

# INSTALLATION

***TowerSentry***<sup>®</sup>  
**Dual Beacon Monitoring System**  
**(DBMS)**

**For red incandescent towers without alarm outputs.**

**This system will monitor one Top Beacon,  
1 or 2 Mid Beacons and up to nine Marker/Sidelights**

***TowerSentry***<sup>®</sup>  
2720 Industrial Park Drive  
Lakeland, FL 33801  
(863) 667-1006

**Warning!!! Lethal voltages are present in the lighting system. Remove AC power from the tower light system at the circuit breaker panel before proceeding with installation. Death or Serious injury may result if the unit is not disconnected**

**Installers Notes:**

Installation will require basic tools **including an AC/DC Volt/Ohm meter and an Amprobe.**

**TowerSentry® Technicians are available to assist in installation and final checkout M-F 8am – 4:30pm Eastern Time. TowerSentry® technicians are not available any other hours.**

**Proper operation must be confirmed before installer leaves the site.**

**TowerSentry® will not commence monitoring until proper operation has been confirmed by one of our technicians.**

**Failure to call and confirm proper operation will result in the installer having to revisit the site for final checkout.**

**Caution: Only qualified personnel should perform Installation. Death or permanent injury may result.**

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## **Installation of *TowerSentry*® Dual Beacon Monitoring System (*DBMS*)**

1. Mount the *DBMS* cabinet next to the lighting system. One 3/4" pre-drilled hole is provided **at the bottom** of the cabinet for the flex cable that will connect the *DBMS* to the tower light controller.

**NOTE: On outdoor installations, the cabinet must be mounted with the conduit connectors facing down to avoid water intrusion and to avoid voiding the warranty.**

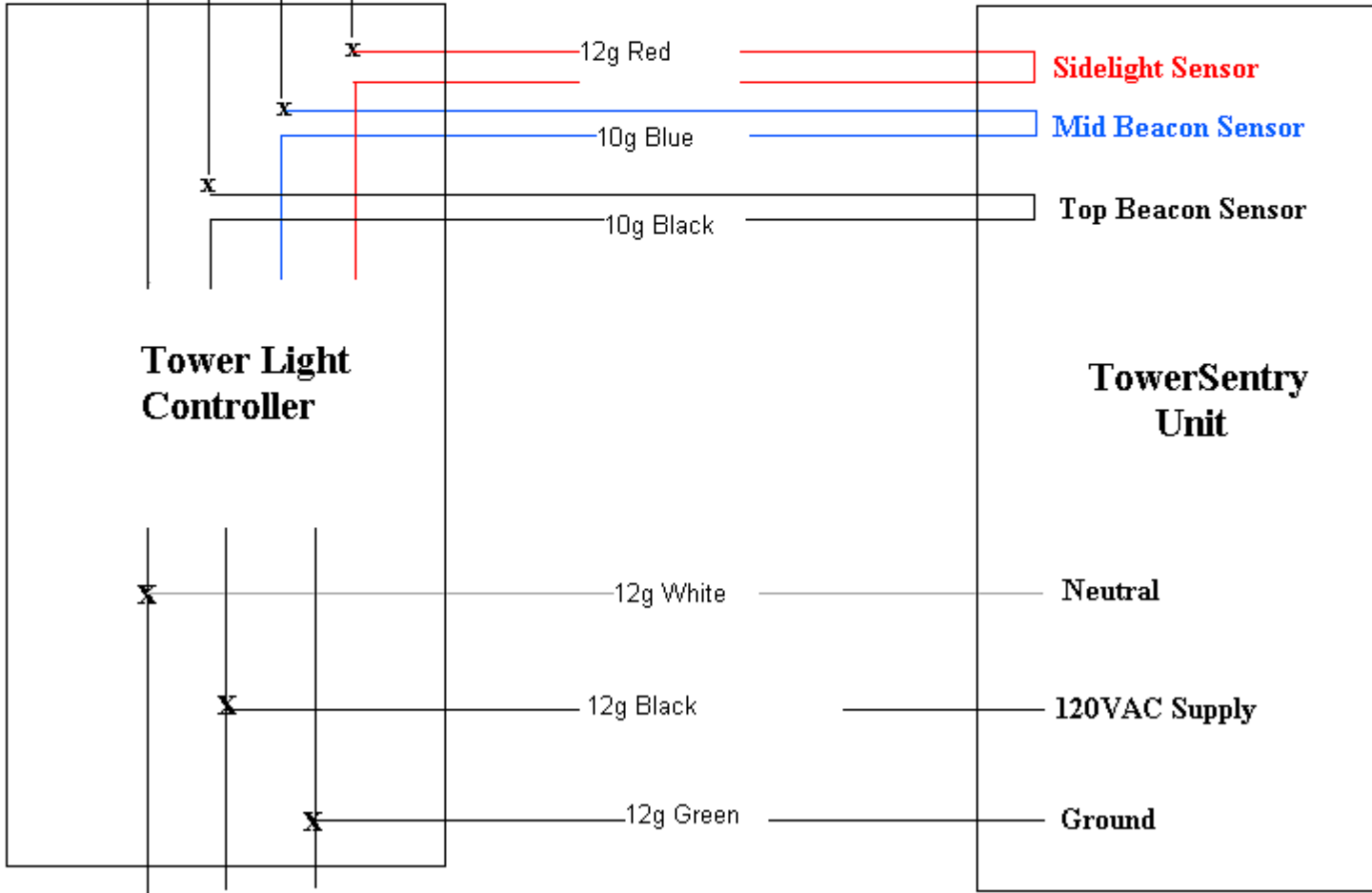
2. Locate the 1/2" flex with wires. Attach the flex to the bottom of the *DBMS* cabinet and connect the wires to the terminal blocks inside the *DBMS* cabinet as follows...
  - Connect the two 12 gauge red wires to the larger red terminal blocks.
  - Connect the two 10 gauge black wires to the larger black terminal blocks.
  - Connect the two 10 gauge blue wires to the larger blue terminal blocks.
  - Connect the 14 gauge white wire to the smaller white terminal block.
  - Connect the 14 gauge black wire to the smaller black terminal block
  - Connect the 14 gauge green wire to the smaller green terminal block.
3. Install the other end of the flex to the bottom of the tower light controller. Some manufacturers have "knock outs" already on the box. Some have "plugs" screwed into the box. Some do not have any access and will require that you drill a hole. The flex provided with the *DBMS* will screw directly into a 3/4" pipe thread knock out.
4. On the tower light controller, examine the wiring leaving the controller, **going up** to the tower lights.
5. Locate the top beacon wire at the point where it comes down the tower and is connected to the tower light controller. Disconnect the beacon wire from the controller's terminal block. Connect one of the 10 gauge black wires from the *DBMS* flex **in its place** on the controller's terminal block. Connect the other 10 gauge black wire to the beacon wire using a wire nut. (In effect the beacon power now loops through the *DBMS* and then goes up the tower.)
6. Locate the Mid beacon wire at the point where it comes down the tower and is connected to the tower light controller. Disconnect the mid beacon wire from the controller's terminal block. Connect one of the 10 gauge blue wires from the *DBMS* flex **in its place** on the controller's terminal block. Connect the other 10 gauge blue wire to the beacon wire using a wire nut. (In effect the beacon power now loops through the *DBMS* and then goes up the tower.)
7. Locate the sidelight wire at the point where it comes down the tower and is connected to the tower light controller. Disconnect the sidelight wire from the controller's terminal block. Connect one of the 12 gauge red wires from the *DBMS* flex **in its**

**place** on the controller's terminal block. Connect the other 12 gauge red wire to the sidelight wire using a wire nut. (In effect the sidelight power now loops through the **DBMS** and then goes up the tower.)

8. Locate the neutral wire coming from the circuit breaker panel to the tower light controller. Loosen the neutral wire terminal. Connect the 12g white wire from the **DBMS** to this same terminal so that they share the terminal.
9. Locate the ground wire coming from the circuit breaker panel to the tower light controller. Loosen the ground wire terminal. Connect the 14 gauge green wire from the **DBMS** to this same terminal so that they share the terminal.
9. Locate the “hot” wire coming from the circuit breaker to the tower light controller. Loosen the hot wire terminal. Connect the 14 gauge black wire from the **DBMS** to this same terminal so that they share the terminal.
10. If a telephone line is being used, hook up the telephone line to “Telco R” and “Telco T” on the larger circuit board inside the **DBMS** cabinet. **Customer supplied modems or answering devices must be programmed to answer on three or more rings so as not to interfere with the proper operation of this device.**
11. Place the backup battery in the bottom of the cabinet. Hook up the black and red leads from the circuit board to the battery. Red to “+” (plus), black to “-“ (neg).
12. The installation is now complete. Close up all cabinets and turn on the circuit breaker to the tower lights and the **DBMS**. **Please call our office at (863) 667-1006 so that we may confirm proper operation of the unit.**

# Simplified Wiring Diagram

To tower lights  
 N B1 B2 S



Wiring from Circuit Breaker

# *TowerSentry*<sup>®</sup>

## Trouble-shooting guide

### **Tools needed:**

Telephone or “butt set” with alligator clips  
AC/DC Volt / Ohm meter (Fluke 77 or equivalent)  
Amprobe  
Small and medium size flat-blade screwdriver  
Medium size Phillips screwdriver

**There are five different areas where problems can occur... the telephone service, wireless provider, *DBMS* unit, AC power source, and the tower light controller. The purpose of this trouble-shooting guide is to help the installer determine the source of the problem.**

**Please follow the guide step by step. Please don't assume that something is, or is not working without verifying it.**

### **AC Power**

- With the voltmeter set to AC volts, measure the input voltage to the *DBMS* at the AC input terminals on the circuit board. The reading should be between 16-18VAC. If voltage is present, proceed to the next section. If voltage is not present, check for 110-120VAC power at the fuse-block. If voltage is not present check the fuse in the fuse block or look for a tripped circuit breaker.

### **Telephone Line**

- If a telephone line is being used, check the telephone line for dial tone on the terminals of the *DBMS* circuit board. (Telco T and Telco R) If dial tone is present, proceed to the next section. If not, report the outage to your local telephone company.

### **Wireless Provider**

- The *DBMS* unit utilizes the control channel of selected cellular wireless carriers. Signal coverage is adequate throughout most of the country, but there are areas where coverage is weak or non-existent.

### **The *SBMS* Unit**

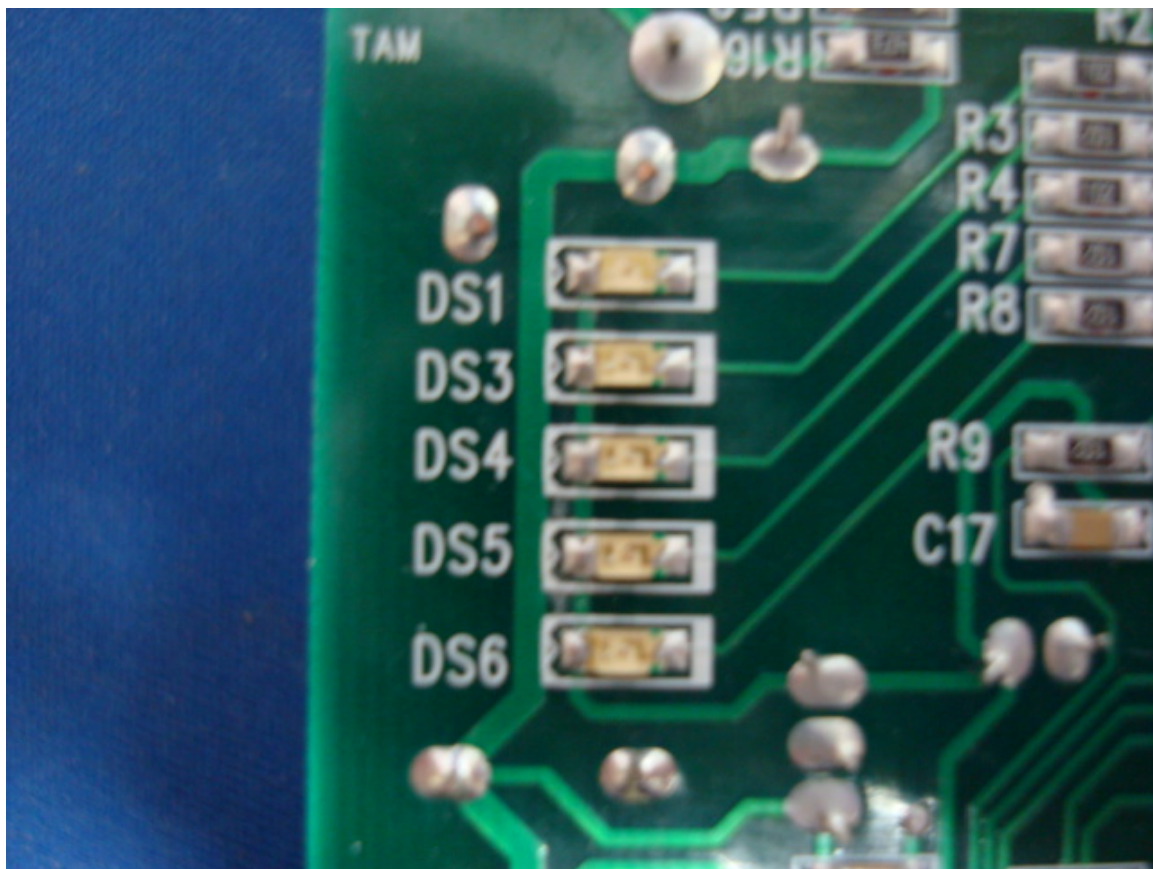
- The *DBMS* provides ~6.5 volts DC between a particular zone and “com”. When the alarm sensors provide an alarm contact closure, this voltage will drop to zero. **(a “short” has been applied across that zone and com).** When the lighting system is working normally, the voltage across the alarm zones and common will remain at ~6.5 volts DC.
- There is a 7-minute reporting delay to eliminate false alarms.
- If the *TowerSentry*<sup>®</sup> monitoring station is not receiving signals, the *DBMS* board is bad or cellular coverage is not adequate. (Contact *TowerSentry*<sup>®</sup> during normal business hours for assistance in determining the problem).

## **Explanation of Radio Power Up / LED Lights and sequence.**

DS1, when flashing, means that the transceiver is communicating properly with the control board. When the transceiver is first booted up, it transmits a brief signal, requesting an acknowledgement from an active cell tower in the area. The DS4 light is lit during this process. If NO service is found, all lights will flash in unison. After a 10-minute period, the radio will again try to find a site.

When the transceiver receives an acknowledgment back from a carrier the DS5 LED will light.

Once a carrier is found, the radio will transmit additional information then re-boot itself looking for a second carrier (possibly stronger in signal, possibly weaker), it then goes back to DS4 while it sends out a new search. If a second carrier is found, DS5 will again light. The transceiver then compares the two signals and will chose the stronger of the two. The radio then reboots again, DS4 is lit again, then DS5. Once locked on, DS6 will light very briefly (sometimes quicker than you can spot). Once on line, only DS1 will flash.



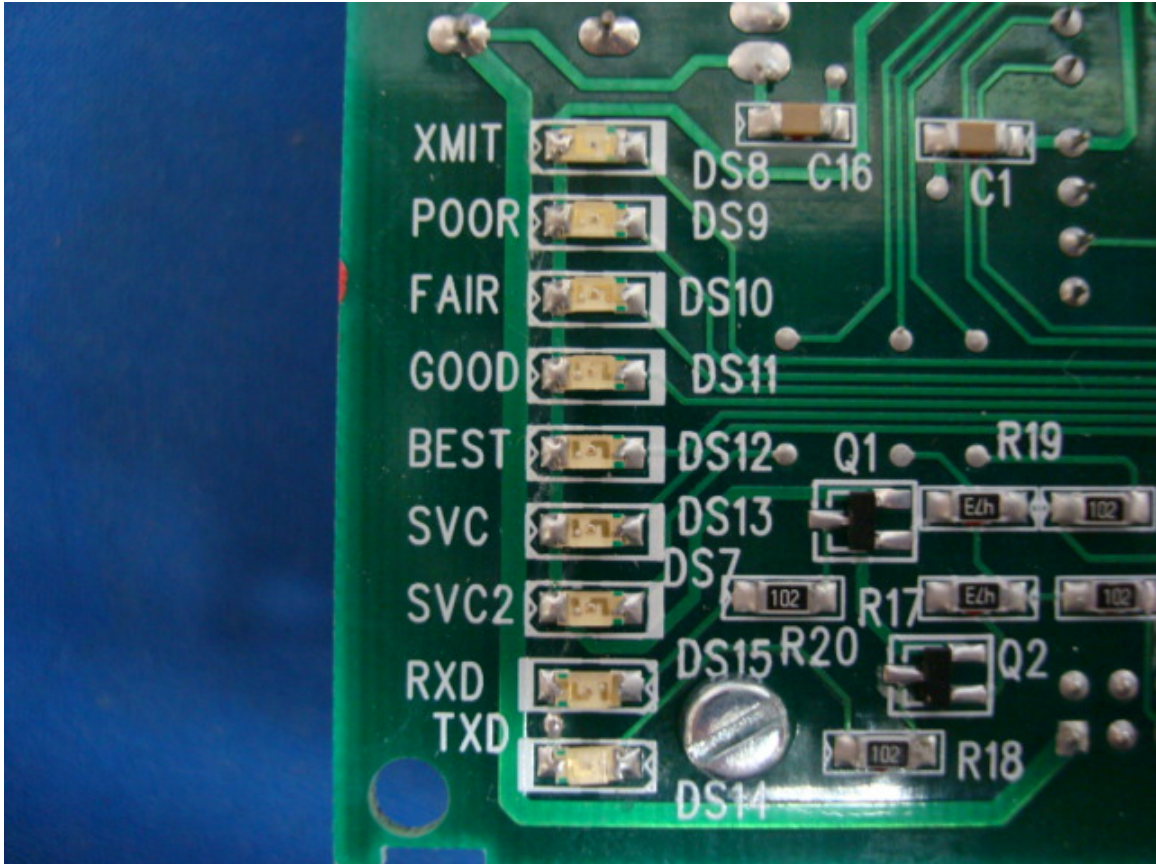
Additional information:

DS3 to DS6 LED's flashing = Network failure

DS3 to DS6 LED's off= Normal idle condition

(DS3 and DS4) and (DS5 and DS6) flashing alternately=Shutdown

The second set of LED's show the relative signal strength received, and you will also notice a XMIT LED that lights whenever a signal is transmitted. Each LED is tri-mode. Fast flashing, slow flashing and steady on. The LEDs are labeled as Poor, Fair, Good, Best. Each Led will light and flash relative to the signal received.



Description of relative signal strength for the LED's

Signal	Strength	Poor	Fair	Good	Best
-114	-197	Off	Off	Off	Off
-106	-104	Slow	Off	Off	Off
-103	-101	Fast	Off	Off	Off
-100	-98	On	Off	Off	Off
-97	-95	On	Slow	Off	Off
-94	-92	On	Fast	Off	Off
-91	-89	On	On	Off	Off
-88	-86	On	On	Slow	Off
-85	-83	On	On	Fast	Off
-82	-80	On	On	On	Off
-79	-77	On	On	On	Slow
-73	Higher	On	On	On	On