ROBOLITY® RULES 1.0 (01. April 2025)

This is the initial version of the rules, which will be continuously updated and refined over the coming weeks. The goal is to make the rules clearer and more precise, though the overall framework and objectives will remain unchanged.

Background

The **Robolity** challenge is inspired by dog agility competitions, which test a dog's ability to navigate obstacles that mimic typical terrain challenges. In these competitions, the trained dog is guided by a human handler who knows the order of the obstacles and can direct the dog using any form of communication from a distance. The final performance is evaluated based on how well the dog overcomes the obstacles and the time it takes to complete the course.

The key aspects of the agility competition are: (1) training the dog for optimal physical performance and how to overcome the specific obstacles, (2) developing effective communication using visual and acoustic signals, and (3) achieving good team performance under the pressure of live competition.

Specific rules govern how each obstacle must be completed, ensuring that the dogs' performance is comparable. The design of these obstacles also prioritizes minimizing risk to the dogs' health.

Robolity®

Robolity® courses are designed based on the existing capabilities of **four-legged robots (4LRs),** where specific actions are controlled by a human operator (handler) using a joystick.

The final stage of Robolity® will be achieved (in probably 3–8 years) when the human-robot teams rely solely on natural communication signals and the 4LR is fully autonomous. Thus, it is expected that the complexity of the courses for competition increases in parallel to the improvements of 4LRs year by year.

The basic competition course is compiled from a set of obstacles (see below) based on current experience with typical quadrupled robots existing today, making sure that all obstacles can be overcome by present day technology without harming the robot.

Robolity® envisions enabling four-legged robots (4LRs) to develop physical problem-solving and communication skills comparable to those of dogs by competing in specialized obstacle courses.

The development of Robolity ® rules is based on the Agility Regulations of the FCI (2023).

Conditions for participation

(1) The course is designed for **4-legged robots (4LR)** with the size of maximum height (65 cm) width (50 cm) and length (80 cm). The 4LR must not have any parts sticking out of its body silhouette. 4LRs bigger than the maximum size are not allowed to compete.

(2) There is no restriction on the number of people making up a technical support group, but the competing team has only two members the handler and the 4LR. During the competition the team must not get any support from outside the course.

(3) The handler can practice with and test the robots before the competition on individual obstacles but not on the court for the competition.

(4) The handlers may at any point withdraw from the competition without any consequence.

(5) The handlers must take all responsibility for the participation in the competition. The organisers do not take any liability for any ruination of the robot or its parts.

Basic rules of Robolity®

About the course

- The competition takes place on a court is approximately 20m × 40m (wide and long) court covered by artificial grass
- One run is approximately 150 m long and the 4LRs should overcome 15 obstacles
- Order of the obstacles is indicated by numbers, some obstacle types may be presented repeatedly during the run
- The organisers determine in advance the standard course time for calculating the time faults which is announced before the competition
- The judge is responsible for the layout of the obstacles, and he/she is also responsible for judging the faults and obtaining the measure of the running time

About the competition

- Before starting the trial, the judge briefs the handlers, explaining them the nature of the competition, the standard course time (SCT), the maximum course time, the way the run is executed (order of obstacles), and reminding them of the rules.
- No practise is allowed on the course, but competitors are allowed to walk the course without their 4LRs before the trial begins.
- All 4LRs should be controlled via joystick or any other method during the run
- The handler must be present on the court during the run and can move freely on the court
- The 4LR must not be touched by the handler at any time during the run

Trial procedure

- The handler cannot start the 4LR before the judge has signalled that he is ready
- The handler is allowed only to have the joystick in his/her hands
- The handler is allowed to position himself anywhere on the course
- The time starts as soon as the 4LR crosses the start line
- A variety of commands and signals are allowed during the run
- The handler must ensure that the 4LR traverses the obstacles in the correct order without touching the 4LR or the obstacles.
- The handler must not navigate the obstacles himself or go under or over them.
- The run is finished, and the time is stopped, when the 4LR crosses the finish line by negotiating the last obstacle in the correct direction.
- The handler and 4LR leave the ring.

- Handler and 4LR are under the judge's supervision from the moment they enter the ring until both have left the ring

Performance measures and definition of faults
The final performance of the 4RL is a combined measure of the duration of the run (compared to the SCT) and the number of faults made.

Faults:
Exceeding the SCT: The number of time faults is equal to the amount by which the course time exceeds the SCT. The course time must be measured with a precision of 0.01 seconds.

Faults on the course:
All faults are in units of five (5 faults).
A handler who gains an advantage by touching his 4LR or an obstacle will be faulted: 5 faults each time it occurs.
The following faults are relevant to the obstacle that the 4LR is supposed to negotiate:

a) *Knockdowns*: When negotiating an obstacle, it is a fault each time any part of the obstacle (pole, wing, tile…) is knocked down (5 faults).
b) *Refusals*: The following are faulted with a refusal (5 faults): **e.g.** a 4LR that stops in front of an obstacle; a 4LR that turns away from or runs by an obstacle, or goes under the pole of a jump; a 4LR that puts its head or a paw in a tunnel and comes back out again; a 4LR that jumps over a tunnel or hurdle wing; a 4LR that takes the long jump from the side; a 4LR that runs under or jumps over a contact obstacle.
c) A 4LR can only be faulted with a refusal (for stopping in front of an obstacle, turning away from an obstacle or running by an obstacle) when it is on the side of the obstacle from which it should be negotiated.
d) Contact zones: On the dog-walk and A-frame, the 4LR must touch the down contact zone with at least one paw or part of paw. On the see-saw, the 4LR must touch both the up and down contact zones with at least one paw or part of a paw. Failure to do so: 5 faults each time it occurs. The 4LR is considered to have left the obstacle when all four paws are on the ground.

Refusals must be corrected; failure to do so results in elimination.

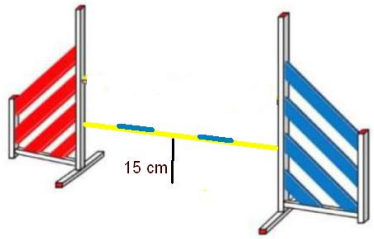
Other faults: knockdowns or missing a contact zone - the 4LR is penalised, but it continues its run.

Videos from Robolity will be available soon until then watch videos from dog competition.

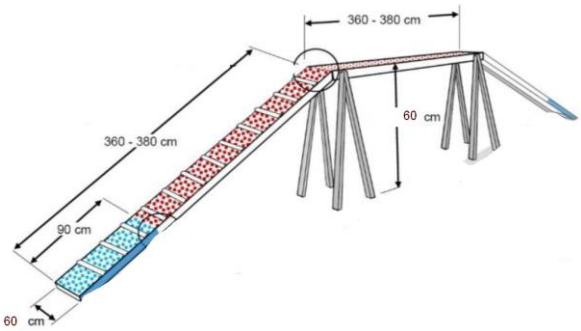
The obstacles approved by Robolity in 2025

The minimum distance on the 4LR's path between consecutive obstacles must not be less than 5m. The maximum straight-line distance between consecutive obstacles must not be more than 7m and the maximum distance on the 4LR's path between consecutive obstacles must not be more than 9m. For 4lR safety, all high obstacles will be surrounded by deep soft materials to prevent damages in case of falling.

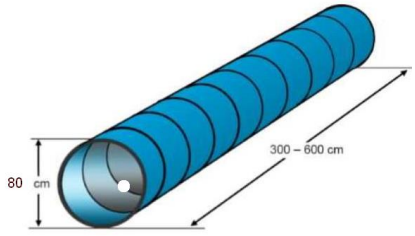
Hurdles:
Height: 15 cm



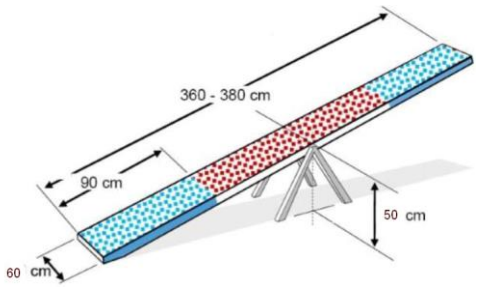
Dog-walk
Height: 06 cm
Width: 50 cm



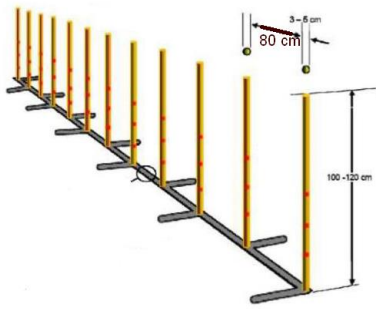
Tunnel
Height/diameter: 80 cm



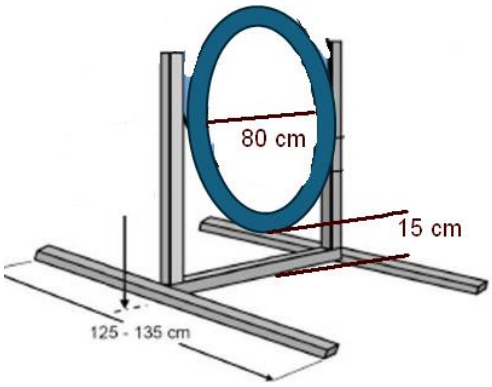
See-saw
Width: 50 cm



Weave Poles
Distance: 80 cm



Tyre: 15 cm (height), diameter: 80cm



A-frame
Width: 90 cm
Height: 60 cm