GAMIC Multi-purpose Weather Radar

GMWR-1000-SST

Solid-state X-band Doppler weather radar with dual polarization

The GMWR-1000-SST is a cost-effective, flexible, and entirely solid-state X-band Doppler weather radar. It is designed for operation with a range of 100 km up to a maximum of 150 km and uses Doppler technology for accurate radial wind velocity measurements. Its dual polarization feature offers attenuation correction, advanced product generation, hydrometeor classification, and detection of non-meteorological objects.

NEW POSSIBILITIES WITH SOLID STATE

The GMWR-1000-SST **hardware is entirely solid-state**, including the transmitter. This novel technology offers enhanced dual polarization features, like simultaneous or alternating polarized signals, enabling new approaches for scientific issues. The higher possible pulse repetition frequency (PRF) allows measurement of higher wind velocities, a feature for regions suffering from strong winds and storms. Looking for a radar with magnetron transmitter? Check out our GMWR-25-DP.

RELIABLE HARDWARE COMPONENTS

The GMWR-1000-SST is built with a minimum number of components and few wearing parts. This enables **low investment and small operating costs while being highly reliable**. Hardware maintenance effort is reduced because of higher MTBF rates and can be performed by any local technical service with experience in radar maintenance. The symmetrical splash plate antenna provides perfect conditions for dual polarization measurements and thus is the ideal completion of the solid-state weather radar.

ADVANCED SIGNAL PROCESSING

All GAMIC radars include our digital receiver and signal processor ENIGMA which allows **rapid scanning and analysis products of scientific quality and accuracy**. Digital Doppler velocity processing enables accurate velocity measurement.

The processing allows filtering of the input data, including clutter suppression (40 dB or better) resulting in less ground clutter, and the removal of distortions, speckles, interferences, and more. The result is **clean weather output data** which can be further processed as meteorological products.

COMPREHENSIVE SOFTWARE SUITE

The perfect enhancement for your radar system is our weather radar software suite Frog-Muran. It provides **full product generation capability**, including volume scan products and hydro-meteorological rainfall analysis. The **visualization system** serves high quality radar images which can also be displayed via our browser-based Webview application.

FLEXIBLE OPERATIONAL APPLICATIONS

Besides the typical **stationary radar installation**, we also offer **transportable and mobile radars**. Our custom solutions comprise mounting on a vehicle or trailer, a self-erecting hydraulic mast, a flexible container for transport and deployment in remote areas, and more. Tell us about your needs, we will find a solution that suits you.

Features

- **Weather radar** for hydrology, aviation, population and asset protection, agriculture, research, gap-filling, early warning systems, and more
- **Compact design** – stationary, transportable, or mobile
- **Powerful signal processing** with ENIGMA
- **Radar software suite Frog-Muran** for meteorological and hydrological data analysis
- **Entirely solid-state** design

Technical details

- X-Band weather radar system
- Doppler velocity wind measurement
- Dual polarization
- Splash plate antenna
  - 1.3 m with <2° pencil beam
  - 1.9 m with <1.3° pencil beam
  - 2.4 m with <1° pencil beam
- Optimal range 100 km, max. up to 150 km
- Entirely solid-state design (transmitter, modulator, power supplies)
- Transmitting power 2×500 W with pulse compression (2×200 W optional)
- Integrated low noise receiver front end
- Low phase noise enables high coherency

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WEATHER RADAR & SIGNAL PROCESSING

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DIGITAL VERSION

GMWR-1000-SST
Technical specifications

Transmitter	
Polarization	Dual polarization (H/V)
Operating frequency	9300–9500 MHz
Transmitter	Solid-state (GaAs & GaN)
Peak power	1000 W (2×500 W) *400 W (2×200 W) is optionally available*
Pulse width	Short pulse 0.5–3.0 µs / long pulse 5–100 µs
Resolution	down to 30 m
PRF (pulse repetition freq.)	200–3000 Hz (within duty cycle)
TX signal generation	Configurable pulse schema and frequency modulation with GAMIC TXDAC

Receiver	
Type	Dual polarization (2 independent channels), Doppler
A/D conversion	6×16 bit
Sample rate	80 MHz (others available)
Dynamic range	>95 dB (typically 100 dB)
Sensitivity	-114 dBm
Intermediate frequency (IF)	60 MHz
Noise figure LNA	<1 dB

Antenna			
Type	Parabolic, pencil beam, splash plate		
Diameter	**1.3 m**	**1.9 m**	**2.4 m**
Lobe width (H/V)	<2°	<1.3°	<1°
Gain	-23 dB within 10°	-23 dB within 10°	-25 dB within 10°
Side lobes	39 dBi	42 dBi	45 dBi
Cross-polar isolation	>36 dB	>36 dB	>30 dB
Antenna motion	Volume scan		
Azimuth	360° (continuous)		
Elevation	-2° to 92°		
Azimuth max. speed	36°/sec		
Elevation max. speed	15°/sec		
Weight (antenna + pedestal)	<200 kg	<210 kg	<350 kg
Radome size / weight	1.8 m / 80 kg	2.5 m / 230 kg	3.8 m / 300 kg
Radome type	Sandwich (laminated glass fiber)		

Signal processor	
Type	ENIGMA V (6 channels)
Moments	Z, V, W, SNR, CCR, SQI, ZDR, PhiDP, RhoHV, KDP, ...
Processed bins	>4000 (max. 8000)
Clutter correction	DFT, PPT, CMAP, CPA, IIR, regression filter
Pulse integration	Fixed or angle synced
Calibration	Manual with support tools (automatic optional)

Software	
Operating system	Linux
Software	Frog-Muran (Frog, RadarControl, Colibri), Webview, Dashboard
Data resolution (raw)	8, 16, 32 bit IEEE floating point
Max. range	400 km
Range resolution	30 m – 10 km
Vertical resolution	<100 m
Horizontal resolution	100 m – 1 km
Output products	>50 products for meteorology, hydrology, air traffic control, and more (please consult us)

General	
Power consumption	~500 W average / <2000 W peak (without radome A/C)