Doppler Weather Radar Systems

DWSR-5001C

The DWSR-5001C system is a powerful C-Band (5 cm) Magnetron based Doppler weather surveillance radar. This EEC exclusive design meets the demands of the world's most discriminating customers. The system boasts exclusive Magnetron and modulator technology unavailable from any other radar manufacturer in the world.

More than three decades of technical and manufacturing expertise have gone into making the DWSR-5001C EEC's latest innovative, industry-leading radar system. It is built for continuous 24/7 unattended operation anywhere in the world and is available in fixed-site and transportable configurations.

The design concept of the DWSR-5001C emphasizes precision, stability, reliability and value utilizing industrial grade modular hardware, while interfacing to a wide range of software based control systems. Durable construction and inherent redundancy of critical components ensures dependable remote operation and provides maximum flexibility in meeting the needs of demanding users.

The DWSR-5001C transmitter provides a 500 kW peak RF power pulse with durations of 0.4, 1.0, 2.0 and 3.0 microseconds, providing excellent weather detection at the maximum range in all modes. The transmitter radiates in staggered PRF modes at 3:2, 4:3 and 5:4 ratios allowing dual PRF sampling by the radar signal processor to produce unambiguous velocity values of 64 m/s in short pulse...the best in the industry.

DWSR-5001C System Advantages

- Exclusive 500 kW Magnetron technology
- Advanced radar motion control system provides better spatial resolution resulting in more accurate data
- Sophisticated BITE with user-defineable system monitoring capability
- Built for unattended remote operations 24/7
- Optional automated preventative maintenance features
- Industry leading 16-bit signal processor
- Patented clutter suppression technology >46 dB
- Redundant high-voltage power supply
- Solid State modulator
- SIDPOL™ option available
- Flexible configuration options that maximize available bandwidth on any standard TCP/IP network

Specifications

DWSR-5001C

SYSTEM	DWSR-5001C
Operating Frequency	5400-5900 MHz
Pulse Width	0.2 – 3.0 µsec
Range Resolution @ PW	as low as 30m
Pulse Repetition Frequency	200-2400 Hz, user selectable
Range (Unambiguous) @ PW	up to 480 km
Typical Operational Range	240 km
Velocity (Unambiguous) @ Single PRF (1180 PPS – 5600 MHz)	up to 16 m/s (31 knots)
Velocity (Unambiguous) @ Dual PRF 5:4 (1180 PPS – 5600 MHz)	64 m/s (123 knots) or more
Sensitivity – Reflectivity	as low as -4.0 dBz
Sensitivity – Rain Rate	as low as 0.01 mm/h
Clutter Suppression Capability	≥ 46 dB (EEC patented technology)
Data Output	UZ, Z, V, SW, ϕDP, KDP, ZDR, ρHV
ANTENNA / PEDESTAL	
Type	Parabolic, Prime Focus Reflector
Reflector Diameter	4.2m (typical) – other sizes available
Gain – minimum	> 45.0 dB
Half Power Beam Width (typical)	0.95°
Polarization	Linear Horizontal / Vertical Orthogonal Feed Horn
Angle Span (Azimuth)	0 to 360° continuous
Angle Span (Elevation)	-2 to +90°
Angular Positioning Accuracy	± 0.1°
Scanning Speed	0 (stopped) to 6 rpm
RADOME	
Size	5.5 meter (typical)
Type	Sandwich Foam Core Stealth Radome
Transmission Loss (one way)	< 2.0 dB or better
TRANSMITTER	
Type	High-Power Coaxial Magnetron
Peak Power	500 kW typical (250 kW per channel)
RECEIVER	
Type	Superheterodyne, Single Down Conversion with Image Reject Mixing
Minimum Discernable Signal	as low as -114 dBm
Noise Figure	< 2.5 dB
Linear Dynamic Range	up to 105 dB
DIGITAL RECEIVER / SIGNAL PROCESSOR	
Type	Modular, multi-channel Digital Receiver, Signal Processor
Intermediate Frequency	60 MHz
IF Sampling	Multi-channel, up to 70 MHz, 16 bits each per polarization
Maximum No. of Processed Range Bins	up to 4096
Minimum Processing Resolution	as low as 30m
Processing Mode	Pulse Pair or Discrete Fourier Transform (DFT/FFT)
Clutter Filters	up to 16 Time Domain, > 16 Frequency Domain
MAINTENANCE SOFTWARE	EDGE 5.3 or better
Computer System	Commercial Off-the-Shelf PC, dual or quad core processor, 2.8 GHz, 4GB RAM
Operating System	Linux
METEOROLOGICAL USER SOFTWARE	EDGE 5.3 or better
Computer System	Commercial Off-the-Shelf PC, dual or quad core processor, 3.0 GHz, 4GB RAM
Operating System	Linux
Standard Products	PPI, RHI, BASE, CAPPI, Pseudo-CAPPI, HMAX, LRA, X-SEC, VIL, ETOPS, EBASE, ACM, VAD, VVP, VVP2, UWT
Optional Product Groups	Severe Weather (Forecasting + Warning), Hydrological, Aviation, Dual Polarization

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