JMA-254 Series

JRC

S-Band Doppler Radar Rainfall Sensor with Solid State Technology

RAINWATCHER

Features

- S-Band Doppler function with fully solid state technology
- High accuracy rainfall sensor
- Short time starts up, No tuning and pre-heating
- Low power consumption
- Higher reliability and performance and low maintenance cost
- J-BIRDS™ Software Package provides optimized observation data for easier meteorological analysis
- Open File Format

System Configuration

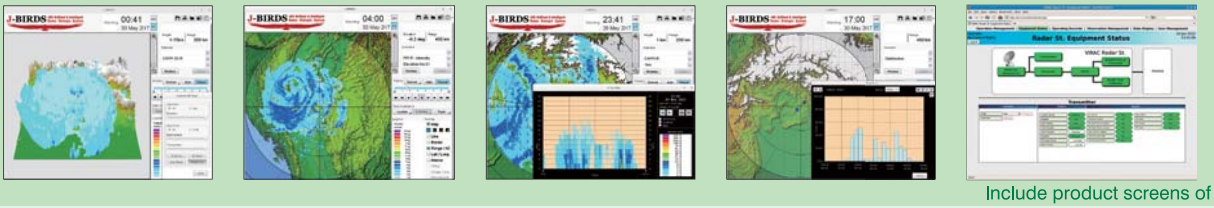
Antenna & Radome

Transmitter

Receiver/Signal Processor
Antenna Controller

LAN

Radar Workstation



Include product screens of J-BIRDS™

Basic Functions

- Minimum observation mesh: 500m mesh
- Observation radius: 450 km

System Applications

- Rainfall Observation and Measurement System
- Landslide Monitoring System
- Dam Operation and Control System
- Water Resource Management System

JRC Japan Radio Co., Ltd.

JMA-254 Series S-Band Doppler Radar Rainfall Sensor RAINWATCHER

SYSTEM	
Type	Doppler radar with solid state technology
Operating Frequency	2.7 - 2.9 GHz
Pulse Width	Short (P0N): 1.0 / 2.0 µsec Long (Q0N): 50 /100 µsec
Pulse Repetition Frequency (PRF)	250 Hz to 1,200 Hz
Staggered PRF Ratio	None, 3:2, 4:3 or 5:4 (selectable)
Maximum Doppler Velocity	19, 38, 57 or 76 m/s (depend on PRF)
Observation Range	450 km @ 23 dBz
T/R Duplexer	Circulator with TR Limiter
Basic Data Output	Received Signal Power (Pr) Radar Reflectivity (Z_{hh}) Doppler Velocity (V_h) Spectral Width (W_h)
Operating Temperature	Outdoor: -20 °C to +50 °C Indoor: +5 °C to +35 °C
Operating Relative Humidity (Non-dew condensation)	Outdoor: ≤ 95 % @ < 40 °C, ≤ 75 % @ ≥ 40 °C Indoor: 20 % to 80 % @ 25 °C
Power Consumption	≤ 15 kVA, @ 200-230 VAC, 50/60 Hz
ANTENNA / PEDESTA	
Type	Parabolic, prime-focus reflector
Reflector Diameter	Approx. 5 m (=16.4 feet)
Antenna Gain	≥ 39 dB
Half Power Beam Width	≤ 1.7 °
Polarization	Linear, Horizontal
Side Lobes	≤ -25 dB
VSWR	≤ 1.4
Pedestal Structure	Elevation over Azimuth
Angle Span	AZ: Full 360 ° EL: -2 to +90 °(0.1 ° step)
Angular Positioning Accuracy	≤ 0.1 °
Scanning Speed	AZ: 0 - 6 rpm (0.1 rpm step) EL: 0 - 2 rpm (0.1 rpm step)
Angle Resolution	≤ 0.1 ° (angle bits: ≥ 12 bits)
Angle Data Accuracy	≤ +/-0.1 °
Weight	Approx. 2 t
Safety Devices	Safety switches

RADOME	
Type	Sandwich, fiberglass with polyurethane foam core
Size	Approx. 8.2 m (=27 feet) diameter
Weight	Approx. 2 t (without Base Rings)
Transmission Loss	≤ 0.5 dB (one way, dry surface)
Beam Shift	≤ +/-0.1 °
Survival Wind Speed	≤ 125 m/s (gust)
Lightning Protection	Lightning rod
TRANSMITTER / RECEIVER	
Transmitter Type	Solid State Power Amplifier - no transmitting tube
Peak Power	10 kW
Duty Cycle	≤ 10 %
Occupied Frequency Bandwidth	≤ 9 MHz, V0N (P0N+Q0N)
Off-center Attenuation	≥ 60 dB @ +/-10 MHz
Transmission Blanking	AZ and EL
Receiver Type	Double Superheterodyne with Image reject mixing
Minimum Discernible Signal	≤ -110 dBm @ 1.0 µsec pulse width
Noise Figure	≤ 2.5 dB
Linear Dynamic Range	≥ 110 dB with STC
IF DIGITAL RECEIVER/SIGNAL PROCESSOR	
Type	Multi-channel Digital Receiver & Signal Processor
Intermediate Frequency	60 MHz
IF Sampling	up to 96 MHz
A/D Resolution	16 bits each per polarization
Pulse Compression Ratio	< 150
Maximum No. of Processed Range Bins	up to 2,500
Minimum Processing Resolution	25 m
Processing Mode	FFT
Clutter Suppression Capability	≥ 40 dB
Various Processing Functions	Range Correction, Velocity De-aliasing
2nd Trip Echo suppression	Random Phase
Interference rejection	Multi Pulse Comparing
RADAR WORKSTATION	
Computer System	Commercial Off-the-Shelf PC, Core i5 or higher spec.
Operating System	Linux
Application Software	- Radar control, monitoring and observation schedule - Quick graphical overview of the status of the radar units - Presentation of BITE - Calibration with sun tracking - Radar supervise on remote Web image - Support of single and multi-radar networks

Center System for Master Station (not included in JMA-254 series, * =option)			
Computer System	Commercial Off-the-Shelf PC, Core i5 or higher spec.		
Operating System	Linux		
Application Software	J-BIRDS™ Software Package		
Remote Radar Workstation	Same function as the Radar Workstation on radar site		

Radar Product Server	- Multi-windows showing different products
	- Customizable geographic play maps and text annotation
	- Data zooming, animation & screenshot utility
	- Radar Volume Corrections:*
	  - Sea Clutter Detection & Correction
	  - Bright Band Correction
	  - Vertical Profile Correction
	  - Occultation Correction
	- Support Data Type: NetCDF, BUFR, HDF5, XML, ASCII, UF, NEXRAD Level 2 (Selectable)
	- Automatic Output Data: GIF, PNG, JPG, NetCDF (Selectable)*
	- Data Transfer Type: FTP
	- Graphical Indication by Region, Basin or Route *
		- Standard Meteorological Products	- PPI, CAPPI & RTI
			- Echo Top, Echo Base & Echo Thickness
			- Vertical Maximum Radar Reflectivity
			- Arbitrary Vertical Cross Section
			- Layer Reflectivity Average *
			- Column Maximum with Horizontal Maximum *

	- Extended Meteorological Products	- Surface Rainfall Intensity (Base Reflectivity) - Precipitation Intensity by R-Z Relation - VAD, VVP, Wind Direction and Wind Speed - Wind Shear Detection & Analysis - Multi-radar Data Composite
	- Hydrological Products	- Vertically Integrated Liquid (VIL) - Arbitrary N-hours Rainfall Accumulation by R-Z Relation - Point Rainfall Total and Rainfall Intensity Histogram
	- Forecasting and Warning Products	- Rain Tracking & Centroid Tracking Support for Forecasting - Strong Rainfall and Wind Warning of Specified District with text output
	- Sensor & Data Integration	- Data Integration with 3rd Party Weather Radars, Rain Gauges, Satellites and etc.* - Correction with Ground Rain Gauge *
Data Archival and Retrieval Server	- Archive radar data temporarily on a PC hard disk by appropriate method - Transfer to external media such as Optical Disk - Archival data: Raw data, Product Data, System Log and BITE Messages - Open data structure and the file format of archived raw and products data - Archive and retrieve data: HDF5 or BUFR priority over other formats		

• Specifications may be subject to change without notice.

For further information, contact:

JRC Since1915 Japan Radio Co., Ltd.
URL http://www.jrc.co.jp/eng/

Main Office: NAKANO CENTRAL PARK EAST
10-1, Nakano 4-chome, Nakano-ku, Tokyo
164-8570, Japan
Telephone: +81-3-6832-0981
Facsimile: +81-3-6832-1726

Overseas Branch Office : Manila
Liaison Offices : Hanoi, New York
Overseas Subsidiaries : Rio de Janeiro, Jakarta

ISO9001, ISO14001 Certified