

**Features**

- Low cost
- Small and Flat Profile
- Rugged, Reliable Construction
- Low Power Consumption
- High Sensitivity
- Electronically tunable
- Meets FCC Part 15 Requirements

**Description**

The MDU (Motion Detector Unit) is an X-Band microwave transceiver that utilizes the Doppler shift phenomenon to "sense" motion.

The unit, contained in a lightweight plastic housing, features an electronically tunable dielectric resonator stabilized FET oscillator, which provides stable operation over a broad temperature range in either CW or low duty cycle pulse mode and a balanced mixer for enhanced sensitivity and reliability.

**Applications**

- Data transmission
- Range (distance) measurement
- Intrusion Alarms (Room, Vehicle)
- Automatic Door Openers
- Speed Measurement
- Collision Avoidance

This document only gives a general description of the product and shall not form part of any contract.  
Microwave Solutions pursue a policy of continuous product improvement and reserve the right from time to time to amend the specifications of products.

**Operation**

The basic principle of operation consists of detecting the frequency shift between a transmitted and a received signal reflected back from a moving object within the field of view of the unit. This produces a low level output signal that can be amplified and processed.

The tunable transceiver incorporates provision for electronically tuning the unit over a frequency range of approximately 5MHz. This enables frequency modulation to be applied to the transceiver or fsk ranging to be performed.

The unit employs low cost surface mount manufacturing techniques that are field proven as being rugged and reliable.

The following patents (and others) apply to this product: US Patents 6,064,276, 5,262,783, 5,208,567

**Electrical Characteristics**
Transmitter

Frequency	: see table
Frequency Setting Accuracy	: 3MHz
Power Output (Min.)	: 13dBm EIRP
Operating Voltage	: +5V ±0.25V
Operating Current (CW)	: 60mA max.
	: 45mA typ.
Harmonic Emissions	: < -10dBm
Electronic Tuning Range	: > 4MHz

Pulse Mode Operation

Average Current (5% DC)	: 2mA typ.
Pulse Width (Min.)	: 5µSec
Duty Cycle (Min.)	: 1%

Receiver

Sensitivity (10dB S/N ratio)	: -86dBm
Noise	: 10µV
(Both in 3Hz to 80Hz bandwidth)	

Antenna

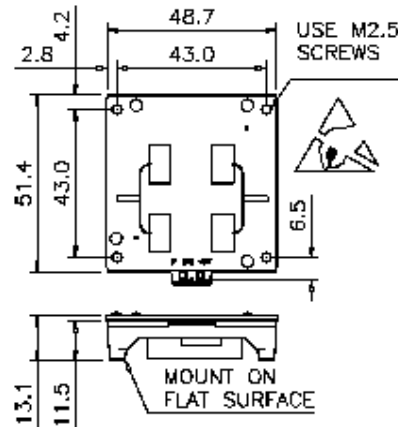
Gain	: 8dBi
-3dB Beamwidth	
Orientation	: Tab @bottom
Vertical	:36deg
Horizontal	:72deg

**Mechanical Characteristics**

Weight	: 15grams
Tab Connections	: 0.1" spacing

**Environmental Characteristics**

Power/Temp. Coefficient	
(over operating temp. range)	: 3dB
Frequency/Temp. Coefficient	
(over operating temp. range)	: 6.5MHz Operating
Temperature	: -10°C to +55°C Storage
Temperature	: -30°C to +70°C

**Outline Drawing**

**Notes:**

Detection range is dependent on size and reflectivity of target and S/N ration.  
Doppler shift at 10.525 GHz is 31Hz/m.p.h.  
Unit functions over -30°C to +70°C but harmonics may exceed specified levels.

<b>Model</b>	<b>Application</b>	<b>Order Code</b>	<b>Frequency</b>	<b>Comments</b>
MDU1020	USA	C900662	10.525Ghz	Suitable for US FCC Part 15 "Outdoor" intermittent applications