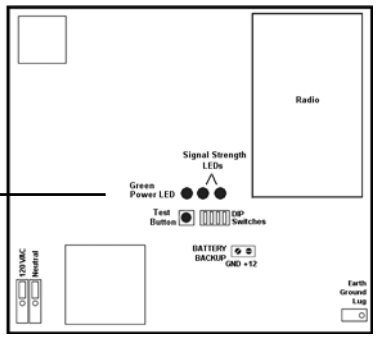
TVM Troubleshooting

The TVM unit includes either an analog radio or a multi-mode radio that operates over the analog and digital cellular networks. These following step instructions are used to help troubleshoot when the unit is experiencing problems communicating with the cellular network.



Step Instructions for the Analog Radio

For units that use analog radios, two LEDs are used to troubleshoot the unit.

At the middle of the TVM board, locate the Green and Red LEDs.

Note: Green LED D4 will light when power is on.

Note: Green LED D12 will blink if the unit is communicating.

Note: Red LED D11 will flash if the unit has difficulty communicating.

Locate the Test Button. Press the button for two seconds and release.

- ❑ You will see the Green LED blink at a one second rate if there is good signal strength and available cellular coverage. Unit is ready to operate.
- ❑ If the Red LED flashes – waits three seconds – and again flashes but repeats this cycle, then cell coverage is unavailable or the antenna needs to be checked. Go to *Antenna Installation Tips*.
- ❑ If the Green LED blinks for 5 seconds – pauses for one minute – Red LED blinks for 5 seconds and repeats this cycle; the unit cannot register with channel A or B of the cellular tower. Go to *Antenna Installation Tips.*

For system information and more details, refer to the **Telemetric TVM Users Guide.**

To download a copy, login to www.telemetric.net

Go to:
Product Information > TVM MicroRTU > Users Guide

Step Instructions for the Multi-Mode Radio

For units that use multi-mode radios, two LEDs are used to troubleshoot the multi-mode radio board in addition to the two LEDs on the TVM main board.

Perform the below step instructions:

Note: After these instructions, you may need to perform *Step Instructions for the Analog Radio*.

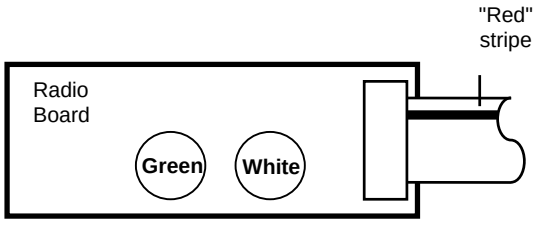
On the radio board, locate the Green LED.

- ❑ If the Green LED is Off, the radio board is not working. Contact Product Support Ext 21.
- ❑ If the Green LED is blinking, the radio board is working. Proceed to instructions for the White LED.

On the radio board, locate the White LED.

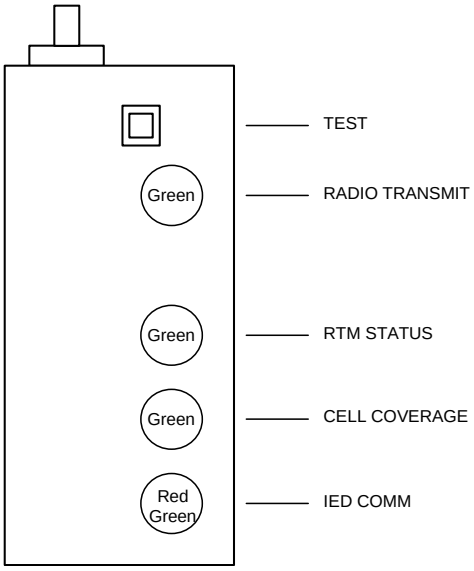
At the middle of the TVM board, locate and press the Test Button for two seconds and release.

- ❑ The White LED will flash Green then Red, which indicates the radio board and TVM main board are communicating. If the LED remains off, the radio board and TVM main board lost communications. Go to *Step Instructions for the Analog Radio.*



DNP-RTM Troubleshooting

The DNP-RTM unit includes either an analog radio or digital radio that operates over the analog and digital cellular networks. The following description is used to help troubleshoot when the unit is experiencing problems communicating with the cellular network.



LED Operation

Four LEDs are used to troubleshoot the unit:

- ❑ Radio Transmit **Green** LED will flash **Green**/**Red** when the unit is receiving or transmitting data.
- ❑ RTM Status **Green** LED will blink at a one second rate when the unit's firmware and hardware are functioning.
- ❑ Cell Coverage **Green** LED will light when signal strength is strong for receiving and transmitting data.
- ❑ IED Comm LED will flash **Green** (receiving) and **Red** (transmitting) when the unit is communicating with the IED.

Status of the LEDs when commands are issued

When a command is issued from the website, the LEDs will operate in the following sequence:

1. Cell Coverage LED is solid **Green.**
2. RTM Status LED will blink **Green** at a one second rate.
3. The Radio Transmit LED flashes from **Green** to **Red** to show cellular communications.
4. The IED COMM LED flashes **Green** to **Red** to show communication between the DNP-RTM and IED.

- ❑ If the IED COMM LED flashes only **Green**, communication between DNP-RTM and IED has failed. Verify the cable connections between the DNP-RTM and IED.
- ❑ If the IED COMM LED flashes **Red** to **Green** but the Cell Coverage **Green** LED is off, then communications between the DNP-RTM and IED are good but cellular communications has failed.

Press the Test button to test cellular signal strength

LED will indicate the following:

Solid red	Weak
- slow **red** blink	↓
- slow **green** blink	
- fast **green** blink	
Solid green	Strong

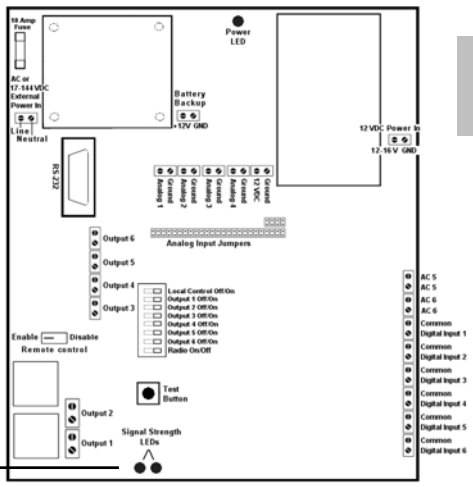
Press the Test button to test the signal strength:, refer to the **Telemetric DNP-RTM Users Guide.**

To download a copy, login to www.telemetric.net

Go to:
Product Information > DNP-RTM > Users Guide

T646 Troubleshooting

The T646 unit includes either an analog radio or a multi-mode radio that operates over the analog and digital cellular networks. These following step instructions are used to help troubleshoot when the unit is experiencing problems communicating with the cellular network.



T646 Main Board

Step Instructions for the Analog Radio

For units that use analog radios, two LEDs are used to troubleshoot the unit in addition to the T646 Local Configuration Program.

At the bottom of the T646 board, locate the Green and Red LEDs.

Note: Green LED will blink if the unit is communicating.

Note: **Red** LED will flash if the unit has difficulty communicating.

Locate the Test Button. Press the button for two seconds and release.

- ❑ You will see the **Green** LED blink at a one second rate if there is good signal strength and available cellular coverage. Unit is ready to operate.
- ❑ If the **Red** LED flashes – waits three seconds – and again flashes but repeats this cycle, then cell coverage is unavailable or the antenna needs to be checked. Go to *Antenna Installation Tips*.
- ❑ If the **Green** LED blinks for 5 seconds – pauses for one minute – **Red** LED blinks for 5 seconds and repeats this cycle; the unit cannot register with channel A or B of the cellular tower. Go to *Antenna Installation Tips.*

For system information and more details, refer to the **Telemetric T646 Users Guide.**

To download a copy, login to www.telemetric.net

Go to:
Product Information > T646 MicroRTU > Users Guide

Step Instructions for the Multi-Mode Radio

For units that use multi-mode radios, two LEDs are used to troubleshoot the multi-mode radio board in addition to the two LEDs on the T646 main board.

Perform the below step instructions:

Note: After these instructions, you may need to perform *Step Instructions for the Analog Radio*.

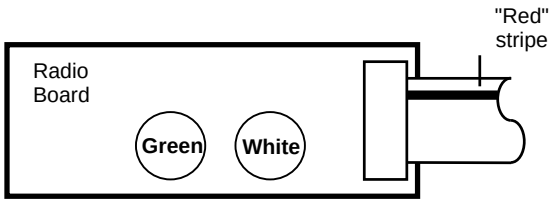
On the radio board, locate the Green LED.

- ❑ If the **Green** LED is Off, the radio board is not working. Contact Product Support Ext 21.
- ❑ If the **Green** LED is blinking, the radio board is working. Proceed to instructions for the White LED.

On the radio board, locate the White LED.

On the bottom of the T646 board, locate and press the Test Button for two seconds and release.

- ❑ The White LED will flash **Green** then **Red**, which indicates the radio board and T646 main board are communicating. If the LED remains off, the radio board and T646 main board lost communications. Go to *Step Instructions for the Analog Radio.*



Antenna Installation Tips

When a Telemetric unit is installed, the location of the unit and antenna may affect communications. Good installation practice will dictate good signal coverage.

- ❑ Place all non-Yagi antennas in a vertical position.
- ❑ Properly align Yagi antennas with a cell tower that provides subscription service to Telemetric units.
- ❑ To avoid signal reflections, install antenna away from metal structures.
- ❑ Ensure that a multiband antenna,800Mhz/1900Mhz, is installed with digital and multi-mode radios.
- ❑ If a cell tower is near the unit, the signal strength can be too strong and prevent reliable communications. Too strong of signal strength is between –50db and – 40db. Contact Product Support for help.
- ❑ Ensure cellular coverage is available at the installation site, especially for analog radios. In 2008, the FCC will no longer require carriers to support analog. Contact Product Suppor for help.

YAGI Directional Antenna

A Yagi directional antenna includes a coverage pattern where signals are received and transmitted in the direction where the antenna is pointed. This antenna is used in areas where cellular coverage and signal strength is weak or where the signals are received and transmitted over a long distance.

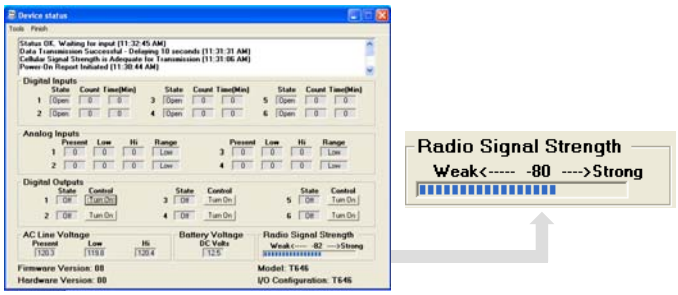
Step Instructions for Adjusting a Yagi Antenna: T646

To adjust a Yagi Antenna with a T646 unit, you will need the Local Configuration Program to view the Radio Signal Strength Indicator (RSSI) graph.

To adjust a Yagi Antenna, perform the following step-by-step instructions:

- ❑ Open the local configuration program and view the Radio Signal Strength Indicator (RSSI)

Note: The RSSI indicator updates the signal strength every minute.



- ❑ Point the antenna in the general direction of the tower or any direction.
- ❑ While viewing the RSSI Indicator, rotate the antenna 360 degrees in 10 degree increments until strong signal strength is observed.

Note: If structures interfere with line-of-sight between the antenna and tower, adjust the antenna height.

Step Instructions for Adjusting a Yagi Antenna: TVM

To adjust a Yagi Antenna with a TVM unit, two LEDs are used to indicate Radio Signal Strength.

In the middle of the TVM board, locate the Green and Red LEDs.

Note: Green LED D4 will light when power is on

Note: Green LED D12 will blink if the unit is communicating.

Note: Red LED D11 will flash if the unit has difficulty communicating.

- ❑ Point the antenna in the general direction of the tower or any direction.

Locate the Test Button. Press the button for two seconds and release.

- ❑ You will see the Green LED blink at a one second rate if there is good signal strength.
- ❑ If the Red LED flashes, rotate the antenna by 10 degrees and press the Test Button for two seconds. Repeat this process until the Green LED blinks at a one second rate.

Antenna Troubleshooting

Telemetric units are installed with antennas that are mounted directly to the unit or remoted away from the unit with extension cables. When a unit is first installed, weak signal strength may cause the unit to be unresponsive to remote commands issued by an operator. To increase signal strength, a new antenna type may be required.

Selecting another Antenna

If a unit is unresponsive and not communicating, reconsider the antenna type by consulting the below table and matching the condition to the antenna type.

From	Condition	Radio Type			To
		analog	multi mode	digital	
A	unit and cell tower installed in remote location		X	X	E
B	replacing an analog radio with a multi-mode or digital radio		X	X	A,E
C	replacing an analog radio with a multi-mode or digital radio in a remote location		X	X	E
D	replacing an analog radio with a multi-mode or digital radio		X	X	D*
C	unit and cell tower installed in remote location	X			B
D	unit and cell tower installed in remote location		X	X	E
A	unit and cell tower installed in remote location but need a HIGH gain antenna		X		F

* The low profile antennas are available in single-band and dual-band models and look identical. The single-band antennas operate only with analog radios. If an analog unit is replaced by a digital unit, then the antenna may prevent any communications. Below are the part numbers:

C **Low Profile – SMA Compatible (color black & white)**
analog radio — single-band 800Mhz (antenna is black)
digital radio — dual-band 800Mhz/1900Mhz (antenna is in white & black)

D **Low Profile – TNC Compatible (color white)**
TRA8213P — single-band
TRA821/1850JP — dual-band

Antenna Type

A

Standard Antenna
Dual Band Antenna

B

Standard Antenna
Yagi Antenna

C

Low Profile – SMA Compatible
External Mounting Applications

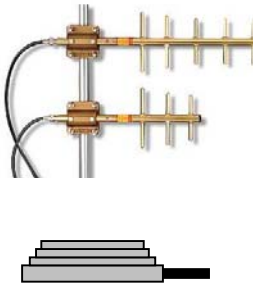
D

Low Profile – TNC Compatible
External Mounting Applications

E

Directional Gain Antenna
Remoted Height Applications

F



Special Order Antennas
Yagi Antennas and Low Profile