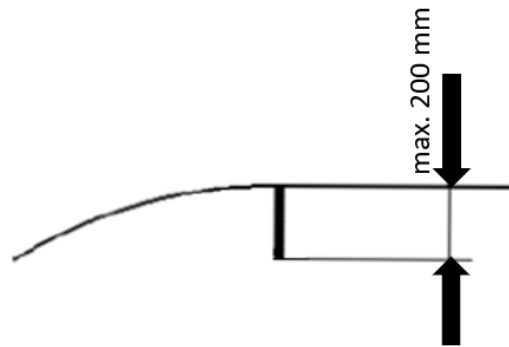


Figure 3: Obstacle wall

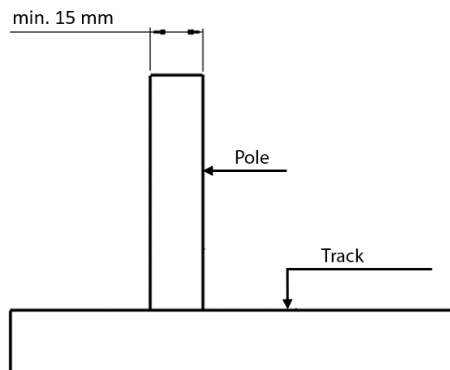


Figure 4: Post