GAMIC Multi-purpose Weather Radar

# GMWR-25-DP

## **Magnetron X-band Doppler weather radar** with dual polarization

**The GMWR-25-DP is a cost-effective and flexible X-Band Doppler weather radar with magnetron transmitter. 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 allows for attenuation correction, advanced product generation, and hydrometeor classification.**

### WELL PROVEN AND RELIABLE HARDWARE

Our GMWR-25-DP radars use a stable, well proven design based on standard radar technology and built with a minimum number of components. This enables a system with **low investment and small operating costs while being highly reliable**. Hardware maintenance can be performed by any local technical service experienced in radar maintenance. The GMWR-25-DP hardware is entirely solid-state, except the magnetron transmitter. Alternatively, we also offer weather radar systems with solid-state transmitters, the GMWR-1000-SST.

GMWR-25-DP radars have **dual polarization for enhanced measurements**. They are shipped with the GAMIC designed symmetric splash plate antenna providing perfect conditions for ideal dual polarization measurements. A single polarization model of the radar is available optionally, please contact us for more details.

### 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

### Technical details

- X-Band weather radar system
- Doppler velocity wind measurement
- Dual polarization (single pol. is optional)
- 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
- Magnetron transmitter with 25 kW peak power, solid-state modulator and power supplies
- Integrated low noise receiver front end

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WEATHER RADAR & SIGNAL PROCESSING

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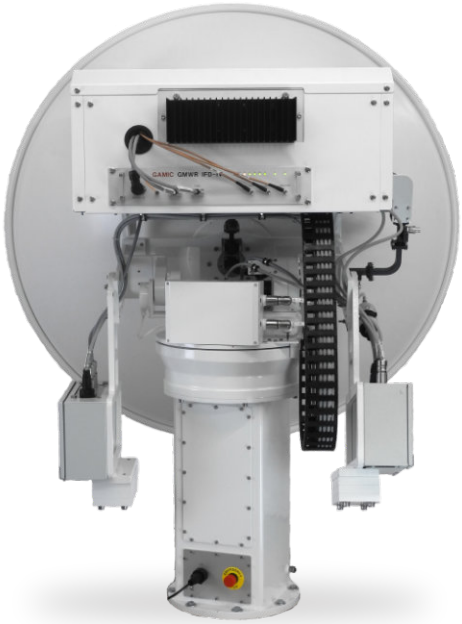
DIGITAL VERSION

# GMWR-25-DP
Technical specifications

| Transmitter | |
|---|---|
| **Polarization** | Dual polarization (H/V) *Single polarization is optionally available* |
| **Peak power** | 25 kW (12.5 kW per channel) |
| **Operating frequency** | 9410 ± 30 MHz |
| **Transmitter** | Magnetron |
| **Pulse width** | 0.2–1.1 µs (configurable) |
| **PRF (pulse repetition freq.)** | 250–2500 Hz |
| **Modulator** | Solid-state |
| **TX signal generation** | Magnetron and modulator |



| Receiver | |
|---|---|
| **Type** | Dual polarization (2 independent channels), Doppler |
| **A/D conversion** | 2 × 16 bit |
| **Sample rate** | 76.8 MHz (others available) |
| **Dynamic range** | ~94 dB, >90 dB nominal |
| **Sensitivity** | -112 dBm @ 0.75 µs |
| **Intermediate frequency (IF)** | 60 MHz |
| **Noise figure LNA** | <1 dB |
| **Tuning** | Adaptive AFC (automatic frequency control) |

| Antenna | | | |
|---|---|---|---|
| **Type** | Parabolic, pencil beam, splash plate | | |
| **Diameter** | **1.3 m** | **1.9 m** | **2.4 m** |
| **Beam width (H/V)** | <2° | <1.3° | <1° |
| **Side lobes** | -23 dB within 10° | -23 dB within 10° | -25 dB within 10° |
| **Gain** | 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 (3 channels) |
| **Moments** | Z, V, W, SNR, CCR, SQI, ZDR, PhiDP, RhoHV, KDP, ... |
| **Processed bins** | >4000 (max. 8000) |
| **Clutter correction** | DFT, PPT, CMAP, 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** | 25 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) |