Tehama Wireless Submetering Solution
Quick-Start Guide

This document provides an abbreviated list of steps to setup a Tehama Submetering system, from hardware power-up to DCAP commissioning.

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Step 1: Installing the CIT (Configuration and Installation Tool)

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.

Items needed:
- PC with Internet access

Steps:
1. Contact Tehama for a link to the Tehama CIT software. Or follow the link as provided in the documentation accompanying the DCAP.

2. Run the downloaded program and Follow the prompts to install the program. Click yes if prompted by Window's to allow this program to proceed.

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.

Step 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. Evaluation kit users should definitely skip this step.

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

Steps:
1. Power up the DCAP with the supplied power adaptor.
2. Screw in the DCAP antenna that came with the unit.
3. Attach the supplied USB cable to your computer and to the DCAP. If this is the first time attaching a DCAP, Windows may respond with a *"Found new hardware"* message. Follow the prompts to let Windows download the driver software. The PC needs to be connected to the Internet during this step.
4. Attach the DCAP to the local LAN (or the already powered Tehama Wireless CellConnect cellular modem) with the supplied Ethernet cable.

5. Double click the ![Tehama Commissio...] CIT icon on the desktop or Choose *Start | Programs | Tehama | Tehama Commissioning & Installation Tool (CIT)* to launch the CIT tool.

6. From the Main menu, choose *DCAP | DCAP Configuration via USB.*

7. Click 'OK' that you want to proceed.
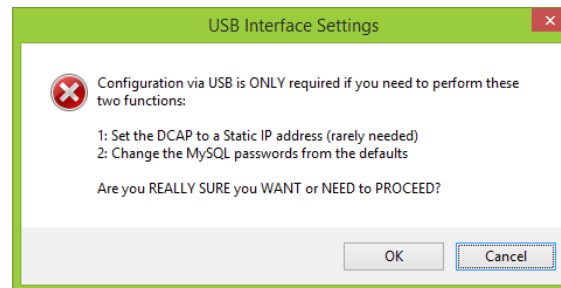
8. Click on the '*Refresh*' button to load communication data. The *COM Port* field will be automatically populated with the correct serial port.
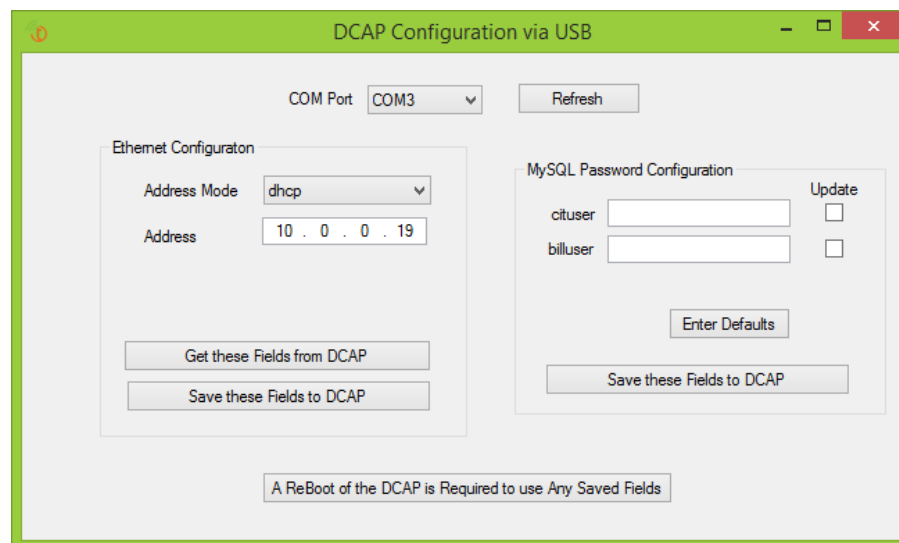
9. In the *Ethernet Configuration* section:
   - The DCHP (Dynamic IP Address) is the default Address Mode
   - If a static IP is required, select *static* for the Address Mode, fill out the extra fields, and then click on the '*Save these Fields to DCAP*' button to load the chages to the DCAP.

10. In the *My SQL Password Configuration* section:
    - Enter the Passwords that you want to use for both users. Clicking on the '*Enter Defaults*' button will fill the fields with the factory default passwords. This is provided as a convenience if password security is not an issue (for example in an evaluation system).
    - Under *Update*, click on the one or both check boxes to select which password you want to update.

- Click on the '*Save these Fields to DCAP*' button to load the password data displayed to the DCAP.

11. Click on the 'A ReBoot of the DCAP is Required to use Any Saved Fields' button to reboot the DCAP.

12. Wait for the DCAP Status LED to turn green: the reboot is then complete.

13. Unplug the USB cable. You will not need it again unless you need to change the IP address or the passwords at a future time.

Step 3: Setting up the Site Information

Note: If you skipped step 2, use the CIT menu *DCAP | Find* to find the DCAP on the local LAN. Alternatively 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.
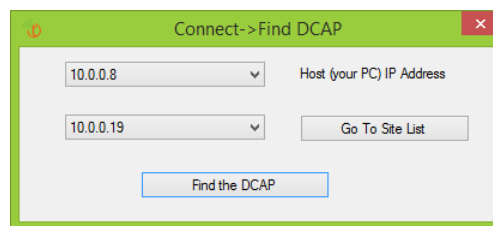
Note: In all situations, the connection between the laptop and the DCAP must be via an Ethernet LAN or the Internet (when using Access Code). A direct cable connection between the laptop and the DCAP *does not* work. If there is no LAN or Internet, you can use a small portible router to create a LAN.

1. In the Tree View tab you will see a site called "yourDCAP" (or "foundDCAP").
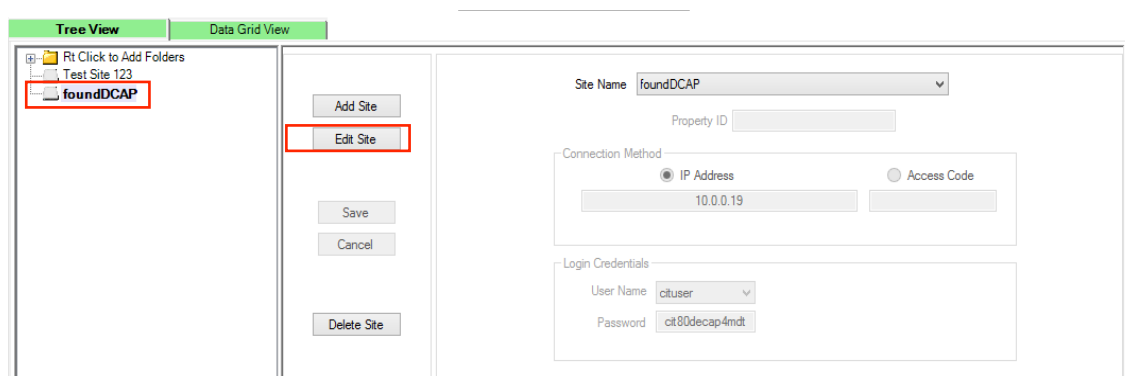
2. Select it and click on the 'Edit Site' button.

3. The site specifications will be pre-populated with the minimum necessary information.
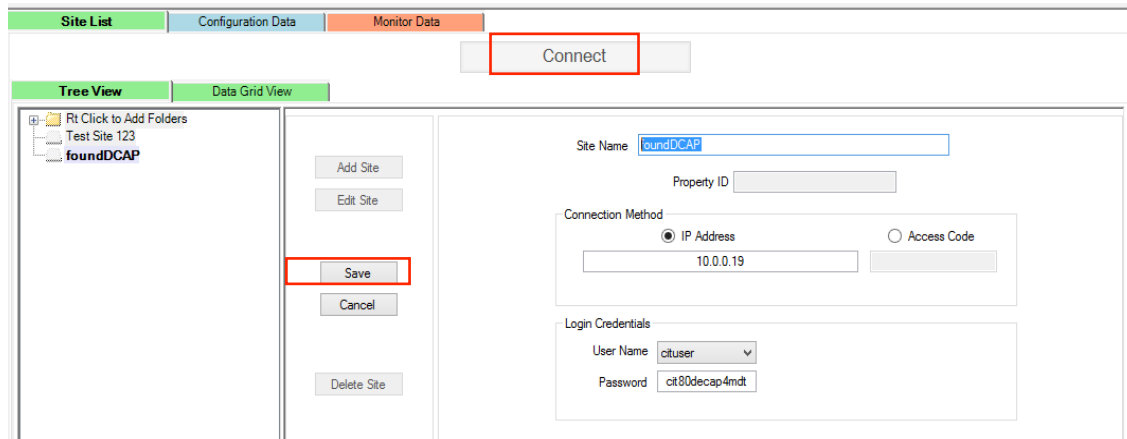
4. Edit the Site Name from "yourDCAP" to something more meaningful for easy identification.
5. Make sure the MySQL password is the same one you used to set up the DCAP (Step 2.9, if that step was required).
6. Click 'Save'.
7. Click the 'Connect' button to connect to the DCAP.

Step 4: Setting up the DCAP

In the Configuration *Data tab | DCAP View tab | Site Configuration* tab, you will see 4 quadrants on the screen.
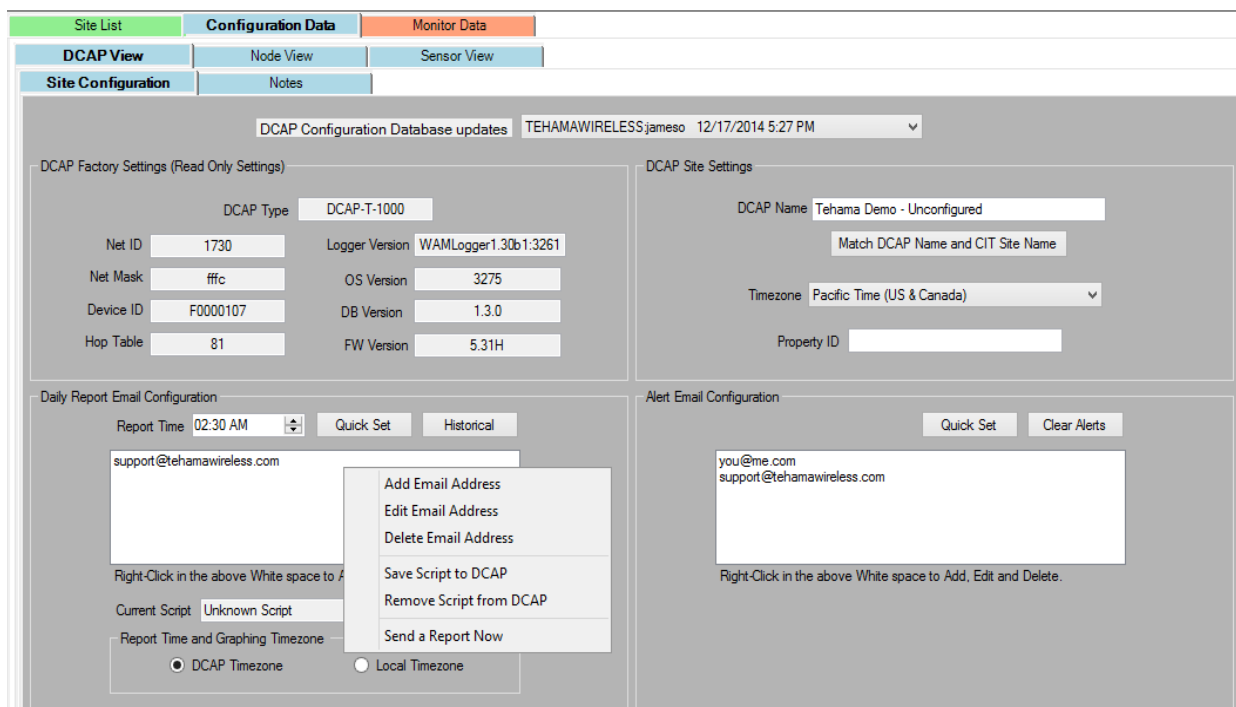
1. The DCAP Factory settings quadrant display system settings that are read only.

2. DCAP Site Settings quadrant:

- **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.

- **Time zone**: Select the Time zone from the drop down selection

- *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.

3. Daily Report Email Configuration quadrant:

- Setup 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).

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

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

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.

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

Step 5: Powering-up the MDTs and Repeaters

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

NOTE: They do not need to be wired to a meter yet. That step is covered at the end of this Quick Start guide.

MDT and original Repeaters in the same sized enclosure: The yellow circle 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 in the clear window to the right gives you feedback when the button is pushed.

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.

1. To turn a unit ON, press and hold the button until the LED starts to blink (about four seconds).
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 than go out. The long flash indicates that the unit is communicating with the network.
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:

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.

Double Flash: The unit is OFF.

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 forgets to turn the MDT on, it will do so automatically during meter testing, assuming it is wired correctly to the meter. This feature has the benefit of also reducing tenant tampering as it will turn on should they try to turn it off to lower their bill.

Note: This feature does NOT work with Encoder meters.

Step 6: Commissioning the DCAP using the CIT

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

Important! Note that only one DCAP should be powered up at a time to avoid incorrectly registering an MDT to the wrong DCAP.

The following steps take you through a typical site Commissioning process.

1. *Connect:* Assuming you clicked the Connect button at the end of Step 3, you are now connected to the DCAP. If not reconnect as instructed in Step 3.

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

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 indication about the health of the network, but takes a longer time to download to the CIT.
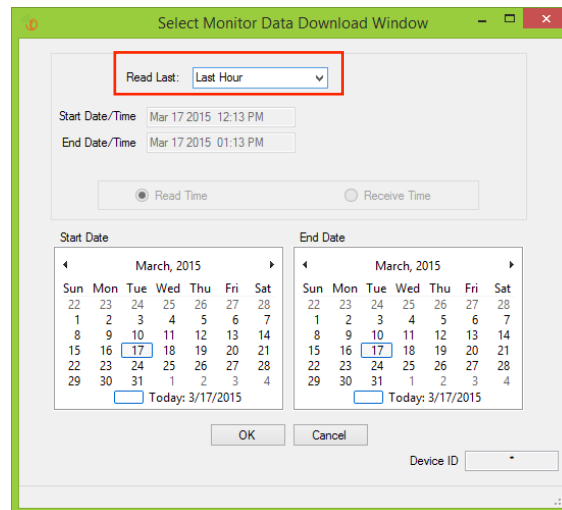
4. The Tehama devices powered up previously in Step 5 will appear in the *Network Tree* area on the left side of the screen.
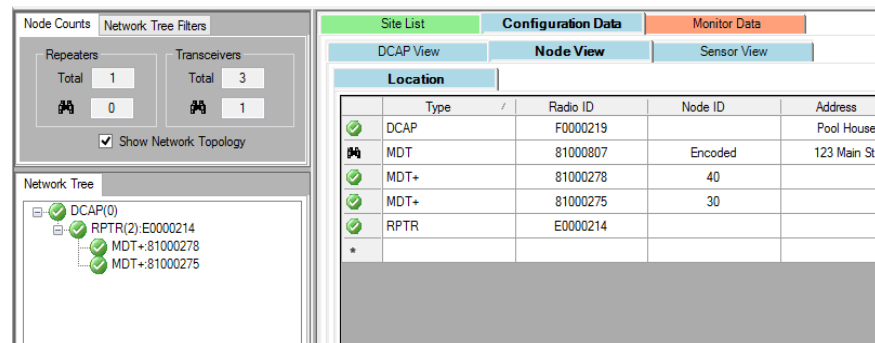
- If some do not appear, wait a moment and then click on the icon to get the latest monitor data.

5. Add Devices: Go to th*e Node View* tab within th*e 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 to the left of their Radio ID in the Network Tree tab area.
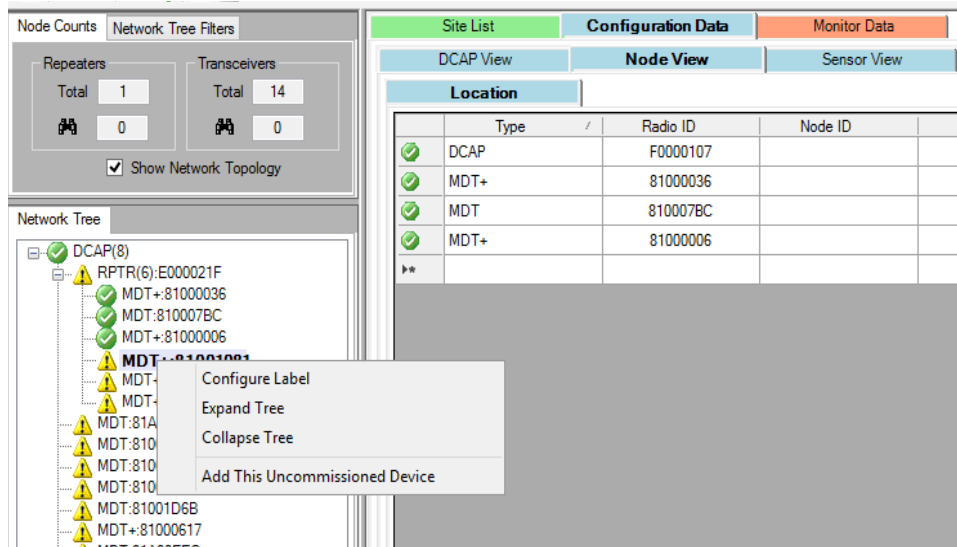
They can be added to the site configuration by either:
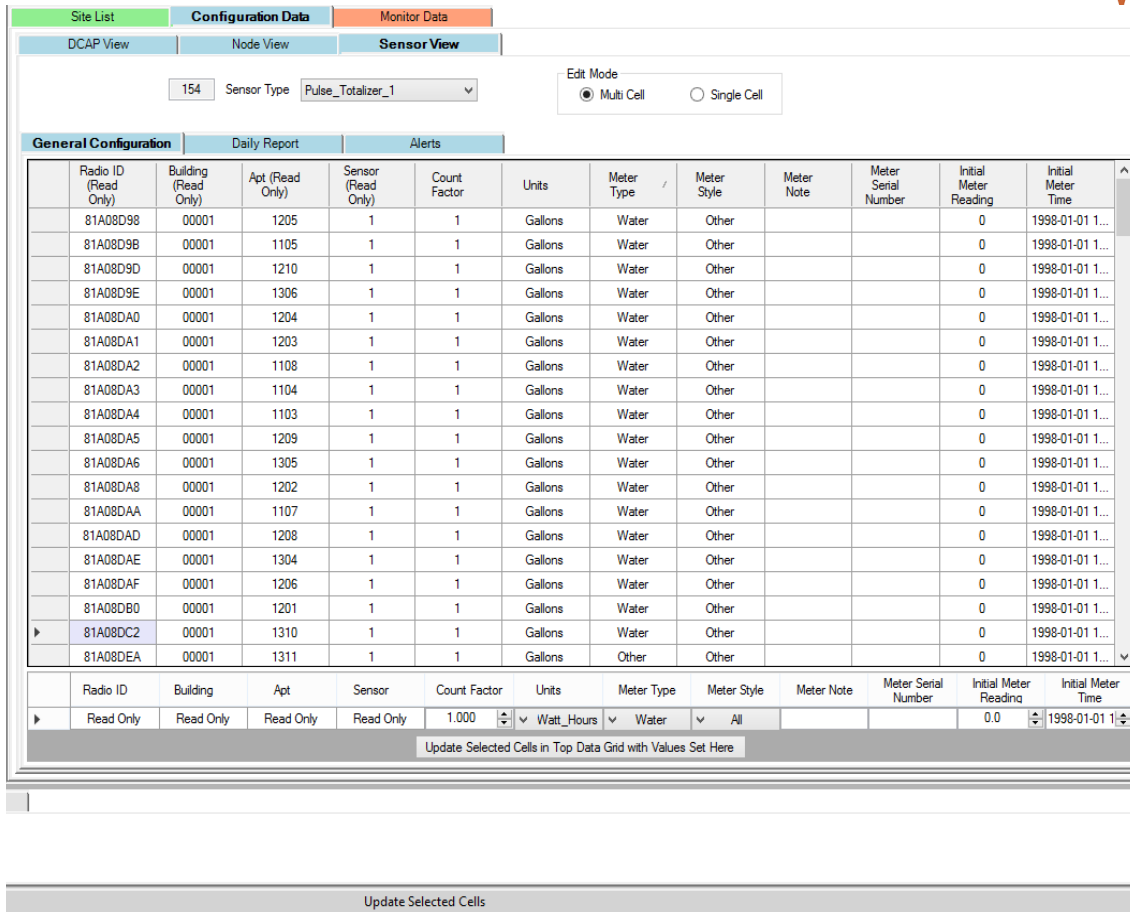
A) Right clicking on a Radio ID and selecting *Add This Uncommissioned Device*,

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

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.

	Type	Radio ID	Node ID	Address	Building	Apt	Zip Code	Location Note
	RPTR	E000579E			2			breezeway attic unit 2307
	RPTR	E0005748			4			breezeway attic unit 4310
	RPTR	E000575C			3			breezeway attic unit 3312
	RPTR	E0005702			1			breezeway attic unit 1302
	RPTR	E0005746			4			breezeway attic unit 4302
	RPTR	E00058E0			2			breezeway attic unit 2302
	RPTR	E0005525			1			breezeway attic unit 1312
	MDT	81A08D98	212410011205		00001	1205		
	MDT	81A08D9B	212410011105		00001	1105		
	MDT	81A08D9D	212410011210		00001	1210		
	MDT	81A08D9E	212410011306		00001	1306		
	MDT	81A08DA0	212410011204		00001	1204		
	MDT	81A08DA1	212410011203		00001	1203		

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/timestamp is automatically recorded.

Site List	Configuration Data	Monitor Data
DCAP View	Node View	Sensor View

154 Sensor Type Pulse_Totalizer_1

Edit Mode: ● Multi Cell ○ Single Cell

General Configuration | Daily Report | Alerts

Radio ID (Read Only)	Building (Read Only)	Apt (Read Only)	Sensor (Read Only)	Count Factor	Units	Meter Type	Meter Style	Meter Note	Meter Serial Number	Initial Meter Reading	Initial Meter Time
81A08D98	00001	1205	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08D9B	00001	1105	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08D9D	00001	1210	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08D9E	00001	1306	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA0	00001	1204	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA1	00001	1203	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA2	00001	1108	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA3	00001	1104	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA4	00001	1103	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA5	00001	1209	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA6	00001	1305	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DA8	00001	1202	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DAA	00001	1107	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DAD	00001	1208	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DAE	00001	1304	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DAF	00001	1206	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DB0	00001	1201	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DC2	00001	1310	1	1	Gallons	Water	Other			0	1998-01-01 1...
81A08DEA	00001	1311	1	1	Gallons	Other	Other			0	1998-01-01 1...

Radio ID	Building	Apt	Sensor	Count Factor	Units	Meter Type	Meter Style	Meter Note	Meter Serial Number	Initial Meter Reading	Initial Meter Time
Read Only	Read Only	Read Only	Read Only	1.000	Watt_Hours	Water	All			0.0	1998-01-01 1

Update Selected Cells in Top Data Grid with Values Set Here

Update Selected Cells

8. **Important!** Save your edits to the DCAP: Click on the [icon] 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.

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).

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 off-line 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*.

Step 7: Wiring MDT to Meter

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 .

Wire size: 20 -26 AWG solid/stranded.
Strip length: 5/16'' (8mm)

Water & 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.

Electric Meters
Important! The polarity is crucial for connecting to most electric meters!

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

° 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.

More details can be found on our web site. Look for these two app notes: Application Note "*AN-102 MDT Wiring Guide*" and "*AN-102-P Pulse MDT Wiring Guide*"   A direct link to our Documents web page is here.

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