

The C-Gull SAR Payload

for Hybrid VTOL & Helicopter UAVs

SYSTEM OVERVIEW

The C-Gull SAR Payload developed by the CSIR provides advanced SAR imaging capability such as VideoSAR, GMTI and Colourised man-made target detection modes for smaller UAV platforms in the 10–15 kg payload class, including hybrid VTOL and helicopter UAVs.

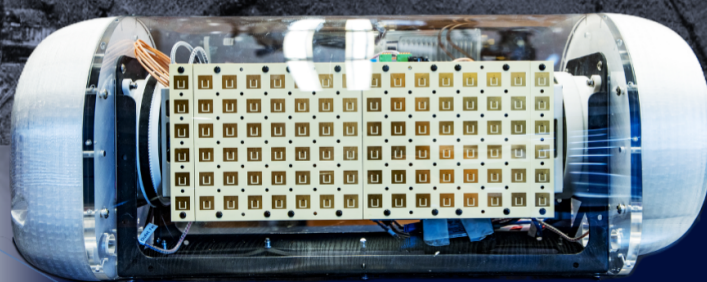
Designed to operate with only 300 W of input power and with a mass of <10 kg, the C-Gull SAR sensor is the smallest in a family of UAV SAR sensors developed at CSIR. A left/right swivel gimbal allows imaging to both sides of the UAV for effective border control / monitoring flights.

The 600 MHz IBW phased array aperture allows for imaging at resolutions as fine as 25 cm in range and cross range, whilst being flexible and programmable in its waveforms to also support electronically scanning GMTI modes and multi-aspect SAR modes.

For tactical operations, the sensor provides integrated real-time SAR and GMTI processing, with down-linking of data to its ground station through standard ethernet radio datalinks. For detailed post-mission analysis, the system also supports full rate data recording, which enables ground based post-processing of the Raw Sensor Data enabling analysis such as coherent change detection or multi-pass interferometry.

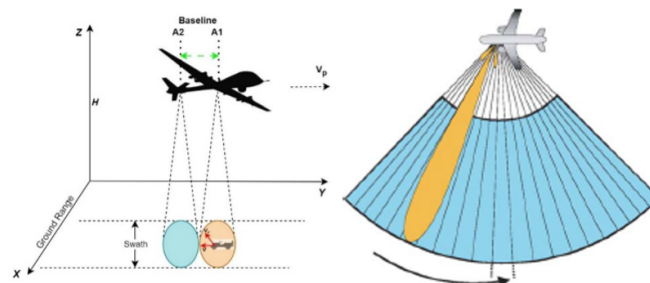
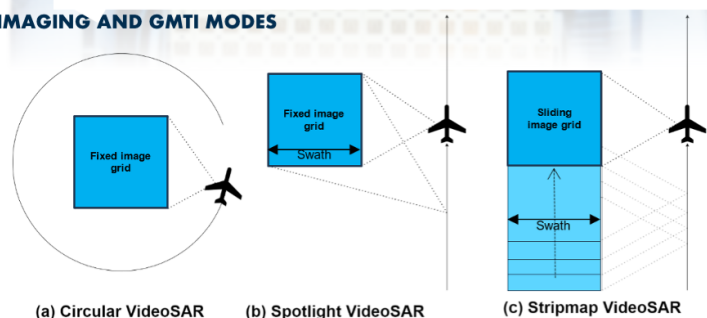
SYSTEM SPECIFICATIONS

Mass	< 10 kg	
Dimensions	520 x 250 x 250 mm	
Power	Standby mode	< 25 W
	Ready	< 120 W
	Operate Mode	< 300 W (~ 56 W Peak Tx)
Frequency	C-Band	
Polarization	VV	
Rx Channels	2 (azimuth phase centers allow GMTI)	
Antenna	C-band phased array	
Scanning	Azimuth e-scan	+/- 45°
	Elevation e-scan	+/- 20°
On-board Processor	Real-time SAR and GMTI data processing	
	Offline data processing	
Storage	Up to 8 TB	
Operational Radar Modes	SAR modes	1. Stripmap 2. Spotlight 3. VideoSAR 4. Colourised Multi-aspect
	GMTI modes	1. Fixed angle GMTI 2. Scanning GMTI
Resolution	Range resolution	< 0.3 – 3 m
	Cross-range resolution	< 0.15 – 3 m



The C-Gull C-Band Phased Array SAR Sensor

IMAGING AND GMTI MODES



Fixed Beam GMTI

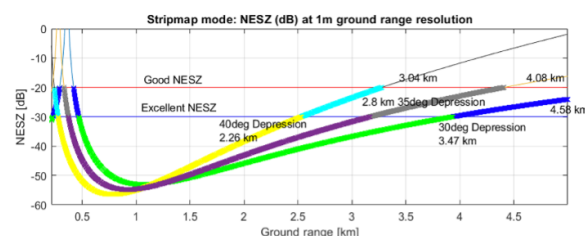
Scanning Beam GMTI

INTEGRATION WITH UAV

Power supply: 28V
Data and Control: Gigabit Ethernet control laptop with GIS based mission planning, execution and post-mission analysis software. Non-expert operator ready, mission planning and execution done through simply graphical UI

Data link: Requires up to 50mbps data for VideoSAR modes. Data throttling through reducing scene size if required
Cooling: Via air-ducts or fans dependent on platform and operational speed

Modelled Performance at Several Antenna Down-Look Angles @800m altitude



This data sheet is provided as an initial draft. Specifications and interfaces could still change as the C-Gull SAR payload is matured to final production status.

Contact: e-mail: wajnel@csir.co.za



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Department:
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