R170 Wire-Free PDU Sensor Tag

RF Code™
discover. track. monitor.

Integration Guide

Contents

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FCC Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

RFCode is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Industry Canada Compliance Statement
This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de conformité à la réglementation d'Industrie Canada
Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

The system is designed to operate with RF Code RFID Tags – whose operating frequency is 433.92 MHz which have been certified or are in the certification process. These devices comply with part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) these devices may not cause harmful interference, and
(2) these devices must accept any interference received, including interference that may cause undesired operation.
   a. FCC ID: P6F2005433 for beacon intervals greater than, or equal to 10 seconds.
   b. FCC ID: P6F433MHZ for the security tag with beacon intervals less than 10 seconds.

CE Compliance

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures. This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022 class A, the essential protection requirement of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

WEEE Compliance

Do Not Dispose Product with Municipal Waste. Special Collection/Disposal Required.

R170 Wire-Free PDU Sensor Tag

Introduction

RF Code has worked corroboratively to integrate RF Code's wire-free sensor technology with 3rd Party industry leading rack power distribution units (PDUs). The result of this effort is the RF Code R170 Wire-Free PDU Sensor Tag which enables data center managers to monitor real-time power consumption and utilization via RF Code's wire-free sensor network and Sensor Manager application. The RF Code R170 PDU Sensor Tag currently works in concert with Raritan's "RF Code Ready" PX family of rack PDUs, with other industry leader PDU integration to follow.

The easy-to-deploy wireless RF Code solution enables IT racks to be instrumented quickly for power monitoring and eliminates the time and cost associated with expensive wired Ethernet connections. Deploying the joint solution simply involves installing the PDU into the rack and then plugging an RF Code sensor tag into a PDU. All IP address association, configuration, and IP address maintenance is eliminated drastically reducing the cost of PDU power monitoring.

The R170 PDU Sensor Tag simply plugs into the sensor port on the PDU via a locking RJ12 connector. When connected, the R170 PDU Sensor Tag collects vital power usage statistics and transmits the information using RF Code's patented radio frequency technology to an RF Code Reader which is connected to the Ethernet network. The RF Code Readers decode all of the RF transmitted data which is then collected by RF Code's applications (Zone Manager, Sensor Manager, and Asset Manager).

Features

Some of the features of the R170 Wire-Free PDU Sensor Tag are:

- Encoded Radio Transmissions at 433 MHz
- Power consumption and utilization trend monitoring, including:
  - Main PDU Data
  - PDU Phase Data
  - PDU Outlet Data
  - PDU Breaker Data
- Works with Raritan's "RF Code Ready" PX family of rack PDUs
- Integrates with RF Code's Sensor Manager and Asset Manager software solutions
- Easy-to-Deploy, "Wire-Free" Monitoring
- Low Power Consumption for Long Battery Life

Contents

The R170 Wire-Free PDU Sensor Tag package contents are:

- R170 Wire-Free PDU Sensor Tag with 7ft cable with RJ-12 connector
- One zip-tie and one zip-tie mount
- Printed R170 Integration Guide

Overview

The R170 PDU Sensor Tag data collection and reporting cycle involves sets of data at two levels of timeliness. The most critical power information is reported every 10 minutes and while information that is less time critical is reported every hour. These cycles result in the following reporting periods:

- Per-Phase voltage/power-factor/watt-hours transmitted every 10 minutes
- Per-breaker amperage transmitted every hour
- Per-socket watt-hours and configuration transmitted every hour
- Per-socket power-factor transmitted every hour
- PDU model and PDU serial number packets transmitted at least once per hour
- Per -breaker tripped status is sent in real-time upon a state change

The PDU Sensor Tag for Raritan provides the following power attributes which are surfaced in the RF Code Zone Manager middleware as well as the Sensor Manager and Asset Manager applications:

- Main PDU Data:
  - » PDU Model
  - » PDU Disconnected
  - » PDU Serial Number
  - » PDU Active Power
  - » PDU Apparent Power
  - » PDU Total Active Power Used
  - » PDU Total Apparent Power Used
  - » PDU Total Power Start Time

- PDU Phase Data:
  - » Phase Active Power
  - » Phase Amperage
  - » Phase Apparent Power
  - » Phase Power Factor
  - » Phase Total Active Power Used
  - » Phase Total Apparent Power Used
  - » Phase Total Power Start Time
  - » Phase Voltage (L-L)
  - » Phase Voltage (L-N)

- PDU Outlet Data:
  - » Outlet Active Power
  - » Outlet Amperage
  - » Outlet Apparent Power
  - » Outlet Total Active Power Used
  - » Outlet Total Apparent Power Used
  - » Outlet Total Power Start Time
  - » Outlet Voltage

- PDU Breaker Data:
  - » Breaker Amperage
  - » Breaker Tripped

By utilizing the power calculated attribute feature of RF Code's Asset Manager and Sensor Manager applications, Active Power and Apparent Power metrics can be produced for the various locations defined such as a rack, a row, and an entire data center. Furthermore all of the power information described above is available for use by Asset Manager and Sensor Manager's data management features such as:

- Live table views
- Map views
- Interactive graphing
- Scheduled reporting and graphing
- Alerting and thresholds

The following illustrations show the information collected by the RF Code PDU Sensor Tag being utilized by Sensor Manager and Asset Manager in a variety of different ways:

Figure 1: Wire Free PDU Sensor Tag Architecture

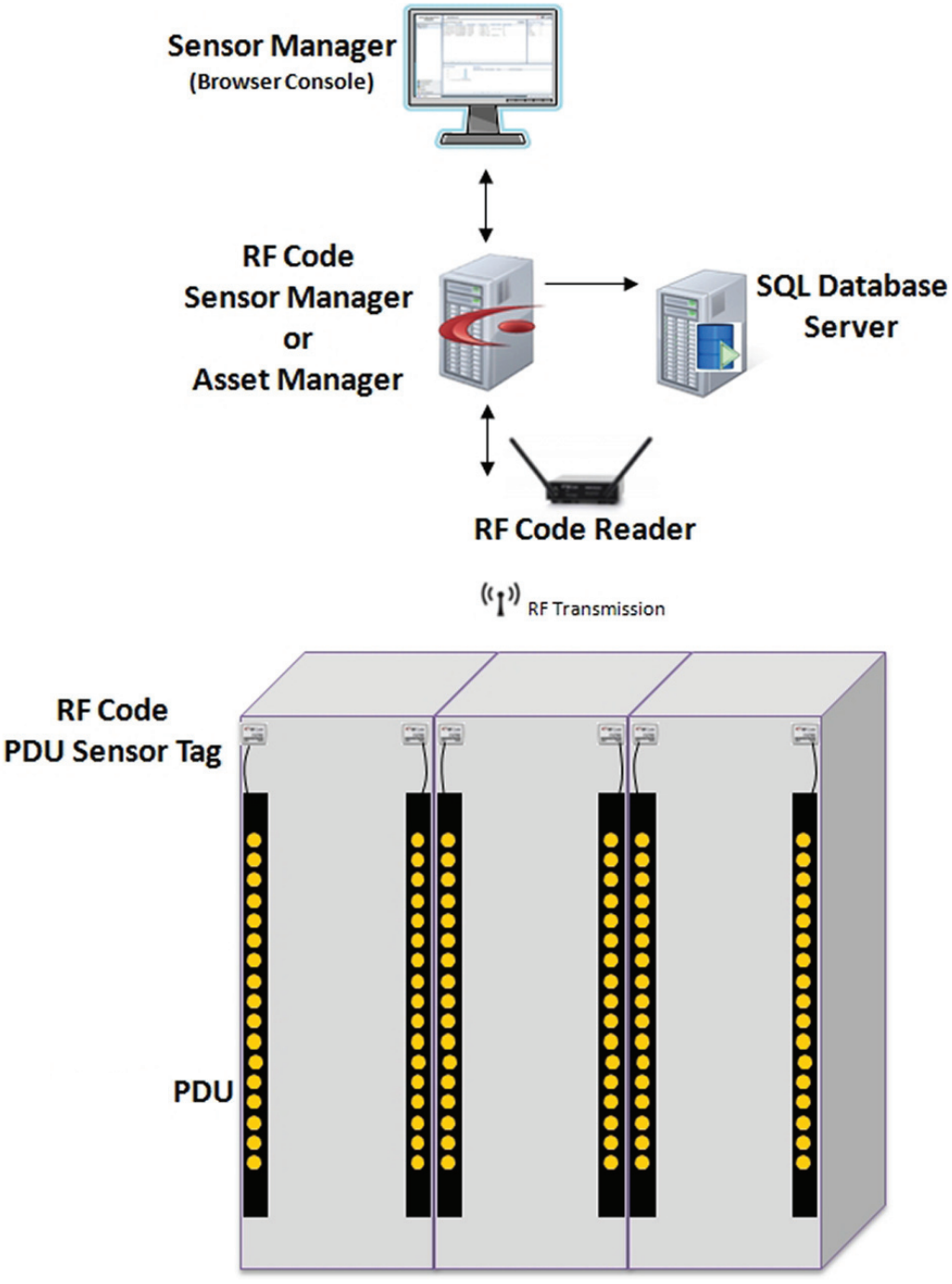


Figure 2: PDU Sensor Tag Details

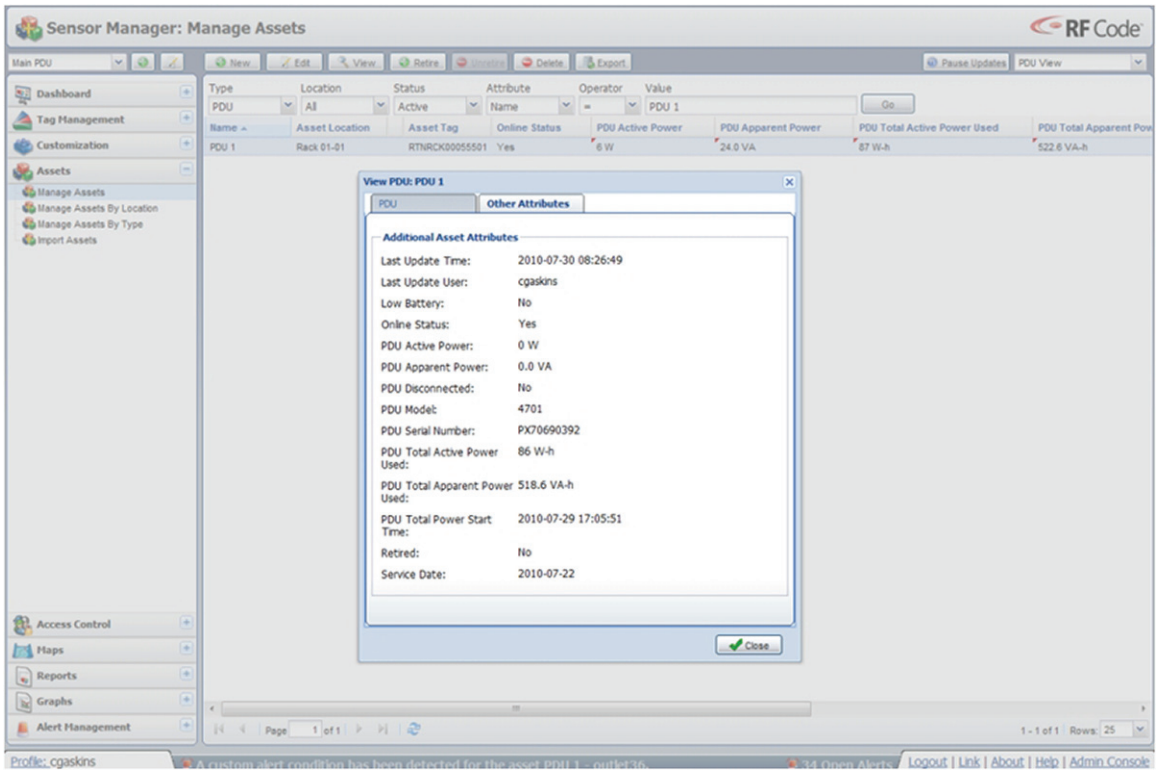
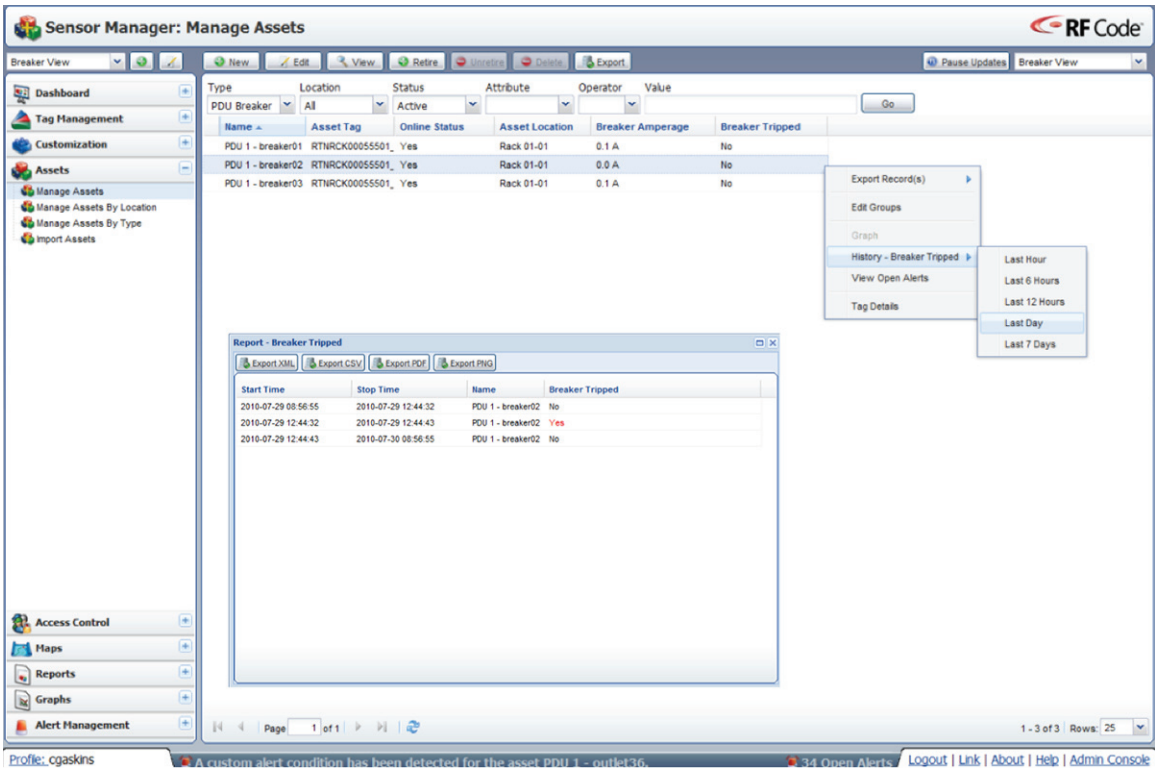


Figure 3: PDU Sensor Tag Report



Integration

The following are a list of steps required to install and integrate the R170 PDU Sensor Tag into RF Code software (Sensor Manager, Asset Manager, Zone Manager):

1. Install Raritan PDUs into racks and power them on (Refer to the documentation that came with your PDU for installation information).

2. Install RF Code Readers. Please refer to the RF Code M200 and M250 Reader User Manuals for information on installation. These manuals can be accessed on the CD-ROM that came with the Reader or on our library downloads page:

   http://www.rfcode.com/Resources/Library/Library.html

3. Install and perform basic configuration of RF Code software (readers, tag groups, locations, rules, assets, etc.). Please refer to the appropriate documentation for your RF Code software (this is located on the CD-ROM that came with your purchase or is available online at the above URL).

   Note You must allow at least two hours for power information to become available in the RF Code software due to the time delay of the data collection and data transmission.

4. Install R170 PDU Sensor Tag by plugging the tag cable into the RJ-12 "Sensor" port connector on the Raritan PDU.

   Note Due to the large number of sequential beacon payloads that must be successfully received, the R170 tag should be mounted outside and above the IT rack to reduce metal interference with the radio frequency signal.

   - Missed beacons will cause further time delays in the reporting cycle so they should be eliminated as much as possible by proper positioning of the tags.

   - In cases where environmental noise levels or high tag densities occur, additional readers may need to be installed to assure successful delivery of data from the R170.

   A strain relief method should be used for mounting the tag. Position the R170 Tag on the outside of the rack near the top. Remove the release liner from the back of the tag and press firmly to mount the tag to the surface of the rack.

   Note When mounting the tag, a strain relief method with the supplied tie-wrap and tie-wrap mount should be used to prevent potential problems resulting from being bumped or snagged.

If further assistance is needed, please contact RF Code support at **support@rfcode.com** or **512.439.2244/866.830.4578**.

Figure 4: Sensor Port on PDU

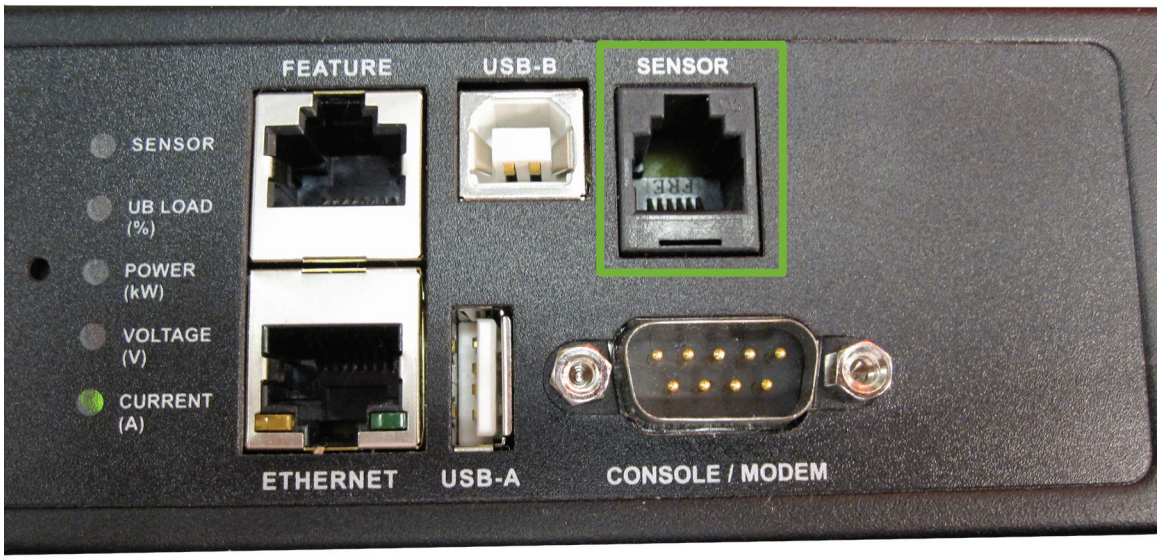


Figure 4: Strain Relief Wire Mounting Method

Limited Standard Warranty Terms

RF Code warrants its products to be free from defects in materials and workmanship for a period of 1 year (12 months) for hardware and software from the date of purchase from RF Code. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. This warranty does not apply to equipment that has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser (end-user) and is not transferable.

Standard Warranty Limitations

Except as provided herein, the entire liability of RF Code and its suppliers under this limited warranty will be that RF Code will use reasonable efforts to repair or replace, without charge, all defective Products returned to RF Code by Customer, all as more particularly described in the End User Warranty. Except for the express warranties STATED HEREIN, RF Code makes no other representations or warranties and RF Code hereby disclaims, all other warranties, express, implied, statutory, or otherwise, including without limitation, any warranty of merchantability, non-infringement of third party intellectual property rights, fitness for a particular purpose, performance, satisfactory quality, or arising from a course of dealing, usage or trade practice.

Obtaining Service & Support

For in-warranty service, customers have several options. Customers having difficulty with RF Code products should attempt to solve those problems through RF Code's Technical Support Problem Escalation Process:

First, contact the RF Code representative or other distributor from whom the RF Code product was purchased for information on how to obtain local support.
Second, contact the RF Code Customer Support via e-mail.
Third, contact the RF Code Customer Support via the Support Line.

For product returns, the support engineer will give you a return material authorization (RMA) number. No returns will be accepted without an RMA number. If the warranty expired, there is a charge for repair or replacement per RF Code's out-of-warranty policy. For full details of the RF Code RMA policy, please review the "RF Code Warranty, RMA, and Extended Warranty Policy" document.

RF Code Customer Support

RF Code Customer Support gives entitled customers and partners the ability to contact RF Code about installation and usage-related questions as well as make defect inquiries about eligible products that are covered under RF Code warranty agreements. A team of technical specialists can be contacted electronically or via phone.

The Support Line is available to provide General Support during normal business hours: Monday through Friday, 8:00am to 5:00pm Central time, excluding national holidays.

E-mail: support@rfcode.com
Support form: http://www.rfcode.com
Voice: 512.439.2244 or toll-free at 866.830.4578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