

# Twin satellites TerraSAR-X and TanDEM-X

## What

TerraSAR-X and TanDEM-X are **Synthetic Aperture Radar (SAR)** satellites from DLR (the German Aerospace Centre). Imagery from the twin satellites feature a **unique geometric accuracy** that is unmatched by any other spaceborne sensor

## When

Launched on



TerraSAR-X TanDEM-X

Both launched from the Baikonur Cosmodrome

## Built By

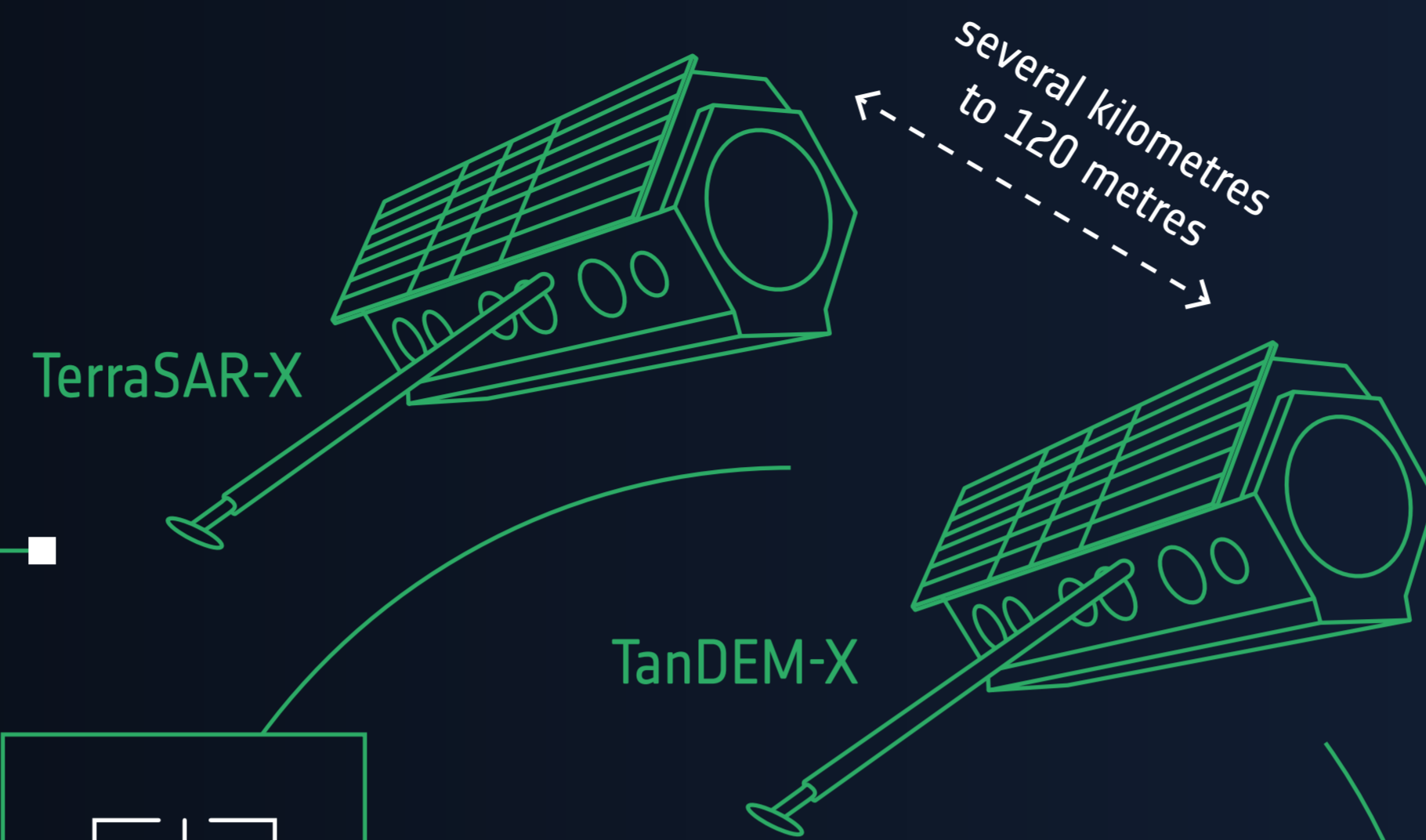
Built by Airbus for DLR, who also own the data distribution rights for the radar constellation. ESA's contract is with Airbus (Germany) for the distribution of the data

## Instruments

The payload is an X-band radar sensor. This instrument allows the satellites to acquire images with different swath widths, resolutions and polarisations. The instrument is an active phased array antenna system, with operational modes of 'stripmap', 'spotlight' and 'scanSAR', permitting the **acquisition of both high-resolution imagery and wide-swath imagery**

## Constellation

The satellites operate in the same orbit of PAZ (carrying the same on board sensor), and the **three work together as a high-resolution radar constellation**, based upon a commercial agreement between Hisdesat Servicios Estratégicos S.A. and Airbus Defence and Space GmbH. The three almost identical spacecraft also feature identical ground swaths and imaging modes



unique geometric accuracy

active phased array antenna system

high-resolution imagery and wide-swath imagery

## Applications

Both satellites perform a wide range of EO applications, including:

- **Staring SpotLight mode mainly for image intelligence applications;**
- **Wide ScanSAR, particularly suitable for maritime applications;**
- **support of intelligence and security;**
- **disaster response and mapping;**
- **generation of digital elevation models, using interferometry and radargrammetry**

## Data and Users

Through ESA's TPM programme, the data from both missions are available to a range of stakeholders, such as researchers, businesses, regulators and governments. The data have supported over 100 scientific projects

## Curiosity

The distance between the satellites varies between several kilometres and sometimes only 120 metres. This enables the radar sensors to obtain a 3D view of Earth

## Objectives

Flying in close formation, the objective of both satellites is to simultaneously image Earth's terrain from different angles with unprecedented accuracy for research and development purposes, as well as scientific and commercial applications. The innovation of the mission is the generation of WorldDEM, a consistent global Digital Elevation Model (DEM) with an unprecedented accuracy better than Digital Terrain Elevation Data (DTED) Level 2 specifications.