Installation Guide

Submetering System

Palladium Building Project
Seattle, WA
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1.1 Overview

This document is intended to guide the user through the initial set-up of a Water Gas and Electric Submetering System. The system is made up of usually one or more PETRC units and up to 600 PET modules.

PETRC units are a receiving device that collects information from the PET modules via Radio Frequencies in the 902 to 928 MHz band and stores this information for later retrival by various “head end” software. The device is powered by 110 Volts AC and incorporates a 3dBd gain antenna.

The PET module is a transmit only device that transmits its consumption information once each 10 to 15 minutes. The consumption information is gathered continuously from any pulse output device including Water, Gas and Electric. The device is for indoor use in a non-condensing environment. The unit has a battery life of greater than 4 years.

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1.2 FCC Regulatory Information

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

Service Requirements

The PET modules and PETRC units have no user serviceable parts.

In the event of equipment malfunction, all repairs should be performed by Itron. It is the responsibility of users requiring service to report the need for service to our company. For service call 1-800-635-5461 and ask for the Customer Service Department.

Caution changes or modifications not expressly approved by Itron, Inc. could void the user's authority to operate this equipment.

1.3 Purpose

This document is intended to aid installation personnel involved in the installation and operation of the SubMetering network's **PETRC unit** and **PET module** and become familiar with the details of the design. This document describes how the units operates as a system and does not detail the specified limits or the performance.

1.4 Scope

This document covers the Revision 1 of system hardware. Functional blocks are broken down into component or group of components and explanations of how they operate with each other, their inputs and outputs are given.

1.5 Basic Components of Itron's Submetering Network

1.5.1 PET Modules

Itron's Meter End Point RF Devices or PET modules encode consumption and tamper information, then transmit this data and other information via RF to the network PETRC units. The PET modules for Electric meters are normally installed under the glass of standard meters and do not require battery power; the Devices for Gas and Water meters are self-contained low-power units, powered by long-life batteries. PET modules can be installed by the meter manufacturer during the manufacturing process or easily retrofitted into most existing meters.

1.5.2 Network PETRC Units

The network PETRC unit receives Water, Electric and Gas usage data via RF from the PET modules, and transmits the data to the head-end MV-RS meter reading software via telephone or cellular telephone. Two types of PETRC units are utilized in the network: the base PETRC unit and relay PETRC units. The base PETRC unit is similar to all other PETRC units except it is equipped with a telephone connection. The telephone connection can be either a standard line or a cellular type.

An optional cellular phone interconnect can be utilized on either a temporary or permanent basis depending on the application. As a temporary option, the varying lead time of telephone installation can be circumvented by utilizing the cellular phone interconnect option until a cost-effective solution can be installed. In large scale roll-outs, often in areas large enough to span multiple telephone companies' service territories, a single contact within one telephone company is often not available, which inevitably results in delays. With the cellular telephone option, these delays can be eliminated. Additionally, the cellular telephone option can be migrated from new installation to new installation as hard-wired telephone services are eventually installed at each site.

The base PETRC unit is generally mounted at a central point in a apartment complex where ease of interconnection to power and telephone lines are available. This base unit can monitor and retain data on up to 600 Water,

Electric, and Gas PET modules. All Water, Electric, and Gas usage data is gathered from the PET modules via a Frequency Hopping Spread Spectrum RF technology. Having the PET modules utilize a very slow “bubble up” rate minimizes the power consumption of the PET module, thus providing a much longer field life. The slow bubble up rate also minimizes unnecessary RF interference to other users in the RF band.

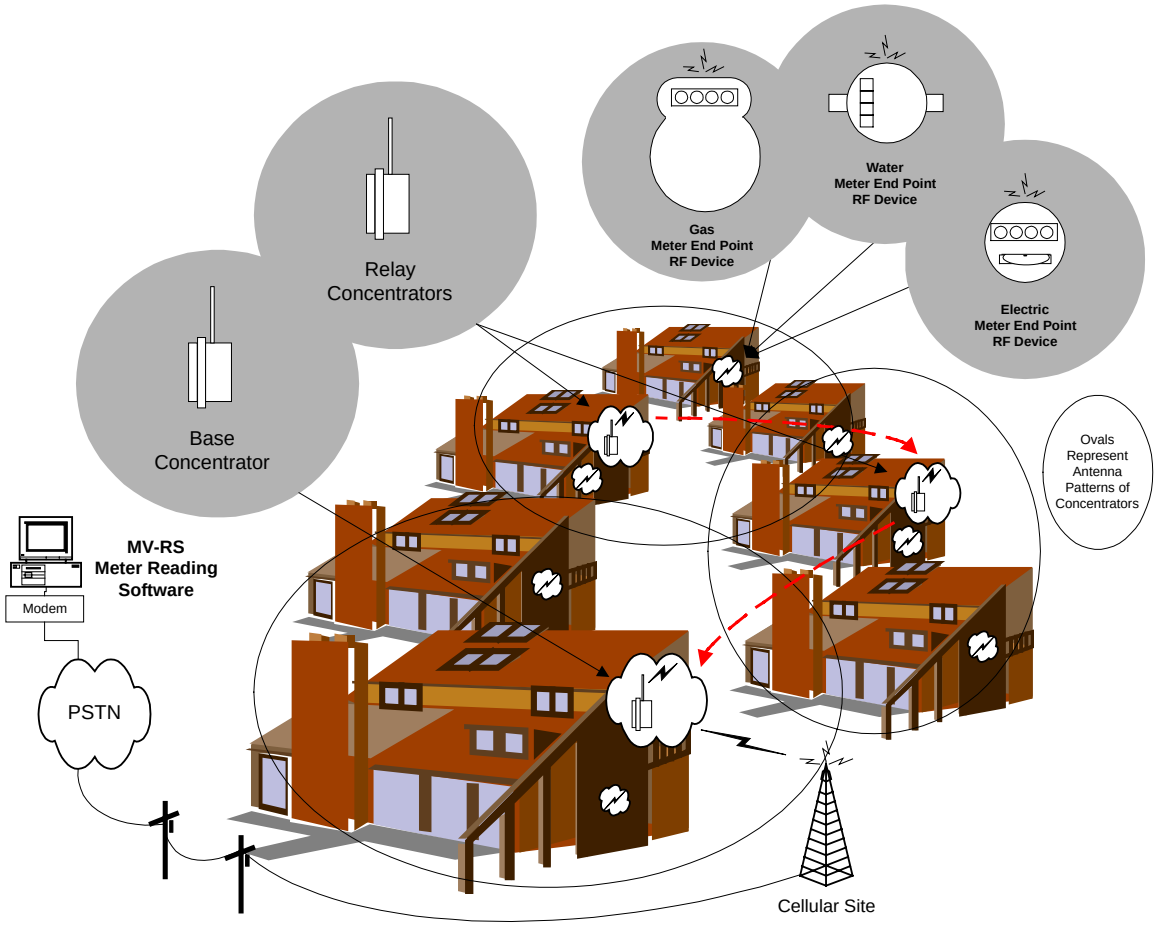
The relay PETRC unit provides a store-and-forward functionality in the network. This unit receives PET module RF transmissions from surrounding PET modules, adds a time stamp, and upon a predetermined time, forwards the stored PET module data to other PETRC units (either additional relay PETRC units or the base PETRC unit). Up to 8 levels can be configured in a string of PETRC units. Each level can communicate with all of the units at lower levels. Thus, the system can be configured to provide universal coverage in typical multi-dwelling or high rise environments.

The ruggedized PETRC unit (both base and relay) is capable of being mounted outside and is impervious to weather and potential vandalism.

Water, Electric and Gas usage data transmitted by the network PETRC unit via telephone or cellular telephone is processed by the head-end MV-RS Meter Reading Software. The MV-RS system runs on a standard PC. MV-RS not only processes data received from network PETRC units, it provides an interactive, graphical user interface to allow users to extract and report key information.

Itron’s MV-RS Meter Reading Software has been deployed throughout the world at over hundreds of locations. Originating within the utility market, this Multi-Vendor Reading Software has years of reliable service with millions of meters read. Itron has chosen the MV-RS Meter Reading Software, along with the network PETRC units and the PET modules, as key components in Itron’s Submetering Network because of their substantial history of reliable operations in the utility meter reading environment around the world.

Figure 1 - Basic Components of Itron's Submetering Network



PET Modules – Itron's Meter End Point RF devices or PET modules are installed into the Water, Electric and Gas meters and transmit usage data via RF to the PETRC unit

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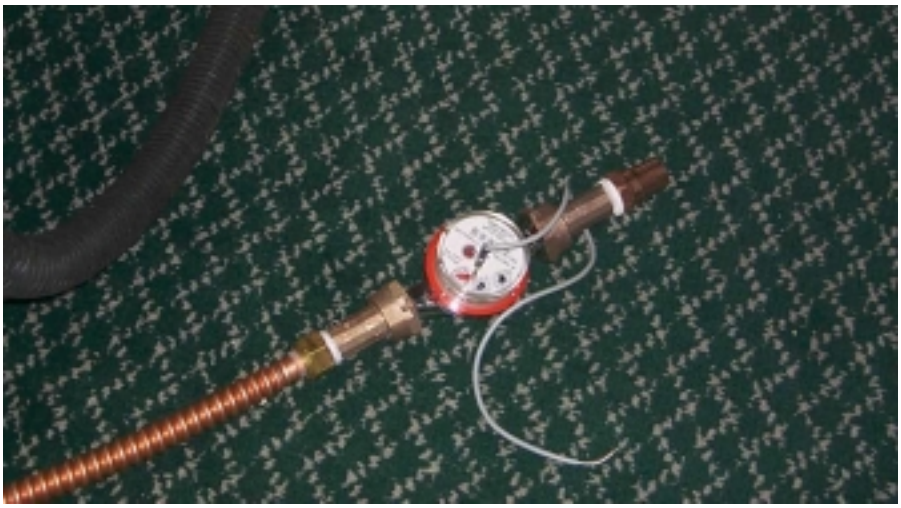
Network PETRC Unit – Itron's Network PETRC unit receives Water, Electric and Gas usage data via RF from the PET module, and sends the data to the head-end MV-RS Meter Reading Software via telephone or cellular telephone.

MV-RS Meter Reading Software - Water, Electric and Gas usage data sent by the network PETRC unit via telephone or cellular telephone is processed by the head-end MV-RS Meter Reading Software.

Required Equipment and Materials for Electronic Installation

Hardware	• PETRC Unit • Laptop Computer • 40’ Data Cable (Part Number 520-0329-001) [See Figure 1] • 20’ DB9 serial cables • DC/AC Inverter (150 watt minimum) • 50’ AC Electrical Extension Cord • Magnetic roof top antenna • Drill (battery operated) • 12” Drill Bits (regular and able to penetrate walls) • Wrench set up-to 9/16 • Socket set up-to 9/16 • Screwdrivers (Phillips and Slotted) • Crimp tool • PET Module
Software	• Microsoft Excel (with Itron scripts and macros) • ProComm Plus • MicroSurvey
Data	• Installed ERT Population Database including an ERT ID list that has been checked for corresponding apartment number. (***Critical for proper installation)*** • Maps/diagrams of area • Concentrator configuration/parameters
Supplies	Lag bolts Clean tools Alcohol

NOTE: Use only a dry rag to clean the PETRC unit. No user-serviceable items are in the PETRC unit or PET module unit**. If the PETRC unit or PET module is suspected of improper operation see trouble shooting section of this document,**



Water Meter with Transducer

PETRC Unit

PET Module

Typical Water Submetering Components

Wrong Way to Install a Pet Module

Note that the PET Module is installed behind hot water tank and under the copper tubing. The preferred location in this instant would be at least 6 inches from any metal surfaces as indicated

1.6 Trouble Shooting the MicroNetwork Components

If you have difficulties with overall system operation this generally indicates a PETRC unit problem. If you are having problems with some of the PET units this may be an PETRC antenna or interference problem The following information details some basic items that a user can do to correct most difficulties.

The PETRC Unit and the PET module has "No internal user Serviceable Components" and **must be returned to Itron in Spokane, WA for service**. Call 1800 635 5461 and ask for Customer Service

Before you begin:

- **The PC and the PETRC unit must both be powered on. Use the Itron-supplied Concentrator power cable to power the Concentrator unit.**

- **With the PC and the Concentrator powered ON, connect the Concentrator unit to the PC using the Itron-provided diagnostic cable. The 10 pin end of the cable should be connected to the diagnostic port on the Concentrator unit and the 9 pin end of cable should be connected to the Com 1 com port of the PC.**

Step 1:

- Click the Window 95 “Start” button in the lower left portion of the PC screen.
- Choose the “Programs” menu option.
- Choose the “MicroSurvey” menu option.
- Choose the “MicroSurvey” menu option.
- Choose “OK” on the “Select Port” screen that appears (leave the “Com 1” default selection).
  NOTE:
  - The MicroSurvey application screen should appear. Maximize screen using the maximize button in the upper right of the screen.
  - The “Connection:” field on the MicroSurvey screen should be set to the “Direct Connection” default.

Step 2:

- Click the “Terminal” button on the MicroSurvey application screen.
- In the “Terminal Screen” that appears,

- Click the “Debug ON” button.
  NOTE:
  - The “Terminal Screen” screen will begin to scroll information.

  NOTE:

If Information does not scroll on the screen the unit is not operating properly and must be returned to ITRON

- Allow the system to operate independently for approximately 10 minutes.
- Click the “Receive” button.
- Click the “Debug OFF” button.
- Click the “Close” button.

Step 3:

- Click the “ERT Database” tab on the MicroSurvey application screen.
- Click the “Dial” button.
  NOTE:
  - The “Status Window” screen will scroll information and a “Download” screen will be displayed.
  - The first time that the “Dial” button is clicked, an error condition may occur. To proceed, wait 10 seconds and click the “Dial” button again.
- When the “Download” screen disappears, the fields in the “ERT Database” tab table will be filled.

Importing Site Data into the MicroSurvey Application:

Step 1:

- Click the “Import” button on the MicroSurvey screen.
- In the browser screen that appears, choose “All Files” in the “Files of Type:” field.
- Locate your comma separated (CSV format using Microsoft Excel) file containing two fields (ERT ID and ERT Location) and double click on the file name.
- Verify that your comma separated file has been imported into the MicroSurvey application by clicking the “ERT Database” tab on the MicroSurvey application screen.
  NOTE:
  - The “ERT ID” and the “Location” fields should contain your data.

Exporting Field Survey Data from the MicroSurvey Application:

Step 1:

- Click the “Export” button on the MicroSurvey application screen.
- In the “Export Text File Name” screen that appears, choose the exported data destination in the “Save in:” field.
- Name the exported data file in the “File name” field (do not add an extension to the file name).
- Use the default “Text File (*.txt)” in the “Save as type:” field.
- Click the “Save” button.

Step 2:

- Click the “Delete All” button on the MicroSurvey application screen.
  NOTE:
  - This clears the MicroSurvey database in preparation for the next field survey.

Step 3:

- Launch Microsoft Excel from the Windows “Start” button.
- Under the “File” menu, choose “Open”
- In the “Open” screen that appears, choose “All Files (*.*) in the “Files of type:” field.
- Locate the exported data file. (It should have a .txt extension.)
- Double click on the exported data file.
- In the “Text Import Wizard-Step 1 of 3” screen that appears, choose the “Delimited” button in the “Original data type” field.
- Click the “Next” button.
- In the “Text Import Wizard-Step 2 of 3” screen that appears, choose the “Comma” button in the “Delimiters” field.
- Click the “Next” button.
- In the “Text Import Wizard-Step 3 of 3” screen that appears, choose the “Finish” button.
  NOTE:
  - An Excel spreadsheet will appear with the exported data in it.
- Select the entire spreadsheet by holding down the “Ctrl” key and clicking the “a” key.
- Under the “Data” menu choose “Sort”.
- In the “Sort” screen that appears
  - Select the “Header row” button in the “My list has” field.
  - Select “Location” in the pull down list in the “Sort by” field.

- Also select the “Ascending” button in the “Sort by” field.

Analyzing Survey Data:

- The Field Survey data is now sorted by location. The presence of ERT data in columns B through G in the Excel spreadsheet indicates that the PET Module was received by the PETRC unit.