

### Selected Use cases

MAINBOT proposes the use of mobile platforms for inspection tasks in large areas and vertical infrastructures. A set of application scenarios that cover the general requirements of the maintenance activities in large industries have been selected.

The ground robot has to move in a large area, the solar field, and it has to reach different inspection areas in the plant and stop at pre-established points. The climbing robot has to move in a vertical structure, a tower, and it has to reach different inspection points and stop at pre-established points.

**Scenario:: Use cases**

**Applies to**

**Ubiquitous sensing**

**Operation 1: Mirror reflectivity measurement**

- Number of mirrors: 209.664 (each)
- Total surface of mirrors: 510.120 m2 (each)

**Ground Robot**

**Leakages**

Operation 2: Heat Transfer Fluid Leakage detection

- Leakage detection
- 90km of tubes (each)

Ground Robot

**Surface defects**

Operation 3: Coating degradation

Climbing Robot

Operation 4: Broken mirrors

Ground Robot

Operation 5: Loss of vacuum in collector pipes

Ground Robot

**Internal defects**

Operation 6: Corrosion, cracks

Climbing robot

---

## Selected Scenarios



*Valle Thermosolar plant*



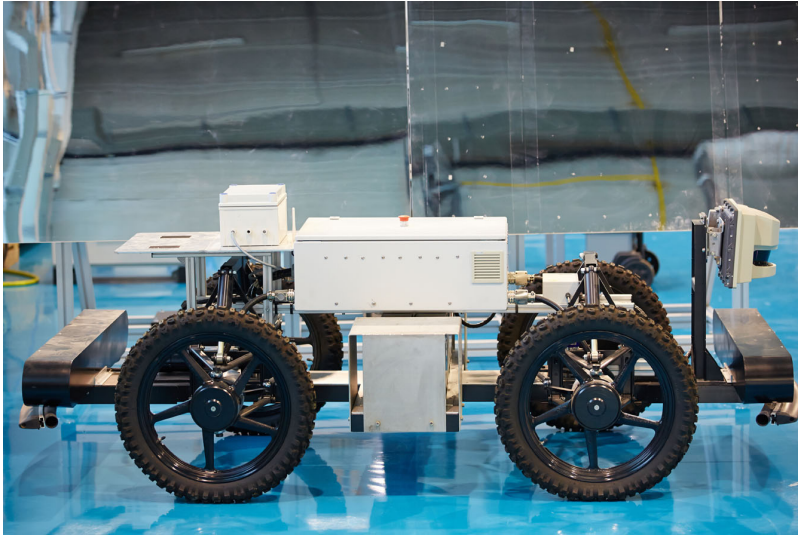
*Gemasolar Thermosolar tower*

---

## Robot prototypes and mockups

Two kind of Robotic Solutions are developed in MAINBOT. Ground robot, a mobile manipulator composed of a mobile base a RobuCarTT and a 6DOF Manipulator. Vertical robot that consist of a mobile base and a internal arm for inspection system positioning.

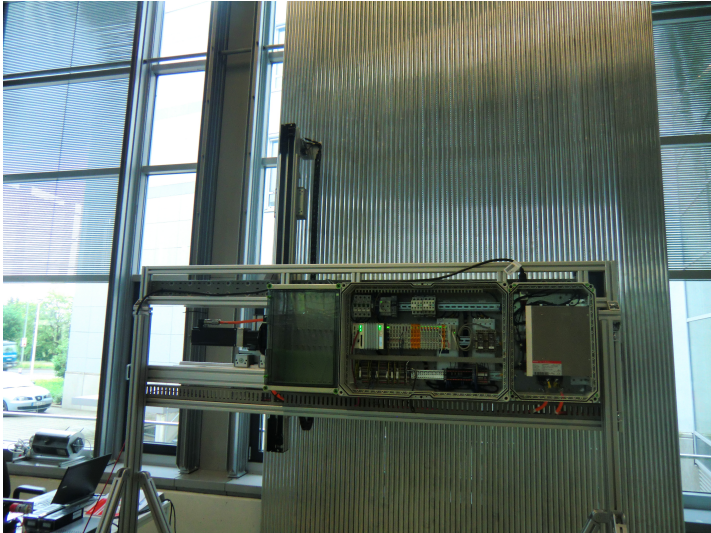




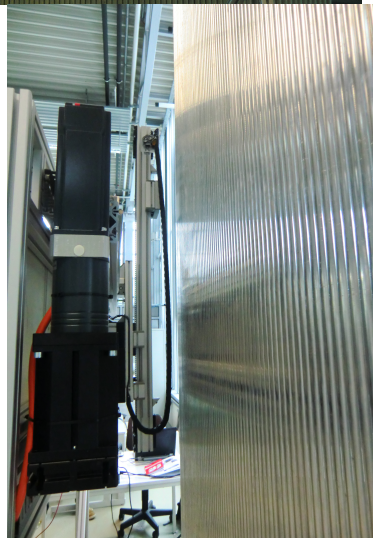
*Ground platform*



*Ground arm*



*Climbing robot*



*Climbing robot arm*

Ground Mockup (Operation 1)

**Parabolic Through mockup allows simulating the position of the mirrors that can be found in a Parabolic Through Technology solar field. It will be used to evaluate the performance of the navigation and manipulation algorithms.**

The mockup consists of two curve mirrors similar to those used in the real Parabolic Through solar field. The structure allows positioning the mirrors in different angles.







*Ground robot moving inside a loop during the experiments*



*Robot setup*





*Robot setup*