



CYRENTIS

CR-FX18

X-Band Long-Range FMCW Low-Altitude Surveillance Radar

Technical Specification



Image for reference only. Finish color can be customized on request, e.g. desert tan, tactical gray, or camouflage patterns.



Version	Date	Description
V1.0	2025-10-18	Initial version.
V2.0	2026-03-16	Specifications updated to the latest production configuration; packing list and logistics dimensions added.
V3.1	2026-05-20	Product images and document structure revised; maintenance, transportation and service sections added; minor editorial corrections.



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1 Product Overview

The CR-FX18 low-altitude surveillance radar is a three-dimensional radar system capable of integrated air and ground detection. It can quickly detect and continuously track targets such as drones, aircraft and birds, while simultaneously monitoring ground targets like personnel and vehicles, as well as water surface targets such as vessels.

Utilizing simultaneous multi-beam technology and high-performance signal processing techniques, the radar rapidly and accurately acquires target position and motion states even in complex, dense multi-target environments. The radar employs a continuous wave operation mode with low transmission power, significantly enhancing its resistance to electromagnetic interception compared with pulse-based systems.

Within a cooperative detection system, the radar can serve as the core sensing unit, providing high-precision target data to other sensors (such as electro-optical devices and bird dispersal equipment) to achieve precise guidance.

This radar is suitable for widespread application in various fields including vital area protection, the low-altitude economy, airport bird detection, air traffic control, and border/coastal defense.



2 Main Functions

Detection & Coverage

- Mechanical azimuth scanning combined with elevation Digital Beam Forming (DBF) achieves extensive coverage in azimuth and elevation;
- A high-performance signal processor enables real-time detection and tracking of multiple targets across the entire field of view, capably handling large-area, multi-target complex scenarios;
- Advanced signal processing algorithms and system hardware architecture deliver outstanding accuracy in distance, speed, azimuth and altitude measurements, providing stable and precise perception data for command decision-making and target tracking/countermeasures.

Tracking & Recognition

- Under high refresh rate conditions with advanced tracking filter algorithms, the radar significantly enhances its tracking capability for high-speed, highly maneuverable targets;
- Sophisticated clutter suppression effectively extracts weak target signals in challenging electromagnetic environments characterized by strong ground clutter or weather clutter, while maintaining an extremely low false alarm probability;
- With extremely high visibility under clutter, the radar continuously and stably tracks ultra-low-altitude moving targets in the clutter environment of urban buildings.

Safety & Low Interceptability

- The continuous wave working system keeps transmission power at a low level, effectively enhancing operational safety for nearby equipment and personnel;
- Compared with pulse radar, the risk of electromagnetic interception is greatly reduced, and the anti-interference and concealment performance is more outstanding.

Deployment & Maintenance

- An intelligent human-machine interface design makes the radar quick and easy to learn;
- The lightweight, modular structural design enables rapid deployment and retraction, supporting high-mobility operations.



3 Technical Specifications

3.1 Basic Performance & Accuracy

Item	Parameter
Frequency band	X band (9.2GHz ~ 9.8GHz)
Operating mode	Azimuth mechanical scanning + elevation DBF (CW)
Detection range	20km
Detection performance	Small UAV (RCS 0.01m ² , DJI Phantom 4): ≥10km; medium UAV (RCS 1m ²): ≥20km; car / helicopter (RCS 5m ²): ≥20km
Maximum detection altitude	3000m
Blind zone	50m
Coverage	Azimuth 360°, elevation -5° ~ +60°
Velocity measurement range	1m/s ~ 150m/s
Measurement accuracy (RMS)	Range ≤5m, velocity ≤0.5m/s, azimuth ≤0.3°, elevation ≤0.3°
Refresh rate	2s (30rpm, standard); 1s (60rpm); 3s (20rpm); configurable
Simultaneous tracking capacity	≥500 targets

3.2 Electrical Interface

Item	Parameter
Power supply	DC 36-52V (supplied with AC220V-DC48V adapter)
Power consumption	≤500W
Communication	Ethernet (circular aviation connector)

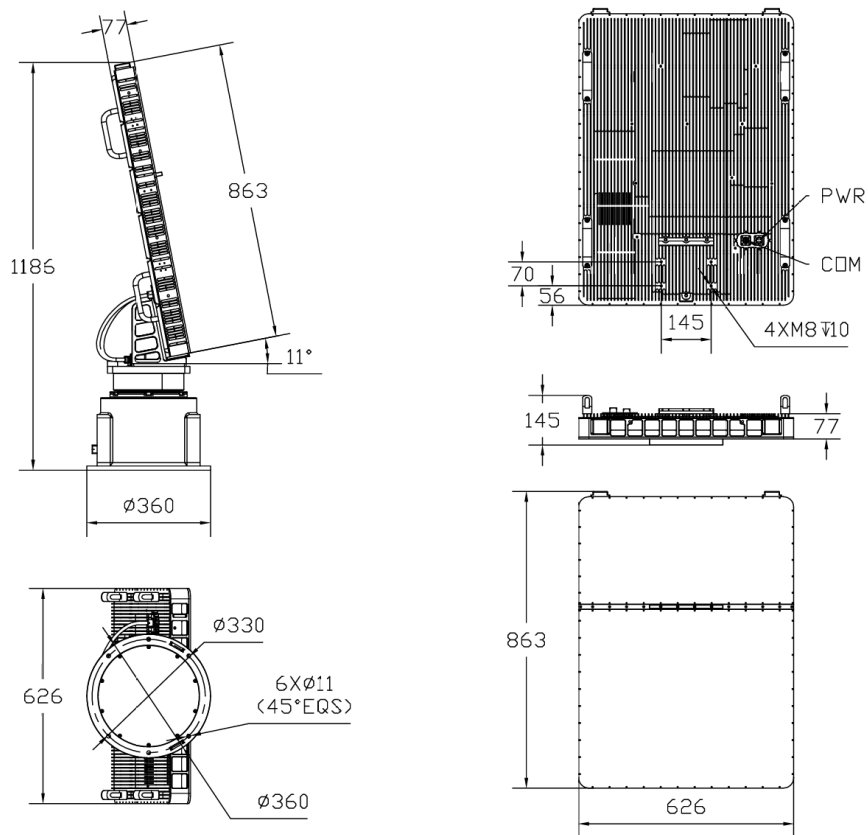
3.3 Physical & Environmental

Item	Parameter
Weight	≤55kg (host 28kg + turntable 27kg)
Operating temperature	-40°C ~ +55°C
Operating humidity	≤90%
Protection rating	IP66

The above specifications are typical nominal values; actual values are subject to the product contract and technical agreement.



4 Equipment Dimensions



CR-FX18 structural and installation dimensions (unit: mm)



5 Delivery List

No.	Item	Unit	Qty
1	Radar host unit	Unit	1
2	Radar pedestal	Unit	1
3	Tripod	Unit	1
4	Radar host unit transport case	Unit	1
5	Radar turntable transport case	Unit	1
6	Power adapter (AC220V to DC48V, 15m cable)	PC	1
7	Communication cable (radar to display & control terminal, 15m)	PC	1
8	Assembly tools & screws (host, pedestal, tripod)	Set	1
9	Documentation (user manual etc., electronic)	Copy	1



6 Maintenance

6.1 Maintenance Schedule

The maintenance schedule may be determined according to actual service conditions, and shall in principle meet the following requirements:

- a) Perform maintenance once after transportation and before use;
- b) For radars in storage, perform maintenance every 3 months.

6.2 Maintenance Content

- a) Check the equipment appearance and completeness; check the installation for rust or cracks, installation firmness, and potential safety hazards of the installation platform;
- b) Power on and run the equipment for testing to ensure there is no abnormal radar alarm;
- c) Wipe dust and stains off the housings of the radar array face, servo turntable and power module with a dry, clean cloth;
- d) After the turntable has actually operated for 2 years, please contact the manufacturer for maintenance and replacement.



7 Transportation and Storage

7.1 Transportation Requirements

- The equipment can be transported by road, railway or air. Shock-proof packaging in dedicated packing cases is required during transportation.

7.2 Storage Requirements

7.2.1 Storage Environment

Packaged products shall be stored under the following environmental conditions to ensure their service life:

- a) Temperature
- b) Relative humidity
- c) The warehouse shall be free of acids, alkalis and other corrosive gases harmful to the equipment; during storage there shall be no strong mechanical vibration, shock or strong magnetic field.

7.2.2 Storage Life

- Unless otherwise specified in the contract, the storage period of this product shall not exceed five years from the date of receipt by the ordering party.



8 After-Sales Service

- a) The warranty period is 1 year. During this period, if the product is damaged or fails to work normally due to quality problems, the manufacturer is obliged to repair or replace it free of charge;
- b) The company responds to after-sales service requests from purchasing units within 12 hours.