Crestron MP-FS-RX1/RX2 FreeSpeech™ Single/Dual-Channel Wireless Mic Receiver

Operations & Installation Guide

CRESTRON®

This document was prepared and written by the Technical Documentation department at:

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Regulatory Compliance

As of the date of manufacture, the MP-FS-RX1 and MP-FS-RX2 have been tested and found to comply with specifications for CE marking and standards per EMC and Radiocommunications Compliance Labelling.

Federal Communications Commission (FCC) Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following conditions:
(1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Industry Canada (IC) Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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Single/Dual-Channel Wireless Mic Receiver: MP-FS-RX1/RX2

Introduction

Crestron® FreeSpeech systems provide a very simple and affordable solution for adding speech reinforcement as part of a complete classroom media presentation system. The MP-FS-RX1 is a single-channel receiver, capable of supporting one wireless microphone (MP-FSMIC*). The MP-FS-RX2 is a dual-channel receiver capable of supporting two wireless microphones. Built-in amplification provides everything needed to drive a set of speakers (sold separately), and even allows for the connection of a DVD player, computer, or other program audio sources.

Features and Functions

- Single- or dual-channel receiver for one or two FreeSpeech™ wireless microphones
- Advanced combined RF/IR wireless operation ensures trouble-free performance
- 2.4GHz RF technology with "error recovery" minimizes noise and feedback
- "Automatic Gain Control" maintains consistent speech levels
- Built-in 30 Watt stereo amplifier drives one or two pairs of speakers
- Line output enables connection to an external amplifier or video projector
- Two stereo line inputs provide amplification for a DVD player, laptop computer, or other program sources
- Speech and program audio signals are independently adjustable via a control on the wireless mic*
- "Ducking" feature automatically turns down the program source whenever the instructor speaks
- Built-in master volume, bass, and treble adjustment helps optimize the overall sound quality
- High-efficiency, energy-saving design minimizes power consumption during operation and while idle
- Includes external power pack and external antenna(s)

*Item sold separately or as part of a MP-FS100_PAK or MP-FS200_PAK system package.

Specifications

Specifications for the MP-FS-RX1/RX2 are listed in the following table.

MP-FS-RX1/RX2 Specifications

SPECIFICATION	DETAILS
Communications	
Wireless	
RF	2.4 GHz ISM Device; 79 channels, FHSS (2402 to 2480 MHz)
IR	38 kHz (requires MP-FSIR IR Beacon Sensor*)
Range (typical)	50 ft (~15 m) indoor, subject to site-specific conditions
Wired	
USB	USB host port for firmware update and configuration
Audio	
A-D/D-A Conversion	16-bit, 44.1 kHz
Master Volume Range	-55dB to +20dB
Bass Gain Range	±15dB @ 100Hz
Treble Gain Range	±15dB @ 10kHz
Ducking Adjustment	Software adjustable Threshold, Depth, Attack, and Release
Alert Tone	Software configurable functionality
Frequency Response	20 Hz to 20 kHz ±0.5 dB
S/N Ratio	75 dB 20 Hz to 20 kHz A-weighted
THD+N	0.7% 20 Hz to 20 kHz
Output Power	15 Watts per channel at 8 or 4 Ohms
Amplifier Protection	Electronic short-circuit and overload protection
Power Requirements	
Power Pack	2.0 Amps @ 24 Volts DC, 100-240 Volts AC, 50/60 Hz power pack, included
Environmental	
Temperature	41° to 104° F (5° to 40° C)
Humidity	10% to 90% RH (non-condensing)
Heat Dissipation	35 BTU/Hr
Enclosure	
Chassis	Metal with polycarbonate label overlay
Faceplate	Plastic with polycarbonate label overlay
Mounting	Freestanding
Dimensions	
Height	2.36 in (60 mm)
Width	8.12 in (207 mm)
Depth	5.95 in (152 mm)

(Continued on following page)

MP-FS-RX1/RX2 Specifications (Continued)

SPECIFICATION	DETAILS
Weight	
MP-FS-RX1	2.3 lbs (1.1 kg)
MP-FS-RX2	2.4 lbs (1.1 kg)
Included Accessory	
Power Pack	Desktop, 24VDC, 2A (50 Watts), Regulated, US/International
Available Accessories	
CBL-KAUDIO-RCAM2-L-P-50	RCA Stereo Audio Cable Kit, Plenum, 50 ft
CBL-RCA2-1.5	Crestron Certified RCA Stereo Audio Interface Cable, 1.5 ft
CBL-RCA2-3	Crestron Certified RCA Stereo Audio Interface Cable, 3 ft
CBL-RCA2-6	Crestron Certified RCA Stereo Audio Interface Cable, 6 ft
CBL-RCA2-12	Crestron Certified RCA Stereo Audio Interface Cable, 12 ft
CBL-SPK-P-35	Speaker Cable, 16AWG, Plenum, 35 ft
FS6	6.5” 2-Way Surface Mount Speakers, Pair
FSDI8	8” Drop-in Ceiling Speakers, Pair
MP-FSIR	FreeSpeech IR Beacon
MP-FSMIC	FreeSpeech Wireless Microphone
MP-FS-PAS	FreeSpeech PA Audio Sensor

*Item sold separately or as part of a MP-FS100_PAK or MP-FS200_PAK system package.

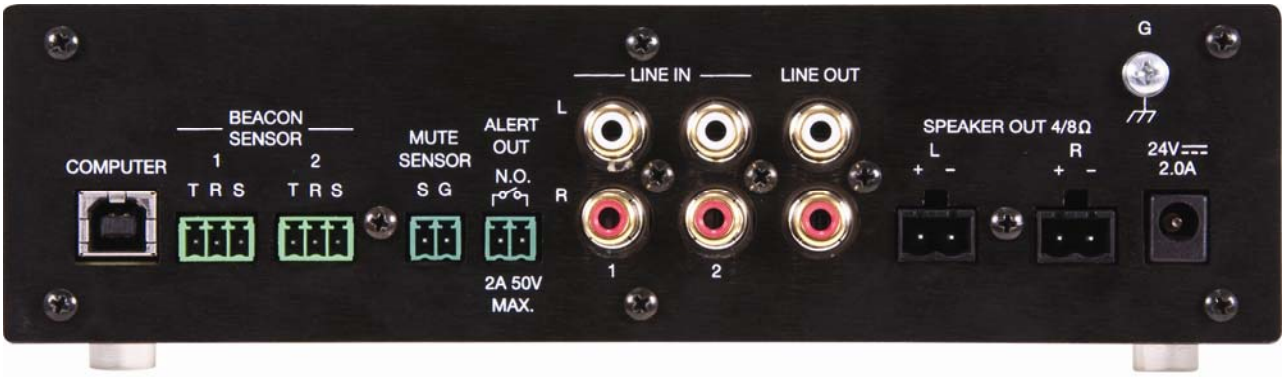
Physical Description

This section provides information on the connections, controls and indicators available on your MP-FS-RX1/RX2.

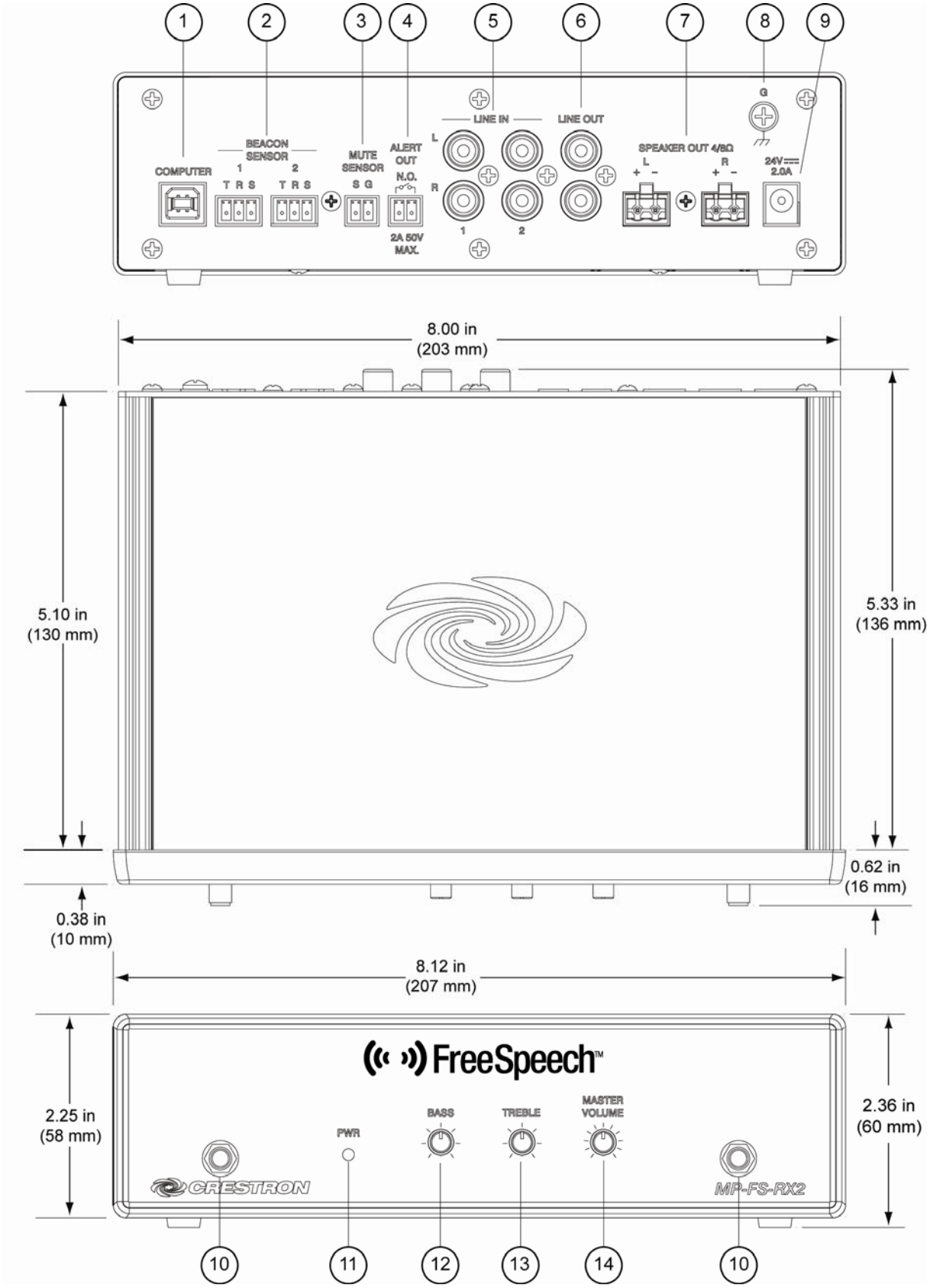
MP-FS-RX1 Front View

MP-FS-RX2 Front View

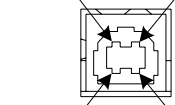
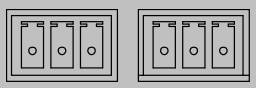
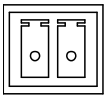
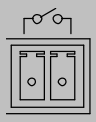
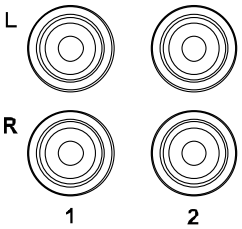
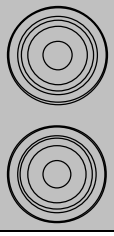
MP-FS-RX1/RX2 Rear View



MP-FS-RX1/RX2 Overall Dimensions (MP-FS-RX2 Shown)

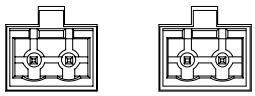
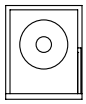


Connectors, Controls & Indicators

<table>
<tr><th>#</th><th>CONNECTORS[1], CONTROLS & INDICATORS</th><th>DESCRIPTION</th></tr>
<tr><td>1</td><td>COMPUTER
Pin 2 USB Pin 1
 
Pin 3 Pin 4</td><td>(1) USB Type B female; USB computer console port for firmware update and configuration only
<table><tr><th>PIN</th><th>DESCRIPTION</th></tr><tr><td>1</td><td>+5 VDC</td></tr><tr><td>2</td><td>Data -</td></tr><tr><td>3</td><td>Data +</td></tr><tr><td>4</td><td>Ground</td></tr></table></td></tr>
<tr><td>2</td><td>Beacon Sensor 1 – 2
1 2
T R S T R S
  </td><td>(2) 3-pin 3.5mm detachable terminal blocks; Interface for up to (2) MP-FSIR IR Beacon Sensors[2] per terminal block; (4) beacon sensors, total</td></tr>
<tr><td>3</td><td>MUTE SENSOR
S G
  </td><td>(1) 2-pin 3.5mm detachable terminal block; Contact closure sensing input, or interface for MP-FS-PAS PA Audio Sensor[2];
NOTE: Sensor black wire connects to terminal G; red wire connects to terminal S.
Mutes all audio outputs when a contact closure or PA audio signal is sensed</td></tr>
<tr><td>4</td><td>ALERT OUT
N.O.
 
2A 50V
MAX.</td><td>(1) 2-pin 3.5mm detachable terminal block; Normally open isolated relay, software configurable functionality;
Rated 2 Amp, 50 Volts maximum;
Controlled by mic ALERT button. (Hold button for 8 seconds, alert relay closes, speakers emit two beeps)</td></tr>
<tr><td>5</td><td>LINE IN 1 – 2
 
L
R
1 2</td><td>(4) RCA female comprising (2) unbalanced stereo line-level audio inputs;
Maximum Input Level: 2 V_{rms}
Input Impedance: 18k Ohms nominal</td></tr>
<tr><td>6</td><td>LINE OUT
  </td><td>(2) RCA female;
Unbalanced stereo line-level audio output;
Maximum Output Level: 2 V_{rms}
Output Impedance: 100 Ohms nominal</td></tr>
</table>

(Continued on following page)

Connectors, Controls & Indicators (Continued)

#	CONNECTORS[1], CONTROLS & INDICATORS	DESCRIPTION
7	SPEAKER OUT 4/8Ω: L R + − + − 	(2) 2-pin 5mm detachable terminal blocks Left & right channel speaker-level audio outputs; Wire Size: Connector accepts 14AWG maximum; Output Power: 15 Watts per channel at 8 or 4 Ohms
8	G 	(1) 6-32 screw, chassis ground lug
9	24 VDC 2.0A 	(1) 2.0mm barrel DC power jack; 24 Volt DC power input (power pack included)
10	Antenna 	(1) Connection for supplied antenna (MP-FS-RX1) (2) Connection for supplied antennas (MP-FS-RX2)
11	PWR 	Green LED, indicates operating power supplied from external power pack
12	BASS 	Rotary low frequency boost/cut adjustment
13	TREBLE 	Rotary high frequency boost/cut adjustment
14	MASTER VOLUME 	Rotary master level adjustment

1. Interface connectors for **BEACON SENSOR, MUTE SENSOR** and **ALERT OUT** ports are provided with the unit.
2. Item sold separately or as part of a MP-FS100_PAK or MP-FS200_PAK system package.

Setup

Installation

The MP-FS-RX1/RX2 can be placed on any convenient flat surface in the room, such as a desk, shelf, table, or ceiling-mounted third-party equipment platform.

- Install all accessory hardware, including power pack, MP-FSIR Beacon Sensor(s), MP-FS-PAS Audio Sensor, FS6 or FSDI8 speakers, following their supplied instructions.
- For the MP-FS-RX1, attach the supplied single antenna; for the MP-FS-RX2, attach the cables from the two supplied antennas (the antennas should be spaced at least 6 feet (~ 2 meters) apart.
- Orientation of antennas for desk, shelf, or table mounting installations should be straight up. For ceiling mounted installations (including the MP-FS-RX1 on a third-party ceiling-mounted equipment platform), antenna orientation should be straight down. For wall-mounted installations, the antennas should be at a 45° angle, either up or down, from the wall.
- Install all other required interconnecting cables.

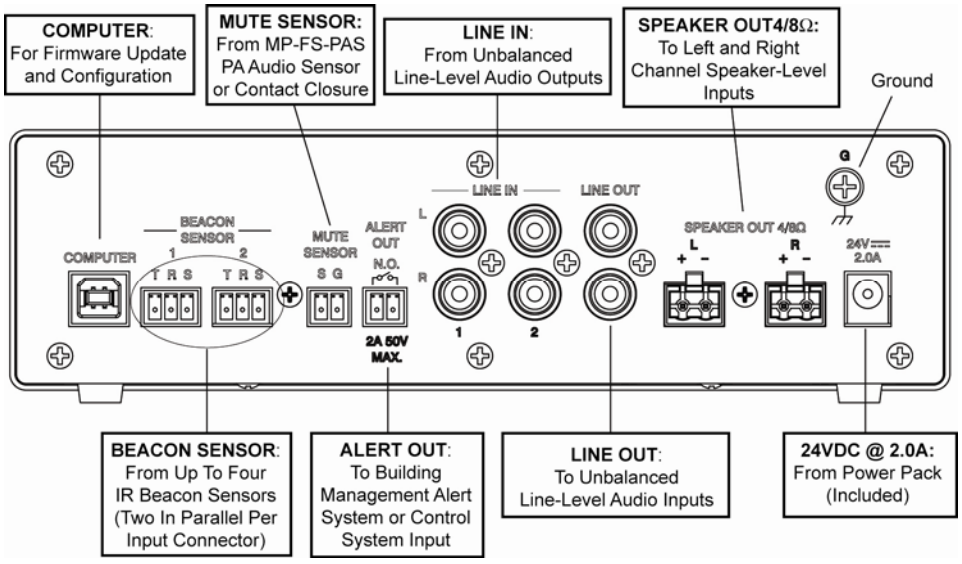
Hardware Hookup

Make the necessary connections as called out in the illustration that follows this paragraph. Apply power after all connections have been made.

When making connections to the MP-FS-RX1/RX2, note the following:

- Use Crestron power supplies for Crestron equipment.

Hardware Connections for the MP-FS-RX1/RX2



NOTE: Ensure the unit is properly grounded by connecting the chassis ground lug to an earth ground (building steel).

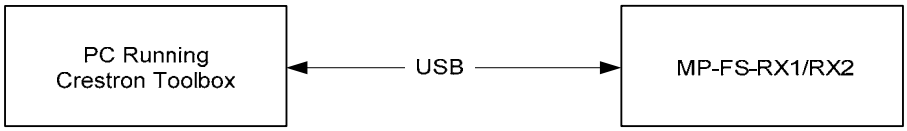
Uploading and Upgrading

Crestron recommends that each device contains the latest firmware to take advantage of the most recently released features. However, before attempting to upload or upgrade it is necessary to establish communication. Once communication has been established, firmware can be transferred to the device.

Establishing Communication

Use Crestron Toolbox™ for communicating with the MP-FS-RX1/RX2; refer to the Crestron Toolbox help file for details. There is a single method of communication: USB communication.

USB Communication



The **COMPUTER** port on the MP-FS-RX1/RX2 connects to the USB port on the PC via the included Type A to Type B USB cable:

1. Use the Address Book in Crestron Toolbox to create an entry using the expected communication protocol (USB).
2. Display the MP-FS-RX1/RX2's "System Info" window (click the icon); communications are confirmed when the device information is displayed.

Firmware

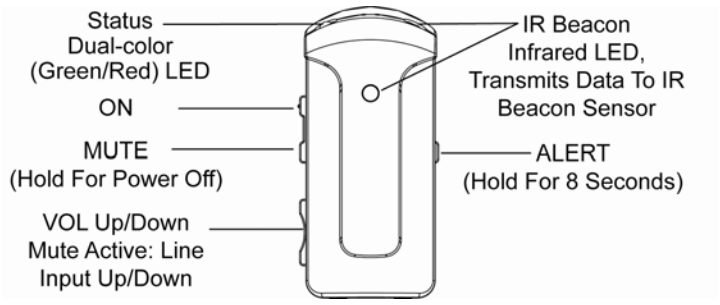
Firmware files may be distributed from programmers to installers or from Crestron to dealers. Firmware upgrades are available from the Crestron Web site as new features are developed after product releases. Upgrade via the Crestron Toolbox. For details on upgrading, refer to the Crestron Toolbox help file.

Operation

Basic Procedures

Before beginning, ensure that the MP-FS-RX1/RX2 receiver is installed and connected as instructed in "Setup" on page 8, that power is on (the green LED is on), that line level audio is supplied from a DVD player, a laptop computer, or other device, and that the MP-FSMIC microphone has been fully charged.

Microphone Button/LED Functions



During the following verification procedures, refer to the illustration above.

Pair Microphone with Receiver

1. Hold the MP-FSMIC **ON** button until the mic Status LED rapidly flashes green.
2. The mic will begin pairing with the receiver. Make sure the mic has line of sight proximity to the MP-FSIR. When pairing is complete, the Status LED will slowly blink green. Time to pair is typically between five and ten seconds. The mic must be turned off and turned on again to pair to another receiver.

Mute and Volume Adjustments

1. Press the **MUTE** button to mute the mic (observe the blink pattern); press it again to un-mute. When muted, the mic automatically turns off after two minutes.
2. When the mic is not muted, the **VOL** button can be used to adjust the mic volume.
3. When the mic is muted, the **VOL** button adjusts the line level audio volume.
4. Line volume is automatically "ducked" (reduced) when the user talks into the mic.
5. Hold the **MUTE** button for five seconds to turn off the mic (turns off automatically if muted for two minutes, or when placed in the charger.)
6. If the mic loses sight of the MP-FSIR for seven seconds (time is configurable), the mic will automatically mute (turns off automatically if muted for two minutes).
7. If RF link is lost for 10 seconds, mic turns off.

Emergency Trigger

Hold the **ALERT** button for eight seconds (time is configurable) to generate two beeps from the speakers and close the alert relay contacts until the button is released.

Receiver Controls - Default Settings

BASS and **TREBLE:** Typically, set these controls to their center detent positions. Slightly reducing treble can help to reduce feedback.

MASTER VOLUME: Have the instructor speak from the most likely position in the room and adjust this control clockwise so that the speakers just begin to exhibit feedback, and then reduce the setting slightly by turning counterclockwise.

Problem Solving

Troubleshooting

The following table provides corrective action for possible trouble situations. If further assistance is required, please contact a Crestron customer service representative.

MP-FS-RX1/RX2 Troubleshooting

TROUBLE	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Mic mutes.	Loss of IR signal	Make certain beacon sensor is not mounted near window or lighting fixture.
		Make certain IR beacon LEDs are not blocked by clothing or by being held.
	Low battery	Charge the mic.
High-pitch noise (feedback)	Mic is picking up sound from speakers	Turn down mic volume, decrease master volume, move speakers to a location that the mic is not typically close to, e.g., the back of the room.
Poor sound quality.	Cables improperly connected.	Verify all cables are secure.
	For MP-FS-RX2, antennas not 6 feet (2 meters) apart.	Adjust antenna spacing to 6 feet (2 meters) minimum.

Further Inquiries

If you cannot locate specific information or have questions after reviewing this guide, please take advantage of Crestron's award winning customer service team by calling Crestron at 1-888-CRESTRON [1-888-273-7876]. For assistance in your region, please refer to the Crestron Web site (www.crestron.com) for a listing of Crestron worldwide offices.

You can also log onto the online help section of the Crestron Web site (www.crestron.com/onlinehelp) to ask questions about Crestron products. First-time users will need to establish a user account to fully benefit from all available features.

Future Updates

As Crestron improves functions, adds new features and extends the capabilities of the MP-FS-RX1/RX2, additional information may be made available as manual updates. These updates are solely electronic and serve as intermediary supplements prior to the release of a complete technical documentation revision.

Check the Crestron Web site periodically for manual update availability and its relevance. Updates are identified as an “Addendum” in the Download column.

Return and Warranty Policies

Merchandise Returns / Repair Service

1. No merchandise may be returned for credit, exchange or service without prior authorization from CRESTRON. To obtain warranty service for CRESTRON products, contact an authorized CRESTRON dealer. Only authorized CRESTRON dealers may contact the factory and request an RMA (Return Merchandise Authorization) number. Enclose a note specifying the nature of the problem, name and phone number of contact person, RMA number and return address.
2. Products may be returned for credit, exchange or service with a CRESTRON Return Merchandise Authorization (RMA) number. Authorized returns must be shipped freight prepaid to CRESTRON, 6 Volvo Drive, Rockleigh, N.J. or its authorized subsidiaries, with RMA number clearly marked on the outside of all cartons. Shipments arriving freight collect or without an RMA number shall be subject to refusal. CRESTRON reserves the right in its sole and absolute discretion to charge a 15% restocking fee plus shipping costs on any products returned with an RMA.
3. Return freight charges following repair of items under warranty shall be paid by CRESTRON, shipping by standard ground carrier. In the event repairs are found to be non-warranty, return freight costs shall be paid by the purchaser.

CRESTRON Limited Warranty

CRESTRON ELECTRONICS, Inc. warrants its products to be free from manufacturing defects in materials and workmanship under normal use for a period of three (3) years from the date of purchase from CRESTRON, with the following exceptions: disk drives and any other moving or rotating mechanical parts, pan/tilt heads and power supplies are covered for a period of one (1) year; touchscreen display and overlay components are covered for 90 days; batteries and incandescent lamps are not covered.

This warranty extends to products purchased directly from CRESTRON or an authorized CRESTRON dealer. Purchasers should inquire of the dealer regarding the nature and extent of the dealer's warranty, if any.

CRESTRON shall not be liable to honor the terms of this warranty if the product has been used in any application other than that for which it was intended or if it has been subjected to misuse, accidental damage, modification or improper installation procedures. Furthermore, this warranty does not cover any product that has had the serial number altered, defaced or removed.

This warranty shall be the sole and exclusive remedy to the original purchaser. In no event shall CRESTRON be liable for incidental or consequential damages of any kind (property or economic damages inclusive) arising from the sale or use of this equipment. CRESTRON is not liable for any claim made by a third party or made by the purchaser for a third party.

CRESTRON shall, at its option, repair or replace any product found defective, without charge for parts or labor. Repaired or replaced equipment and parts supplied under this warranty shall be covered only by the unexpired portion of the warranty.

Except as expressly set forth in this warranty, CRESTRON makes no other warranties, expressed or implied, nor authorizes any other party to offer any warranty, including any implied warranties of merchantability or fitness for a particular purpose. Any implied warranties that may be imposed by law are limited to the terms of this limited warranty. This warranty statement supersedes all previous warranties.

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Specifications subject to
change without notice.