ORION® Cellular Endpoints

This document provides information regarding radio frequency (RF) of the ORION® Cellular endpoint.

Badger Meter is the market leader for utility cellular solutions, having deployed millions of endpoints with thousands of customers.

Cellular technology for machine-to-machine applications is designed to ensure transmission accuracy, immunity from outside interference and other forms of attenuation to avoid the loss of customer data. Likewise, the ORION Cellular endpoint is designed to eliminate interference from outside electromagnetic and RF energy fields. As its primary communication, the ORION Cellular endpoint utilizes licensed frequencies that are specifically set aside for its cellular communications, recognized as one of the most secure approaches to network communication available. Specific configurations also transmit an RF message to facilitate troubleshooting in the field.

FAQS

What standards related to RF emissions apply to ORION Cellular endpoints?

In the United States, FCC and CTIA are the bodies responsible for regulating domestic wireless telecommunications programs and policies, including licensing, and are responsible for implementing rules and regulations regarding frequency allocations, operating and design characteristics of equipment, power limits and testing/certification requirements, among other responsibilities. As its primary communication, the ORION Cellular endpoint utilizes licensed frequencies that are specifically set aside for its cellular communications. ORION Cellular endpoints utilize licensed frequencies to avoid interference from unauthorized users. Certain configurations of the ORION Cellular endpoint include an additional RF message for troubleshooting that communicates on the FCC-regulated 902-928 MHz frequency. ORION Cellular endpoints comply with Part 15, Part 22, Part 24 and Part 27 of FCC Rules.

Are there any health impacts related to these RF emissions?

The radio frequency signals broadcast from the ORION Cellular endpoint are well below the levels most people come into contact with on a typical day in their home. Devices such as televisions, wireless phones and cell phones all utilize radio frequency technology that provides much greater contact to radio frequency signals. The endpoint operates like a cell phone and under normal operation will awaken approximately four times per day to communicate data via the cellular network. Some configurations include an additional RF message for troubleshooting. The duration of each of these RF transmissions is 1.4 milliseconds, equating to approximately 8 seconds of transmission time per day. This means that the endpoint transmits as little energy as a brief cell phone call.

Additionally, the exposure to radio frequency signals decreases with the square of the distance to the device. This means the farther away anyone is from the RF device, the less the radio frequency contact. For example, the energy measured two feet away from the endpoint is 1/4 of the energy measured at a distance of one foot. Since the ORION endpoint is typically located in the basement, on the outside of the house or in a pit below grade away from the house, the extended distance and material between the endpoint and the individual further reduces contact with radio frequency signals.

What is the output power of the ORION Cellular endpoint during a data transmission?

The ORION Cellular endpoint is designed for reliable data delivery over long distances, transmitting at a maximum power that is governed by the cellular standard, 23 dBm (0.20 W). For configurations that support the RF message for troubleshooting, the RF broadcast will be at approximately 10 dBm.

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What frequencies do ORION Cellular endpoints utilize?

As its primary communication, the ORION Cellular endpoint utilizes licensed frequencies that are specifically set aside for cellular communications. Unlike many AMI solutions that use shared frequencies and bandwidth, ORION Cellular endpoints utilize licensed frequencies to avoid interference from unauthorized users. Endpoint configurations that support the RF message for troubleshooting communicate on the FCC-regulated 902-928 MHz frequency. ORION Cellular endpoints comply with Part 15, Part 22, Part 24 and Part 27 of FCC Rules.

ORION CELLULAR ENDPOINT CONFIGURATIONS

Endpoint	Troubleshooting Message
ORION Cellular C	Includes RF and IR messages for troubleshooting
ORION Cellular CS	Secondary carrier; includes RF and IR messages for troubleshooting
ORION Cellular LTE-M	Includes RF and IR messages for troubleshooting
ORION Cellular LTE-MS	Secondary carrier; includes RF and IR messages for troubleshooting
ORION Cellular HLA	Includes IR message for troubleshooting

TERMS

dBm decibel-milliwatts
IR infrared
RF radio frequency
W watts