WIRELESS DOOR-SWITCH SERVICE GUIDE

SensorLINK 200x Diagnostics

Sensor, Module, Wiring, Thermo King SR-4 and Carrier APX Checks



SAFETY

Work Safely Before You Begin

> **WARNING — Unexpected Starting and Hazardous Voltage**
> Refrigeration units can start automatically or remotely. Some units can be started remotely even when switched off. Moving parts and electrical power can cause serious injury or death. High voltage can be present while a unit is running in diesel mode or connected to electric standby.

- **Turn the unit off and disconnect the battery.** Follow the unit manufacturer's service instructions before opening equipment, unplugging connectors, or working on wiring.
- **Disconnect electric standby power if equipped.** Turn off the external power source before handling the standby cord, then disconnect the cord.
- **Isolate and verify all hazardous energy.** Follow the facility's energy-control and lockout/tagout procedures, including stored energy. A qualified person must verify isolation before work begins.
- **Protect yourself.** Wear safety glasses and the appropriate protective equipment. Keep hands, clothing and tools clear of fans, belts and hot surfaces.

When Power Is Needed for Testing or Setup: Follow the unit and facility procedures for safely restoring power. Keep people clear of moving parts. Only qualified personnel should perform live electrical checks with appropriately rated equipment and protective gear. Isolate power again before further work on wiring or connections.

BEFORE YOU START

Start with the Complete Installation

Identify the SensorLINK 200x module, the affected door and the refrigeration controller. The wireless checks apply to the 200x system. The white-wire voltage tests and SR-4 settings describe the **Thermo King configuration**; use the **Carrier APX checks** for Carrier controller and relay diagnosis. Other wiring and controller configurations may behave differently.

- Inspect the transmitter, magnet, antenna, module and wiring for loose, damaged or missing parts.
- Check that the transmitter and magnet alignment marks meet with the specified **1/4-inch gap** when the door is closed; nothing metallic should be between them.
- Check connectors, fuses and the harness for corrosion, displaced terminals, chafing or loose connections.
- For a multi-door installation, identify every trained door and check them one at a time.

A digital multimeter and access to the unit wiring information are useful for the electrical tests. Record the symptom, LED behavior, door position and current settings before changing anything.

CHOOSE THE SYMPTOM

Where Does the Diagnosis Start?

First observe the module LED while opening and closing the affected door. Then choose the result below.

No Light on the 200x Module
Check power, ground, connector and fuses →

Module Stays Green When a Door Opens
Check the transmitter and training →

Module Stays Red with the Doors Closed
Check each trained door and magnet →

Thermo King: DOOR Shows When Closed
Compare the module light and output →

Thermo King: DOOR Missing When Open
Check the output and unit input →

Thermo King: Door Indication Is Backward
Separate training from output polarity →

Module Remains Solid Green
Check training time and jumper →

Thermo King: Alarm 108 or Unexpected Response
Review timeout, defrost and settings →

Carrier APX Door or Unit Response
Check the relay, input and settings →

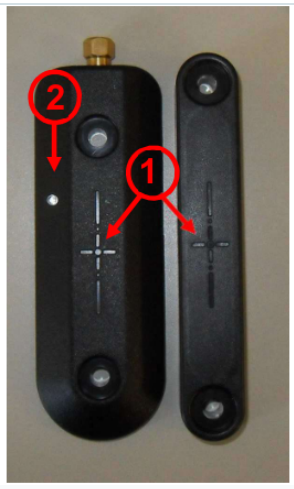
Replace a Door Sensor
Mount, align, train and verify →

TWO LIGHTS, TWO JOBS

Read the Module and Transmitter LEDs

The **module LED** indicates the state received by the 200x receiver. The small **transmitter LED** on the door switch helps check the sensor and its battery. Do not assume one light describes the other.

Observation	What to Check
Module blinking green	In normal operation, the module indicates closed doors. Open one trained door and look for a change.
Module blinking red	A trained door is indicated open. Count the red blinks to identify the door.
Module solid green	Normal during the approximately one-minute training period. If it persists or repeatedly returns, inspect the trainer jumper.
Transmitter rapid flicker in bursts	The diagnostic reference describes a rapid burst with about a one-second pause as normal battery/transmission behavior. Confirm that the module also responds.
Transmitter slow flash	The reference identifies a weak transmitter battery; replace the door switch.
Transmitter shows no activity	The reference identifies a depleted battery. Observe it while operating the door and replace the door switch if it remains inactive.



1 Alignment marks on both pieces. **2** Transmitter LED.

The module's red-blink count identifies the trained door. The Thermo King SR-4 controller may take approximately four seconds to recognize a changed door-switch state. Carrier timing and alarm delays depend on the unit and configuration.

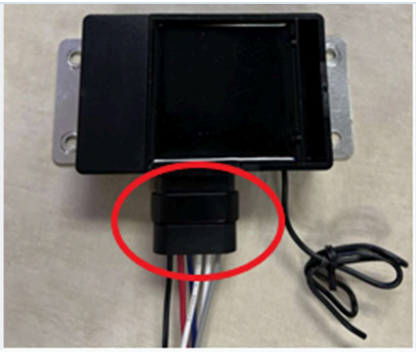
MODULE LED

No Light on the 200x Module

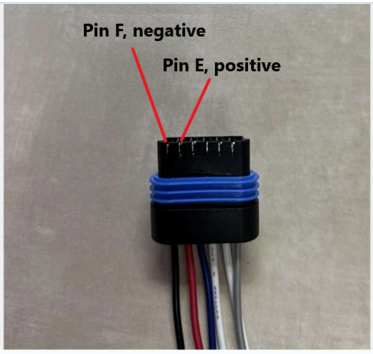
Before Restoring Power: Follow the safety instructions above and keep people clear of moving parts. Isolate power again before working on wiring or connections.

A dark module LED can result from loss of power or ground, a fuse or harness fault, or a faulty module. Establish that the module has a good supply before replacing it. The pin locations below come from the supplied 200x diagnostic procedure; confirm the connector and harness for the installed system.

1. Turn the unit off and disconnect the unit battery. Inspect and unplug the module's six-pin harness connector.
2. Identify **pin E, red wire (power)** and **pin F, black wire (ground)** on the harness connector. Use the connector image and verify the terminals before testing.
3. Have a qualified technician restore power as needed and measure between pins E and F. Compare the reading with battery voltage. The source diagnostic procedure calls for full battery voltage at the connector.
4. If voltage is missing or low, inspect the power and ground paths, connections and fuses. Check ground continuity with power disconnected.
5. If voltage is present, reconnect the module and verify that power and ground remain sound with the circuit operating. A voltage reading with the connector unplugged alone does not prove a connection can carry current under load.



Locate the module's six-pin harness connector.



Measure between **E: red power** and **F: black ground**.

Inspect the Fuses

> **1-amp module harness fuse, if fitted:** Inspect the fuse and module-side wiring. The source procedure identifies an internal module fault as a possible cause if it is blown; check the circuit before concluding that the module has failed.

> **3-amp power-tap fuse:** Inspect the unit-side power tap and supply wiring where this fuse is fitted. A blown fuse can indicate a supply wiring problem.

Fuse locations and ratings depend on the installed harness. Correct the cause of a blown fuse and use the specified replacement rating for that installation. If supply, ground and connections are verified but the LED remains dark, the module is suspect; confirm the diagnosis before replacement. For replacement steps, see the **SensorLINK 200x Replacement Guide**.

MODULE LED

The Module Stays Green When a Door Opens

The module is not indicating an open signal from the affected door. Work from the door switch toward the receiver.

1. Close all trained doors. Identify the door to test and open it while watching the module LED.
2. Inspect the transmitter and magnet. When closed, confirm both alignment marks and the 1/4-inch gap; check that the antenna is present and undamaged.
3. Operate the door and observe the transmitter LED. A rapid flicker burst with about a one-second pause is the normal pattern described in the source procedure; a slow flash indicates a weak battery, and no activity indicates a depleted battery. **Replace the switch** if its battery is weak or depleted.
4. If the transmitter appears to operate but the module does not respond, **retrain the sensors** with every door closed at the start.
5. If the module still does not respond during training, try a known-good switch, bench-tested first, following the same training procedure. If that switch works, suspect the original switch. If it also fails, recheck module power, antenna, wiring and training conditions before suspecting the module.

MODULE LED

The Module Stays Red with the Doors Closed

The module is indicating that a trained door is open. In a multi-door system, count the blinks and check **which sensor they identify**.

1. Confirm every trained door is physically closed and latched. Inspect the indicated door's transmitter, magnet and antenna.
2. Check the alignment marks and 1/4-inch closed-door gap. Look for a shifted magnet, damaged mounting or a door that does not close fully.
3. Operate the door and check its transmitter LED. The source procedure identifies slow flashing as a weak battery and no activity as a depleted battery.
4. Retrain the sensors if needed. Start with all doors closed, and keep other door sensors from being operated or trained within range.
5. If the affected door still fails to train, try a known-good, bench-tested switch. Recheck module power, antenna and training conditions before deciding whether the original switch or module needs replacement.

THERMO KING CONTROLLER INDICATION

DOOR Shows When the Door Is Closed

With the door fully closed, wait at least four seconds and compare the module LED with the controller display.

> **Module blinks red:** The module is indicating an open door. Follow **red with doors closed** before testing the controller input.

> **Module blinks green:** The module recognizes a closed door. Continue with the Thermo King output check below.

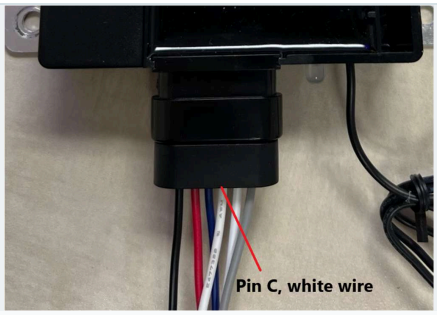
Check the White Output Wire

1. Confirm this installation uses the Thermo King positive-output configuration. Locate the **white wire at pin C** of the six-pin connector.
2. With the connector connected and the door closed, have a qualified technician back-probe the circuit and measure the white output against ground without damaging the seal or terminal. The source procedure expects no battery voltage on this wire for a closed door.
3. If battery voltage is present, disconnect power, unplug the six-pin connector, and restore power only as needed for the next measurement on the **unit-side harness**.

> **Voltage disappears with the module unplugged:** The module side was supplying the voltage. Verify the output configuration and trainer jumper; if the supply and configuration are correct, the module is suspect.

Voltage remains on the unit-side harness: Investigate the unit-side DS-02 circuit for unintended power or a short, using the applicable unit wiring information.

No battery voltage at pin C with the door closed: The module output matches the source procedure. Continue with the unit-side wiring, controller input and configuration; a display/input fault is possible.



The white wire at **pin C** is the output test point in the supplied Thermo King diagnostic procedure.

THERMO KING CONTROLLER INDICATION

DOOR Does Not Show When the Door Is Open

Open the affected door, wait at least four seconds and compare the module LED with the controller display.

Module blinks green: The module is not indicating the open door. Follow **green with a door open**.

Module blinks red: The module recognizes an open door. Continue with the Thermo King output check.

1. Confirm the Thermo King positive-output configuration and locate the **white wire at pin C** on the six-pin module connector.
2. With the connector connected and the door open, have a qualified technician back-probe the white output against ground. The source procedure expects battery voltage on this output for an open door.

Battery voltage is present: The module output matches the source procedure. Check for an open or damaged DS-02 circuit and inspect the unit's controller or BlueBox input and configuration, as fitted.

Battery voltage is absent: Check the module supply and ground under operating conditions and verify the output/trainer configuration. If those checks pass and the output remains incorrect, the module is suspect.

Do not rely on a single open-circuit voltage reading to condemn a part. Confirm the applicable wiring and repeat the check after repairs.

THERMO KING CONTROLLER INDICATION

The Door Indication Is Backward

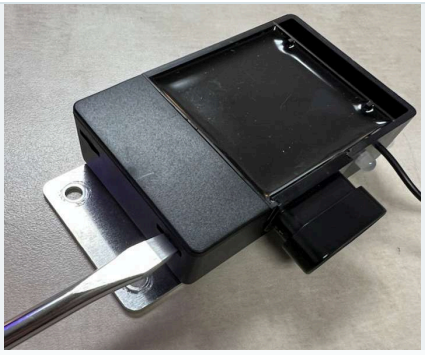
Open and close the door while watching the **module** LED, then compare it with the controller display after the recognition delay.

Red with the door closed; green with it open: The module is recognizing the sensor backward. **Retrain the sensors**, starting with every door closed.

Green when closed; red when open, but the controller is opposite: The module recognizes the door correctly. Check the trainer jumper, output polarity and unit-side wiring/configuration for the installed Thermo King setup.

Inspect the Trainer Jumper

1. Disconnect the unit battery before opening the module cover or unplugging the trainer jumper.
2. Remove the jumper cover. Inspect the plug and its wires for corrosion, damage and pushed or displaced pins. The source diagnostic procedure identifies a damaged jumper or connection as a possible cause of reversed output.
3. Repair the confirmed problem, reconnect the plug and retest. If the jumper, supply and configuration are correct but the output remains incorrect, the module is suspect.



The trainer jumper is under the module cover.



Inspect the jumper, wiring and terminals.

TRAINING MODE

The Module Stays Solid Green or Keeps Retraining

A solid green module LED is normal during the approximately one-minute training window. Wait for the module to return to blinking green after training is complete.

1. If solid green continues or repeatedly returns, disconnect the unit battery and open the trainer-jumper cover.
2. Inspect the trainer plug and wiring for corrosion, damage, loose connections or pushed pins. The source procedure identifies jumper problems as a cause of repeated or persistent training mode.
3. Correct any identified problem, reconnect the jumper, restore power and observe the module again.
4. If the jumper and its connections are sound but the condition continues, verify the power supply and suspect the module.



Trainer jumper plug.

DOOR SENSOR SERVICE

Replace a Door Sensor

Use a compatible replacement transmitter. Inspect the magnet and mounting surfaces before installing it; a missing, damaged, or loose magnet or bracket must be corrected as well.

1. Identify the affected door. If the transmitter is still mounted, note its position and the door number shown by the module before removal.
2. Remove the old transmitter. Check the stationary mounting surface, magnet on the door, and antenna for damage or loose fasteners.
3. Install the replacement transmitter on the stationary trailer or truck-body surface. Keep the magnet on the door. Use mounting hardware appropriate to the installation and secure the antenna to the trailer body where fitted.
4. With the door closed, align the transmitter and magnet crosshair marks with a **1/4-inch gap**. Keep metal out of the space between them. Check that the parts and antenna are protected and clear throughout the door's movement.
5. After replacing a door switch, **retrain every installed door sensor** in its existing door-number order, starting with every door closed.
6. After training, open and close each trained door individually. Confirm the expected module blink count and the controller or connected device response, then reinstall the jumper cover.

For the alignment marks and transmitter LED, see **Read the module and transmitter LEDs**. For replacement steps, see the **SensorLINK 200x Replacement Guide**.

TRAINING PROCEDURE

Train the Module to the Door Sensors

> **Start with Every Door Closed**
> Training with a door open can reverse the reported door position. After replacing a switch or module, retrain every installed door sensor in its existing door-number order. Do not operate or train other door sensors within range during this procedure.

1. Verify that all trained doors are closed. Access the module's jumper plug.
2. Remove the SensorLINK jumper plug for **10 seconds**. The module LED continues blinking green.
3. Replace the jumper plug. A solid green module LED indicates training mode, which lasts approximately one minute.
4. Open Door 1. The module LED alternates one red blink and one green blink to indicate Door 1 has been trained.
5. Close Door 1. The LED returns to solid green while training remains active. For additional doors, repeat the open-and-close sequence one door at a time.
6. When finished, wait for the module LED to blink green, indicating that the training period has ended.
7. Open and close each door individually. Confirm the expected red-blink count when open and the return to green with all doors closed. Reinstall the jumper cover.

MULTI-DOOR REFERENCE

Identify the Door and Zone

With training complete, open one door at a time and count the module's red blinks.

Sensor	Open-Door Indication	Zone Output	Wire
Door 1	1 red ●	Zone 1	White
Door 2	2 red ●●	Zone 2	White/black
Door 3	3 red ●●●	Zone 3	Gray
Door 4	4 red ●●●●	Zone 3	Gray

Up to four door sensors can be trained. **Doors 3 and 4 share the Zone 3 output**; use the module's blink count to distinguish them.

CARRIER APX CONTROLLER

Carrier Door Indication and Unit Response

First check the **module and transmitter LEDs** while operating one door at a time. A correct module indication means the receiver recognizes the door; it does not prove that the relay, unit input, or controller settings are correct.

> **Check the Installed Wiring Before Testing**
> Carrier installations can use different harnesses, relay arrangements, and connected devices. Identify the unit, SensorLINK harness, and the actual wiring path. Do not apply the Thermo King white-wire voltage test or assume a wire color, terminal, or relay state is the same.

Module and APX Indication Do Not Agree

1. If the module remains green with a door open or red with all trained doors closed, follow the matching **wireless symptom** first.
2. If the module changes correctly but the Carrier indication does not, identify whether the 200x output feeds the APX door input, a telematics device, or both. Check the path associated with the symptom.
3. With power disconnected as required, inspect the installed harness, fuse, ground, connectors, and relay if fitted. Look for chafing, loose terminals, corrosion, and damaged connections.
4. A qualified technician can verify the applicable relay and input change state when the door opens and closes, using the correct unit and harness wiring information. Do not assume the expected contact state without identifying the installed configuration.
5. Review the APX door or remote-switch input configuration. The selected open/closed contact behavior must match the installed switch or relay. Record the existing settings and follow the fleet's approved configuration before making changes.

Check the APX Input and Connection

In the documented **HAR-00010** installation, the door-switch connection is a two-position connector with two white wires. The instructions show it behind the display or underneath the engine; they distinguish it from a similar connector with one white and one black wire. Confirm the connector against the unit and harness documentation before unplugging or testing it. Other Carrier harnesses can differ.

For the APX display shown in those instructions, enable authorized technician access, then use **Tech Mode → Configuration Settings → Remote Sensors → Door Switch**. The input setting and the operating response are separate choices. Check which input is used and compare its open/closed setting with the actual relay or switch state. Menu labels and available options may differ on other units.

The Door Is Detected, but the Unit Does Not Respond as Expected

Check the configured door response, the input assigned to the door, and any applicable delay, override, or ambient-temperature condition. On multi-temperature units, also verify the affected compartment and its configured response. A door event does not always mean the entire unit should shut down.

For example, Carrier's **X4 7700 service manual 62-12251 Rev. E** lists Alarm Only, Unit Shutdown, Low Engine Speed, and Data Recorder Only. In Data Recorder Only, a door event is recorded without a MessageCenter alarm or message. Available settings and behavior vary by unit and software.

Check Carrier Door-Related Alarms

Carrier's APX and Advance alarm guide lists **00061: Door Open**, **00057: Door Open (Remote Switch 1)**, **00058: Door Open (Remote Switch 2)**, and **00064: Door Open Override** where supported. Confirm the actual alarm and input on the unit; not every unit uses every switch.

1. Record the alarm and whether the door was actually open. Close the relevant doors and compare the module indication with the controller.
2. Inspect the corresponding sensor, wiring, relay, and configured input as applicable. Review the door-response and delay settings before treating the alarm as a failed sensor.
3. After correcting the cause, follow the applicable Carrier alarm-clearing procedure and operate the affected door again. Confirm the indication and the unit's authorized response.

Refer to the **Carrier APX and Advance Alarm Guide** and the service manual for the specific unit.

THERMO KING SR-4

When the Unit Response Seems Wrong

A correctly working door switch does not always cause the unit to shut down. Review the installed unit's **Door Open Forces** and timeout settings before treating its operating response as a sensor fault. Screen options can vary by software revision and configuration.

Setting	Single-Temp	Multi-Temp	Expected Response
LOG ONLY	Available	Available	Logs the door event while the unit continues to run.
UNIT NULL	Available	Available	Requests a unit shutdown for the door-open condition, subject to defrost and the configured timeout.
HIGH SPEED LOCKOUT	Available	N/A	Restricts the single-temperature unit to low speed while the setting applies.
ZONE NULL	N/A	Available	Shuts down the affected zone; the unit can continue for other zones requiring heating or cooling.

- Allow approximately **four seconds** after a door state changes for the controller to recognize it.
- If the relevant unit or zone is in defrost, the defrost cycle can finish before a requested shutdown.
- With an enabled door-open timeout, a unit or zone may resume operation even while the door is still open. High Speed Lockout can return to normal operation after its configured timeout.

- Record current settings and follow the fleet's requirements. Do not change settings merely to make a symptom disappear. OptiSet Plus may control settings on some units.

For the full SR-4 setup sequence, use the **SensorLINK 200x Thermo King SR-4 installation guide**.

THERMO KING SR-4

Investigate Alarm 108

Alarm 108: Door Open Timeout means the configured door-open time was exceeded. It does not by itself establish that the SensorLINK switch failed.

1. Confirm the door is closed and review whether it was actually left open during loading or unloading.
2. Check the module LED and the affected door sensor. If the indication does not match the physical door position, follow the corresponding symptom path above.
3. Review Door Open Forces, Door Open Timeout and the available Door Timeout Alarm setting. An enabled timeout can permit the unit or zone to resume operating while the door remains open.
4. When available, download and review ServiceWatch records with the applicable Thermo King service tool. Compare recorded door events and timing with the observed condition.
5. Follow the unit's alarm-clearing procedure after the cause has been addressed and verify that the alarm does not recur.

For additional alarms, see **Thermo King alarm codes**.

FINAL VERIFICATION

Verify the Repair

- Reconnect the module, trainer plug and unit harness; reinstall the jumper cover and secure the wiring.
- With all doors closed, confirm the module's normal closed-door indication. Open each trained door one at a time and verify its red-blink count.
- Confirm the transmitter and magnet stay aligned and protected throughout door movement.
- On the Thermo King controller, allow the recognition delay and verify that the displayed door state matches the physical door and the module indication. On a Carrier APX unit, verify the applicable indication and response using the unit's configuration.
- Check that the unit or zone response agrees with its authorized configuration, including timeout and defrost behavior.
- Record the fault, readings, repair and settings. If the symptoms remain, continue diagnosis using the applicable unit and SensorLINK service information before replacing additional parts.

RELATED RESOURCES

SensorLINK Guides and Support

Choose a guide for your equipment or the service you need.

SERVICE ↗
Door Sensor & Module Replacement
Replace a door sensor or receiver and retrain every door.

INSTALLATION ↗
Thermo King SR-4 Installation
Single- and multi-temperature installation.

INSTALLATION ↗
Carrier Installation
Single- and multi-temperature installation.

WARRANTY · PDF ↗
Warranty Claim Form
Claim form and limited warranty terms.

Additional references: Carrier APX and Advance Alarm Guide · Fluke: diagnosing voltage drop.

Need help? Contact Transport Wireless Technologies.

REGULATORY INFORMATION

FCC Notice

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.