



433MHz Radio Frequency (RF) Troubleshooting

RTI handheld controllers that use the 433.92 MHz radio frequency send trigger codes to an RTI central control processor. Since commands (IR, RS232) and macros are stored in the central processor as opposed to the remote, RF performance should be very reliable in most applications. It is possible that other products may emit RF interference, or operate at 433MHz, which may cause communication issues, such as intermittent performance or poor range. Some examples of devices that have been known to cause interference are:

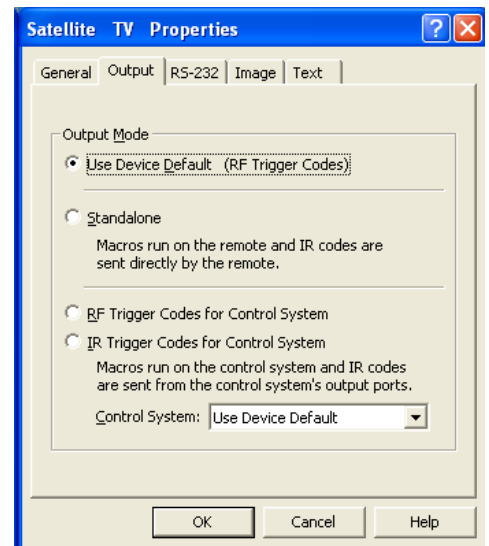
- Old models of cordless phones - Home weather stations - Security systems - Kids toys - Wireless pool thermostats - AV equipment
- Refrigerator compressors

RF Troubleshooting Steps:

1) Verify that the buttons you are testing are in RF Trigger Mode

Verify in Integration Designer that the button(s) you are testing are in RF Trigger mode. You can do this by right clicking on a button in the software then click: Edit Properties>Output. Verify the button is in “RF Trigger Code for Control System” mode. In most cases you will probably have the remote property already set to “RF Trigger Code for Control System”, in which case the button will say “Use Device Default (RF Trigger Codes)” In either case, the remote is in RF mode and should give feedback on the antenna data light when buttons are pressed.

NOTE: If you need to send IR and RF on a single button press - the button can be in Standalone output mode when a system macro has been created on the central processor containing all of the codes that will be sent by the processor. Visit our website - www.rticorp.com - support section for a tech bulletin on setting this up.



2) Verify that you have downloaded to the remote and processor

You will need to download the program you have created in Integration Designer to both the handheld remote, as well as the central control processor. Please note that the processor will remain in programming mode when there is an active USB connection. **Disconnect the USB cable from the computer, processor, or both devices before testing.**

3) Test remote within a few feet of RF antenna

Check the RF Data indicator on the RF antenna module (RM-433 or RP-1). The data light should blink green when you are pressing a button on an RTI remote (assuming the remote is in RF trigger mode). If the status indicator is not flashing when you are pressing a button on the remote, move to within a few feet of the antenna, and try pressing a button again. If you are still not able to get feedback on the RF antenna within a few feet, there may be faulty wiring, a defect with either the RF transmitter in the remote or the RF receiver in the antenna - proceed to steps 7 - 9.

4) Verify the whip antenna is installed prior to powering RM433/RP-1

The RM-433 antenna module and RP-1 processor will do a test of the RF noise in the environment to determine the level of interference. To ensure the reliability of RF signal, a filter is set within their RF receivers. If the whip antenna is not installed prior to powering the RM-433/RP-1 it is possible this filter will be set too low. To ensure this is not an issue, verify the whip antenna is installed and cycle the power to the unit.

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5) Try moving the location of the RF antenna or adding additional antennas

If the RF Data light is flashing or constantly red, you are most likely picking up RF interference. For troubleshooting purposes, try moving the antenna 20-30 feet from its current location, usually a few feet will not be enough. If you are using a processor that uses the RM433 antenna, you can add additional RF antennas (up to 10 RM-433 antennas per processor), which can improve range and reliability when dealing with environments that have RF interference. See the IR Trigger Code solution below if you cannot eliminate the RF performance issues due to interference.

6) Try testing remote and processor in a different environment

Try moving the RTI equipment (just the handheld remote and processor/antenna - not the emitters, CM232 modules etc.) and testing in a different environment. Try it in a different part of the home/office as far away as possible from its installed location or if possible at your office to see if the performance changes. If the problem is eliminated by placing it in a different environment, then the equipment has been eliminated as the cause, and there is most likely RF interference in the original environment - see step 5 or the IR Trigger Code solution below.

7) Verify that the wiring between the RM433 antenna and control processor is connected properly (does not apply to RP-1 control processor).

Verify that the 12VDC, Ground, and Signal terminals on the RM-433 antenna are connected properly, and that the wires are aligned to the 12VDC, Ground, and Signal In on the control processor.

8) Use a different RTI remote for testing RF performance (if possible)

If you have performed the above tasks and continue to experience an RF issue such as poor range, no RF, or intermittent performance, try using a different RTI handheld controller (any model). If you are able to eliminate the RF problem with a different remote, most likely there was a defect or damage to the original remote's RF transmitter.

9) Use a different RTI antenna for testing RF performance (if possible)

If you continue to experience similar RF issues, try replacing the RM-433/RP-1 unit being used including the whip antenna.

In case RF interference cannot be eliminated.

Possible Solution #1 – Try installing a BNC Attenuator

If interference issues can not be overcome via the methods described above, in some cases using a BNC attenuator may help. A BNC attenuator shrinks the range of the antenna and may minimize RF interference that is coming from a distant source. The BNC attenuator screws onto the BNC connector of the RM433/RP1 between the module and the whip antenna. Having a 3db, 5db and 10db (50ohm) attenuator is helpful as it may be possible to interchange or stack more than one of the different sizes to further “tune” the RF.

Search the internet for “BNC Attenuator” for retailers and purchasing information.

Possible Solution #2 – Use IR trigger codes and an IR receiver with the control processor

Note: This solution will not work with RP-1 control processor

If interference issues can not be overcome via the methods described above, you have the option of using IR trigger codes. With IR trigger codes, you still have the benefit of control commands being stored on the central processor, which can result in better reliability than standalone IR control, and also allows for the ability to take advantage of the central processor features (RS232, IR routing, relay control, video/voltage sensing).

To use IR trigger codes:

- Connect an IR receiver to the signal input/ground of the control processor, in lieu of an RM-433.
- Set the remote output properties to “IR Trigger Codes for Control System” mode in the Integration Designer software.
- Re-download the program to both the handheld controller and the control processor.

