

 Radiometer Physics A Rohde & Schwarz Company	RPG-FMCW-94 Cloud Radar (Installation Manual)	Code:	RPG-FMCW-IM
		Date:	28.06.2022
		Issue:	01/08
		Pages:	46

4 Instrument Specifications

Parameter	Specification
Frequency	94 GHz ($\lambda=3.2$ mm), bandwidth up to ± 100 MHz
Transmitter Power	1.5 W (solid state amplifier)
Antenna Type	Bi-static Cassegrain with 500 mm aperture
Antenna Gain	50.1 $\pm$ 0.3 dB
Beam Width	0.56 $\pm$ 0.03° FWHM
Polarisation	V (optional V / H)
Passive Channel Noise Figure	4.5 dB
Dynamic Range (Sensitivity)	-46 to +20 dBZ @ 5km distance / 30 m resolution / 10 s sampling time
Ranging	50 m to 12 km typical, 18 km maximum
Vertical Resolution	15-30 m (down to 4 m for a limited distance range)
Calibration (automatic)	Transmitter power monitoring and receiver Dicke switching for gain drift compensation (radar and passive channels)
Calibration (maintenance)	Liquid nitrogen receiver calibration
End-to-end Calibration Verification	(1) Comparison with a disdrometer (2) Comparison with a calibrated radar
Calibration Accuracy	± 1 dB
ADC Sampling Rate	11.45 MHz
IF Range	0.3 to 3.7 MHz
Sampling rate (full profiles)	Adjustable: typically ≥ 1 second
Doppler Resolution	± 4 cm/s or better
Doppler Range	± 9 m/s max (0-2500m), ± 4.2 m/s above
Chirp Variations	3 typical, 5 possible, re-programmable
Passive Channels	89 GHz for integral liquid water (LWP) detection (2 GHz BW)
Control connection	TCP/IP connectivity via fiber optical data cable
Operation software	Real time visualization, real time data extraction, real time control (adaptive observation modes depending on context), data archiving, radar can be operated in stand-alone mode
Data products	Raw spectra, Spectral polarimetric parameters, Reflectivity, Mean Doppler velocity, Doppler width, Skewness, Kurtosis, Differential reflectivity, Differential phase shift, Correlation coefficient.
Data Formats	proprietary binary netCDF (conformity with CF convention)

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Mitigation system for rain/fog/dew	Strong dew blower (4000 m ³ /h), radomes with hydrophobic coating
Additional sensors	Automatic weather station
Scanning (optional)	Scanner unit for full sky scanning capability with maximum angular velocity of 5 °/sec in azimuth and elevation
Weight	Radar main body: 90 kg Blower: 90 kg Table: 30 kg Air conductors: 25 kg
Maximum Power Consumption	Radar 700 W, Blower 750 W, Scanner: 800 W, AC 230 V 3~ 16A 50-60 Hz