

WCRC 2026

Wall Climbing Robot Challenge



OFFICIAL SAFETY MANUAL

Critical Safety Protocols, Inspection Checklists,
and Emergency Procedures

Date: July 2 – 4, 2026

Venue: Fikr AI Hub & Study House

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1 Safety Philosophy

Zero Tolerance Policy

Safety is the absolute priority at WCRC. The organizers reserve the right to IMMEDIATELY DISQUALIFY any team that:

- Operates a robot in an unsafe manner (e.g., spinning motors in the pits without clearance).
- Uses prohibited batteries (damaged LiPos, Lead-Acid).
- Causes malicious RF Interference (e.g., powering on controllers in the Pit Area without permission).
- Disregards instructions from the Safety Inspectors or Referees.
- Tampers with the arena or other teams' equipment.

2 Pit Area Safety Protocols

The "Pit Area" is where teams work on their robots. It is a high-risk zone.

1. LiPo Charging: All batteries MUST be charged inside a LiPo Safe Bag. No exceptions. Unattended charging is banned.
2. Controller Discipline (2.4GHz): To prevent frequency interference, all remote controllers and transmitters must remain POWERED OFF in the Pit Area. Turn them on ONLY when instructed by the referee at the Start Zone.
3. Cleanliness: Keep your station clear of wire clippings and debris to prevent short circuits.
4. No Test Runs: Robots cannot climb walls or run at full speed in the Pit Area.

3 Technical Inspection Checklist (The "Tech Check")

Every robot must pass this mandatory inspection BEFORE Wave 1. Failing to meet these criteria means the robot cannot compete.

1. Mechanical Safety & Constraints

- Weight Limit: Robot is ≤ 5.0 kg.
- Start Size: Robot fits entirely within $30 \times 30 \times 30$ cm (Note: Unlimited horizontal expansion is permitted post-launch, provided it stays on the wall face).
- Single Cohesive Unit: The robot climbs as one piece; no detachable chassis.
- Sharp Edges: No exposed sharp edges capable of injuring humans or damaging the 2.0mm Galvanized Steel wall.
- Prohibited Adhesion: No glue, water, gels, or sticky tape used.
- Structural Integrity: No loose parts. Shaking the robot does not cause parts to detach.
- Tether Point (Optional but Recommended): If a tether is used, it must be non-elastic and have a secure attachment point.

2. Electrical Safety & Power Systems

- Voltage Limit: Maximum voltage does not exceed 24V Peak at any point in the circuit (including charged capacitors).
- Master Switch: A physical, easily accessible switch is installed that cuts ALL power.
- Battery Mounting: Battery is rigidly secured using Solid Holders or Battery Straps. It cannot move when the robot is shaken.
- E-Stop Functionality: Emergency Stop system (Physical or Wireless) physically CUTS power to 0V. (Using E-stop to trigger a speed boost is banned).
- Insulation: No exposed copper wire. All connections are heat-shrunked or properly taped (no "twist-and-tape").
- Battery Chemistry: Battery is a permitted type (LiPo, Li-ion, LiFePO4, NiMH).

4 Battery Emergency Procedures

⚠ DANGER: LIPO FIRE PROTOCOL

In the event of a battery fire or thermal runaway (hissing, smoke):

1. DO NOT USE WATER. Lithium reacts violently with water.
2. ALERT EVERYONE: Shout "FIRE!" immediately.
3. CONTAINMENT: If safe, move the robot/battery to the designated Sand Bucket or concrete floor.
4. EXTINGUISH: Use a Class D (Metal) or ABC Dry Powder fire extinguisher.
5. EVACUATE: If the smoke becomes thick, evacuate the area. LiPo smoke is toxic.

5 Human Safety & Liability

- **♥ MAGNETIC HAZARD (PACEMAKERS & MEDICAL DEVICES):** This competition involves robots that may utilize strong magnetic adhesion systems. Any participant, staff member, or audience member with an implanted Pacemaker or ICD MUST maintain a safe distance of at least 200 cm (6.55 feet) from all robots and the competition wall at all times. Handling the robots is strictly prohibited for these individuals.
- The "Kill Zone": No one (except Referees) is allowed in the drop zone directly under the climbing wall during a run.
- First Aid: A basic First Aid kit is available at the Judge's Table. For serious injuries, call emergency services (911) immediately.

⚠ DANGER: DISCLAIMER OF LIABILITY

Participation in the WCRC 2026 is entirely at the team's and individual's own risk. The organizers (IEEE RAS - University of Jordan), the host venue (Fikr AI Hub & Study House), sponsors, and staff shall NOT be held legally or financially responsible for any personal injury, medical emergencies, loss of belongings, or damage to robots, tools, and equipment before, during, or after the competition. By registering and entering the venue, all attendees explicitly waive their right to pursue any claims against the organizing committee.

Appendix A: Team Safety Declaration

This form must be signed by the Team Leader and submitted at Registration/Technical Inspection.

STATEMENT OF RESPONSIBILITY

Team Name: _____

Team Leader: _____

Robot Name: _____

I, the undersigned Team Leader, hereby declare that:

1. I have read and understood the WCRC 2026 Official Rulebook (v1.0) and this Safety Manual.
2. Our robot complies with all safety regulations, including the 24V Peak Voltage limit and all insulation requirements.
3. Waiver of Liability: We acknowledge that participation is entirely at our own risk. We fully release IEEE RAS - University of Jordan, the venue, and the organizers from any legal or financial liability regarding personal injuries, health complications (including magnetic hazards), or damage/loss of our robot and personal property.
4. We accept full financial liability for any damage our robot causes to the venue, the 2.0mm Galvanized Steel wall, or the timing sensors due to negligence or prohibited mechanisms.
5. We understand that remote controllers must remain POWERED OFF in the Pit Area to prevent RF interference.
6. We understand that any "Safety Tethers" used must remain visually slack at all times and cannot be used to hoist the robot.
7. We will strictly follow the "Pit Area" rules and will charge batteries ONLY inside LiPo Safe Bags.

Signature: _____

Date: _____