

DESCRIPTION

ORION® Cellular water endpoints are innovative, two-way endpoints for smart water applications. The endpoints utilize existing IoT (Internet of Things) cellular infrastructure to efficiently and securely deliver meter reading data to the utility in a Network as a Service (NaaS) approach. Leveraging existing cellular infrastructure, the NaaS solution offers all the performance benefits of AMI, while eliminating network-related maintenance and technology concerns and enhancing deployment flexibility.

Cellular endpoints are members of the time-tested ORION family of products from Badger Meter, designed for maximum flexibility. Since 2002, the ORION product family has provided comprehensive Advanced Metering Analytics (AMA) for interval meter reading and data capture using both one-way and two-way communications.

FUNCTIONALITY

Operation: ORION Cellular water endpoints communicate with the encoder and capture 15-minute interval read data and meter status information. The endpoints then automatically broadcast the information, including endpoint status information, via the cellular network to BEACON® Software as a Service (SaaS). ORION NaaS is powered by the proven ORION system for interval data capture and two-way communication. The solution employs cellular endpoints which, as they leverage the public cellular network and require no proprietary gateways to operate, dramatically reduce infrastructure requirements compared to a traditional fixed network. This speeds installations and simplifies expansion as a system evolves.

The endpoints are designed to call in four times each workday and feature a configurable schedule that enables utility customers to select call-in times that best support their processes.

Activation: ORION Cellular water endpoints are shipped in an inactive, non-transmitting state. The Badger Meter IR Communication Device can be used to activate the endpoints and verify the encoder connection. Successful endpoint function can be confirmed through a web app demonstrating that communication has been verified to both the encoder and the network.

Alternatively, the endpoints offer a Smart Activation feature. After installation, the endpoints begin broadcasting data when the encoder senses the first usage of water. No field programming or special tools are required.

Broadcast Mode: ORION Cellular water endpoints broadcast fixed network reading data through the secure cellular network within the service area.

Specific configurations also transmit a radio frequency (RF) message to facilitate troubleshooting in the field. See ["Configurations" on page 2](#).

Data Storage: The endpoints store 42 days of 15-minute data.



ORION Cellular C endpoint (pictured)

Output Message: ORION Cellular water endpoints broadcast a unique serial number, meter reading data, and applicable status indicators. As an advanced data security measure, each message is securely transported to BEACON SaaS only via private network and never over the public internet.

APPLICATION

Configurations: ORION Cellular water endpoints are multi-purpose endpoints that can be deployed in indoor, outdoor and pit (non-metal pit lid) applications. The electronics and battery assembly are fully encapsulated in epoxy for environmental integrity. The endpoint is available with a connector assembly for ease of installation.

Meter Compatibility: When attached to a Badger Meter High Resolution Encoder, the ORION Cellular water endpoint is compatible with all current Badger Meter Recordall® Disc, Turbo Series, Compound Series, Combo Series and Fire Service meters and assemblies, and with E-Series G2® Ultrasonic, E-Series® Ultrasonic, E-Series® Ultrasonic Plus, and ModMAG® electromagnetic flow meters.

Encoder Compatibility: The ORION Cellular water endpoint is suitable for use with a Badger Meter High Resolution Encoder as well as the following Badger Meter approved three-wire encoder registers that have a manufacture date within 10 years of the current date as long as the encoder has three wires connected to it and is programmed into the three-wire output mode for AMR/AMI: Honeywell® (Elster/ABB) ScanCoder, evoQ4 meter with Sensus® protocol module; Master Meter® Octave® Ultrasonic meter encoder output; Metron-Farnier Hawkeye; Mueller Systems 420 Solid State Register (SSR) LCD; Neptune® ProRead, E-Coder®, ARB-V®, and ProCoder; and Sensus iPerl®.

SPECIFICATIONS

Dimensions	5.125 in. (130 mm) (H)
	1.75 in. (44 mm) Diameter at top
	2.625 in. (W) x 2.875 in. (D) at base
	(67 mm (W) x 73 mm (D) at base)
Broadcast Network	LTE-M cellular network (primary communication technology)
	NB-IoT (secondary communication technology for certain variants)
RF Message for Troubleshooting	Where available (see table below) frequency is FCC-regulated 902...928 MHz frequency hopping modulation
Operating Temperature Range	
	• Storage, Meter Reading and RF Message (for troubleshooting)
	• Cellular Communications
Humidity	0%...100% condensing
Battery	One (1) lithium thionyl chloride D cell (nonreplaceable)

Construction: All ORION Cellular water endpoints are housed in an engineered polymer enclosure with an ORION RF board, battery and antenna. For long-term performance, the enclosure is fully potted to withstand harsh environments and to protect the electronics in flooded or submerged pit applications.

Wire Connections: ORION Cellular water endpoints are available with inline connectors (Twist Tight® or Nicor®) for easy installation and connection to compatible encoders/meters. The endpoints are also available with flying leads for field splice connections. Other wire connection configurations may be available upon request.

FEATURES

Smart City Ready	Future-proof technology
Communication Type	Two-way
Application Type	Control/Monitor
Endpoint Communication	Configurable call-in schedule, up to four times each workday
Reading Interval Type	15-minute
Encoder Compatibility	Absolute
Fixed Network Reading	✓
Cut-Wire Indication	✓
Encoder Error	✓
Low Battery Indication	✓
Remote Clock Synchronization	✓
Firmware Upgrades	✓

CONFIGURATIONS

Endpoint	Notes
ORION Cellular C	Includes RF and IR messages for troubleshooting
ORION Cellular HLD	Includes RF and IR messages for troubleshooting
ORION Cellular LTE-M	Includes RF and IR messages for troubleshooting

NOTE: For the ORION Cellular LTE-MP endpoint, see the *ORION Cellular LTE-MP Endpoint product data sheet*, available at www.badgermeter.com.

ORION Cellular endpoints are IoT Network Certified by CTIA, an association representing the U.S. wireless communications industry and companies throughout the mobile ecosystem. The certification signifies that the endpoints meet global 4G and 5G standards and are ready for use on wireless IoT networks.



- License Requirements:**

ORION Cellular water endpoints comply with Part 15, Part 22, Part 24, and Part 27 of the FCC Rules. No license is required by the utility to operate an ORION meter reading system. This device complies with Industry Canada license-exempt RSS standard(s).
- Transportation:**

WARNING: The operation of transmitters and receivers on airlines is strictly prohibited by the Federal Aviation Administration. As such, the shipping of radios and endpoints via air is prohibited. Please follow all Badger Meter return and/or shipping procedures to prevent exposure to liability.
- Warning:**

To reduce the possibility of electrical fire and shock hazards, never connect the cable from the endpoint to any electrical supply source. The endpoint cable provides SELV low voltage limited energy power to the load and should only be connected to passive elements of a water meter register.
- Caution:**

Endpoint batteries are *not* replaceable. Users should make no attempt to replace the batteries. Changes or modifications to the equipment that are not expressly approved by Badger Meter could void the user's authority to operate the equipment.

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