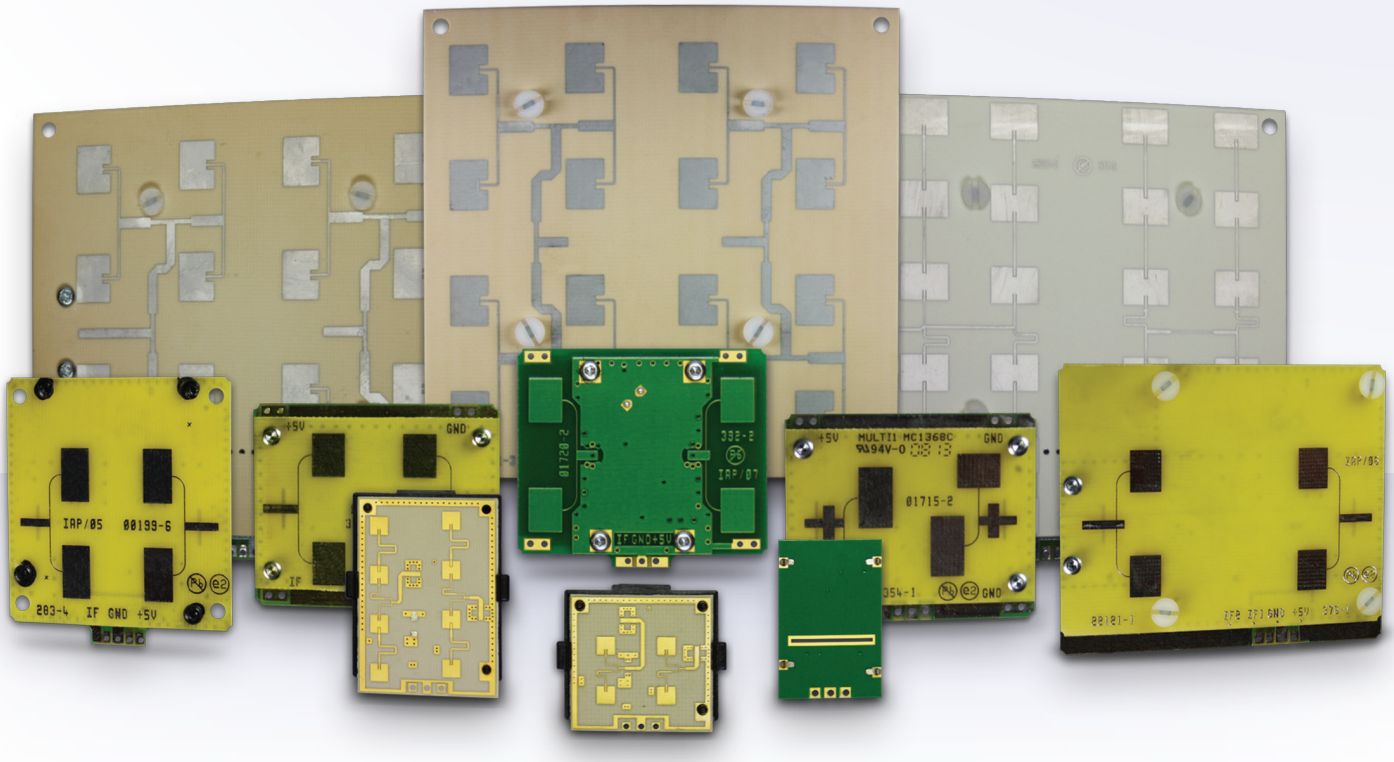
microwave solutions

# A Complete Family of Microwave Motion Detection Units

Microwave Solutions Ltd design, manufacture & supply MDU's, miniature microwave Doppler radar sensors optimised for low power consumption and low cost.

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# Product Finder

**Find the right product for you based on your country of use and optional features.**

1) Choose your frequency based on the country your product will be used in.

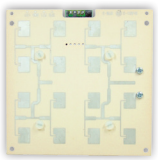
| | Frequency Band | Technical Standard |
|---|---|---|
| Austria, Germany Slovak Republic, Switzerland | 9.2 - 9.5 GHz | EN 300 440 |
| France, Italy, Portugal, Switzerland | 9.88 - 9.92 GHz | EN 300 440 |
| Ireland | 10.4 - 10.42 GHz | EN 300 440 |
| Belgium, Holland, Italy, Spain | 10.50 - 10.55 GHz | EN 300 440 |
| Canada, Mexico, USA | | FCC CFR 47 Part 15 |
| UK | 10.575 - 10.600 GHz | EN 300 440 |
| Most countries worldwide | 24.05 - 24.25 GHz | EN 300 440/FCC Part15 |

2) Choose frequency option and module features to find the product family.

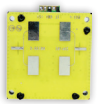
| EUROPE | Tuneable | Medium Range Wide Beam | Long Range Narrow Beam | Miniature | K Band |
|---|---|---|---|---|---|
| 9.35GHz | | MDU1750 | | | |
| 9.9GHz | MDU1100T | MDU1750 | | | |
| 10.41 GHz | MDU1100T | MDU1750 | MDU4220 | | |
| 10.525GHz | MDU1100T | MDU1750 | MDU4220 | MDU2000 | |
| 10.587GHz | MDU1100T | MDU1750 | MDU4220 | MDU2000 | |
| 24.15GHz | | | | | MDU2400 |

| N AMERICA | Tuneable | Medium Range Wide Beam | Long Range Narrow Beam | Miniature | K Band |
|---|---|---|---|---|---|
| 10.525GHz | MDU1100T | MDU1720 | MDU4220 | MDU2000 | |
| 24.15GHz | | | | | MDU2400 |

Typical application examples



**MDU4220**
Long range direction sensing module for traffic detection.



**MDU1100T**
Electronically tuned module for direction & range detecting.

**MDU1750C**
Ceiling mount unit for security & energy management.

**MDU1750**
European wall mount unit for security & energy management.

**MDU1720**
Wall mount unit for US FCC indoors applications only.

**MDU2400**
24GHz wall mount unit.

**MDU2000**
Miniature unit for short range applications.

# Product Features

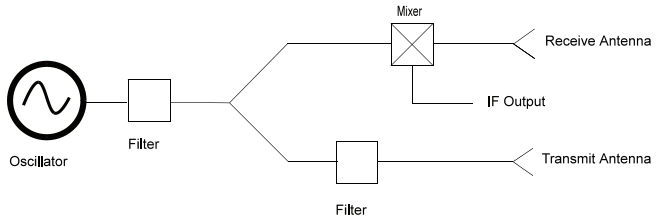
## Understanding motion detector units

### Performance

- An MDU (Motion Detector Unit) will only detect a moving target.
- Medium Range units will detect human targets at a maximum range of 8 – 25 metres.
- Long Range units will detect vehicles at a maximum range of 150 metres.
- Units are also available to detect the direction of motion or distance from the MDU to the target.

### Operation

The MDU transmits a low level signal which is reflected from all objects within its coverage area and then received back. If an object is moving, the frequency of the reflected signal changes due to the Doppler effect. The MDU compares the transmitted and received signals producing an IF output signal with an amplitude dependant on the size, distance away and reflectivity of the object at a frequency proportional to its velocity. External signal processing circuitry (not provided) amplifies and analyses this signal so that when specified criteria are met an output signal can be generated to activate a process such as turning on a light or initiating an alarm.




**MDU Schematic Diagram**

### RF Power Level

The RF power levels radiated by the MDU are extremely low under all conditions, and many orders of magnitude below the maximum recommended levels in normal operating modes.

The maximum transmitted power is less than 15mW. Per EN 62479:2010, any equipment containing an MDU as the sole emitter of electromagnetic fields is exempt from the testing requirements for human exposure to electromagnetic fields under the safety aspects of the R&TTE directive. The emissions from the MDU are also below the recommended maximum permissible exposure levels specified in IEEE standard C95.1-1991.

### Coverage Pattern

The coverage patterns for a selection of different MDU's are shown overleaf.

### Mounting

The MDU can be mounted in a non-metallic housing or behind a plastic cover. No specific window or lens is required, so installation is discrete and unobtrusive.

### Approvals

Each country has an approved frequency range and recognised technical standards for the legal operation of MDU's. The technical standards broadly split into two – EN 300 440 for Europe and US FCC Part 15 for the US with technical equivalents for Canada & Mexico.

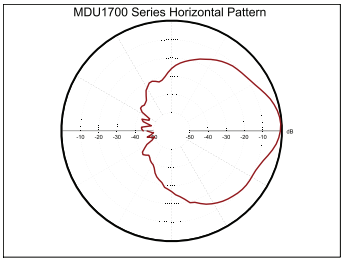
Each country establishes its own approved frequency range(s) which are definitive.
The European Communications office also maintains a recommended range of frequencies for various applications, although this is not mandatory or generally adopted.

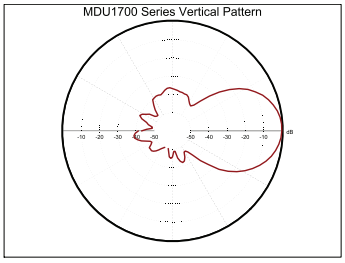
Microwave Solutions Motion Detector Units are generally available to meet either technical standard.

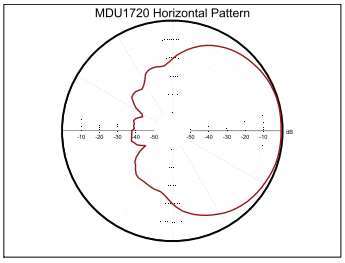
# Coverage

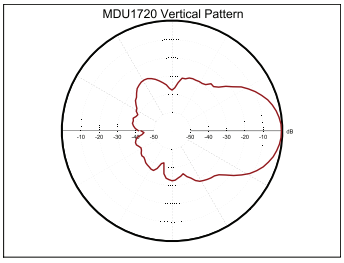
**Standard units are available for mounting in the corner of a room, on the ceiling and for long range corridor or outdoor use. Custom units can also be made to meet your exact need.**

## Standard

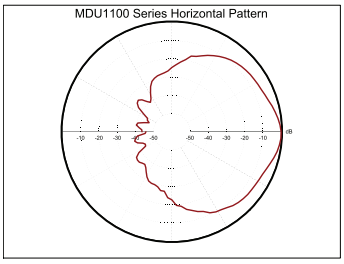


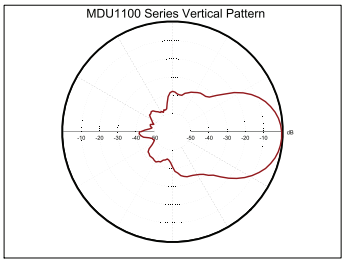



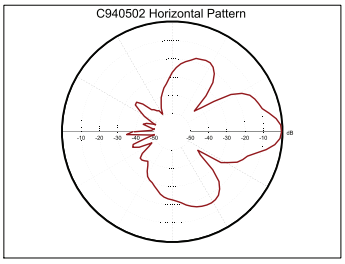



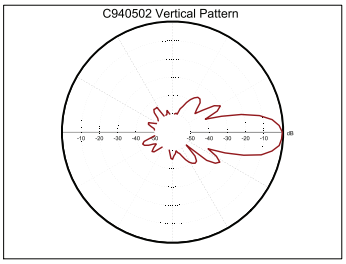

## Tuneable



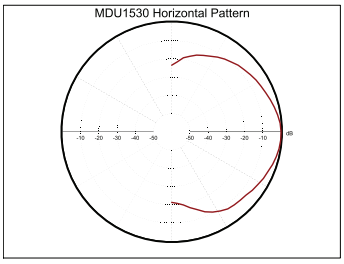



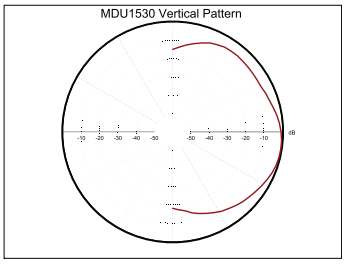

## Long Range / Narrow Beam



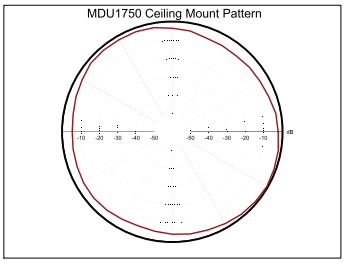



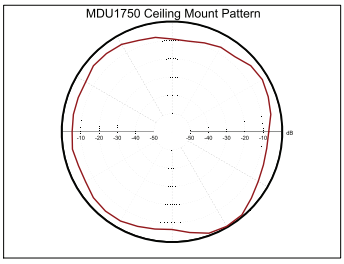

## Miniature



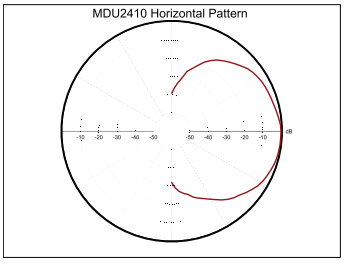



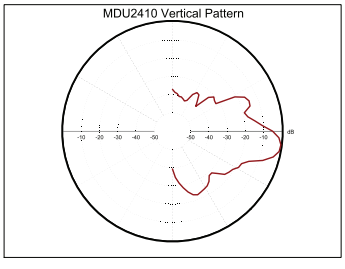

## Ceiling Mount



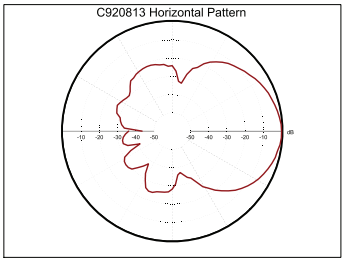



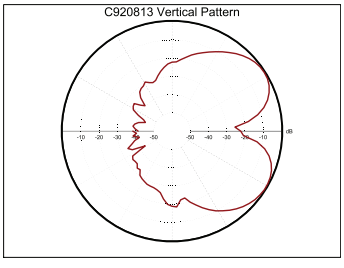

## 24 GHz




## Custom





**For further information**

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