

## Zigbee® Installation & Troubleshooting

Following this guide will ensure reliable Zigbee communication between devices.

Please note, **MOST Zigbee communication issues are due to one or more devices needing updating.** Having a blend of outdated and updated software/firmware will cause issues.

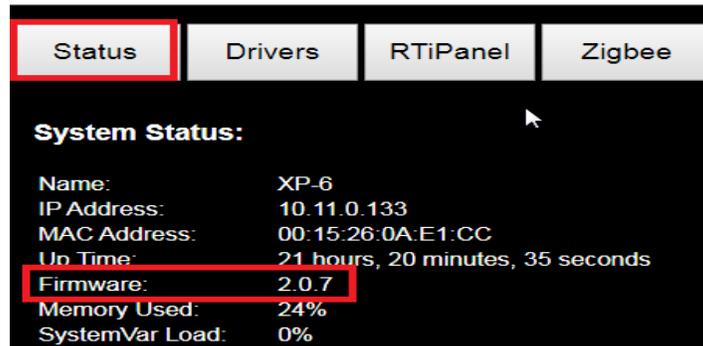
### Firmware Update Instructions

Install firmware updates on all remotes, processors and KX3 touchpanels.

**IMPORTANT NOTE:** The processor firmware also updates ZM-24 transceivers. Follow steps below to ensure a successful Zigbee chip update.

#### 1) Check processor firmware version:

- Connect USB cable to processor, open Integration Designer and go to Communications> Get Firmware Version - OR - You can view it in XP Diagnostics dashboard (shown below).
- Compare to version listed on the rticorp.com dealer portal.



- Update firmware on processors** as needed (All Primary/Master, Secondary/Slave and KX3's).
  - Follow instructions in attached readme document.
  - Let the firmware update finish - wait until processor is fully booted up.
  - Power cycle processor** – This will push the firmware update to the Zigbee chip on the ZM-24 transceiver.
    - IMPORTANT:** YOU MUST RESET THE PROCESSOR POWER IN ORDER FOR A ZM-24 UPDATE TO BE INITIATED. Resetting ZM-24 power, pressing ZM-24 reset button will NOT initiate an update of the ZM-24 Zigbee chip.
    - While it's updating the ZM-24 red light is off, and the green light will flash rapidly. This process takes roughly 20 seconds to complete and the red light is lit solid when it's done.
- Update firmware on remotes**
  - Connect USB to each remote, open Integration Designer, go to Communication> Get Firmware Version and verify it is the latest version on rticorp.com dealer portal
  - Update remote firmware to latest version as needed.

### Update Programming and Test

Update programming in all processors and remote controls using latest software version and test the system.

- 1) Open Integration Designer (9.x/10.x), go to Help > About, compare to version on dealer portal and update version as needed.
- 2) Download the System file to all devices.
- 3) Reset power on remote controls within **1 meter** of the ZM-24/XP-3/KX3 where they will be used.
- 4) Test wireless control on each remote.
  - a. If Zigbee communication is not working, utilize the XP Diagnostics and Zigbee counter driver to verify wireless range and antenna placement. (See Zigbee Troubleshooting section)
- 5) Reset Zigbee network.
  - a. If Zigbee wireless control is still not functioning properly, reset the Zigbee network. (See Resetting Zigbee Network section).

## Zigbee Troubleshooting

If a remote loses Zigbee communication, reconnection time should be less than a second. If it takes longer than this, there is most likely an installation issue caused by one or more devices needing updating, poor placement of the ZM-24, or some type of interference.

### No Communication

- 1) Look at the lights on the ZM-24 to verify it has power.
- 2) Verify that the ZM-24 is plugged into the RTICOM port on the processor.
- 3) Verify that you are using an RTI Zigbee enabled remote control. (Some older models did not support Zigbee).
- 4) Verify the output set to “Two-way trigger codes for control system” and the control transport method set to “Zigbee” in the software.

### Testing Zigbee Coverage

- 1) Open Integration Designer file and install the ZigBee Counter Driver (available on dealer website).
- 2) Program the Zigbee Counter driver text variable to a button on the remote touchscreen.
  - a. NOTE: If using Integration Designer APEX, [click here](#) for a bundle with the counter driver and diagnostics preprogrammed on to the remote touchscreen.
- 3) Power cycle the remote within 1 meter of the ZM-24.
- 4) A number will appear on the button and begin counting up every second.
- 5) Move the remote away from the ZM-24 and watch the number to see if it begins to skip numbers (indicating connection is lost).
- 6) If it begins to skip numbers, move closer to the ZM-24 until the numbers stop skipping and install a ZM-24 configured as a repeater as needed.

### XP Diagnostic Driver

Integration Designer 9.x and APEX places an XP Diagnostics driver in the “Control Drivers” folder. With version 1.03 (or higher) the diagnostics dashboard shows information about the connection to each remote (see XP Diagnostics Web Interface description below).

- 1) Add/update the driver in the Integration Designer system file to v1.03 or higher.
- 2) Download the system file into the XP control processor.
- 3) Enter the XP processor IP address into a web browser and click the Zigbee tab.

RTI Diagnostics

10.11.0.61

RTI Forums - Index

RTI Diagnostics Connected

Status Drivers RTIPanel **Zigbee** UPnP Sysvars Flags Log Get Report

**Zigbee Coordinator:**

Current ZigBee Channel: 25

Device	TX bytes	RX bytes	Last RX	RSSI	LQI	TX packets	RX packets	Activity
BrianR_XP6#2	23402	11651	2019-6-18 2019-08-46	-85	255	2076	2343	

**Zigbee End Devices:**

Device	TX bytes	RX bytes	Last RX	RSSI	LQI	TX packets	RX packets	Activity
R#3 T3x	7842	3148	2019-6-17 2019-17-15	-94	0	663	496	
T4x	2579	808	2019-6-17 2019-17-06	-93	62	234	226	
T4X	5501	3308	2019-6-18 2019-08-46	-85	255	525	697	
T3x New	7480	4387	2019-6-17 2019-17-07	-93	158	654	924	

Remote Technologies Inc.

### XP Diagnostics Web Interface – Zigbee Tab:

- Current Zigbee channel: Channels 11-26 – (See below for frequency information)
- Zigbee Coordinator: Statistics for a ZM-24 connected to the XP processor, or XP-3/KX3 built in Zigbee transceiver
- Zigbee End Device: Statistics for wireless remote controls.
- Statistic descriptions

NOTE: These statistics are for baseline testing. Results may vary based on equipment model, environment etc.

- **TX bytes** - Transmitted data byte count
- **RX bytes** - Received data byte count
- **Last RX**: Time Stamp of the last received packet
- **RSSI** (Receiver Signal Strength Indicator): Usually a value between -30 to -85 is normal, with -30 indicating that the Remote is closer and -85 indicating the Remote is far from the ZM-24 Coordinator.
- **LQI** (Link Quality Index): Usually a higher value (255) indicates a strong signal. Lower values indicate a weaker signal. (NOTE: Older remote controls may return higher values compared to newer models).
- **TX Packet**: Data packets transmitted
- **RX Packet**: Data packets received
- **Activity indicator**: Indicates a button press

- **Additional Channel Information:**

- This is the RF channel that the ZM-24/XP-3/KX3 has chosen. Once the network is formed, this will never change. The channel number will be in the range of 11 – 26.
- It is possible that ZigBee signal quality could be compromised by having an overlapping Wi-Fi channel. In some cases, changing the Wi-Fi channel could improve signal quality. If you are using Wi-Fi Auto-Channel Selection, this could cause signal overlap occasionally.
- The chart below shows how the selected Zigbee channel overlaps with Wi-Fi:

Zigbee Channel	Frequency	Wi-Fi Conflict
11	2.405 GHz	Overlaps Wi-Fi Ch 1
12	2.410 GHz	Overlaps Wi-Fi Ch 1
13	2.415 GHz	Overlaps Wi-Fi Ch 1
14	2.420 GHz	Overlaps Wi-Fi Ch 1
15	2.425 GHz	Overlaps Wi-Fi Ch 6
16	2.430 GHz	Overlaps Wi-Fi Ch 6
17	2.435 GHz	Overlaps Wi-Fi Ch 6
18	2.440 GHz	Overlaps Wi-Fi Ch 6
19	2.445 GHz	Overlaps Wi-Fi Ch 6
20	2.450 GHz	Overlaps Wi-Fi Ch 11
21	2.455 GHz	Overlaps Wi-Fi Ch 11
22	2.460 GHz	Overlaps Wi-Fi Ch 11
23	2.465 GHz	Overlaps Wi-Fi Ch 11
24	2.470 GHz	Overlaps Wi-Fi Ch 11
25	2.475 GHz	No Conflict (US/CAN) / Overlaps Wi-Fi Ch 13
26	2.480 GHz	No Conflict (US/CAN) / Overlaps Wi-Fi Ch 13

## Resetting Zigbee Network

If all other troubleshooting has been attempted and Zigbee communication is still intermittent, follow these steps to reset the Zigbee network, effectively clearing all of the previous Zigbee settings and reestablishing them.

- 1) Generate new Zigbee Network key:
  - a. Open Integration Designer system file using latest software version.
  - b. Go to File>System Properties>Zone, go to “Network Key” section and click the “Generate” button.
- 2) Download the system file to Primary/Master processor.
- 3) Download into all Secondary/Slave processors (if any).
- 4) Re-configure the ZM-24 wireless repeaters (ZM-24’s not wired to a processor) using the ZB-Pro configuration tool.
- 5) Download system file into all remotes.
- 6) Reset power on remotes within 1 meter of the ZM-24 or processor (XP-3/KX3) where they will be used.
- 7) Test control on each remote.

## Zigbee FAQ's and Best Practices

### ZM-24 Location Best Practices

- Make sure the collapsible antenna is attached snugly to the ZM-24.
- Locate ZM-24 three or more (3+) meters away from electronics and wireless networking equipment.
- Establish the coverage range of the ZM-24 (or XP-3/KX3) to determine where ZM-24 Repeaters are needed.
- Mount in the middle of a wall (NOT the floor, ceiling, back of a TV or the equipment rack).
- Mount in a vertical orientation (if the ZM-24 must be laid flat, flip the antenna into a vertical position).
- Avoid placing ZM-24 on brick, stone or concrete construction materials.

### No Roaming

- An RTI Zigbee® enabled remote control cannot “roam” from one ZM-24 to another automatically. The remote will “connect” itself to the ZM-24 that has the strongest signal when the remote is powered on. It will remain “connected” to this ZM-24 until, the remote power is reset, the “Reconnect Object” is used, the remote has been idle for 5 days, or the remote has lost communication with this ZM-24 for 1 minute.

### “Reconnect” Remote

- A remote can be forced to “reconnect” to the nearest ZM-24 using the Zigbee Reconnect Object programmed on a button – OR – resetting power on remote control.
  - The Zigbee Reconnect object can be found in the Library Browser under the “Objects” tab and may be programmed on to a button.
  - NOTES:
    - A macro may also be programmed on to the button, but the Reconnect object cannot be inside the macro.
    - Also, a macro that is programmed on to this button will not execute until the Zigbee communication is running.
    - SURFiR remote control does not support the reconnect object - removing the batteries is required to reset the SURFiR.

### Zigbee Network Using Multiple Processors

When multiple processors are used, you must consider the types of processors and configuration of the programming as this will determine which Zigbee antennas need to be within range of each other.

- Primary/Secondary Processor Configuration
  - One benefit of the Primary/Secondary processor configuration is Secondary processors can form completely independent Zigbee networks.
- Multiple Primary/Master Processor Configuration
  - In this configuration all the XP processors are considered “Primary” and operate independently. In this case, it is critical that all the Zigbee transceivers (ZM-24/XP3/KX3) are in range of one another, allowing Zigbee information to be transferred between the devices and a network to be formed. NOTE: Applies to ID 9.x only – does not apply to APEX. Visit

## Installation Step by Step

For complete Zigbee installation step by step [Click Here](#)