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100W and 100WP Pit Datalogging Water Endpoint Installation Guide

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Identification
100W and 100WP Pit Datalogging Water Endpoint Installation Guide
11/23/2010 TDC-0909-001

Confidentiality Notice
The information contained herein is proprietary and confidential and provided subject to the condition that (i) it is held in confidence except to the extent required otherwise by law and (ii) it is used only for the purposes described herein. Any third party given access to this information is similarly bound in writing.

Compliance Statement
This device complies with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Operation is subject to the following two conditions:
- This device may not cause harmful interference.
- This device must accept any interference that may cause undesirable operation.

This device must be permanently mounted such that it retains a distance of 20 centimeters (7.9 inches) from all persons in order to comply with FCC RF exposure levels.

Compliance Statement
This equipment has been tested and found to comply with the limits, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Operation is subject to the following conditions:
- This device may not cause interference.
- This device must accept any interference that may cause undesired operation of the device.

Compliance Statement
This equipment complies with policies RSS-210 and RSS-GEN of the Industry Canada rules.
Operation is subject to the following two conditions:
(1) this device may not cause interference, and
(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Modifications and Repairs
To ensure system performance, this device and antenna shall not be changed or modified without the expressed approval of Itron. Any unauthorized modification will void the user's authority to operate the equipment.

Trademark Notice
Itron is a registered trademark of Itron, Inc.
All other product names and logos in this documentation are used for identification purposes only and may be trademarks or registered trademarks of their respective companies.

Warning To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

Warning Follow these procedures to avoid injury to yourself or others:
- The lithium battery may cause a fire or chemical burn if it is not disposed of properly.
- Do not recharge, disassemble, heat above 100° Celsius (212° Fahrenheit), crush, expose to water, or incinerate the lithium battery. Fire, explosion, and severe burn hazard.
- Keep the lithium battery away from children.
- Replace the lithium battery only with batteries meeting Itron specifications. Any other battery may cause a fire or explosion.

Warning This unit cannot be modified and is not repairable. Modification of this device could cause non-compliance with FCC rules. Attempts to modify this device will void the warranty.

Warning Substitution of components may impair intrinsic safety.

Transportation Classification
The Federal Aviation Administration prohibits operating transmitters and receivers on all commercial aircraft. When powered, endpoints are considered operating transmitters and receivers and cannot be shipped by air. All product returns must be shipped by ground transportation to Itron.

Suggestions
If you have comments or suggestions on how we may improve this documentation, send them to TechnicalCommunicationsManager@itron.com
If you have questions or comments about the software or hardware product, contact Itron Technical Support:

Contact
- Internet: www.itron.com
- E-mail: support@itron.com
- Phone: 800 635 8725

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CHAPTER 1

Before You Begin

Document Conventions

Convention	Example
Itron product part numbers are noted in parentheses.	To install the endpoint (ERW-1300-XXX), do the following steps.
Hypertext links are in blue.	See the Copyright Page for identification information.

Note A Note indicates neutral or positive information that stresses or supplements important points of the main text. A note supplies information that may apply only in special cases.

Caution A Caution advises users that failure to take or avoid a specified action could result in a loss of data.

Warning A Warning advises users that failure to take or avoid a specified action could result in physical harm to the user or the hardware.

Document Purpose

This document provides the installation instructions for the 100W and 100WP endpoints. Mounting options for 100W endpoints include rod mount, wall mount, through-lid (remote antenna), and shelf mount installation. The 100W and 100RP are available with the following configurations:

- Integral connector
- 5-foot open-end cable
- 20-inch open-end cable

An optional Itron Leak Sensor is available for all three configurations to provide leak monitoring capability. 100W Endpoint configurations provide an easy interface to several register types. The 20-inch cable variant allows meter manufacturers to mount the endpoint directly to their respective meter registers before delivery to the installer.

Caution Installing an integrated 100W endpoint and meter register in a water pit box reduces the endpoint's RF signal distance significantly. If read reliability is a problem, install a remote antenna or select a new installation method.

How This Document is Organized

This document is organized into the following chapters:

Chapter	Description
1. Before You Begin	Information about this publication
2. About the 100W and 100WP Endpoint	Overview of 100W and 100WP endpoint installation.
3. Connecting, Initializing, and Programming	Instructions to initialize the 100W endpoint, connect the endpoint to the water meter, and program the 100WP.
4. Installing the 100W and 100WP Endpoint	Step-by-step endpoint installation instructions for: • Rod mount • Wall mount • Base mount • Shelf mount (kit CFG-1300-001) • Through lid mount • Optional Leak Sensor installation • Remote antenna installation (CFG-0900-001)
Appendix A Using an Inline Connector	Instructions for installing an inline connector.
Appendix B Using Gel Cap Connectors	Instructions for installing gel cap connectors.
Appendix C Troubleshooting	Tips for troubleshooting 100W and 100WP operation.

Related Documents

Document Description	Itron Part Number
Field Deployment Manager Endpoint Tools Mobile Application Guide	TDC-0934-XXX
900 MHz Belt-Clip Radio User's Guide	TDC-0889-XXX
FC300 Getting Started Guide	TDC-0898-XXX
FC200 Series Getting Started Guide	TDC-0598-XXX
Water Endpoint Ordering Guide	PUB-0063-001
Water Meter Compatibility List	PUB-0063-002
mlogonline™ Network Leak Monitoring System User Guide	TDC-0792-XXX

Note: XXX designates the document revision and is subject to change without notice.

CHAPTER 2

About the 100W and 100WP Endpoint

The 100W Endpoints are high-power radio frequency automatic meter reading (AMR) devices that attach to water registers to collect consumption usage and tamper data the endpoint then transmits to a data collection device. The endpoint operates in both bubble-up mode and two-way modes.

The 100W Endpoints ship in Factory Mode. The endpoints acquire and transmit meter register data within one hour following register connection. The endpoint transfers meter data immediately if the unit is initialized with a handheld computer during installation (see Initializing the 100W on page 7).

Caution Failure to initialize the endpoint may delay the initial reading up to 1 hour. The 100W endpoint will default to a consumption value of 0 if the endpoint is not programmed with Itron's Field Deployment Manager (FDM).

The 100W Endpoint supports protocols for a variety of meter manufacturer's registers. Refer to the *Water Meter Compatibility List* (PUB-0063-002), for the list of supported meters and registers.

100W Endpoints feature the following capabilities:

- **Leak Detection and Reverse Flow Detection.** 100W endpoints feature the same robust features as Itron's 60 series water endpoints to provide Leak Detection and Reverse Flow Detection. For more information about Leak Detection and Reverse Flow Detection, see the Itron white paper *Detecting Leaks and Reverse Flow with 60 Series Endpoints* https://extranet-kc.itron.com/Water%20Endpoints/Detecting%20Leaks%20and%20Reverse%20Flow%20with%2060%20Series%20Endpoints.pdf.
- **Communication Error Indicators.**

  Last Good Read. The cable is cut.

  

  Note Last Good Read may be an indicator of a damaged register.

  Extended Cut Cable. The Last Good Read flag was set in the last 24 hours (Fixed Network [FN] mode) or the last 40 days (Mobile Mode).

100W and 100WP Models

100W and 100WP Endpoint Description	Itron Part Number
100W Encoder, integral connector	ERW-1300-101
100W Encoder with Leak Sensor, integral connector	ERW-1300-102
100W Encoder, 5-foot cable	ERW-1300-103
100W Encoder with Leak Sensor, 5-foot cable	ERW-1300-104
100W Encoder, 20-inch cable	ERW-1300-105
100W Encoder with Leak Sensor, 20-inch cable	ERW-1300-106
100WP Pulser, integral connector	ERW-1300-107
100WP Pulser with Leak Sensor, integral connector	ERW-1300-108
100WP Pulser, 5-foot cable	ERW-1300-109
100WP Pulser with Leak Sensor, 5-foot cable	ERW-1300-110
100WP Pulser, 20-inch cable	ERW-1300-111
100WP Pulser with Leak Sensor, 20-inch cable	ERW-1300-112

Battery Life

Powered by two non-replaceable, long-life lithium batteries, the 100W has an expected battery life of 20 years when the endpoint operates in default Mobile or Fixed Network Operating mode. If the 100W endpoint is programmed for Hard to Read Mobile Mode, the battery life is reduced to 13 years. To proactively indicate the battery has reached a <10% useful battery life, a *Low Battery flag* is set to indicate impending battery failure. Battery life is 15 years for the 100WP-R when endpoint cable lengths exceed 150 feet.

100W and 100WP Transmission Modes

The 100W Endpoint can be set to transmit in Fixed Network, Mobile High Power, Mobile and Handheld, or Hard to Read Mobile and Handheld Mode.

- **Fixed Network Mode.** The 100W water endpoint transmits a high-powered NIM RF message every five minutes and a contingency SCM RF message every minute.
- **Mobile and Handheld Mode.** The 100W water endpoint transmits a medium-powered SCM RF message every 9 seconds.
- **(Optional) Mobile High Power Mode.** The 100W water endpoint transmits a high-powered SCM RF message every 60 seconds.
- **(Optional) Hard to Read Mobile and Handheld Mode.** The 100W water endpoint transmits a high-powered SCM RF message every 30 seconds. The *Hard to Read Mobile and Handheld Mode* should only be used for exceptionally hard-to-read applications.

Note The battery life is significantly affected in Hard to Read Mobile and Handheld Mode. The 900 MHz Remote Antenna can be used to increase reading range.

An FCC license is not required to read 100W Endpoint.

100W Operating Modes

1. Factory Mode

- 100Ws are shipped from the factory in Factory Mode.
- The endpoint's transmitter is turned off.
- The endpoint's receiver is bubbling-up to listen for a programming command.
- 100W encoder models will attempt to read the register every hour.
- Last good read and cut tamper flags may be set when a register is not connected.
- If the 100W reads a connected register, the endpoint automatically moves to Run Mode (100W only).

2. Run Mode
    - 100W normal operation mode.
    - The 100W transmitted message is dependent on its factory settings for standard consumption messages (SCM) or network interval message (NIM).
        - For SCM, the 100W default bubble-up rate is 9 seconds.
        - For NIM, the 100W default bubble-up rate is five minutes. When the endpoint is set for NIM, the 100W transmits a contingency SCM message every minute. NIM mode is configured by programming FN mode with a programming device.

100WP Operating Modes

The 100WP has three standard operating modes.

1. Factory Mode
    - 100WP s are shipped from the factory in Factory Mode.
    - The endpoint's transmitter is turned off.
    - The endpoint's receiver is bubbling-up to listen for a programming command.
    - 100WP encoder models will attempt to read the register every hour.
    - Last good read and cut tamper flags may be set when a register is not connected.
    - If the 100WP reads a connected register, the endpoint automatically moves to Run Mode and defaults to a zero consumption.

2. Run Mode

- 100WP's normal operation mode.
- The 100W transmitted message is dependent on its factory settings for standard consumption messages (SCM) or network interval message (NIM).
    - For SCM, the 100WP default bubble-up rate is 9 seconds.
    - For NIM, the 100WP default bubble-up rate is five minutes. When the endpoint is set for NIM, the 100WP transmits a contingency SCM message every minute. NIM mode is configured by programming NIM mode with a programming device.

3. Quiet Mode

- OEMs can configure the endpoint for quiet mode after programming and direct mounting the 100WP-R in a factory.
- An endpoint is awakened from quiet mode and enters Run Mode in one of two ways:
    - Counting two pulses. The pulses are counted internal to the 100WP-R while it is in quiet mode.
    - Receiving a two-way command, such as a **Read ERT** using FDM.
- If an endpoint installed in quiet mode is not bubbling up SCM or NIM messages, it may be due to zero consumption on the endpoint, such as a vacant or vacation home. Initiate a two-way command (for example, perform a **Read ERT** with FDM) before removing the unit.

CHAPTER 3

Initializing, Connecting, and Programming

This chapter provides the instructions to connect the 100W or 100WP endpoint, to initialize the 100W endpoint, connect the endpoint to the meter register, and program the 100WP endpoint. The 100W initializes immediately when the endpoint is programmed with an approved handheld computer or the endpoint recognizes the meter register and activates itself after connection to a register.

Caution To obtain an immediate reading, initialize the 100W with an approved handheld computer. Failure to initialize the endpoint may delay the initial reading up to 1 hour.

Initializing the 100W

- To initialize the 100W immediately, use one of the following handheld computers running Field Deployment Manager (FDM) version 1.0 or later.
  - FC200SR handheld computer (Itron part number FC2-0005-004 or FC2-0006-004)
  - FC300 with SRead
- For normal activation, connect the 100W to the water meter register. The endpoint polls for a register every hour. After a register is detected, the 100W automatically activates.

Connecting to a Meter Register Using the Inline Connector

The inline connector system easily allows a separation of the endpoint and meter register and provides for general maintenance or system troubleshooting (see Using an Inline Connector on page 33).

Connecting to a Meter Register Using a Cable

The 100W endpoint may be connected to the water meter register using the 5-foot or 20-inch cable.

Caution The wire terminations must be properly sealed with a non-conductive gel material to prevent water intrusion (otherwise, this configuration should not be used in a pit box environment). Itron recommends the 5-foot cable configuration for OEM users only.

To connect the 100W to the register

- Connect the 100W wires to the register screw terminals according to the following table.

Register Manufacturer	100W wire color		
	Red (data)	Black (power/clock)	White (ground)
	Register screw terminal		
Elster AMCO Invision	R	G	B
Elster AMCO Scancoder	R	G	B
Elster AMCO evoQ4 (Q4000)	R	W	B
Hersey Translator	G	R	B
Badger ADE	G	R	B
Sensus ECR	G	R	B
Sensus ICE	G	R	B
Metron Farnier	G	R	B
Itron (Actaris) Coder	G	R	B
ProRead	R	B	G
Performance ETR	G	R	B
Severn Trent SM700 SmartMeter (Sensus Protocol)	G	R	B

Caution The wire should wrap one complete revolution around the register screw. Completely tighten register screws and verify wire insulation is not under the screw terminal heads or intermittent electrical connection may occur. You must use a moisture-proof sealant if the meter is used outdoors or in any environment where moisture can collect on the screw terminals.

Connecting the 100WP to a Remote Meter Register

- Connect the 100WP wires to the register screw terminals according to the following table.

100WP Connections			
	100WP wire color		
	Red (signal)	Black (common)	White (tamper)
Register Manufacturer	Register screw color designator		
Elster Digital	BLK	GRN	R
Itron (Actaris) Cyble Sensor (2-wire)	Either wire	Remaining wire must be connected to both endpoint wires	
Badger RTR	R	BLK	Green/bare
Elster V100	BLK	R	Blue
Sensus PMM	R	BLK	Bare

Connect the endpoint to the cable using gel-cap connectors (see Using Gel Cap Connectors on page 35).

Using an Extension Cable

Order the 25-foot inline connector extension cable assembly (CFG-0151-401) to extend the 100W with the inline connector.

Verifying Operation of the 100W Endpoint

Use one of the following handheld computers to verify consumption:

- FC200SR handheld computer (Itron part number FC2-0005-004 or FC2-0006-004)
- FC300 with SRead

Notes

- Each handheld radio requires special setup and configuration parameters to successfully read and program 100W products. Refer to the respective meter reading application for specific instructions.
- When comparing the actual register value to that reported by the 100W endpoint, please keep in mind the endpoint's consumption value is updated once an hour when it is in Run Mode.

Caution Do not use ReadOne Pro, FS2PN, FS3PN, or FC200 readers to read the 100W or 100WP endpoint. These readers do not keep their receivers on long enough or at the right frequency to reliably capture an endpoint transmission.