Calibrator Driver Manual

Brief

The calibration is a multi-step process in which you have to find different reference points in the galactic map using the calibrator's sensors.

The map

The map is **square-shaped**, with each side measuring **2 * 10^9 galactic units**.
The coordinates range between -10^9 and +10^9 and the center is (0, 0).

The calibrator

The calibration is a **47-stepped process**. In each step the goal is to find a single point in the map,
that will be used by the software as a reference.

The calibrator can point at any location in the map and **detect** if its pointing at the reference point, or if the reference point is in its radius or not. The radius of the calibrator is a **circle of radius R**.

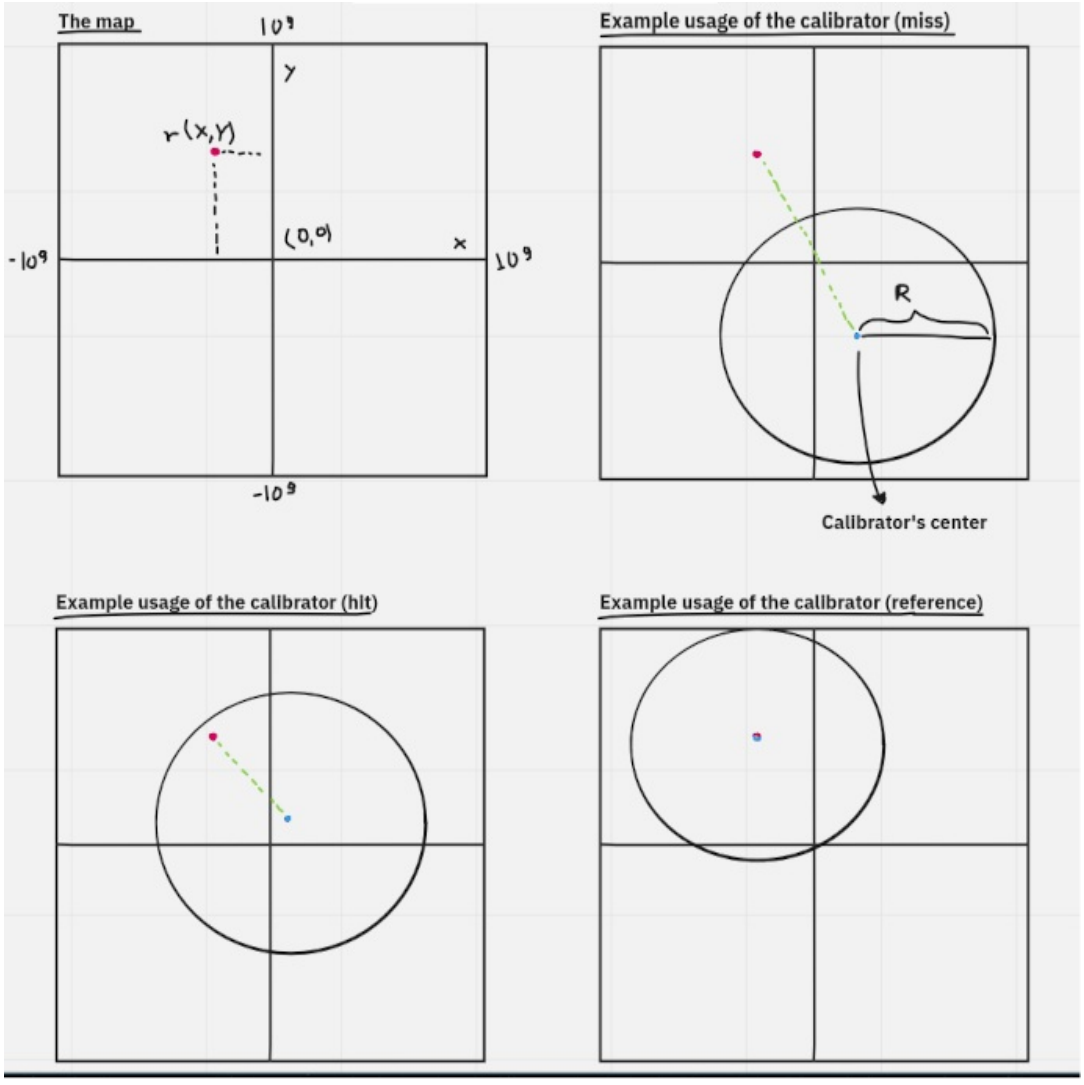
Given a pair of coordinated the calibrator responds with different codes:

- **REFERENCE**: if its pointing to the reference point. [1]
- **DETECTED**: if the REFERENCE point is within its radius
- **UNDETECTED**: if the REFERENCE point is outside of its radius

The calibrator can only run **up to 300 times in each step**.
If the reference point is not found within 300 attempts, the **calibrator stops** and the process must be restarted.

In each step the **coordinates (X, Y)** of the reference point, as well as the **radius R** of the calibrator are **unknown**.

Visualization



Notes

[1] The calibrator's has error correcting capabilities so it can point up to e=2 galactic units away from the reference point and still return REFERENCE.

Constraints

$10^9 / 2 <= R <= 10^9$

$-10^9 + R <= X <= 10^9 - R$

$-10^9 + R <= Y <= 10^9 - R$

Communication with the calibrator

After initiating connection to the calibrator, you must complete the 47 calibration iterations.

In each iteration you will enter a pair of coordinates (seperated by space and ending with newline '\n').

Then the server will respond with either DETECTED, UNDETECTED depending on wether the given coordinate is in or out of the calibrator's radius or REFERENCE if they hit the reference point.

Exceeding the 300 attempts will terminate the calibrator.