



# R900<sup>®</sup> Radio Frequency (RF) Emissions

This document provides general information about radio frequency (RF) electromagnetic fields from R900<sup>®</sup> wireless communication equipment. This information has been provided by Neptune Technology Group, which has evaluated this equipment for RF emissions. R900 equipment has been certified by the Federal Communications Commission (FCC) and Industry Canada (IC).

## What frequencies are used by the meter/radio equipment being installed?

R900 wireless communication equipment operates within the Industrial, Scientific, and Medical (ISM) band which includes frequencies from 902 MHz to 928 MHz.

The Food and Drug Administration (FDA) and the FDA's Center for Devices and Radiological Health (CDR) have classified radiation emitted by devices operating at these RF frequencies as "non-ionizing". Other types of non-ionizing radiation devices include televisions, radios, remote controls, and other devices that use visible light and infrared light.

## Have the meters/radios been certified by the FCC and Industry Canada?

Yes. Radio endpoints being installed have been tested in accordance with Title 47, Part 15 of the Code of Federal Regulations and have been certified by the FCC.

The R900<sup>®</sup> is also certified by Industry Canada who has adopted Health Canada's "Safety Code 6: Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency Range of 3KHz to 300GHz".

## Where can I go to learn more about regulatory compliance?

The FCC's document *OET Bulletin 65 Edition 97-01*, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", details how to measure or calculate levels of RF radiation and to determine compliance of RF facilities with exposure limits.

Additionally, FCC *OET Bulletin 65 Supplement C Edition 01-01* provides further guidance on determining compliance for portable and mobile devices.

These documents may be found at <http://www.fcc.gov/encyclopedia/radio-frequency-safety>

## What is the power output from the R900 devices when they are transmitting data?

The effective radiated output power (ERP) for the R900 devices is less than 100 milliwatts (mW) for Standard Mobile Messages sent every 14 seconds. Fixed Network Messages are transmitted at just under 1 Watt every 7½ minutes. In comparison, portable transmitters used by consumers typically operate over this output power range, and in fact, may operate with output power up to several thousand milliwatts.



### Are there any health hazards associated with this technology?

The World Health Organization (WHO) notes:

“A number of studies have investigated the effects of radiofrequency fields on brain electrical activity, cognitive function, sleep, heart rate and blood pressure in volunteers. To date, research does not suggest any consistent evidence of adverse health effects from exposure to radio frequency fields at levels below those that cause tissue heating. Further, research has not been able to provide support for a causal relationship between exposure to electromagnetic fields and self-reported symptoms, or “electromagnetic hypersensitivity”.

The *WHO Fact Sheet* may be found at <https://www.who.int/en/news-room/fact-sheets/detail/electromagnetic-fields-and-public-health-mobile-phones>

### Are there RF exposure standards for the R900 devices?

The FCC has established rules requiring transmitting facilities to comply with RF exposure guidelines. The limits established in the guidelines are designed to protect the public health with a very large margin of safety. These limits have been endorsed by federal health and safety agencies, such as the Environmental Protection Agency (EPA) and the FDA.

The FCC has established exposure guidelines for RF devices operating in the 300 kHz to 100 GHz range. These safety guidelines are outlined in the publication, *OET Bulletin 65 Edition 91-01*, “Evaluating Compliance with the FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Field,” and can be found at <http://www.fcc.gov/encyclopedia/radio-frequency-safety>

The general-population exposure limits set by the FCC for the frequency range utilized by the meters/radios and other devices such as cordless phones and baby monitors is 0.6 milliwatts per centimeter squared (mW/cm<sup>2</sup>) at 902 MHz.

The R900 device transmits for less than one minute total per day and for seven milliseconds at a time. The exposure to radio frequency energy at a distance of one foot from the meter is never more than 0.08 mW/cm<sup>2</sup> for the Fixed Network Messages. This is approximately eight times lower than the exposure limit set by the FCC. Standard Mobile Messages are an order of magnitude lower.

For more information on the effects of RF energy exposure, please visit:

- **FCC:** For information regarding potential RF hazards from FCC regulated transmitters, please contact the Federal Communications Commission, Consumer & Governmental Affairs Bureau, 445 12th Street, SW, Washington, DC, 20554; Phone: 1-888-225-5322; E-mail [rfsafety@fcc.gov](mailto:rfsafety@fcc.gov); or go to <http://www.fcc.gov/encyclopedia/radio-frequency-safety>
- **FDA:** For information about radiation from microwave ovens and other consumer and industrial products, contact Center for Devices and Radiological Health (CDRH), Food and Drug Administration or go to <http://www.fda.gov/Radiation-EmittingProducts/default.htm>
- **OSHA:** The Occupational Safety and Health Administration’s (OSHA) Health Response Team has been involved in studies related to occupational exposure to RF radiation. [https://www.osha.gov/SLTC/radiation\\_nonionizing/index.html](https://www.osha.gov/SLTC/radiation_nonionizing/index.html)
- **WHO:** The World Health Organization’s Electromagnetic Fields information page is located at <https://www.who.int/peh-emf/en/>

## Does Health Canada have RF exposure standards for the R900 devices?

Health Canada's Safety Code 6 outlines and specifies maximum levels of human exposure to RF energy at frequencies between 3 kHz and 300 GHz, to prevent adverse human health effects. Safety Code 6 also specifies maximum allowable RF contact and induced body currents to prevent the physical perception of internal currents resulting from RF energy in uncontrolled environments, and to prevent RF shock or burns to personnel in controlled environments. The code also serves to provide guidance for evaluation RF exposure levels, to ensure that personnel in controlled and uncontrolled environments are not exposed at levels greater than the limits specified in this code.

For more information on Health Canada's Safety Code 6, please visit <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/fact-sheet-what-safety-code-6.html>

## Will installation of the new meter/radio interfere with my security systems, pacemaker, cell phones, or other RF electronics?

The transmitting devices operate in compliance with FCC 47 CFR Part 15 regulations, which require coexistence with other Part 15 certified devices. Within the 902-928 MHz frequency band, operation is limited to frequency-hopping, direct-sequence, spread-spectrum, and digital modulation intentional radiators. This rule facilitates multiple devices operating in the same location. This includes devices such as security systems, pacemakers, cell phones, and cordless phones. The meter/radio's transmit signal is of very short duration (seven milliseconds), which further decreases the potential for interference with other devices. For comparison, seven milliseconds equates to approximately one minute total transmission time per day.

## How long has this meter/radio equipment been manufactured?

The R900 radio devices have been in production since 1999.

## How many radio devices have been installed in residential applications?

Over seventeen million Neptune R900 radio devices have been deployed on water meters today throughout North America. In addition, over 100 million 900 MHz radio devices have been deployed on water, gas, and electric meters across North America.

## Throughout the life of the R900 product, have there been any cases of interference caused by the R900 radio devices?

There have been no documented cases where the R900 devices have interfered with third-party devices.



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