

CareTRx Sensor – EMC Information and Warnings

The CareTRx Sensor needs special precautions regarding electromagnetic compatibility (EMC) and needs to be installed and put into service according to the information provided in these instructions.

Portable and mobile radio frequency (RF) communications equipment can affect the CareTRx Sensor.

The CareTRx Sensor may be interfered with by other equipment, even if that other equipment complies with CISPR emission requirements.

The CareTRx Sensor should not be stacked with other equipment.

Guidance and manufacturer's declaration – electromagnetic emissions		
The CareTRx Sensor is intended for use in the electromagnetic environment specified below. The customer or the user of the CareTRx Sensor should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment – guidance
RF emissions CISPR 11	Group 1	The CareTRx Sensor uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The CareTRx Sensor is suitable for use in all establishments, including domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC61000-3-2	Not applicable	
Voltage fluctuations/ flicker emissions IEC61000-3-3	Not applicable	

Guidance and manufacturer's declaration – electromagnetic immunity


The CareTRx Sensor is intended for use in the electromagnetic environment specified below. The customer or the user of the CareTRx Sensor should assure that it is used in such an environment

IMMUNITY test	IEC60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC61000-4-2	±6 kV contact ±8 kV air	±8 kV contact (indirect) ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electric fast transient/burst IEC61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	Not applicable	Not applicable as the CareTRx Sensor is an internally powered device.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ±2 kV line(s) to earth	Not applicable	Not applicable as the CareTRx Sensor is an internally powered device.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 s	Not applicable	Not applicable as the CareTRx Sensor is an internally powered device.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE U_T is the a.c. mains voltage prior to application of the test level.

Guidance and manufacturer's declaration – electromagnetic immunity

The CareTRx Sensor is intended for use in the electromagnetic environment specified below. The customer or the user of the CareTRx Sensor should assure that it is used in such an environment.

IMMUNITY test	IEC 60601 TEST LEVEL	Compliance level	Electromagnetic environment – guidance
<p>Conducted RF IEC 61000-4-6</p> <p>Radiated RF IEC 61000-4-3</p>	<p>3 Vrms 150 kHz to 80 MHz</p> <p>3 V/m 80 MHz to 2,5 GHz</p>	<p>Not applicable</p> <p>3 V/m</p>	<p>Portable and mobile RF communications equipment should be used no closer to any part of the CareTRx Sensor, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance</p> <p>$d = \text{not applicable}$</p> <p>$d = 1,17 \sqrt{P}$ 80 MHz to 800 MHz</p> <p>$d = 2,33 \sqrt{P}$ 800 MHz to 2,5 GHz</p> <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,^a should be less than the compliance level in each frequency range.^b</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the CareTRx Sensor is used exceeds the applicable RF compliance level above, the CareTRx Sensor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the CareTRx Sensor.

^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [not applicable] V/m.

**Recommended separation distances between
portable and mobile RF communications equipment and the CareTRx Sensor**

The CareTRx Sensor is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the CareTRx Sensor can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the CareTRx Sensor as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = \text{not applicable}$	80 MHz to 800 MHz $d = 1,17 \sqrt{P}$	800 MHz to 2,5 GHz $d = 2,33 \sqrt{P}$
0,01	N/A	0,12	0,23
0,1	N/A	0,37	0,74
1	N/A	1,17	2,33
10	N/A	3,69	7,38
100	N/A	11,67	23,33

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

RF Characteristics

Technical Specification	Value
Protocol	Bluetooth Smart
Radio Frequency Range	2402 – 2480 MHz
Channels	40
Bandwidth per Channel	2 MHz
Modulation	GFSK
Transmit Power / Effective Radiated Power	+0.54 dBm