

## > Itron white paper

# Pulsed RF vs. OpenWay<sup>®</sup> Smart Meter Communications

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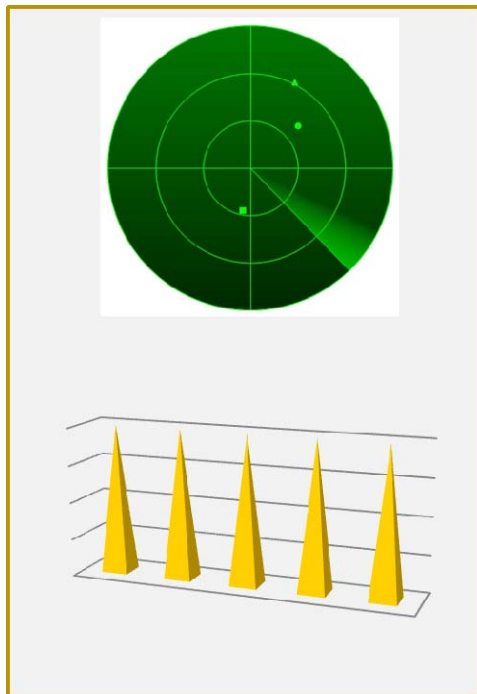
## Overview

In response to concerns about OpenWay® smart meters emitting “pulse”-type signals and questions about RF exposure unique to these types of signals, Itron has published the following paper. This paper discusses the nature of the RF communications from OpenWay smart meters and clarifies the significant difference between these signals and RF “pulsed” signals.

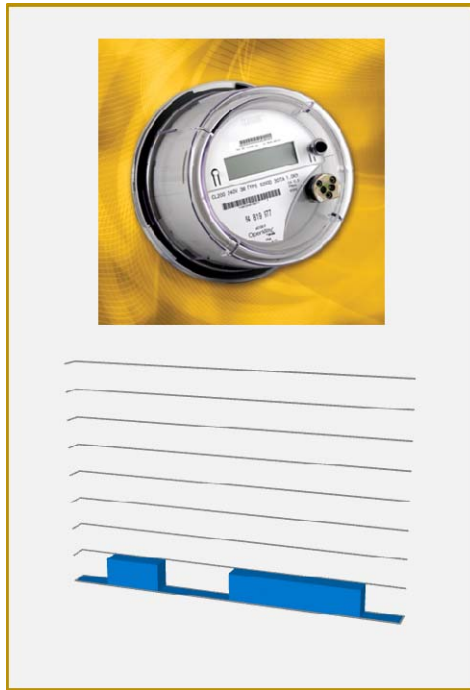
Itron’s OpenWay CENTRON meter uses the 900MHz and 2.4GHz industrial, scientific and medical (ISM) bands for communications. These unlicensed frequency bands are regulated by the Federal Communications Commission (FCC) under part 15, sub paragraph 247. Transmission characteristics such as channel bandwidth, number of channels and maximum data transmission duration are all clearly specified by the FCC, and OpenWay fully complies with these specifications. The specifics of these requirements are all documented on the FCC website.

## Pulsed RF vs. Time-Slotted Packet Communications

The two figures below show two different types of RF communication. Figure 1 represents pulsed RF, which are nearly instantaneous, relatively high power bursts of communication. A good example of pulsed RF communication would be radar, which emits a high power, singular signal and then measures the reflections or scatter of the transmissions to determine, position, movement, etc of certain objects. Figure 2 is a representation of the OpenWay RFLAN’s time slotted communication signals, which are different from Pulsed RF. By comparison, the peak output level is much lower than typical pulsed RF and has a relatively longer duration of transmission.



*Figure 1:  
Representation of “Pulse”  
RF Type Communications*



*Figure 2:  
Representation of  
OpenWay RFLAN Time  
Slotted Packet  
Communications*

Itron's RFLAN protocol is a "packet-based" communication network that transmits in randomized time slots. In developing the RFLAN protocol, RF traffic was optimized in order to achieve maximum performance while limiting the amount of traffic and overhead of RF transmissions. There are two general categories of packets transmitted in the OpenWay RFLAN network: Data Communications and Network Command/Control. Network Command/Control packets are transmitted approximately once every 2.5 minutes (less often for 2nd generation systems). These network overhead packets are small (~29 bytes). While RFLAN Data Communications packets can vary in length, the maximum data packet size used in the RFLAN is ~150 bytes in length (larger in second generation systems) and these data transmissions occur very infrequently (only when data is scheduled/requested by the collection system). These packet sizes translate into actual RF transmissions of approximately 0.012 seconds and 0.120 seconds for Command/Control packets and Data Communications packets respectively. The duration of these relatively low-power transmissions are considerably longer than a typical "pulsed" RF transmission, which can have a sub-millisecond duration (less than 0.001 seconds).

## Conclusion

In summary, the OpenWay RFLAN communications protocol does not utilize pulsed RF signals such as radar, and to characterize these transmissions in this way is not accurate. The OpenWay system uses a protocol that transmits Network Command/Control and Data signals that are less frequent, longer in duration and much lower power than pulsed RF communications.

## About Itron

At Itron, we're dedicated to delivering end-to-end smart grid and smart distribution solutions to electric, gas and water utilities around the globe. Our company is the world's leading provider of smart metering, data collection and utility software systems, with nearly 8,000 utilities worldwide relying on our technology to optimize the delivery and use of energy and water. Our offerings include electricity, gas, water and heat meters; network communication technology; collection systems and related software applications; and professional services. To realize your smarter energy and water future, start here: [www.itron.com](http://www.itron.com).

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