METEOR 700C AND 735C

METEOROLOGY
Gematronik Weather Radar Systems

METEOR 700C AND 735C WEATHER RADAR

The METEOR 700C and 735C systems set the benchmark in weather radar technology and cost effectiveness. These systems are particularly suitable for meteorological services covering moderate distances and precipitation conditions in mid-latitude regions like Europe, North-America and northern Asia.

The METEOR 700C and 735C combine cutting-edge technologies with straight-forward and reliable implementation. Both METEOR C-Band systems are supplied with GDRX® 5 Digital Receiver & Signal Processor and Rainbow® 5, the most up-to-date radar software package for meteorological users. They ensure optimum data quality for the accurate measurement of rain rates, precise detection of severe weather phenomena as well as tracking and nowcasting of such events.

The METEOR 700C baseline configuration includes a 250 KW transmitter. Alternatively, the METEOR 735C boosts the peak power to more than 400 KW. It is driven by a solid-state modulator with graceful degradation providing fault-tolerant operation and higher system availability.

Both the METEOR 700C and METEOR 735C are available with single or dual polarization (DP). The dual polarization option enhances the measurement of precipitation intensity and makes way for the categorization of different types of hydrometeor like drizzle, rain, hail and snow. Thanks to its high-powered transmitter, the METEOR 735C operates in simultaneous DP mode with almost no loss of sensitivity compared to conventional 250 KW single-polarized systems.

METEOR PRODUCT LINE ADVANTAGE

- Optimized for Rainbow® 5, the most advanced meteorological software available on the market today
- Cutting-edge 16 bit signal processor GDRX® 5
- Dynrex dual channel receiver technology for extended dynamic range
- Unattended remote operation 24 hours a day, 365 days a year
- Long-life, state-of-the-art technologies
- Full remote surveillance and control capability based on Ravis® maintenance tool
- Comprehensive BITE system
- Full network capability in heterogeneous networks
- Maximum use of COTS components (e.g. PC-based signal processing)
- Simultaneous Dual Polarization Capability available in conventional and receiver over elevation configurations

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METEOR 700C / 735C SYSTEM ADVANTAGE

- High-end DWR with unparalleled price-performance ratio
- Proven magnetron technology
- Graceful degradation modulator
- EU RTTE Directive compliance due to proprietary high-power filter technology
- Minimization of lifecycle costs due to high reliability
- Improved range resolution and scanning speed through multi-trip echo recovery
- Optimized for high sensitivity in the medium to long range
- Simultaneous Dual Polarization Capability available with both systems, and with a minimum loss of sensitivity due to increased transmitter peak power in METEOR 735C

TECHNICAL DATA

SYSTEM	METEOR 700C, METEOR 735C
Mode	Doppler, Dual-Polarization
Operating Frequency Range	5430 – 5750 MHz (C-Band)
Pulse Width Range	0.5 – 3.5 µs
Pulse Widths	300, freely selectable in increments of 10 ns
Pulse Repetition Frequency [PRF]	250 – 2400 Hz, user selectable
Typical Operational Range /Technical Range	200 km / 600 km
Maximum Doppler Velocity	± 128 m/s
System Phase Stability	≤ 0.15°
ANTENNA	
Type	Parabolic, prime-focus reflector with elevation-over-azimuth positioner
Reflector Diameter	4.1 m
Minimum Gain	≥ 45 dBi @ 5600 MHz
Maximum Half Power Beam Width	≤ 1.0°
Step Response Time for 2° step ± 0.1°	≤ 1.0 s
Polarization	Horizontal / Horizontal and vertical
Angle Span	0° – 360° continuous in azimuth, -2° – +182° in elevation
Angular Positioning Accuracy	± 0.05°
Maximum AZ Scanning Speed	8 rpm
RADOME	
Size	6.5 m
Type	Sandwich, fiberglass with foam core; quasi-random panel cut
Transmission Losses - one-way, dry surface	0.2 dB
TRANSMITTER	
Type	Coaxial Magnetron with solid state, IGBT-switched modulator
Peak Power	250 KW (METEOR 700C), 400 KW (METEOR 735C)

RECEIVER	
Type	Superheterodyne, dual downconversion
Noise Figure (Total Receiver)	≤ 2.0 dB
Linear Dynamic Range @2.0 µs	≥ 118 dB
GDRX® 5 DIGITAL RECEIVER & SIGNAL PROCESSOR	
Type	Modular, multi-channel digital receiver, connected to commercial-off-the-shelf industrial PC as signal processor
Intermediate Frequency [IF]	60 MHz
IF Sampling	16 bit, 180 MHz, 6 channels
Maximum Number of Processed Range Bins	10.000 per polarization @ fully activated algorithm chain
Minimum Processing Resolution	15 m
Processing Mode	PPP, FFT/DFT, Trip recovery and filtering
Clutter Filters	IIR, DFT linear or GIP (Gaussian iterative) interpolation
Matched Filter	Dynamic pulse-to-pulse, TNC
RAVIS® MAINTENANCE SOFTWARE	
Recommended Computer Platform	Commercial Off-the-Shelf Notebook
Operating System	Linux or Windows
RAINBOW® 5 METEOROLOGICAL SOFTWARE	
Recommended Computer Platform	Commercial Off-the-Shelf PC
Operating System	Linux or Windows
Standard Radar Meteorological Products	PPI, MPPI, RHI, CAPPI, Pseudo-CAPPI, MCAPPI, MAX, VCUT, MVCUT, EHT
Optional Product Groups	Hydrological, Aviation, Shear, Short-Term Forecasting, Phenomena Detection, Dual-Polarization, Pre- and Post-Processing, Warning

standard values, not an absolute limitation

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METEOR 1700C

METEOROLOGY
Gematronik Weather Radar Systems

METEOR 1700C WEATHER RADAR

Based on C-Band klystron technology, the METEOR 1700C offers the sophisticated weather detection and warning capabilities required in clutter-pollute environments. Its technological superiority is the result of a fully coherent system design, offering optimum detection capability with maximum clutter suppression.

The METEOR 1700C is streamlined for medium range applications and close to ground observations that are more impacted by ground clutter such as airport terminal usage and the specific needs of aeronautical users. In combination with Rainbow® 5, the most up-to-date software package available to meteorological users, the METEOR 1700C is optimized for the detection of hazardous weather phenomena including micro bursts, wind shear, and gust fronts.

METEOR PRODUCT LINE ADVANTAGE

- Optimized for Rainbow® 5, the most advanced meteorological software available on the market today
- Cutting-edge 16 bit signal processor GDRX® 5
- Dynrex receiver technology
- Unattended remote operation 24 hours a day, 365 days a year
- Long-life, state-of-the-art technology
- Full remote surveillance and control capability based on Ravis® maintenance tool
- Comprehensive BITE system
- Full network capability in heterogeneous networks
- Maximum use of COTS components (e.g. PC-based signal processing)
- Simultaneous dual polarization capability available in conventional and receiver-over-elevation configurations

METEOR 1700C SYSTEM ADVANTAGES

- Cutting-edge klystron technology
- Improvement of up to 15 dB in stability and clutter suppression compared to coaxial magnetron systems
- Improved data quality, scanning speed and range resolution through frequency agility and multi-trip echo recovery

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- Less interference with other radio transmitters due to less occupied RF bandwidth
- Wide dynamic range receiver, based on Dynrex dual-channel implementation
- C-Band advantage: Optimized for high sensitivity in the medium range as required by aviation users

TECHNICAL DATA

SYSTEM	METEOR 1700C
Mode	Doppler, Dual-Polarization
Operating Frequency Range	5600 – 5650 MHz (C-Band)
Pulse Width Range	0.4 – 4.5 µs
Pulse Widths	410, freely selectable in increments of 10 ns
Pulse Repetition Frequency [PRF]	250 – 2000 Hz, user selectable
Typical Operational Range /Technical Range	200 km / 600 km
Maximum Doppler Velocity	± 107 m/s
System Phase Stability	≤ 0.05°
ANTENNA	
Type	Parabolic, prime-focus reflector with elevation-over-azimuth positioner
Reflector Diameter	4.1 m
Minimum Gain	≥ 45 dBi @ 5600MHz
Maximum Half Power Beam Width	≤ 1.0°
Step Response Time for 2° step ± 0.1°	≤ 1.0 s
Polarization	Horizontal / Horizontal and vertical
Angle Span	0° – 360° continuous in azimuth, -2° – +182° in elevation
Angular Positioning Accuracy	± 0.05°
Maximum AZ Scanning Speed	8 rpm
RADOME	
Size	6.5 m
Type	Sandwich, fiberglass with foam core; quasi-random panel cut
Transmission Losses - one-way, dry surface	0.2 dB
TRANSMITTER	
Type	Klystron with solid state, IGBT-switched modulator
Peak Power	250 KW

RECEIVER	
Type	Superheterodyne, dual downconversion
Noise Figure (Total Receiver)	≤ 1.5 dB
Linear Dynamic Range @2.0 µs	≥ 118 dB
GDRX® 5 DIGITAL RECEIVER & SIGNAL PROCESSOR	
Type	Modular, multi-channel digital receiver, connected to commercial-off-the-shelf industrial PC as signal processor
Intermediate Frequency [IF]	60 MHz
IF Sampling	16 bit, 180 MHz, 6 channels
Maximum Number of Processed Range Bins	10.000 per polarization @ fully activated algorithm chain
Minimum Processing Resolution	15 m
Processing Mode	PPP, FFT/DFT, Trip recovery and filtering
Clutter Filters	IIR, DFT linear or GIP (Gaussian iterative) interpolation
Matched Filter	Dynamic pulse-to-pulse, TNC
RAVIS® MAINTENANCE SOFTWARE	
Recommended Computer Platform	Commercial Off-the-Shelf Notebook
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RAINBOW® 5 METEOROLOGICAL SOFTWARE	
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