

Tehama System Installation Guide

General Description

The Tehama AMR system consists of three device types to remotely monitor various environmental and utility readings and provide the data to a central database or PC for formal presentation and reporting. MDT/Sensor devices will be placed in all locations requiring local monitoring of data. The MDT/Sensors will transmit time stamped data to the DCAP device, which receives the data and stores it in a Database. The database information is available over Ethernet on the local LAN or the Internet. For MDT/Sensors that are out of range from the DCAP, Repeater devices are added in appropriate locations to relay the data between MDT/Sensors and the DCAP

The system operates in the 915Mhz ISM bands using off-the-shelf FSK RFIC radios. The system operates as a Frequency Hopper over 60 narrow band frequency channels, incorporating a bidirectional communication link with Acknowledge (ACK) messages to ensure all data reaches the DCAP. The MDT/Sensors are battery operated, bursting data packets at pre-programmed times then shutting down to conserve battery life, estimated to exceed 5 years. The DCAP and Repeater units are line powered.

With an typical MDT/Sensor transmission rate of four per hour for time of use applications, a single DCAP can accommodate many hundreds of MDT/Sensors. Through the use ACK messages and local memory in both the MDT/Sensors and Repeaters, the number of MDT/Sensors supported can exceed a thousand. There is no limit to the number of repeaters, though an average installation may require one Repeater for every 20-30 MDT/Sensors.

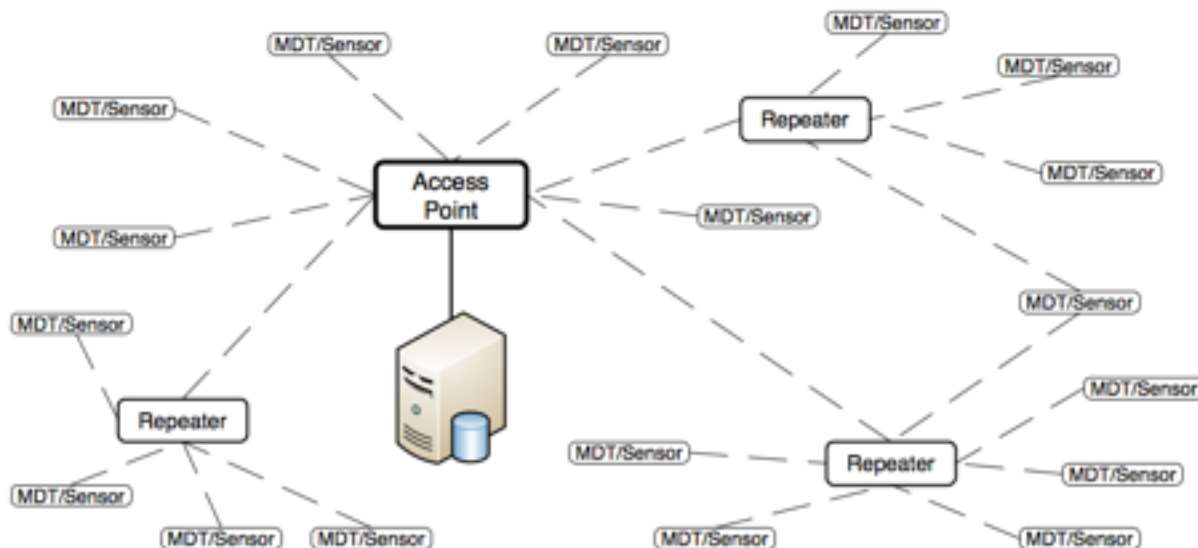


Figure 1: Typical System

A system consists of two or three types of hardware, and a software program:

- One DCAP Unit or Access Point
- A variable number of Sensors units, each with 2 AA batteries
- A variable number of Repeater units (optional, depending on size of installation) with external DC power supply.
- Tehama Configuration Utility (CIT) running on a PC

Warning

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT

Tehama Configuration & Installation Tool (CIT)

You should have received a copy of the Tehama Configuration and Installation Tool (CIT) software. This runs on a Windows based PC. More detailed information can be found in the Tehama CIT User Manual or the Tehama QuickStart Guide.

The tool can be run on the PC either prior to or during a site installation, or when new MDT/Sensors are added to a system. The tool is used to add configuration data to the database. Examples of configuration data include the name, type, and location of equipment an MDT/Sensor is connected to, and alarm trigger settings for the different MDT/Sensors.

DCAP/Access Point Setup

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

- Power up the AP with the supplied power adaptor.
- Screw in the AP antenna that came with the unit.
- Attach the supplied USB cable to your computer and to the AP. If this is the first time attaching tan AP, Windows may respond with a "found new hardware" message. Follow the steps to let Windows download the driver software.
- Attach the AP to your local LAN with the supplied Ethernet cable.
- Launch the CIT tool on the PC
- Go to the Config menu and select DCAP. The Serial Port field should be automatically populated with the correct COM port
- Click on the Get button to see the current settings
- DHCP (Dynamic IP Address) is the default. If you want a static IP, select static and fill out the extra fields.
- Set the MySQL database passwords for both users and click "Set". Clicking on the "Default Vals" 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).



- Click on the "Create a Site Entry" button to auto-fill a Site entry with the information from this panel.
- Unplug the USB cable. It is not needed again unless you need to change the IP address or the database passwords at a future time.

MDT/Sensor Configuration

All MDT/Sensors come from the factory with a default factory-set configuration. The following parameters can be custom configured at the factory . There are no parameters which can be configured on the DCAP or Receiver.

- **Monitor Type**, defined as the type of device the unit is attached to for measurements. This includes temperature via thermocouple or thermistor, humidity, CO2, Pressure, or various pulse type inputs from Utility meters or dry contact outputs from door sensors or other devices.
- **Transmit Interval**, defined as the time between scheduled transmissions of temperature data. A temperature measurement is taken every Transmit Interval, and the data transmitted within 60 seconds after the measurement. The units for this parameter are seconds, and the default value is 900 seconds (15 minutes).
- **Measure Interval**, defined as the time between scheduled temperature measurements. This is used in conjunction with Temperature Change (see below) and must be smaller than the Transmit Interval time. A value of 0 for this parameter will disable measurements in between the Transmit Interval. The units for this parameter are in seconds, with default set to 0.
- **Temperature Change**, defined as a percentage change in the Thermistor resistance value (i.e. temperature) detected by the sensor. A Delta Temp alarm will be generated within the PC Software if a Sensor reading taken at a Measure Interval is more than Temperature Change percent from the prior Transmit Interval value. The units for this parameter are Percent (%), with the default value set to 0.

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.

Usage

The MDT/Sensors will come with Batteries installed. With the Configuration Tool running on the PC and the DCAP or Access Point on and connected to a PC or the Internet, the user will press and hold the button near the LED window until the LED starts to flash. It will flash slowly at



first, then rapidly flash when a Beacon is seen (from a Repeater or DCAP/AP), then finally illuminates for 10 seconds when it successfully communicates with the network.

The unit can be turned off by again holding the button until the LED blips off. Then release the button and the unit will flash twice to indicate it is in the off state.

Button Usage (for MDT/Sensor and Repeater)

When a unit is off, press and hold for three or four seconds to turn on. LED starts to flash
When unit is on, press and hold for three or four seconds to turn off. LED will be off

A single press can indicate the state of the unit

Constant on LED for 10 seconds means unit successfully communicating to network

Single LED flash indicates the unit is on but not communicating with the network

Double LED flash indicates the unit is OFF

A double press when the unit is on and Connected will trigger an immediate data transmission

Device Placement

Warning: All radio devices should be placed at least 8 inches (20 cm) away from people in order to minimize RF exposure.

With the DCAP Unit powered up and the CIT tool running, the repeater backbone can be placed. Start with units closer to the DCAP/AP, and use the LED feedback indication to verify the range is acceptable. At first just the minimum numbers of repeaters can be placed, with additional repeaters added to fill in holes after MDT/Sensor placement.

Once the initial Repeater placement is complete, the Sensor placement phase begins. Again the LED feedback can be used to verify that MDT/Sensors are communicating with the network. Additional repeaters can be placed in areas with minimal coverage. The CIT software can also be used in the placement phase to provide more detailed information such as Link Quality and Signal Strength reading generated by MDT/Sensors and Repeaters. In particularly dense sites such as in modern Hospitals, a Sniffer unit may be used to monitor local radio traffic. A Sniffer is just a receiving unit that displays any received message on a Laptop over a USB cable.

Guidelines

Sensors can be mounted in a number of ways by utilizing velcro strips, tie-wraps, or screws. Units may be mounted to the wall or other flat surfaces with screws or velcro, and strapped to pipes or posts by placing tie-wraps through the two slots on the flanged case.

Units should not be placed directly on the metal surface unless no other option is available. Mounting on a flat metal surface will significantly affect the radio performance of the device.

Notes

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