

# MMWS User Manual

## Foreword

This manual provides instructions on the functions, operation methods, and daily maintenance methods of mmw100 and mmw101.

## Applicable products

This manual applies to the following products:

Product Name	Product Model	Material Number	Software version
MMWS	mmw100	78006833	V02
	mmw101	78008147	V01

## Audience

- Users of the UIH MR System.
- UIH training and customer service engineers.
- UIH marketing personnel.
- Authorized distributors of UIH.

## Contact information

In case of any problem, please contact UIH Service Center.

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# 1 Laws and regulations

This equipment complies with relevant regulations regarding the marketing of equipment.

If there are regulations relevant to the use and operation of this equipment, operators are obliged to comply with such regulations.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

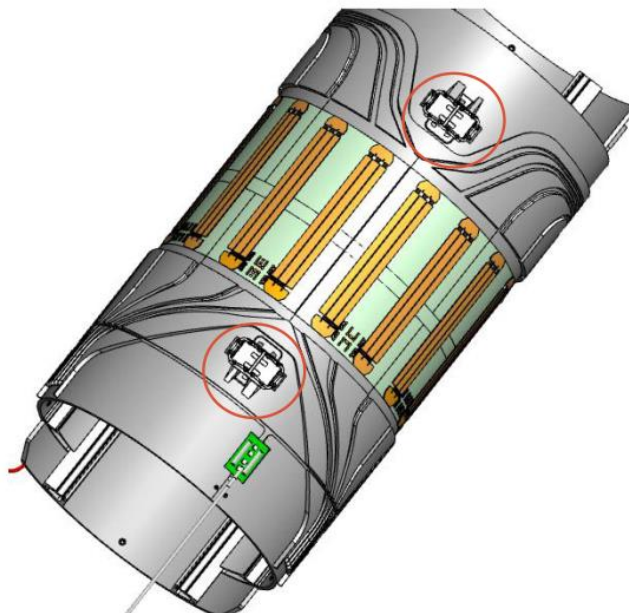
This equipment is only suitable for fixed, extremely short-range surface respiratory motion signal detection in medical imaging equipment, and is not suitable for satellite, aircraft and vehicle-mounted radar systems.

# 2 Product use and maintenance

The millimeter wave sensor is installed inside the Volume Transmit Coil (VTC) of Magnetic Resonance Imaging System (MRI). The use condition is a RF shielded location environment.

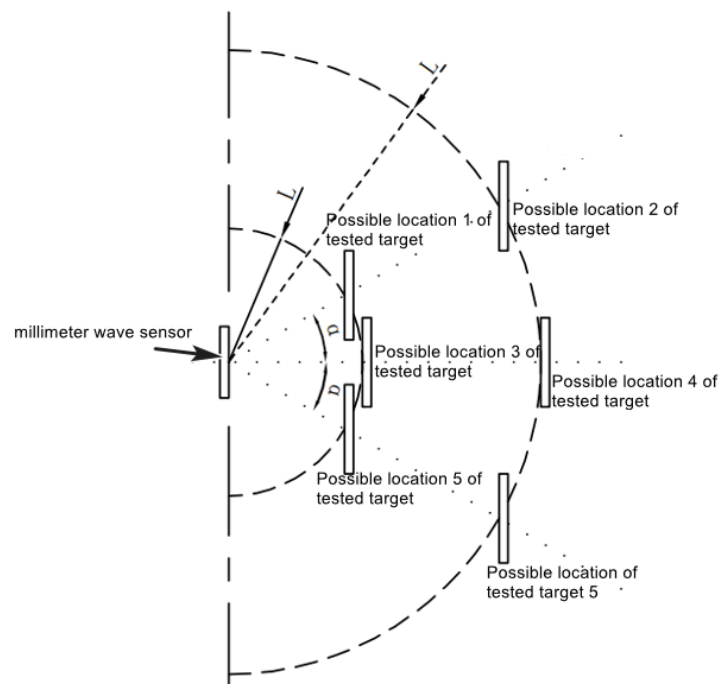
The millimeter wave sensor is used to provide the physiological parameters of the patient's respiratory movement, collect the respiratory signal and transmit it to the system, and realize the gated triggered scanning of the system to reconstruct the image.

The equipment must be professionally installed and installation must be controlled. The device sold to dealer who hires installers with licensed professionals and special training.



After the system is powered on, the sensor directly starts by itself, and collects respiratory signals and uploads data according to the program. The user only needs to view the waveform and configure the specific trigger sequence in the waveform display position on the operation computer interface of MR system.

The area of the detected moving object is not less than 10cm x 20cm, and is used in the millimeter wave sensor transmission angle (the emission angle can be covered  $\alpha$  is  $15^\circ$ , that is, the effective angle of the transmitting surface is  $30^\circ$ ), and the distance (the center distance of the millimeter wave sensor antenna is from the center of the scanning target in the L range of 15cm-35cm, and the tolerance  $\pm 2$ cm) is shown in the figure below.



In case of sensor function problems, UIH service engineers will disassemble and replace the sensor.

**WARNING:** Do not modify this equipment without authorization of the manufacturer.

**WARNING:** Do not replace the components without permission. If any part needs to be replaced, contact UIH Customer Service Center.

### 3 Use case

Millimeter wave radar sensor can emit the electromagnetic waves and then receive the reflected signals of patient body surface. The patient respiratory movement information can be analyzed from the reflected signals and be used in the MRI respiratory triggering scan.

### 4 Technical data

- mmWave Sensor IC: IWR6843 (Texas Instruments)

- Transmission power: 10 dBm
- Receiving noise figure: 12 dB
- Radio frequency: 59 GHz-64 GHz
- Frequency band: 4 GHz
- Modulation mode: FMCW
- Mechanical parameters

The millimeter wave sensor component size is 95.5mm\*66mm\*21.5mm, and the component weight is about 0.1kg.

- Temperature characteristics

Characteristic	Parameter
Operating temperature range	15°C ~30°C
Storage temperature range	-20°C ~60°C

- Relative humidity characteristics

Characteristic	Parameter
Relative humidity range (Storage)	10%~90%
Relative humidity range (Operating)	40%~60%

- Atmospheric pressure characteristics

Characteristic	Parameter
Atmospheric pressure range	700hPa~1060hPa

- Power characteristics

Characteristic	Parameter
mmWave sensor power input	3.7VDC (accuracy±100mV Maximum current 0.6A) 2.9VDC (accuracy±100mV Maximum current 1.6A) 1.8VDC (accuracy±100mV Maximum current 1.6A)
Maximum power consumption of mmWave sensors	<2W

