

VerifEye®
Wireless AMR Solutions
Installation and User Manual
 Cat Nos. T25DX, T7XXX and T95RX

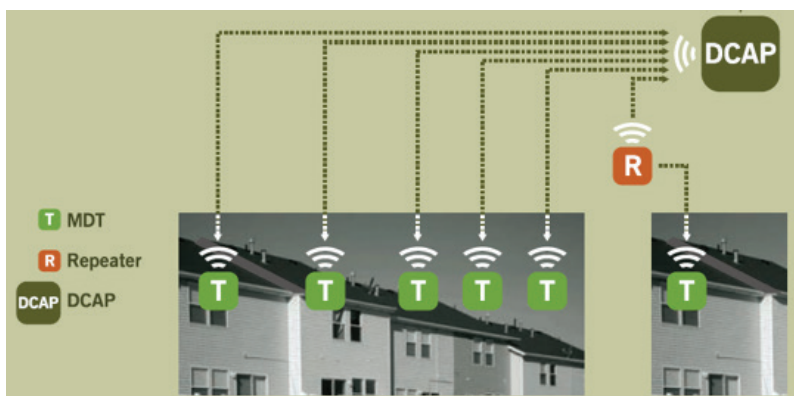


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1 CAUTIONS

CAUTIONS:

- Consult local codes for any possible permits or inspections required before beginning electrical work.
- Like repeaters, MDTs should not be mounted inside a metal box or near a metal wall (i.e. heating furnace or electrical panel). Consult the labels inside the box for placement information.
- MDTs must be mounted using velcro, tie-wraps, or screws. Don't let the MDT dangle by the pulse input wire.
- Avoid locations with dampness, high humidity, or an abundance of mold.

2 PRODUCT DESCRIPTION

2.1 Product Usage

The VerifEye Wireless Automated Meter Reading System (AMR) provides for the collection of energy and water meter data from a wide variety of energy and water sub meters installed in the residential dwelling unit of multi-family developments.

Applications for this type of system/solution are:

- Multi-family residential developments
- Multi-unit commercial developments

2.2 User Manual Purpose

The purpose of this user guide is orient the installer to the unique components of the system, their specifications/capabilities and the steps and conditions associated with planning and completing the installation and start-up of the VerifEye wireless AMR system. This document is intended to be a guideline. It refers the end user to other documents necessary to complete the planning, installation and commissioning of a system.

3 LOCATION PLANNING

3.1 Leviton Design Assist

Leviton offers design assistance to get the best possible project BOM created. Please contact your Leviton Sales representative to take advantage of this useful service.

3.2 Building Materials

This system performs optimally in buildings composed of traditional construction materials, such as wood, cinderblock, etc. Building materials can affect the performance of wireless communications products. Below is a list of building materials and performance issues to consider.

- 3.2.1 **Standard wood framing and wood and brick siding:** this type of structure does not impede performance. Adhere to standard planning considerations.
- 3.2.2 **Standard wood framing and stucco siding:** stucco siding and the underlying steel mesh used can impede performance, especially in multi-building garden style properties. Plan for extra repeaters in these projects.
- 3.2.3 **Aluminum framing and wood and brick siding:** aluminum framing does not impede performance. Adhere to standard planning considerations.
- 3.2.4 **Concrete structures:** concrete buildings (when the development is a vertical building or garden style-multiple buildings) can impede performance. Concrete deck thickness and concrete supports within large vertical structures impede performance. Consider these materials when planning for repeater and DCAP placement.
- 3.2.5 **Cinderblock or stone:** In most cases, this type of structure does not impede performance. Adhere to standard planning considerations.
- 3.2.6 **Steel buildings (exterior steel walls):** any building with a steel envelope will impede wireless communications, especially in multi-building developments. Steel walls within a wood or stone structure can impede line of site communications between devices.

3.3 Construction Type

- 3.3.1 **Garden style property:** Multi-building (3-4 story) garden style projects are ideal candidates for this AMR system. The location, power and communications requirements are listed below.

3.3.1.1 DCAP

- Installation location: in the clubhouse or in the main phone room.
- Other requirements: a live internet connection as well as a 120V electrical duplex outlet for start-up and commissioning and regular operations.

3.3.1.2 Repeaters

- Installation location: one unit in each building, installed in the attic space above the top floor in or close to the center of the building.
- Other requirements: a 120V electrical duplex outlet for power.

3 LOCATION PLANNING

3.3.1.3 Suggested placement:



3.3.2 Mid Rise property: Single building structures of no more than five stories are suitable candidates for this AMR system. The location, power and communications requirements are listed below.

3.3.2.1 DCAP

- Installation location: in the central phone room or as close to the horizontal center of the building as possible.
- Other requirements: a live internet connection as well as a 120V electrical duplex outlet for start-up and commissioning and regular operations.

3.3.2.2 Repeaters

- Installation location: locked service rooms or closets throughout the property that have power available.
- Other requirements: a 120V electrical duplex outlet for power.

3.3.2.3 Suggested placement:



3 LOCATION PLANNING

3.3.3 **High Rise property:** Any tall building with more than 5 floors. The location, power and communications requirements are listed below.

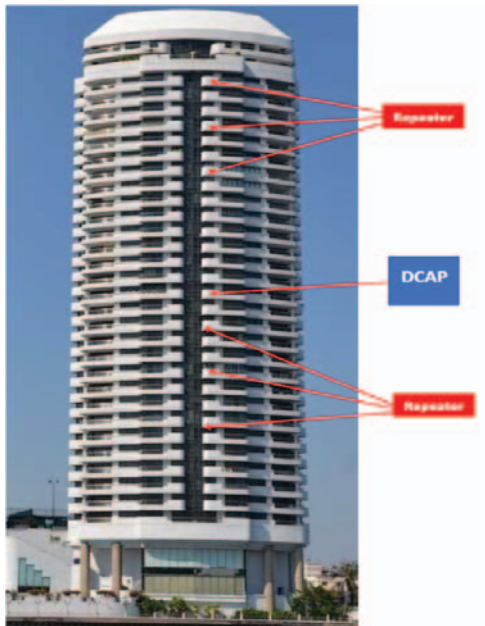
3.3.3.1 DCAP

- Installation location: in the central phone room or as close to the horizontal and vertical center of the building as possible. For example, the AMR system in a 20 story building works best when the DCAP is installed on the 10th floor. The phone room on that floor is usually a good location.
- Other requirements: a live internet connection as well as a 120V electrical duplex outlet for start-up and commissioning and regular operations.

3.3.3.2 Repeaters

- Installation location: Every other floor. For example, a 20 story building with 10 apartments per floor, repeaters should be installed on floors 2, 4, 6, 8, 12, 14, 16 and 18. In buildings with larger footprints of 20 apartments per floor, repeaters work best when staggered on opposite wings on each floor, installing repeaters on even numbered floors in the north wing and odd numbered floors on the south wing.
- Other requirements: a 120V electrical duplex outlet for power.

3.3.3.3 Suggested placement:



4 COMPONENT FEATURES AND SPECIFICATIONS

4.1 Data Concentration Access Point (DCAP)

4.1.1 Features

The Data Concentration Access Point (DCAP) is the brain of the AMR system. It captures all signals from MDTs and Repeaters, stores and transmits data to the end users. Powered by a plug-in transformer, this unit typically connects to the internet via a single ethernet connection but also has cellular communications options. Data is shared in the form of a .CSV file sent via email. It is important that the DCAP is installed in a central area of the property to provide the best reception for the MDT and Repeater radio signals.

4.1.2 Specifications

- Radio 902-928 MHz Radio: FCC and ICC certified
- Power: 5VDC 1A 120V AC Wall Transformer
- Communications: 10/100 Ethernet or Wi-Fi, cell modem optional
- Data Outputs: .CSV file format via email, FTP or through the CIT software
- Data Storage: Over 3 million time stamped data points; 1 year, 250 points 60min intervals.
- Operating Temps: -10°F to 145°F (-23°C to 62°C)
- Security: multiple permission levels for database access
- Size: 6.0"L x 5.2"W x 1.45"D



4.2 Meter Data Transmitters (MDT)

4.2.1 Features

The Meter Data Transmitter (MDT) is a battery operated radio frequency transmitter that captures pulse/contact closures from the attached meter via a two wire connection. It is in a compact plastic housing with a removable cover. The design allows for battery replacement (2 AA Batteries) which last approximately five years.

The MDT can interface with any pulse meter via a two wire connection, typically an 18awg stranded wire. Most pulse meters have a Form A contact closure. The MDT will count pulses from the meter, sum them and transmit the accumulated pulse data to the DCAP every hour or every 15 minutes, depending on the model.

MDT's should be installed within a few feet of the meter they serve and wall mounted with double stick tape or another form of fastener dependent upon adjacent wall materials.

4.2.2 Specifications

- 902-928 MHz Radio: FCC and ICC certified
- Transmission Interval: 1Hr or 15 Minutes Model Dependent
- Open Field Range: up to 10 miles
- Operating Temps: -20°F to 145°F (-28°C to 62°C)
- Powered by 2 AA Alkaline Batteries (included)
- Battery life: 5 years at 50°F-90°F (reduced in extreme temperatures)
- Size: Std - 4.3 in H x 2.2 in W x 1.2 in D
LCD - 4.5 in H x 2.75 in W x 1.2 in D



4 COMPONENT FEATURES AND SPECIFICATIONS

4.3 System Repeater

4.3.1 Features

Line powered unit (plug in transformer) designed to amplify remote signals from MDT's back to the DCAP. Repeaters strengthen the mesh network that provides communications redundancy in the system.

4.3.2 Specifications

- 902-928 MHz Radio: FCC and ICC certified
- Transmit power: 28.5 dBm
- Open Field Range: over 10 miles
- 5V DC 800mA 120VAC wall transformer
- Operating Temps: -10°F to 145°F (-23°C to 62°C)
- Size: 5.3" L x 5.3" W x 1.6" D



4.4 Commissioning and Installation Tool (CIT)

The Commissioning and Installation Tool is a PC application used to set up and configure the system. Download it onto the commissioning agent's PC for use in the start-up process. The CIT organizes essential and beneficial information to make commissioning and start up easier and save time on data entry. The tool also identifies problems with RF network health, communications paths and links between network components.

Download the CIT tool at www.leviton.com/submetering/amr

5 PRE-INSTALLATION REQUIREMENTS

This information must be populated into the appropriate screen on the CIT tool:

5.1 Site address and contact information

5.2 Apt. number listing - This information should match the actual units to be used for billing operations.

5.3 Meter Types Installed

- Water, gas, electric, etc.
- Type of output - pulse, encoder, etc.
- Units of measure/pulse - 10 Gal/Pulse, 1kWh/pulse, etc.
- Data interval requirements, i.e., TOU Data in 15 minute intervals

5.4 Repeaters

- Repeater Radio ID
- Number of Repeaters planned
- Physical location of Repeaters
- Availability of 120V power (duplex receptacle) must be confirmed

5.5 DCAP

- Location
- Availability of power

5.6 Communications-Ethernet drop for Internet Connection at DCAP

5 PRE-INSTALLATION REQUIREMENTS

5.7 CIT Download

Installation manager/commissioning agent must download the CIT tool onto a laptop/tablet that will interface with the DCAP during the commissioning process.

CIT Spreadsheet Template - In order to properly commission a system, some basic information must be entered into the DCAP using a .CSV template. Regardless of the size of the project, using the template to organize data is essential. Do not attempt to commission a system without the spreadsheet data configured as shown below. At a minimum, you must have the radio ID number and the apartment/unit number. Most other data is duplicated for each apartment/unit for the same meter type. It can be entered later, but it is always best to have it entered before installation.

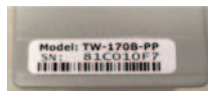
Radio ID	Node ID	Address	Bldg #	Apt	Location Note	Count Factor	Units	Meter Type	Meter Style	Meter Note	Meter Serial Number	Initial Mtr Read	Sensor
81001888	1	123 Main	1	101	Utility Closet	1	kWh	Electric	All	Mini Meter	1123456789	2	N/A
81A02345	2	123 Main	1	102	Utility Closet	1	kWh	Electric	All	Mini Meter	2234567890	0	N/A
81002EFA	3	123 Main	1	103	Utility Closet	1	kWh	Electric	All	Mini Meter	3345678901	0	N/A
8100FACE	4	123 Main	1	101	Utility Closet	10	Gallons	Water	Cold	Norgas	12345678	0	N/A
81001A9C	5	123 Main	1	102	Utility Closet	10	Gallons	Water	Cold	Norgas	23456789	2	N/A
81001ABA	6	123 Main	1	103	Utility Closet	10	Gallons	Water	Cold	Norgas	34567890	1	N/A
81001GF6	7	123 Main	1	N/A	Elec Room # 1	N/A	N/A	N/A	N/A	Repeater	N/A	N/A	N/A

5 PRE-INSTALLATION REQUIREMENTS

5.8 CIT Upload Spreadsheet Required Data

Most of this required data should be available from the property, meter manufacturers and the data from the wireless system itself.

- 5.8.1 **Radio ID** - Each transmitter has a HEX ID and a bar code label with its RADIO ID. This data is typically captured with a bar code scanner, directly into the spreadsheet during set-up.



- 5.8.2 Node ID
- 5.8.3 Address-Street Address of building or structure
- 5.8.4 Bldg # - Typical for garden style or multi-wing property.
- 5.8.5 **Apartment #** - The second most important piece of data. Each apartment will have a transmitter and we must be sure exactly what transmitter is in each apartment
- 5.8.6 Location Note - Physical location of transmitter. Typically adjacent to the meter in a utility room/closet, etc.
- 5.8.7 Count Factor - Very important data point. This factor tells us the value of each pulse we receive from the meter.
- 5.8.8 Units - Unit of measure for the count factor above. A water meter typically has a count factor of 10 and the units are typically in gallons, so the value of each pulse is 10 gallons of water.
- 5.8.9 Meter Type - Electric Meter, Gas Meter, etc.
- 5.8.10 Meter Style - Typically for water meters, referring to hot or cold meters
- 5.8.11 Meter Note: Any notes, but Manufacturer & Model number are useful
- 5.8.12 Meter Serial # - Important data point in some regulatory markets
- 5.8.13 Initial Meter Read - The reading on the meter display at the time it is hooked up to the transmitter. This should be captured during installation to sync the system's start readings with the reading on the meter.
- 5.8.14 Sensor - Used when a dual input transmitter is deployed for cold and hot water meters to differentiate inputs for each.

5.9 Spreadsheet Creation

Follow these important steps to create the spreadsheet and ensure successful installation and operation.

- 5.9.1 Open an excel worksheet and format it as you see above. You may not have all the information at this point, but at a minimum the spread sheet should have every apartment/unit # entered.
- 5.9.2 Using a bar code scanner attached to your PC, you will scan the bar code found on a specific transmitter and assign it to a specific apartment. The bar code scanner will make it easy to do this. Label the MDT with the apartment/unit # so it is easy to identify in the box. Complete this for all MDT's.

6 INSTALLATION INSTRUCTIONS

Before the AMR system is installed, all other meters should have been installed by the appropriate contractor. The steps in this process are the preferred sequence for installation; however, site conditions can vary from project to project. This sequence can be followed in a retrofit application, but new construction applications may require a slightly different sequence.

6.1 CIT Download

Download the latest version of the CIT tool from www.leviton.com/submetering/amr to a laptop or tablet. This is the application used to configure the DCAP and commission the site. Please reference the steps to download the System Set-Up Quick Start Guide, in Appendix B.

6.2 DCAP Installation and Set-up

Follow the installation location guidance found in Section 3.3.3.1. Refer to the Quick Start Guide in Appendix B to start up and configure the DCAP for commissioning.

6.3 Repeater Installation

Follow the installation location guidance found in Section 3.3.3.2 above. An architectural document of the property should have been consulted for the appropriate layout and specific locations for repeaters. See the images in section 3.3 for examples. Repeater installation is straight forward. Locate the area they should be installed and mount them with appropriate fasteners. Plug in the terminal end of the power cord to the repeater and then plug in the wall transformer to a 110V duplex outlet. They will power up immediately. Nothing else needs to be done other than to ensure that the repeater serial number and location have been properly recorded. Location documentation is critical for follow on service or troubleshooting if required.

6.3.1 Once all repeaters are installed and powered up, they will start checking in with the DCAP. At this point you should be able to verify communications with the backbone of repeaters that have been installed to support communications from all MDTs that will be installed. Please refer to Commissioning Guide to validate that all repeaters are checking in.

6.3.2 If repeaters do not check in, there is typically a power or location issue. Check first to insure they have power and then look for any impediments to RF communications like significant metalwork that might be present.

6.4 MDT Installation

All meters should be installed and accessible. **NOTE:** It is **essential** to install the correct transmitter in the right apartment/unit. Most installations involve a single meter and MDT in each apartment/unit.

6.4.1 Mounting - standard MDTs can be mounted adjacent to the meter they will be connected to. Typically they are wall mounted with either double sided tape or the back of the housing can be attached to the wall using small screws. Whichever method is used, they should be mounted in a way that they do not move once installed. Do not leave MDTs hanging from meters or adjacent pipes or other structures. This reduces their reliability and their useful life.

6 INSTALLATION INSTRUCTIONS

6.4.2 Wiring to a meter-usually the meter has a two-wire connection from its pulse output. Most meters have dry contact closures and the polarity of the wires may or may not be relevant.

6.4.2.1 Electric meters - observe polarity when connecting electric meters to MDTs.

6.4.2.2 Water and gas meters - usually these meters are equipped with magnetic reed switches and wiring polarity is not relevant.

6.4.2.3 Refer to Appendix A - MDT Wiring Guide - for specifics instructions on wiring polarity.

7 COMMISSIONING PROCESS

Once all MDTs and repeaters have been installed the commissioning process can be performed. In this process, the goal is to identify every MDT and repeater and ensure that they are communicating with the DCAP. This process can be done immediately after the last device is installed. Since the MDTs transmit every hour, it should not take long to complete commissioning of a typical site.

Appendix B- System Set Up Quick Start Guide, Section B.6 - and Appendix C-Commissioning procedures should be used as reference materials to support commissioning of the system. Please call Leviton Technical Support at 800-736-6682 for additional technical assistance.

APPENDIX A - PULSE INPUT MDT WIRING GUIDE

This guide contains the various connector specs and meter wiring instructions for the pulse input MDTs. We also show how our CIT software will identify each input type.

A.1 Polarity

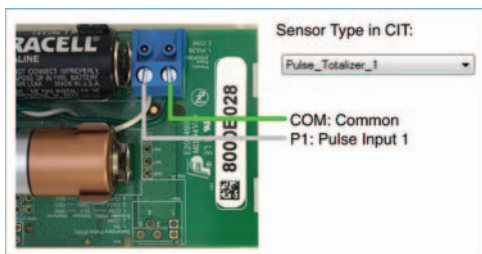
- A.1.1 Most water and gas meters: polarity does not matter for most water and gas meters which typically use a magnetic reed type switch.
- A.1.2 Hersey and some Badger pulse water meters: for these meters, connect the Red wire to the P1 input, and the black to COM.
- A.1.3 Electric meters: polarity is important for connecting to most electric meters.

A.2 Wiring the MDTs (T70MB, T70MD, T75MB, T75MD)

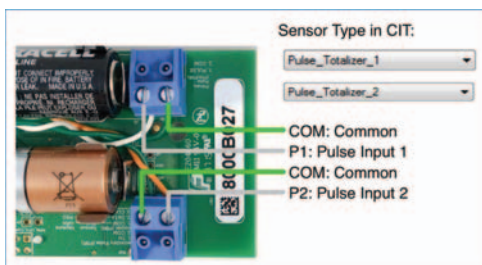
The unit is designed to have the metering wires run between the batteries (as shown in the picture below) and through the hole at the bottom of the unit. When mounted vertically on drywall (recommended), this allows a good drip loop to be formed.

- A.2.1 The pulse input (P1 or P2) goes to the meter's pulse output terminal, labeled variously WH+, P1, "+", or ISOLATED OUTPUT 10/100/1000.
- A.2.2 The common input goes to the common terminal, variously labeled ISOL COM, "-", or COM.
- A.2.3 Wire size (solid/stranded): 14 to 22 AWG
- A.2.4 Strip length: 1/4 inch (6mm)
- A.2.5 Blade type: 2.5mm flat

Single Pulse Input "MB" models



Dual Pulse Input "MD" models



APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

The CIT software tool runs on all modern versions of Microsoft Windows (XP/Vista/7/8/10). Depending on the version you have, extra Microsoft components may need to be downloaded from the internet. The setup program will automatically perform the download and installation of these components if required.

B.1 Installing the CIT (Configuration and Installation Tool)

B.1.1 Required items: PC with internet access

B.1.2 Installation:

- B.1.2.1 To download the CIT software, follow the link as provided in the documentation accompanying the DCAP. If additional assistance is required, contact support at meters@leviton.com.
- B.1.2.2 Run the downloaded program and Follow the prompts to install the program. Click yes if prompted by Windows to allow this program to proceed.
- B.1.2.3 Follow the prompts to install the program. Upon completion, the CIT icon will appear on your desktop. The CIT will check for updates every time it is launched and automatically update the program when updates become available.



B.2 Configuring the DCAP (Data Concentrating Access Point)

This step configures the Internet settings for the DCAP and lets you set unique passwords for remote access.

NOTE: It is recommended to skip this step and jump directly to step 3 if you do not need to set a static IP address for the DCAP or configure a unique password.

B.2.1 Required items:

- B.2.1.1 PC with CIT tool, connected to a local LAN.
- B.2.1.2 For the DCAP, physical access to an Ethernet port of your local LAN (or the Tehama Wireless CellConnect cellular modem).
- B.2.1.3 DCAP with power adaptor, Ethernet cable, and USB cable.

B.2.2 Installation:

- B.2.2.1 Power up the DCAP with the supplied power adaptor.
- B.2.2.2 Attach the DCAP to the local LAN with the supplied Ethernet cable.
- B.2.2.3 Double click the CIT icon on the desktop or Choose Start | Programs | Tehama | Tehama Commissioning & Installation Tool (CIT) to launch the CIT tool.

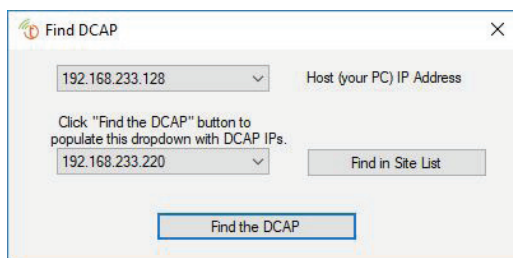


APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

B.3 Setting up the Site Information

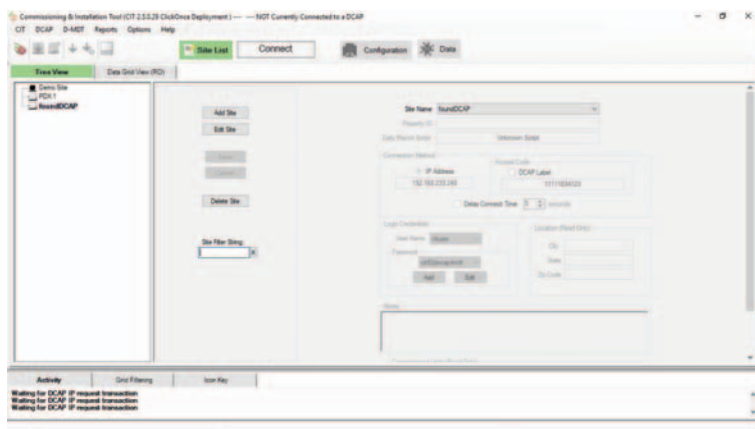
Use the CIT menu DCAP | Find to find the DCAP on the local LAN. Alternately you can enter the access code directly into the site list if both the DCAP and the PC are connected to the Internet (the DCAP Status LED must be green)

In the window that pops up, click on the "Find the DCAP" button, then once an IP address for the DCAP is found, click on the "Go to Site List" button



NOTE: In all situations, the connection between the laptop and the DCAP must be via an Ethernet LAN or the Internet (when using access code). A direct cable connection between the laptop and the DCAP does not work. If there is no LAN or Internet, you can use a small portable router to create a LAN.

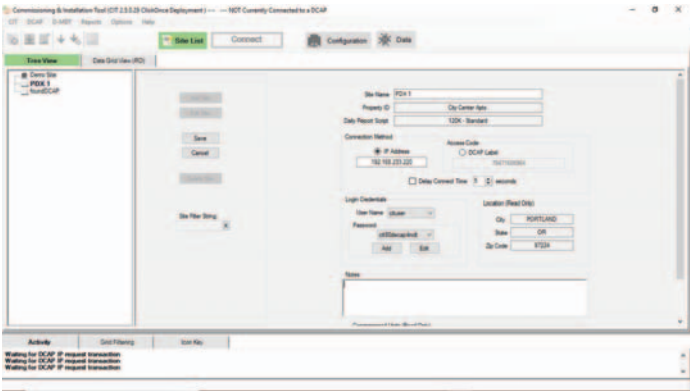
B.3.1 In the Tree View tab you will see a site called "yourDCAP" (or "foundDCAP"). Select it and click on the 'Edit Site' button. The site specifications will be pre-populated with the minimum necessary.



B.3.2 Edit the Site Name from "yourDCAP" to something more meaningful for easy identification.

APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

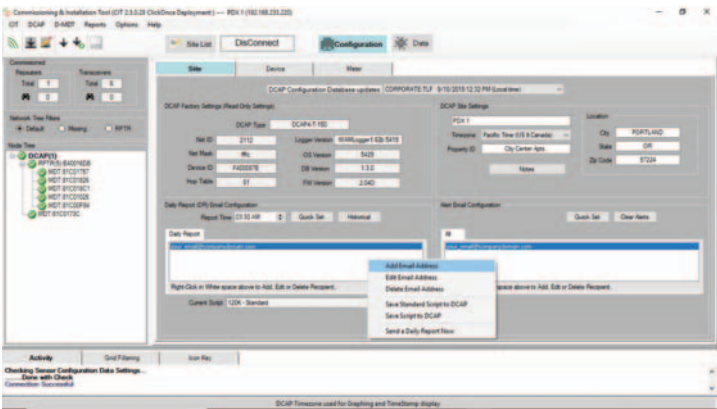
B.3.3 Click 'Save'.



B.3.4 Click the 'Connect' button to connect to the DCAP.

B.4 Setting up the DCAP

In the Configuration Data tab | DCAP View tab | Site Configuration tab, you will see 4 quadrants on the screen.



B.4.1 The DCAP Factory settings quadrant display system settings that are read only.

B.4.2 DCAP Site Settings quadrant:

- B.4.2.1 Site Name:** It is recommended to set the DCAP site's name to the same name you used for the CIT's site list entry for this DCAP, though that is not a requirement. Enter a new name or click on the 'Match DCAP Name...' button, which opens another dialog box showing you both the CIT site name and the DCAP's name (likely empty). Follow the directions to match the two names.

APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

B.4.2.2 **Time zone:** Select the time zone from the drop-down selection.

B.4.2.3 **Property ID:** An optional field for another site identifier beyond the DCAP Name. If this field is not visible, it may be enabled from the Options menu.

B.4.3 Daily Report Email Configuration quadrant:

B.4.3.1 Set up the email: To add email addresses to send reports to, right click in the text box and select 'Add Email Address'. The 'Send a Report Now' menu item can be used to generate an immediate email from the DCAP in order to verify that the address entered was correct (and to train your spam filter).

B.4.3.2 **Report Time:** Select the time of day you want the report sent.

B.4.3.2 Click on the 'Quick Set' button to enable Daily reports from all the sensor types you are interested in receiving in the Daily report.

B.4.4 **Alert Email Configuration quadrant:** To add email addresses to send alerts to, right click in the text box and select 'Add Email Address'. Click on the 'Quick Set' button to enable the most common alerts. Note that this email list is separate and unique from the daily report email list.

B.4.5 **Important:** Save your edits to the DCAP by clicking on the icon in the menu bar, or by selecting CIT | Save to | DCAP | Configuration Data from the menu bar.



B.5 Powering up the MDTs and Repeaters

Diversity Repeater: Connect power using the wall transformer and cord. Applying power will cause the repeater to automatically start the registration process. The button is located on the end of the unit near the power supply port. The LED sequence is the same as for MDT and original Repeaters.

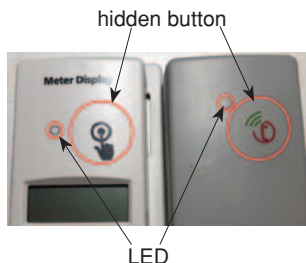
MDT (Meter Data Transceiver) and Repeater devices come from the factory in a powered off state. At this point, power them on so they can start registering themselves with the DCAP that was powered up in the last step.

NOTE: The MDTs do not need to be wired to a meter yet. Directions for wiring to a meter are covered in step B.7.

The icon in the photo to the right shows where a purposely hidden button is located on the enclosure. It may take a few times to get the feel of the button, but an LED next to the button provides feedback when the button is pushed.

B.5.1 To turn a unit ON, press and hold the button until the LED starts to blink (about four seconds).

B.5.2 After about 30 seconds the LED flash frequency should change from slow to fast. After another 30 seconds or so, the LED will stay solid for 10 seconds then go out. The long flash indicates that the unit is communicating with the network.



APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

B.5.3 To turn a unit OFF, press and hold the button again until the LED blips off (about three seconds). LED flash indication states when button is momentarily pressed:

B.5.3.1 Single flash: The unit is in a light sleep mode. It will wake up occasionally to listen for a Tehama network. This mode can prematurely drain the batteries if no Tehama network is nearby.

B.5.3.2 Double flash: the unit is OFF.

B.5.3.3 Long on: The unit is part of a Tehama network. Stays on for about 10 seconds.

NOTE: Pulse input MDTs will automatically turn on when they receive a pulse input. This helps to conserve battery power during shipping, site storage, and installation. If the installer does not turn on the MDT, it will automatically turn on during meter testing if it is wired correctly to the meter. This feature has the benefit of reducing tenant tampering because it will turn on if they try to turn it off to lower their bill.

B.6 Commissioning the DCAP Using the CIT

The primary purpose of the CIT tool is to associate each utility meter with an MDT. Once the steps above have been done, the DCAP and MDTs will be powered up and the CIT is communicating with the DCAP over your LAN.

IMPORTANT: Only one DCAP should be powered up at a time to avoid incorrectly registering an MDT to the wrong DCAP.

Follow these steps to commission the DCAP:

B.6.1 Connect: If you clicked the Connect button at the end of step B.3, you are now connected to the DCAP. If not, reconnect as instructed in step B.3.

APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

B.6.2 Get Data: From the menu go to CIT | Load from | DCAP | Monitor Data, or click the  icon on the icon bar.

Select Monitor Data Download Window

Read Last: Last 12 Hours

Start Date/Time Sep 10 2019 01:38 AM

End Date/Time Sep 10 2019 01:38 PM

Start Date

Sun	Mon	Tue	Wed	Thu	Fri	Sat
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Today: 9/10/2019

End Date

Sun	Mon	Tue	Wed	Thu	Fri	Sat
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

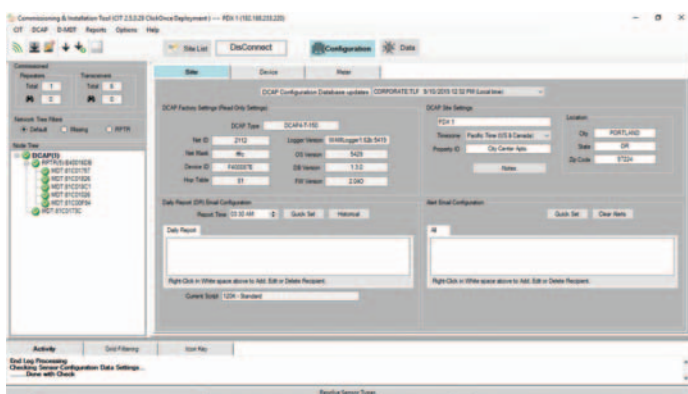
Today: 9/10/2019

OK Cancel

Device ID *

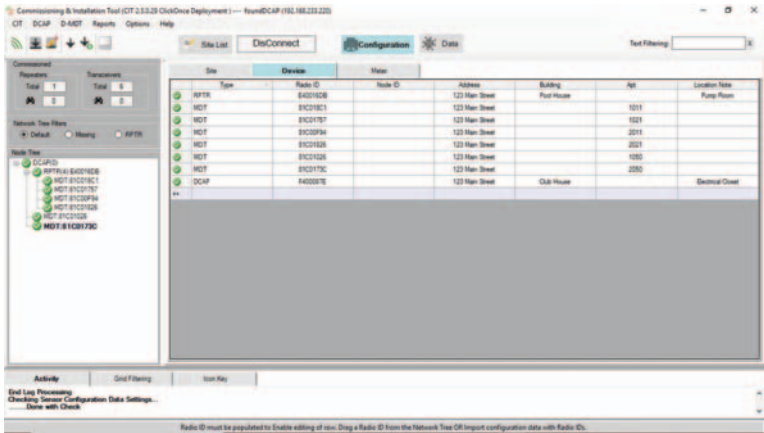
B.6.3 You are prompted for how much data to collect. The default of Last 12 Hours is usually sufficient. A longer time period provides a better picture of the health of the network, but takes a longer time to download to the CIT.

B.6.4 The Tehama devices powered up previously in Step B.5 will appear in the Network Tree area on the left side of the screen. If some of the devices do not appear, wait a moment and then click on the  icon to get the latest monitor data.



APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

B.6.5 Add Devices: Go to the Node View tab within the Configuration Data tab as shown below. Uncommissioned devices are MDTs and Repeaters that have not been added to the site configuration and are marked with a yellow warning symbol 



They can be added to the site configuration by doing one of the following:

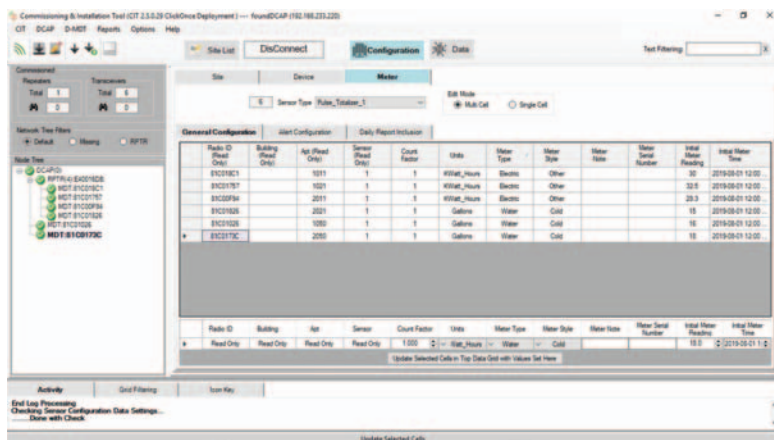
B.6.5.1 Right clicking on a Radio ID and selecting Add This Uncommissioned Device.

B.6.5.2 Click and drag a Radio ID from the Network Topology tab area to an empty RadioID row in the Node View | Location tab.

B.6.6 Add Location Data: In the Node View tab, you can add location data as desired. All fields are optional but will help identify and organize the devices.

APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

B.6.7 Assign Meter Information: click on the Sensor View tab to enter or modify information about each MDT (Count Factor, Units of measure, Meter notes, Serial number of the meter, and Meter Initial Reading). When a Meter Initial Reading count is entered, a date/time stamp is automatically recorded.



B.6.8 **IMPORTANT:** Save your edits to the DCAP: Click on the  icon in the icon bar, or choose CIT | Save to | DCAP | Configuration Data from the menu bar to upload all the configuration and commissioning data to the DCAP. A warning will be issued as a precaution if the DCAP already contains Configuration Data. Click OK to complete the data upload. It is recommended to save this information locally to your PC as a backup by selecting CIT | Save to | PC | Configuration and Monitor Data from the menu.

B.6.9 Getting Readings: Daily readings are sent by email and this is the easiest way to get the daily readings. The billing company can also connect to the installed DCAP using its Access Code. Once connected they can retrieve both configuration data and monitor data in order to obtain the data for billing from the DCAP. **NOTE:** The Reports menu can be used to create various reports. A *.CSV file containing the readings for the calendar time period retrieved from the DCAP can be created by selecting Reports | Monitor Data | View*. The data in the *.CSV file will correspond to the data in the Monitor Data tab | View* tab. (* can be 1, 2 or 3).

APPENDIX B - SYSTEM SET-UP QUICK START GUIDE

B.6.10 Saving the site data to your PC: Both the site configuration data and monitor data retrieved from the DCAP or edited in the CIT can be saved locally to your PC. This is useful so you have a backup of your site configuration for offline access to the site's configuration or to collect a snapshot of usage data. To do this from the menu bar, go to CIT | Save to | PC | Configuration and Monitor Data.

B.7 Wiring MDT to Meter

B.7.1 Pulse output meters

Wiring an MDT to a pulse output meter is quite simple. A pair of wires from the meter is fed through the hole in the case and inserted into the blue or green connectors.

B.7.1.1 Wire size: 20 -26 AWG solid/stranded

B.7.1.2 Strip length: 5/16 in (8mm)

B.7.2 Water and gas meters

The polarity does not matter for connecting to most all water or gas meters. These typically use a magnet reed type switch to generate the pulse.

B.7.3 Electric meters

IMPORTANT: The polarity is crucial for connecting to most electric meters!

B.7.3.1 The common input (closer to the battery, shown in Green) must go to the common terminal, variously labeled ISOL COM, "-", or COM...

B.7.3.2 The pulse input (closer to the top of the unit, shown in white) goes to the pulse output terminal, labeled variously WH+, P1, "+", or ISOLATED OUTPUT 10/100/1000.

APPENDIX C - COMMISSIONING PROCEDURE

This appendix covers two recommended procedures for commissioning a site with a minimum of effort. These procedures assume the commissioning will be done in a staging area at your facility, not in the field. The procedures also assume you start with a spreadsheet which contains the identifying meter location data with each row containing all the information about that apartment.

C.1 Spreadsheet Data

At a minimum, each row of the spreadsheet you start with should have at least the Apartment #, and probably the Building #. The spreadsheet file then must be saved in a .CSV (Comma Separated Values) format in order to be used by the CIT.

You can optionally add a number of extra pieces of information to each row including:

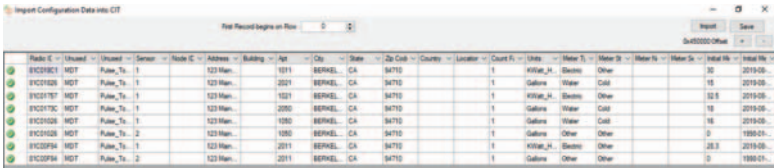
- C.1.1 Meter type (Water/Gas/Electric)
- C.1.2 Meter style (Hot/Cold/Other)
- C.1.3 Units (Gallons/liters/KWatt_hours/ccf/cf/minutes)
- C.1.4 Meter note (can be used for Meter model for example)
- C.1.5 Count factor

C.2 Meter Initial Reading

For most of these items, the values will be identical for every unit, so it is an easy task to copy and paste the common data to all rows.

C.2.1 The following can be used as a header template for your spreadsheet file. If you use these row headings, the CIT will automatically configure the column mapping: Radio ID, Node ID, Address, Building, Apt, Location Note, Count Factor, Units, Meter Type, Meter Style, Meter Note, Meter Serial Number, Meter Initial Reading.

C.2.2 When you import, the setup will look like the image below. Make sure the first record row starts at 1. You can click anywhere in Row 1 to easily set this.



Radio ID	Uncomm	Uncomm	Serial	Node ID	Address	Building	Apt	City	State	Zip Code	Country	Location	Count F	Units	Meter Ty	Meter St	Meter N	Meter S	Initial R	Initial R
ENC19E1	MDT	Pulse, Ts	1	123 Main	1011	BEPWEL	CA	94710					1	KWhr_h	Electric	Other			30	2019-09
ENC19E2	MDT	Pulse, Ts	1	123 Main	1011	BEPWEL	CA	94710					1	Gallons	Water	Cold			15	2019-09
ENC19E3	MDT	Pulse, Ts	1	123 Main	1021	BEPWEL	CA	94710					1	KWhr_h	Electric	Other			12.5	2019-09
ENC19E4	MDT	Pulse, Ts	1	123 Main	2080	BEPWEL	CA	94710					1	Gallons	Water	Cold			15	2019-09
ENC19E5	MDT	Pulse, Ts	1	123 Main	1080	BEPWEL	CA	94710					1	Gallons	Water	Cold			15	2019-09
ENC19E6	MDT	Pulse, Ts	2	123 Main	1080	BEPWEL	CA	94710					1	Gallons	Water	Other			5	1999-01
ENC19E7	MDT	Pulse, Ts	1	123 Main	2011	BEPWEL	CA	94710					1	KWhr_h	Electric	Other			20.3	2019-09
ENC19E8	MDT	Pulse, Ts	2	123 Main	2011	BEPWEL	CA	94710					1	Gallons	Water	Other			3	1999-01

C.3 Adding the Radio ID

At this point the spreadsheet contains everything but the association link between the apartment and the MDT Radio ID. There are two options from this point to capture this data point and commission the MDT. The first involves importing the spreadsheet/.CSV file into the CIT, then dragging and dropping uncommissioned MDTs to the selected row. The second involves using a bar code scanner to read each MDTs RadioID directly into a spreadsheet cell.

APPENDIX C - COMMISSIONING PROCEDURE

C.3.1 Drag and drop method

In this method, the spreadsheet/.CSV file into which you have entered all information other than the RadioID is imported into the CIT. You are left then with a list of apartments in the Configuration Data -> Node View tab. To this table you will add MDTs as you power them up and they communicate with the DCAP.

C.3.2 Procedure

- C.3.2.1 Start by powering up the DCAP and connecting to it with the CIT. Add the DCAP setup information like site name, time zone, and daily report email recipients. Don't enter any alert email recipients at this time as false alerts could be generated during this process.
- C.3.2.2 Next, power up a group of MDT units (we suggest seven which correspond to one row in our shipping box). Give these about a minute to sync up to the network and report into the DCAP. Then, in the CIT, click on the Get Monitor Data from DCAP button. 
- C.3.2.3 The seven units will appear in the Network Topology area with yellow triangle symbols. These yellow symbols indicate they are un-commissioned.
- C.3.2.4 Click and Drag an MDT from the Network Topology window over to the RadioID cell of the apartment you wish to associate with this unit. The symbol for that MDT will change to a green circle. Set aside the commissioned MDT, label it as per your standard procedures (i.e. the apartment number) and turn it off.
- C.3.2.5 Repeat for the remaining MDTs that were first powered up.
- C.3.2.6 At some point before you finish the first group, turn on another group of MDTs and give them time to report in to the DCAP while you finish the first group. After doing this a few times you will learn the optimal time to turn on the next group of units.
- C.3.2.7 When you have completed the first group and the next group has had time to report in, click on the Get Latest Monitor Data button to update the CIT with the new uncommissioned units. 
- C.3.2.8 Continue this process until all the MDTs have been commissioned.
- C.3.2.9 The last step can be to commission the Repeaters, though this can be done in the field since the number of Repeaters needed and their locations won't be known until after the site is installed.
- C.3.2.10 Enter the alert email recipients at this time.
- C.3.2.11 DON'T FORGET to save the data TO THE DCAP!
- C.3.2.12 Complete the Final Steps section below.

Note that the check box above the Network Topology view, "Show only Un-commissioned Units" should be checked during the commissioning step. Checking this option hides all the commissioned (green circle) MDTs from the topology view, so you only see those units waiting to be commissioned. No need to scroll through the list to find the new yellow triangle units.

APPENDIX C - COMMISSIONING PROCEDURE

C.3.3 Summary Highlights:

- C.3.3.1 Commission seven or so MTDs at a time.
- C.3.3.2 Do Repeaters last, if at all before going to the field.
- C.3.3.3 Don't enter alert emails until the end.

C.3.4 Bar Code scanning

The alternative method to dragging and dropping is to add the RadioID to the spreadsheet before importing the .CSV file into the CIT. The RadioID can be hand typed into each row, however it is very easy to make mistakes this way, which will lead to much frustration out in the field. Therefore there will be a simple Code-128 bar code on the outside label of all units shipped after April 1, 2013.

This type of bar code is easily read by inexpensive hand-held USB scanners. Most of these act like keyboards by entering the scanned data directly into the active spreadsheet cell. One bar code scanner that we have tested is the TaoTronics TT-BS003 or TT-BS005, available for about \$40 on Amazon.com, though most every inexpensive scanner can read this bar code format.

This method offers a couple of advantages over the drag and drop method. One advantage is that the spreadsheet file becomes a complete record of the site commissioning information.

Another advantage is that the MDTs need not be turned on and off as you commission the DCAP. This can save time, although some may want to verify operation of all components of their AMR system before deployment in the field.

C.3.5 Procedure

- C.3.5.1 With your spreadsheet open, navigate to the RadioID cell for the apartment unit you are commissioning.
- C.3.5.2 Scan the MDTs bar code to accurately enter the RadioID into the spreadsheet. Set aside the commissioned MDT and label it as per your standard procedures.
- C.3.5.3 Note that labeling for each MDT can be preprinted using the data in the spreadsheet file. (i.e., the apartment number)
- C.3.5.4 Repeat the above step until all the units are commissioned
- C.3.5.5 Save the spreadsheet file as a CSV, and import it into the CIT. With this single import, the site is nearly 100% commissioned. Follow the final steps to complete the setup.

C.3.6 Final Steps

For all methods used, a few remaining steps are still needed to fully commission the DCAP. All are done from the DCAP View tab.

- C.3.6.1 Enable the daily report and alarms. This is most easily done using the Quick Set buttons above the email recipient lists.
- C.3.6.2 Enter the email addresses for both daily report and alert recipients.
- C.3.6.3 Upload the ReportGen script, especially if you have a custom one for your company.
- C.3.6.4 **DON'T FORGET** to save the data **TO THE DCAP!**

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Statement Caution

Any changes or modifications not expressly approved by Leviton Manufacturing Co., could void the user's authority to operate the equipment.

RF exposure Compliance Information

To ensure compliance with FCC's and ISED Canada's RF exposure requirements this device must be installed to provide a minimum of 20cm between the device and people.

Part 15 Information to the user

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.

IC Statement

This device contains license-exempt transmitter/receiver that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

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