

## Data Monitoring Pin and Sleeve User's Manual

### Version 1.1



Wiring Device – Kellems  
Hubbell Incorporated (Delaware)  
Shelton, CT 06484  
1-800-288-6000  
[www.hubbell-wiring.com](http://www.hubbell-wiring.com)

## Contents

Contents .....	1
Safety summary and specifications .....	2
Introduction .....	3
Data Monitoring Pin and Sleeve Overview.....	3
Service types .....	3
Communication .....	3
Hubbell Monitoring Solution Overview .....	3
Wireless Monitoring Nodes.....	3
Communications.....	4
Installation.....	5
Installing the Ethernet Gateway .....	5
Technical Specifications.....	6
Regulatory Information and Labels.....	7

## Safety summary and specifications

This manual is intended for use by personnel responsible for installing or removing the Data Monitoring Pin and Sleeves. Hubbell assumes no liability for user's failure to comply with these safety guidelines. Please read this manual carefully before proceeding.



This symbol is used throughout this manual to indicate critical safety information. Failure to observe the information following this symbol may result in injury or death.



### CAUTION

- Read all instructions carefully prior to installation.
- Data Monitoring Pin and Sleeves should only be connected to the type of power source indicated on the label.
- Do not overload a Data Monitoring Pin and Sleeve as this can result in a risk of fire or electrical shock.
- Adhere to voltage and amperage guidelines and utilize a proper branch circuit protector.
- Cables must be connected to a grounded (earthed) outlet.
- No field-serviceable parts. Do not attempt to disassemble the product as potentially severe electrical shock may result. Installation and maintenance must be performed by qualified personnel.
- Follow basic safety precautions to reduce the risk of electrical shock and damage to equipment.
- Store in a clean, dry location. Clean with a dry cloth.
- Intended for indoor use only, do not install in a wet location.
- Adhere to all local electrical codes and guidelines.
- Failure to use the product in the specified manner may lead to injury or death and damage to equipment.

## Introduction

### Data Monitoring Pin and Sleeve Overview

#### Service types

Data Monitoring Pin and Sleeves are receptacles and connectors with embedded wireless power monitors that transmit real time power and energy usage data wirelessly to a central Gateway module. The Data Monitoring Pin and Sleeve is a monitoring-only device and it cannot disconnect, switch or otherwise interfere with the electrical current flowing through the cable and is inherently failsafe with a no risk of interrupting the circuit in the event of failure to the monitoring device. The monitoring mechanism is powered from the cable itself and consumes less than 0.6W of power.

#### Communication

The Data Monitoring Pin and Sleeves incorporate Hubbell's advanced zero-configuration wireless mesh networking technology to transmit power measurement data. Data is sent across the wireless network to the Hubbell Ethernet Gateway which connects using a standard Ethernet port to the customer's wired network infrastructure.

### Hubbell Monitoring Solution Overview

The overall Hubbell system consists of the following components:

#### Wireless Monitoring Nodes

Wireless Power monitors including:

- **Data Monitoring Pin and Sleeves** that can record and transmit true power usage and monitor temperature internal to the device
- **Ethernet Gateways** (Figure 1) gather data from hundreds of monitoring devices via a wireless mesh radio network. The Gateways form the bridge between the wireless monitoring network and the facility's LAN.



Figure 1:  
Ethernet  
Gateway

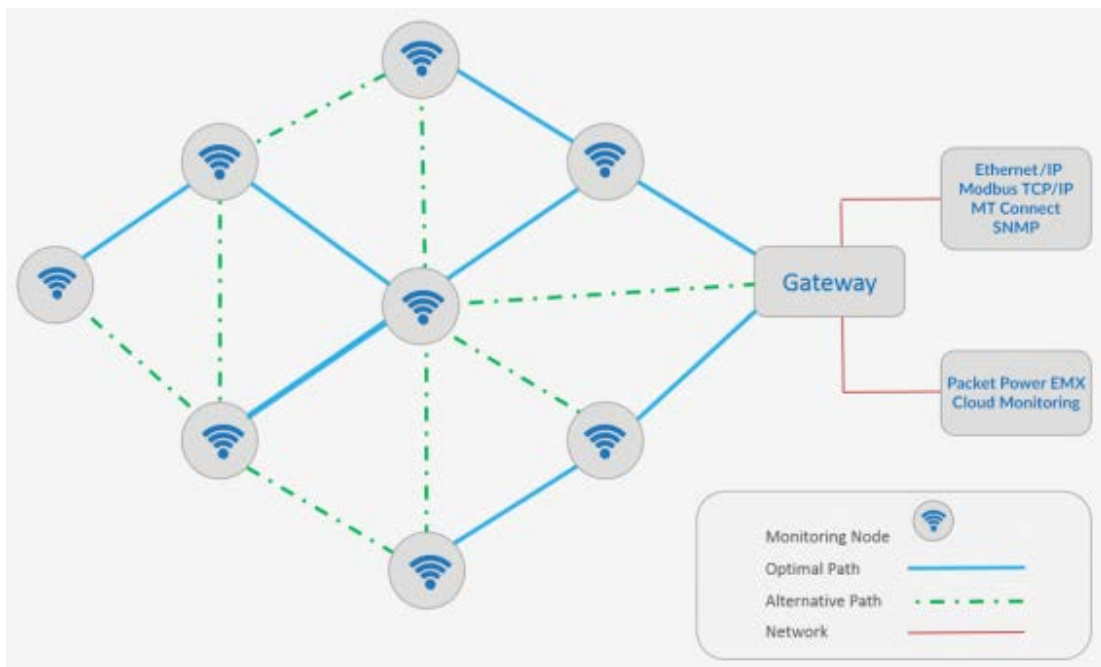
## Communications

Information gathered by a device is transmitted via a Hubbell radio network operating at either 900 MHz or 2.4 GHz (the exact frequencies vary with region – please contact Hubbell for details). The network operates in a mesh topology. Each device in the network must be within range of at least one other device (either another monitoring node or the Gateway) in the network. The effective range of the radio in the Data Monitoring Pin and Sleeves varies depending on several factors, including the environment in which the product is used. Typically, each device has an effective range of 10 to 30 meters. The Data Monitoring Pin and Sleeve will not transmit effectively if it is installed in an enclosure that entirely blocks radio signals such as fully enclosed metallic enclosures.

Every site where a Data Monitoring Pin and Sleeve is deployed must have installed at least one compatible Hubbell Gateway device and associated software to collect data and prepare it for transmission to any approved monitoring and analysis application. It is not necessary for all cables to communicate directly with the Gateway. As long as each device can communicate with at least one other device, and one device can also communicate with the Gateway, information from all devices will reach the Gateway.

The rate at which power monitoring information is gathered from a device depends primarily on the ratio of the number of devices to the number of gateways. As an example, at a ratio of 100 devices per Gateway, a Gateway should read from each device every 5 to 15 seconds. The system will automatically reallocate network traffic across Gateways when new Gateways or devices are added.

*Note: In the event of a loss of power to a power cable, energy consumption information (Wh) is retained in non-volatile memory and will be transmitted when power is restored.*



**Figure 6: Hubbell Communications Architecture**

## Installation



**Prior to installation, check to make sure the Data Monitoring Pin and Sleeve has not been damaged.**

For cable installation of the Data Monitoring Pin and Sleeve devices, refer to the installation instructions for the connector and receptacle.

### DISCLAIMER

Installation of Hubbell monitoring cables involves the disruption of power flow to your devices. Disconnecting power supply cables on running computing equipment and other electrical devices may lead to interruption of service, data loss, equipment damage and other potential losses. Hubbell is not responsible for any losses incurred due to power interruptions during the installation process. The customer is responsible for understanding and mitigating any consequences of interrupting and re-starting power flow to any equipment during the installation process. Installation should only be performed by personnel otherwise authorized to manage power connections to the equipment to be monitored. Dual-powered ("A & B") devices can in some cases be connected live, with one side (e.g. "A") being replaced first, followed by the other side (e.g. "B"). However, any time one of the power supplies is disconnected, the redundancy of a dual power supply and all of the protections it provides against failure are compromised. You are responsible for completely understanding this risk and taking responsibility for any consequences of a power loss while connecting power cables.

## Installing the Ethernet Gateway

Each location in which Smart Power Cables are deployed must have one or more Hubbell Ethernet Gateways to gather data from the Smart Power Cables.

Refer to Hubbell's Ethernet Gateway User's Manual or Quick Start Guide for more information.



## Technical Specifications

Technical Specifications	
<b>Measurement</b>	
Measurements	V, A, W, PF, Temp
Accuracy	+/- 1.0%
Voltage	250 - 480V AC
Current range	Up to 60A
Circuit types	Three phase
<b>Communications</b>	
Operating frequency	860 to 930 MHz and 2.4 GHz. Frequency varies by region
Wireless protocol	Self configuring, load balancing mesh network
Wired network protocol	Ethernet with various protocols available
Firmware updates	Wireless
Typical transmission range	Up to 30 meters between any 2 devices in mesh network
Antenna	Fully enclosed
Monitoring unit to gateway ratio	Up to 150 monitoring units per gateway
Gateways per site	Unlimited
Multi-site support	Yes
Encryption	AES 128-bit
Compatible devices	All Hubbell monitoring units

## Regulatory Information and Labels



This product has been certified to and conforms to the following requirements:

- UL 61010-1 Issued: 2004/07/12 Ed: 2 Rev: 2008/10/28 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements
- CSA C22.2#61010-1 Issued: 2004/07/12 Ed: 2 (R2009) Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Part 1: General Requirements, with general instruction No.1:2008/10/28-(R2009)\*AMD

This product has been tested and complies with the following requirements:

- Council Directive 2006/95/EC (December 12, 2006) on Low Voltage Equipment Safety; IEC 61010-1:2001 (**Second Edition**) and **EN 61010-1:2001 (Second Edition)**
- Council Directive 1999/05/EC - European Union (EU) Radio & Telecommunications Terminal Equipment Directive (R&TTE) ETSI EN 300 220-2, Issued:2006/04/01 and ETSI EN 301 489-3, Issued:2002/08/01 V1.4.1
- Council Directive [2004/108/EC](#) (December 15, 2004) on Electromagnetic Compatibility CENELEC EN 61326-1 Issued:2006/05/01; IEC 61326-1:2005;:1997 –
- AS/NZS 4268: 2008

Class B Device Statement / FCC Regulations:

Section 15.105(a) of the FCC Rules: This equipment has been tested and found to comply with the limits for a Class B 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.

Section 15.19 of the FCC Rules: 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.

Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this product not expressly approved by Hubbell LLC might cause harmful interference and void the FCC authorization to operate this product.

Pursuant to part 2.1091c of the FCC rules device is categorically excluded from routine RF Exposure regulations.

Industry Canada (IC) Compliance Statement

This device complies with Industry Canada license-exempt RSS standard(s). 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.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Per section RSS-102, 2.5 of Industry Canada regulations, this device is categorically excluded from Routine Evaluation Limits.

Industrie Canada (IC) Déclaration de conformité

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance iposotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.