MDR Specification

Motion Detection Radar

DMT Security Radar Solutions

October 2018

SPECIFICATIONS

The MDR is a low-cost Doppler radar for security applications. Unlike other security radars, the MDR does not spin. It is 100% solid-state with no moving parts.

A unique feature of the MDR is its ability to monitor each beam rapidly.

The update rate of the entire protected area (from all beams) can be 10 times per second, which is over 10 times the speed of the fastest rotating radars.

This makes the MDR perfect for perimeter and corridor security applications, such as tank farms and oil terminals, where fast updates are required.

MDR SPECIFICATION

MDR = Motion Detection Radar
Manufacturer = DMT, LLC (Detection Monitoring Technologies)
Warranty = 2-year Limited Warranty

Figure 1. This is the MDR on a Rohn 45 G Tower.

Description

The MDR is a low-cost Doppler radar for security applications. Unlike other security radars, the MDR does not spin. It is 100% solid-state with no moving parts. It comes standard with:

- 3 discrete beams of energy and one 360 degree beam, or
- 4 discrete beams of energy, or
- 8 discreate beams of energy for 360-degrees of coverage.

A unique feature of the MDR is its ability to monitor each beam rapidly. The update rate of the entire protected area (from all beams) can be 10 times per second, which is over 10 times the speed of the fastest rotating radars. This makes the MDR perfect for perimeter and corridor security applications, such as tank farms and oil terminals, where fast updates are required.

For waterside installations, it differs from other marine radars in that it does not use:

- high-power magnetrons (which are not safe for humans long-term exposure, and fail regularly in less than 6 months when used 24/7);
- rotary joints (which regularly fail in less than 1 year when used 24/7)
- motors or belts, which are also high failure points for many radars.

The MDR uses solid-state power amplifiers and electronically switches between the antennas. The amplifiers and solid-state electronics make this radar exceed a 5-year Mean-Time-Between-Failures (MTBF), which is longer than any other radar on the market. In addition, the MDR requires no maintenance for 5 years. After 5 years, it is recommended that the radar be inspected. Marine radars, when used 24/7 in security, require maintenance every 3 to 6 months.

For land installations, the ability of Doppler radar to remove sources of potential alarms due to wind-driven events is unique. Wind blowing tall grass and shrubs are constant headaches for competitive technologies. Doppler also allows for robust filtering of fans, swaying trees and telephone poles and many other phenomena. Marine radars cannot be used for land coverage, and the MDR Doppler ability makes it (and its rotating cousin, the IDAR) the only available radar solution capable of handling land, water, and the shoreline security applications.

The DCPM (DMT Camera and Power Module) completes the system by supplying solid-state AC to DC power conversion, power conditioning and lightning protection, network communication (standard is RJ/45 and multimode fiber), 1-port video server (4-port also available), and solid-state 24 VDC power for cameras. On-off illuminated switches are on the front of the DCPM. Redundant fans on the power supplies permit the operational temperature rated to be -40 to +65 degrees C. Twist-on, weatherproof connectors enable the enclosure to stay outdoors.

Pole and tower mounts are available for the radar. Custom mounts can be provided with details on the installation. The radome comes with or without a mounting hole pattern for other equipment, such as cameras. Adapter plates can be purchased for a wide variety of equipment. Contact DMT for more information.

Sales Information about this product: sales@dmtradar.com, +1-703-291-1524
DMT Corporate Office in USA: 1905 Intermodal Cir, Suite 217, Palmetto, FL, 34221 DMT
Support Offices: Palmetto, FL; Lafayette, LA; Riyadh, Saudi Arabia; Milan, Italy; Perth, Australia

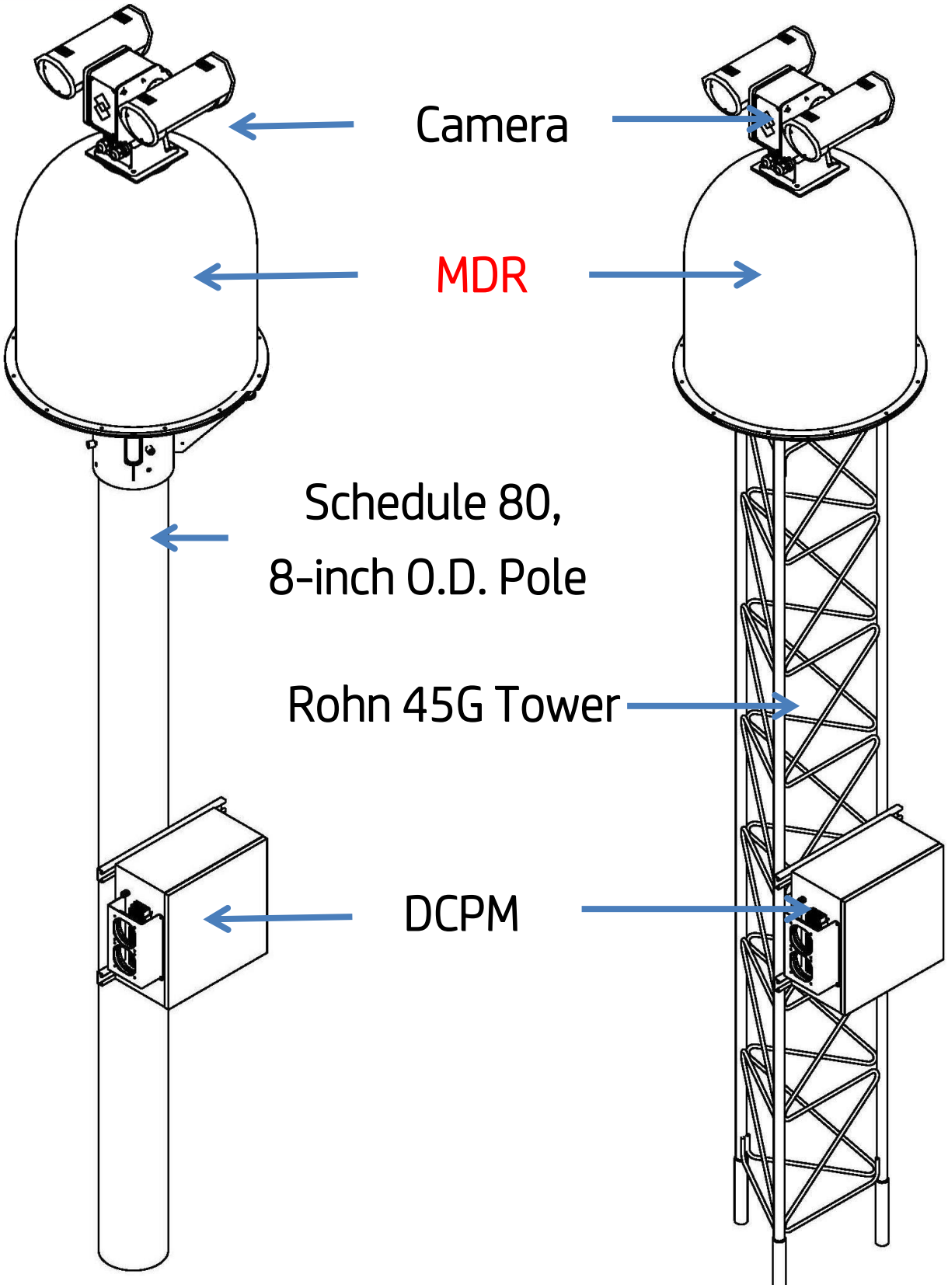

Figure 2. This is the MDR mounted on a pole to the left and a section of Rohn 45G tower to the right.

Sales Information about this product: sales@dmtradar.com, +1-703-291-1524
DMT Corporate Office in USA: 1905 Intermodal Cir, Suite 217, Palmetto, FL, 34221 DMT
Support Offices: Palmetto, FL; Lafayette, LA; Riyadh, Saudi Arabia; Milan, Italy; Perth, Australia

Transmitted Frequency	X-Band, 9.25 GHz
Peak Radiated Power	4-Watts gated (higher power options for longer ranges are available)
Average Power	Maximum 0.4 Watts
Antenna Beamwidth	Two 7 degrees x 7 degrees (azimuth x elevation) antennas, One antenna with 29-degree antenna One 360-degree antenna OR another 28-degree antenna, or another 45-degree antenna
Scanning	The antennas are polled many times a second using electronic switching.
Scan Rate	All 4 antennas are monitored 4 to 10 per second. For 8-antenna model, revisit rate is a minimum 2 times per second, and maximum is about 8 times per second.
Bandwidth	1-5 MHz (selected via dip switches or optionally from radar GUI)
Pulse Repetition Frequency	4 kHz
Range Resolution	1.5 - 6 meters
Range Accuracy	About 3 meters
Maximum Range	Max range that can be set is over 10 km. However, people or small boats are detected to about 1.5 to 2 km's away.
Detection Performance	Approximately 1.5 km for small objects (like humans or kayaks). Longer ranges for cars and boats.
Communications	• TCP/IP connections via RJ/45 connector. • Fiber and wireless available using the DMT DCPM • DMT security protocol and NMEA 0183 formats
Tracking	• Links detections together to form numbered tracks • LAT/LON coordinates provided • Useful for 3rd party trackers
Operating Temperature	-40 to +65 degrees C
Power Requirements	• 24 VDC • AC (autosensing 110/220 V)—requires DMT's DCPM. • Power consumed: 100 Watts
Size	29 W x 29 H inches for 4-antenna models. 8-antenna model is available in 29W x 15H in.
Weight	Radar: 75 lbs. DCPM (AC power, camera & communication module): 60 lbs. (Includes cable weight for up to a 30-foot length). Pole Mounted Bracket: 36 lbs.
Internal Operating System	Windows 7 Embedded
User Interface Operating	Standard Windows Platform running Windows XP, Vista, Windows 7
User Interface Software	Use DMT's Remote Client Interface. Also works with many available maritime interfaces • Opens as a Windows standard software interface • Map, drawing or aerial image/photo overlay of data
Mounting	• Rohn 45G tower mounts • Schedule 80, 8-inch pole mount *Custom mounts are available, but delivery times vary
Radomes	Material: NOMEX with Cardinal coatings to protect against oil, gas, solvents, saltwater, UV, and abrasion. Colors: White, Sand, Green, Gray (default) Radome is attached via stainless steel ¼-inch hardware. ¼-20 threaded hole pattern on top for mounting hardware. Weight limit is 125 lbs.
Connectors:	DMT provides bayonet style connectors that feed power and all signals. • Weatherproof connectors • RJ/45 Connector • Twist-on Power and RJ/45 connector
MTBF:	>5 years.
Required Maintenance:	Occasional radome cleaning.
GPS	Embedded GPS is optional.

Sales Information about this product: sales@dmtradar.com, +1-703-291-1524
DMT Corporate Office in USA: 1905 Intermodal Cir, Suite 217, Palmetto, FL, 34221 DMT
Support Offices: Palmetto, FL; Lafayette, LA; Riyadh, Saudi Arabia; Milan, Italy; Perth, Australia

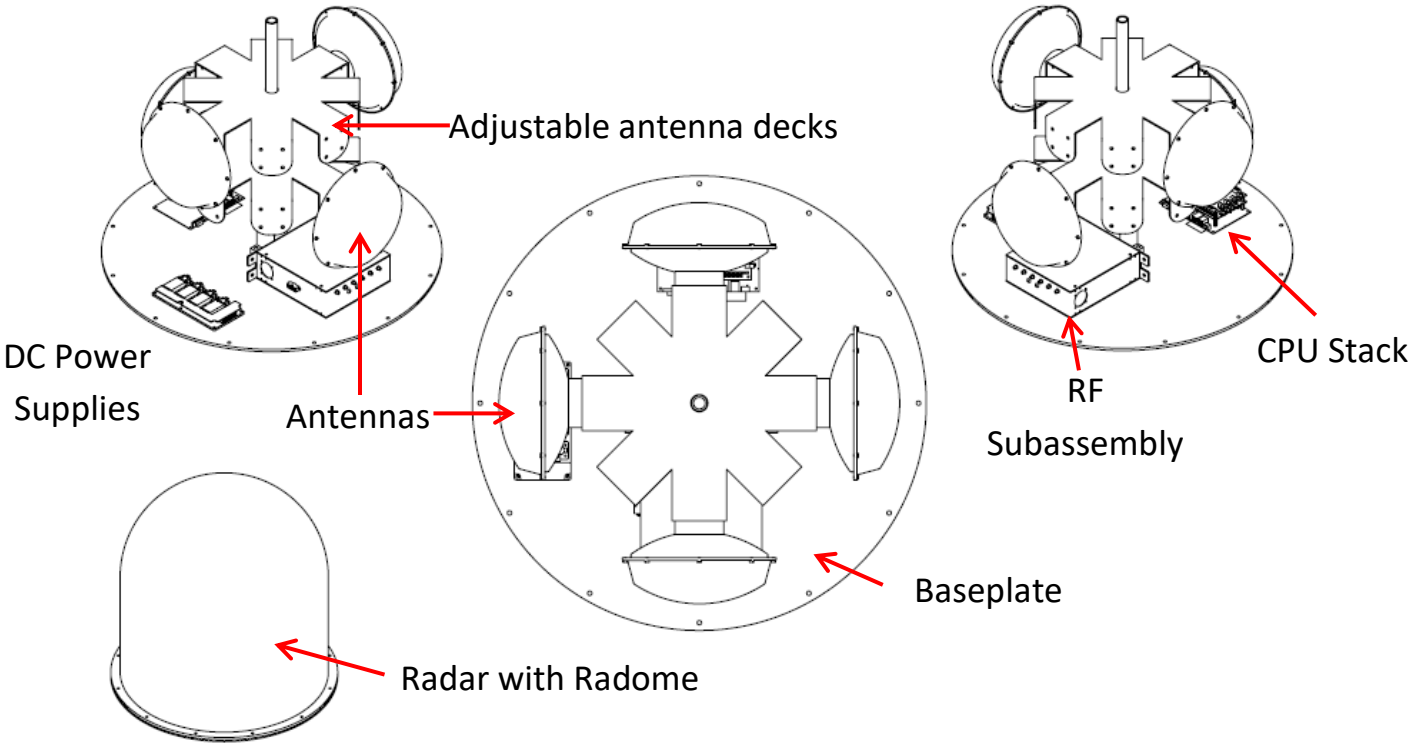

Figure 3. MDR drawings are shown above. Note that there are two floating decks for antennas. These decks can be manually spun to the desired pointing angle and the antennas can be relocated to other positions. Other antennas can be swapped for the ones shown, however, range performance will be impacted for smaller apertures. Also note that the assemblies are modular. If there is an RF failure, the RF module is disconnected and swapped with another. All hardware is field replaceable.

Figure 4. Left -- MDR with radome off. This model has two 7-degree beam antennas, one 360-degree antenna, and one 29-degree antenna. Right picture shows a shipment of MDR's going to protect oil refineries in the Middle East.