

## ECR-C Electronic Corner Reflector

The MetaSensing Electronic Corner Reflector at C-band (ECR-C) is a compact active transponder designed for the end-users of satellite-borne C-band Synthetic Aperture Radars.

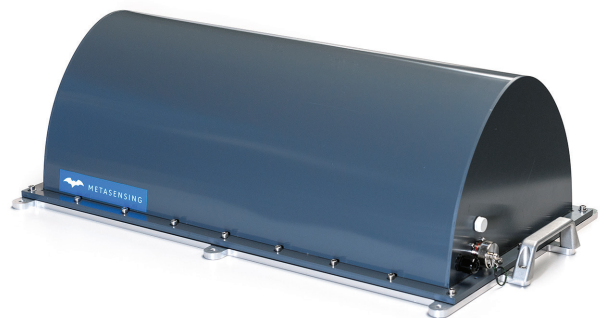
### What is it?

ECR-C is a user-deployed permanent scatterer designed to receive a weak signal from a satellite radar, amplify and filter this signal, and transmit it back to the satellite. This allows for very precise measurements of location and relative displacement, invaluable for satellite-based Differential Interferometric Synthetic Aperture Radar (DInSAR) measurements.

This information can be used when interpreting the satellite images, for example, to precisely monitor terrain deformation or discover information about the atmosphere the signal has travelled through. From the point of view of a satellite radar, the ECR-C looks very much like a corner reflector, however, it is much more compact and uses an active rather than passive design.

The user is required to provide the time and duration of satellite overpasses, which can be uploaded to the ECR-C with a user-friendly control software.

The ECR-C is designed to have an active amplification mode while a satellite is passing overhead, and a sleep mode while waiting for a satellite to pass over.



*The ECR-C enclosure*

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## Advantages

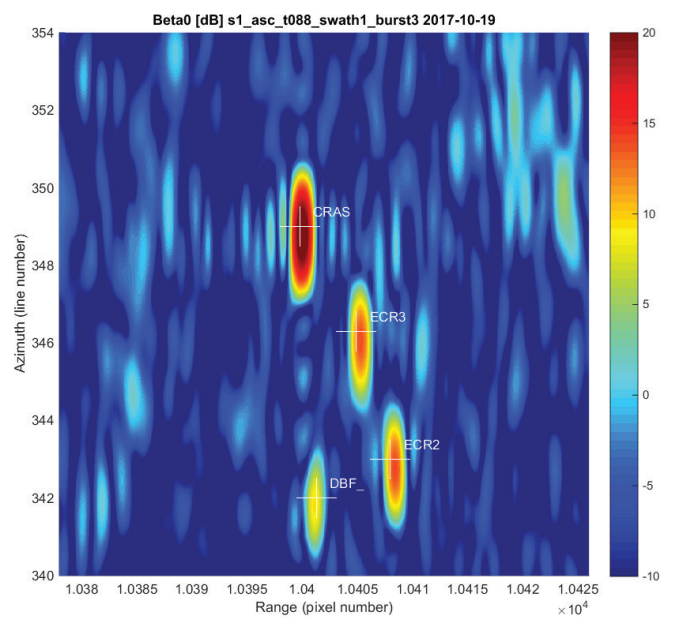
- A more compact alternative to standard passive corner reflectors, which can be meters in size
- Allows for accurate calibration of satellite radar data, including location and atmospheric data
- Operation frequencies compatible with Sentinel-1A, Sentinel-1B and RADARSAT-2
- Capability to measure vertical displacements of 1 mm
- Easy to install next to GNSS ground stations

## Key features

- Operational frequency: C-band (5.4 GHz) with up to 100 MHz bandwidth
- Electronic Gain: 50 dB
- Antenna Gain: 15 dBi
- Equivalent RCS: 30 dBsm
- Polarization: horizontal, vertical (user selectable)
- Control and Configurations with a provided GUI
- GSM/WiFi for remote control
- GPS for clock and position information
- Standard USB connection
- Storage of up to 1000 activation and deactivation times
- Size [mm]: 650 (L) x 400 (W) x 233 (H)
- Weight: < 11 Kg
- Power Supply: two field-replaceable batteries, solar panels, AC mains
- Power consumption: 38 mA idle, 300 mA on
- Ascending and descending orbits covered with one transponder (user selectable via software)

The figure on the side shows the SAR image from Sentinel-1 with four corner reflectors: two ECR-C's, the CRAS is a trihedral with 1.45m square based corner reflector and DBF is a 90 cm triangular corner reflector.

Courtesy of TU Delft.



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