

Automated Meter Reading — Frequently Asked Questions

What is AMR?

AMR stands for Automated Meter Reading. It is a method of using advanced communications technology to read meters remotely. It reduces human errors and ensures that customers receive an accurate bill each month. Utilities use automated reads for billing purposes, however, the dials will still be visible so you can read your own meter and confirm that our reading is accurate.

AMR increases privacy and convenience for our customers as it eliminates the need for a meter reader to enter our customers' property each month to read the meter. Because AMR reduces costs and identifies potential theft, it also helps us keep rates as low as possible.

What approvals do the devices have?

The ERT has an Industry Canada approval (written on the ERT) and meets Safety 6 standard of Industry Canada.

How does AMR work?

The utility attaches a small device called an ERT to the meter. ERT is an acronym for Encoder Receiver Transmitter. An ERT is a computerized recording and encoding device with a built-in radio transmitter. These devices will record the gas and water reading; encodes the information; and then transmits the reading to a remote data collector. Data collectors can be installed in vans or mounted on utility poles. They can also be handheld devices used by a meter reader walking down your street. Some AMR technologies use cable or telephone lines to send the data, and others low-level radio frequencies.

How often does the Endpoint take a reading of water and gas usage?

Once every hour.

What information is collected and transmitted by the Endpoint?

Consumption (the meter read), interval consumption (hourly) and tamper flags (leak detection, cut cable, reverse flow). The module transmits only the collected data. No personally identifiable data transmits the network. Just consumption and meter information.

What type of signals are used in Radio-based Automated Meter Reading system to transmit information to and from the meter?

Two types of devices are used for radio-based AMR systems: the ERTs attached to home meters, and interrogation or data gathering devices that receive the signals from the ERTs. Typically, utilities use devices mounted in vans that receive the signals as the vans drive through neighborhoods. Signals are sent between these devices using radio frequency (RF) energy. RF is the same type of energy used for radio and television broadcasting; cellular telephones; personal communications services (PCS); pagers; cordless telephones; police, fire, and airport radios; and microwave communications. However, the amount of energy emitted from the ERT is less than that from these other devices. Some non-communication applications such as microwave ovens and radar also use RF.

Are any health-related regulations associated with use of the signals and/or transmissions from AMR systems?

No. A number of governmental and non-governmental agencies are responsible for establishing laws, codes, and guidelines intended to provide a safe living and working environment. These include:

Federal Communications Commission (FCC), Office of Technology and Engineering, Institute of Electrical and Electronic Engineers (IEEE) standards, Food and Drug Administration (FDA), Center for Devices and Radiological Health (CDRH), American National Standards Institute (ANSI), Environmental Protection Agency (EPA), National Council on Radiation Protection and Measurement (NCRP), Occupational Safety and Health Administration (OSHA), National Institute for Occupational Safety and Health (NIOSH)

In establishing RF exposure standards, regulatory agencies have generally relied for guidelines on experts from organizations such as American National Standards Institute (ANSI), Institute of Electrical and Electronics Engineers (IEEE), and the National Council on Radiation Protection and Measurements (NCRP). Based on studies by these agencies, the Federal Communications Commission established safety standards for evaluating RF environmental exposure.

The standards identify the threshold level at which harmful biological effects may occur and the values of Maximum Permissible Exposure (MPE) recommended for electric and magnetic field strength and power density. All of Itron's AMR devices operate at a level that is orders of magnitude below the limits of the current standards.

Are those signals and any associated concerns the same as, or similar to, concerns I hear about regarding electromagnetic fields (EMF) or power-line carrier AMR systems?

No. The ERT technology being used by Itron has been around for more than 20 years, and more than 80 million ERTs have been installed throughout the U.S. and Canada. This technology has never been delayed, put on hold, or stopped for reasons of safety.

Have studies been associated with the types of signals being used with this AMR system, and if so, what conclusions have been drawn?

Yes, numerous studies have been done on all aspects of radio signals and their relationship to human health. These studies have shaped the regulations and standards that cover today's technology. To protect the safety and well-being of our customers and employees, we ensure that the systems we purchase and install are well within all the relevant laws, codes, and regulatory guidelines.

The following is from a Technical Information Statement by IEEE:

"In summary, there is no evidence, from laboratory or epidemiology studies, that exposure to RF energy at levels below recommended limits has any health significance for humans."

Institute of Electrical and Electronics Engineers (IEEE) Committee on Man and Radiation (COMAR)

Human Exposure to Radio Frequency and Microwave Radiation from Portable and Mobile Telephones and Other Wireless Communication Devices, September 2000.

<http://www.ewh.ieee.org/soc/embs/comar/phone.htm>

Are any health hazards associated with Itron's AMR devices?

No. There are no known health hazards from the type of devices offered by Itron when used within established guidelines. The equipment is designed to operate at very low levels. This is comparable with electromagnetic fields that are already present in the environment. All equipment operates within provincial and federal standards.

Under current guidelines, the emissions from an ERT located 10 feet away is about one-millionth of the Maximum Permissible Exposure to radiation. Even for someone standing as close as two inches from the ERT, the amount of radiation is still 250 times less than the maximum.

Can you give me a comparison between the radiation Itron's system emits and radiation emitted by other types of RF devices?

A typical commercial radio transmitter located seven miles away puts more RF radiation in your home than an ERT located on the premises. A cell phone emits 800 times more RF energy than an ERT. Because the cell phone is used close to your head, the exposure level is more than 3,500 times greater. Moreover, the cell phone transmission is continuous during its operation, whereas the ERT transmits for a total of approximately one minute per day.

Model	Mode	Power	Bubble-up Frequency	Bubble-up Duration	Relative Power Density in microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$) at 3 Meters from device
100W/100G	Mobile/HH	10-mW (10-dBm)	9-15 sec	7.813 ms	0.013 $\mu\text{W}/\text{cm}^2$

Relative Power Density in microwatts per square centimeter – at 3 Meters from device ($\mu\text{W}/\text{cm}^2$)

FM radio or TV broadcast station signal	0.005
Electric SmartMeter	0.1
Wi-Fi	10 - 20
Laptop computer	10 - 20
Cell phone held up to head	30 - 10,000
Walkie-Talkie at head	500 - 42,000

Where could I look if I wanted to verify the veracity of the conclusions drawn?

Numerous reports are available on the Internet. Following are some examples:

Institute of Electrical and Electronics Engineers (IEEE) Committee on Man and Radiation (COMAR)

Human Exposure to Radio Frequency and Microwave Radiation from Portable and Mobile Telephones and Other Wireless Communication Devices, September 2000.

<http://www.ewh.ieee.org/soc/embs/comar/phone.htm>

Federal Communications Commission Office of Engineering & Technology

Questions and Answers about Biological Effects and Potential

Hazards of Radiofrequency Electromagnetic Fields

OET BULLETIN 56 Fourth Edition August 1999.

[\(http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/](http://www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/)

Will the AMR system interfere with TV, radio, personal computers, home security systems, garage door openers, pacemakers or other electronic equipment?

No. The system operates at a low frequency and power level reserved for this purpose and will not interfere with any other equipment. The ERT randomly transmits anywhere between 910-920 Mhz. This is within the regulated ISM band (Industrial, Scientific and Medical radio bands). The large majority of the messages are at 914-915-916 Mhz. There has been no report of interferences in those frequency ranges.

Is it possible that the meter may cause any health issues or problems?

Please see the following web site:

www.itron.com/na/resourcesAndSupport/Pages/RF-Resource-Center-FAQs.aspx

This site includes quotes from "World Health Organization and Utilities Telecom Council," **Peer-reviewed scientific research has shown no connection between low-power RF emissions and adverse health effects. Most of this research focuses on cell phones, which typically transmit at higher power, operate closer to the body, and have much longer duty cycles.**

As mandated by Industry Canada, where do I find the safety booklet and/or user manual for the device that ensures compliance with SAR and/or RF field strength limits; information on the installation and operation of accessories to ensure compliance with SAR and/or RF field strength limits; and contact information where the user can obtain Canadian information on RF exposure and compliance.

Please see this web site:

www.itron.com/na/resourcesAndSupport/Pages/RF-Resource-Center-Sources.aspx where Canadian standards are published.

More General information on RF systems:

www.itron.com/na/resourcesAndSupport/Pages/RF-Resource-Center.aspx