



METASENSING
RADAR SOLUTIONS

METASAR-X

AIRBORNE SAR PAYLOAD

ADVANCED RADAR SOLUTIONS REDEFINING PRECISION MAPPING

Your Ultimate Solution for Advanced
SAR Imaging



HIGH-PERFORMANCE AIRBORNE SAR IMAGING IN X-BAND

The MetaSAR-X is a cutting-edge Synthetic Aperture Radar system operating in the X-band, engineered to deliver high-resolution, multi-channel airborne imaging. Optimized for mapping, monitoring, and intelligence applications, it enables precise observation of topography, land cover, surface motion, and man-made structures, regardless of weather or lighting conditions. Its compact architecture and refined electronics make MetaSAR-X suitable for deployment on a wide range of aircraft. The system reflects MetaSensing's deep expertise in SAR technology, built over more than a decade of innovation in radar design and remote sensing solutions.



VERSATILE CONFIGURATION, OPTIMIZED PERFORMANCE

Lightweight radar unit with dual-polarimetric antennas and low power consumption, making it easy to install on various aircraft. It supports multiple imaging modes—including Stripmap, Spotlight, and Wide Swath, offering adaptability in resolution and swath width.

The system enables Single-Pass Interferometry in both Cross-Track (XTI) and Along-Track (ATI) modes for precise terrain mapping and moving target detection. All data is synchronized with accurate navigation systems and processed using MetaSAR-PRO, MetaSensing's proprietary SAR processor, delivering georeferenced outputs in professional-standard formats.



TERRAIN MAPPING AND FOREST APPLICATIONS

MetaSAR-X is equipped with fully polarimetric SAR capabilities, enabling advanced applications like Automatic Target Recognition, Land Cover Classification, and Feature Extraction. Its high-resolution imaging also supports Coherent Change Detection (CCD), identifying even subtle changes in the monitored area over time—essential for infrastructure monitoring, situational awareness, and strategic intelligence.

The system is a trusted tool for users in defence, environmental monitoring, and security sectors who require reliable, high-detail airborne data for timely decision-making.

METASAR-X TECHNICAL DATA

MetaSensing MetaSAR-X	X-band Airborne SAR
Frequency	9.5 GHz
Bandwidth	600 MHz
Slant Range Resolution	From 25 cm
Channels	2 alternating transmitters, 2 simultaneous receivers
Embedded Navigation	High-performance IMU/GNSS unit
Interferometry	Single-Pass, Cross-Track (XTI) & Along-Track (ATI)
Polarization	Full Polarimetric (Linear H & V): HH, VV, HV, VH
Swath (from 10,000 ft AGL)	From 2 km to 10+ km (depending on configuration)
Output Format	GeoTIFF NetCDF (including metadata)
Power Consumption	<200 W @ 28 VDC
Weight	<20 kg
Dimensions	Electronic Enclosure: 320 × 320 × 370 mm

KEY FEATURES

- High-resolution X-band SAR
- Compact, lightweight, and low power
- Dual-polarimetric antennas
- Stripmap imaging modes
- Single-Pass Interferometry (XTI & ATI)
- Precise GNSS/INS integration
- MetaSAR-PRO processing software
- Standard georeferenced GeoTIFF output

KEY BENEFITS

- All-weather, day/night imaging
- Fast integration on various aircraft
- Flexible swath and resolution options
- Accurate terrain and motion mapping
- Ready-to-use professional data products
- Proven reliability from MetaSensing expertise

APPLICATIONS:

- Digital Surface Model (DSM) generation
- Land cover and vegetation analysis
- Ocean surface and current observation
- Urban planning and environmental studies



Color-coded composition of fully polarimetric X-band intensity images acquired over a urban scenario. The SAR image has a ground range of 3.5 km and an azimuth range of 10 km. (Red: VV, Green: HH, Blue: VH).



MetaSAR-X image with a landing aircraft.