

frontrow™  
symbio



## INSTALLER GUIDE

5201R Receiver

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## ELECTRICAL WARNINGS

### 1. Avoid Abuse to the Power Supply

To reduce risk of electric shock, unplug the power supply from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

**DO NOT** disassemble the power supply. Return the apparatus to FrontRow for qualified service and repair if service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

**DO NOT** expose the power supply to rain, snow, water, gas, oil, etc.

**DO NOT** operate the power supply if it has received a sharp blow, been dropped, or otherwise damaged in any way; return the apparatus to FrontRow for qualified service and repair.

**DO NOT** block or cover the apparatus and impede ventilation.

### 2. Proper Use of the Power Supply and Wiring

An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. The cord **MUST** be plugged into a grounded outlet. Make sure it is properly wired, in good electrical condition, and wire size is large enough for AC ampere rating of the power supply or charger as specified below. AWG = American Wire Gauge.

To reduce risk of damage to plug and cord when disconnecting the power supply or charger, **ALWAYS** pull on plug - **NEVER** on cord.

Locate cord so that it will not be stepped on, tripped over, or otherwise subject to damage or stress. **DO NOT** lay extension cord on charger.

**DO NOT** operate the power supply with damaged cord or plug - replace them immediately.

## ELECTRICAL SAFETY INFORMATION:



### PRECAUTIONS & SAFETY RECOMMENDATIONS

#### ***Follow Manufacturers' Recommendations***

Before using the receiver and power supply, read all instructions for, and caution markings on the receiver and power supply and in this installation guide.

# Receiver Components

1



2



3



4



## Receiver

1. Receiver
2. Infrared ceiling sensor\*
3. Receiver power supply
4. Receiver mounting tray (optional)

\*Not necessary if FrontRow IR speakers are already installed

# 1 Installation

## Before you begin your installation

Make sure you've got everything you need to set up your FrontRow Symbio system. By taking a few minutes to prepare, you'll help ensure the actual set-up is as quick and problem-free as possible.

### General safety precautions

- Do not install or use the receiver near water or heat sources
- Clean only with a dry cloth
- Do not block any ventilation openings
- Protect all cables from wear and damage from foot traffic, doors, and other hazards
- Use only accessories specified by FrontRow
- Refer servicing to qualified service personnel
- Wear safety goggles when using power tools
- Follow all safety guidelines when using ladders
- Observe your local building, electrical, and fire codes when installing any electrical equipment

### Does your system meet the classroom requirements?

Check the table below to confirm that your classroom is set up properly for the FRONTROW SYMBIO system you have. In most cases one ceiling sensor will be sufficient. However, some classrooms may require one or more additional sensors for optimal room coverage. While other classroom configurations may work with your FRONTROW PRO SYMBIO system, we can only support those listed below.

Size	<input type="radio"/> < 900ft <sup>2</sup>	<input type="radio"/> 900ft <sup>2</sup> - 1500ft <sup>2</sup>
Walls	<input type="radio"/> Light colors	<input type="radio"/> Dark colors
Windows	<input type="radio"/> Few	<input type="radio"/> Many (>50% window-to-wall area)
Obstructions (hanging art, tall free-standing bookshelves, suspended lights)	<input type="radio"/> Few	<input type="radio"/> Many
Shape	<input type="radio"/> Simple (Square, Rectangle)	<input type="radio"/> Complex (Alcoves/bays where teachers may walk)

$$\frac{\text{Total Checked}}{\quad} \times 1 + \frac{\text{Total Checked}}{\quad} \times 3 = \boxed{\quad}$$

#### If your score is:

< = 5

6 - 10

11+

#### We recommend:

1 ceiling sensor

2 wall **OR** 2 ceiling sensors

3 sensors (any combination of wall\* or ceiling)

\*Wall sensors can help where there are ceiling obstructions (hanging lights, artwork, etc.)

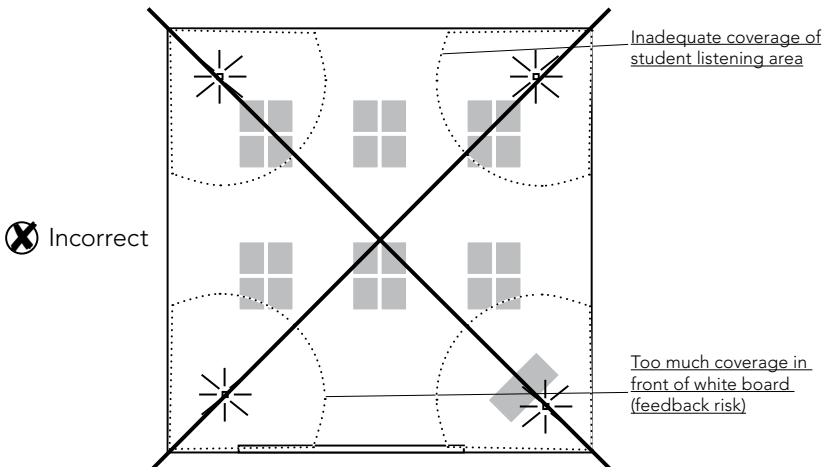
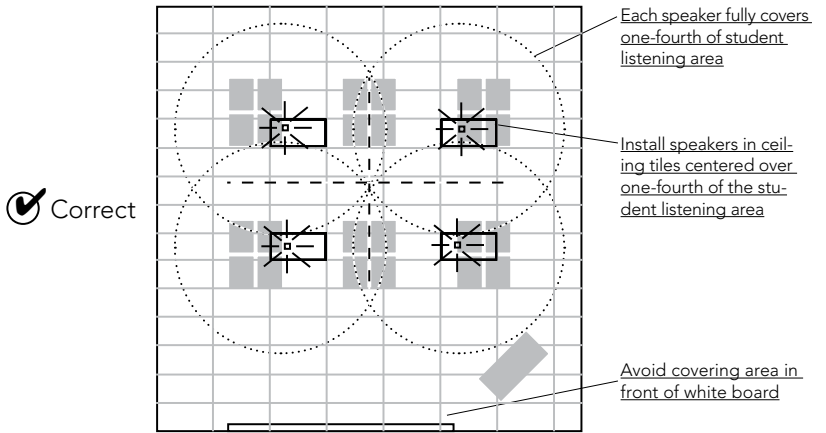
# Are your existing speakers a feedback risk?

It's very important to assess the position of existing speakers — and move them if necessary — to avoid creating acoustic feedback. Confirm before you begin that your speakers are positioned according to these guidelines:

## a Installing ceiling speakers?

Install speakers only over the area where students are sitting — not the entire room.

Avoid installing speakers directly in front of the white board — this not only covers an area not used by students but increases the chance of feedback.



## b Installing wall speakers?

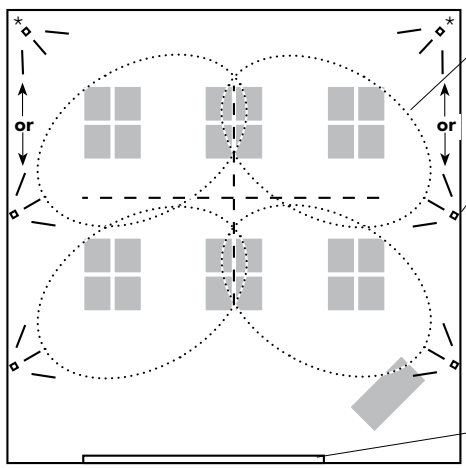
Install speakers only over the area where students are sitting — not the entire room.

As close to the ceiling as possible but not higher than 10ft (3m).

Slightly in front of each section (considering 'front' to be the direction of the white board).

Avoid installing speakers directly in front of the white board — this not only covers an area not used by students but increases the chance of feedback.

 Correct



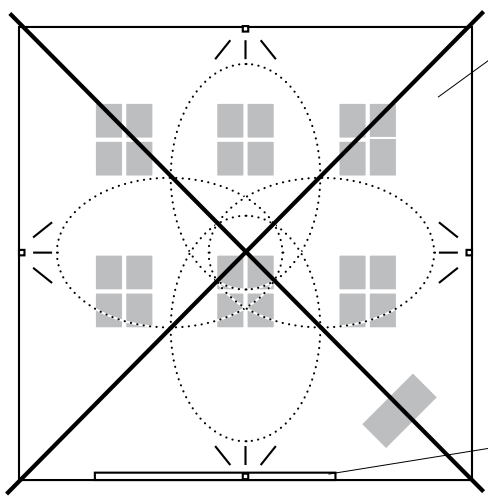
Each speaker fully covers one-fourth of student listening area

Install wall speakers slightly in front of and aimed at the center of each section

Avoid covering area in front of white board

\*Secondary option to accommodate different student arrangements

 Incorrect



Inadequate coverage of student listening area

Too much coverage in front of white board (feedback risk)

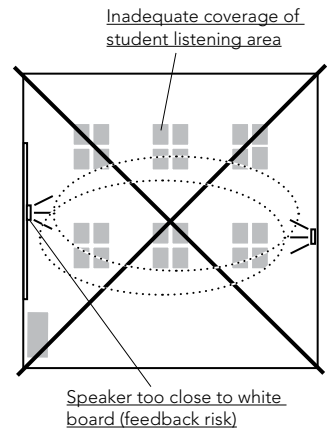
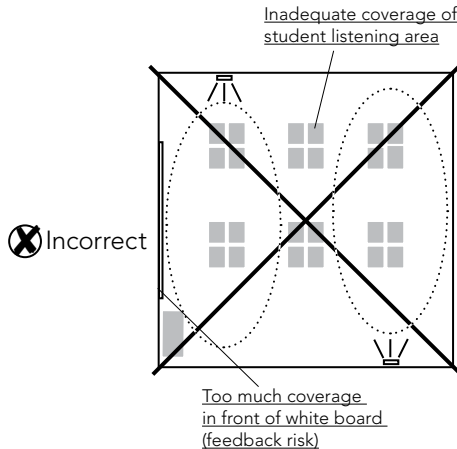
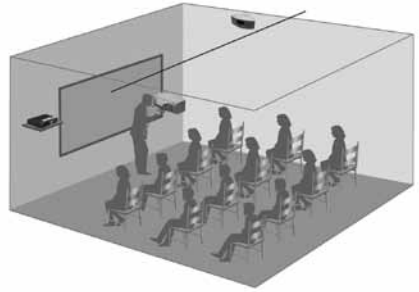
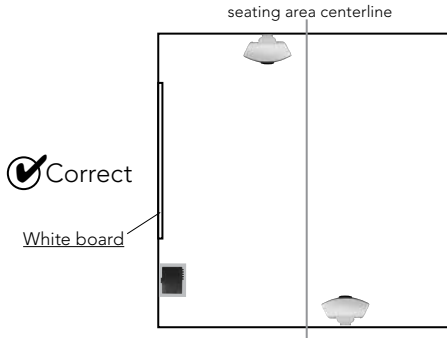
### c Installing IR speakers?

Install speakers only over the area where students are sitting — not the entire room.

Speakers should only be placed on the side walls of the classroom.

Walls should have a space approximately 10in wide by 5in tall (25 x 13cm) to solidly mount the wall bracket.

Avoid installing speakers directly in front of the white board — this not only covers an area not used by students – but increases the chance of feedback.



## 2 Get Your FrontRow Symbio Parts Ready

Check the contents of your FrontRow Symbio installation kit against the parts listed below. To help you stay organized, we recommend that you keep the parts needed for each step separate.

### 1. Open your main component box



5201R Symbio Receiver

+



Power Supply



940CS Ceiling Sensor  
with mounting bracket\*

+



Sensor Cable

\*Not needed if FrontRow IR speakers  
have been installed prior



940TM microphone

OR



950H Mic

+



AA (LR6) NiMH  
Rechargeable Batteries  
(silver sleeve)

+



AA (LR6) NiMH  
Rechargeable Batteries  
(silver sleeve)

+



Aux-in Cord

+



Aux-in Cord

+



Two Unit Charger

# 3 Get Yourself Ready

Nearly everything you need to install your FrontRow Symbio system is included in the boxes we shipped. You will need some basic tools and materials, depending on how your classroom is built:

## 1. What kind of walls do you have?

For drywall installations (similar to most houses) gather the following tools:

Drill	Wall anchors
Drill bits	Cable tacks/staples
Phillips #2 driver bit	Plastic cable (zip) ties
Level or ruler/tape measure	Plastic raceway with screws
Crimp pliers or scissors	Tin snips (optional)
Hammer	Ladder
Staple gun	Safety goggles

For concrete walls, assemble the following tools:

Hammer drill	Hammer
Masonry drill bits	Plastic cable (zip) ties
Phillips #2 driver bit	Plastic raceway with adhesive
Level or ruler/tape measure	Tin snips (optional)
Crimp pliers or scissors	Ladder
Concrete screws	Safety goggles

# 4 Plan Your Sensor Installation

(Skip this section if FrontRow IR speakers have been installed previously)

## SENSOR & SENSOR CABLE

The sensor and sensor cable are critical elements in the system and the most sensitive to electrical noise.

- DO NOT** shorten OR lengthen the sensor cable. Its factory-specified length is critical to the performance of the system.
- DO NOT** use a splitter with the sensor cable.
- DO NOT** use a different cable.
- DO NOT** alter the RCA connectors on the cable.
- AVOID** routing the sensor cable next to other cables or electrical systems (e.g., other electrical conduit, Ethernet cable, video cable, fluorescent light ballast, etc.). Leave at least 6 in. (15cm) space around the sensor cable.
- Excess cable can be coiled, tied and placed safely in a plenum space. **DO NOT** place the sensor coil near other cables or electrical systems (e.g., other electrical conduit, Ethernet cable, video cable, fluorescent light ballast, etc.).
- Route the sensor cable **AWAY** from speaker wires as far as practical. We recommend leaving at least 6 in. (15cm) between the two whenever possible.
- Local regulations may require plenum-rated cable if used in a plenum space. Sensor cable supplied with your system is plenum rated.

## Sensor Mounting

Assessing the individual characteristics of the environment is critical to achieving the best performance. Poor coverage planning can dramatically reduce the performance of the system.

- DO NOT** mount the ceiling sensor or wall sensors in direct sunlight as it will greatly reduce performance.
- The ceiling sensor must have a clear view of the coverage area and must be mounted parallel to the floor to function optimally (figure 1). If drop lights are used in the room, wall sensors may be a better option. Or, a drop mount\* may be used to lower the ceiling sensor.

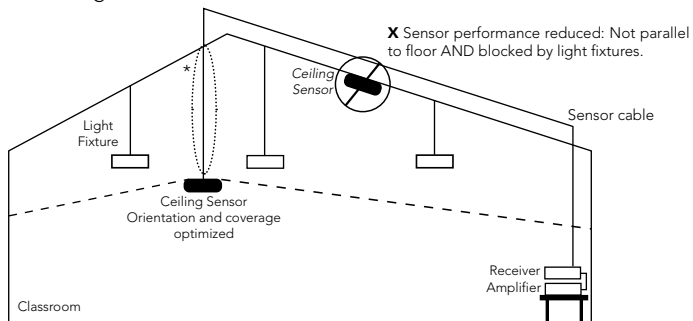


Figure 1: Ceiling Sensor Installation

\*not supplied by FrontRow

# Plan Your Sensor Installation (cont.)

## Interference and IR Coverage

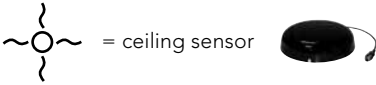
The FrontRow Symbio system uses infrared light to transmit the voice signal from the microphone to the sensor in the ceiling/wall sensors. Proper placement of the sensors is critical for optimal system performance.

- a. Adjacent classrooms that use FrontRow infrared systems can interfere with each other if the rooms are separated by windows. The windows allow the infrared light to “escape” from the classroom only to be picked up by the sensors in the adjacent classroom, causing interference and “cross talk”. Be sure to recommend window coverings to the greatest extent practical when using the system.
- b. Direct sunlight can reduce system performance. Be sure to recommend window coverings to the greatest extent practical when using the system.
- c. Infrared light has better reflection off of white and glossy surfaces. The ceiling sensor can be placed to help provide coverage in areas where the signal may be weak due to insufficient infrared reflection.

# Plan Your Sensor Installation (cont.)

## 1. Positioning a ceiling sensor

Sensor symbols:

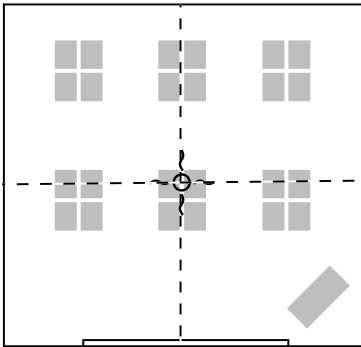


### Installing one ceiling sensor

Mentally divide the room into quarters and locate the center of the room as shown.

Use a piece of tape to mark a spot on the ceiling in the center of the room.

**NOTE:** The sensor must be able to "see" the entire room — do not block the sensor with projector mounts, lighting, hanging art, or other obstructions. If the teacher can see the sensor from all parts of the room, you've probably chosen a good spot.

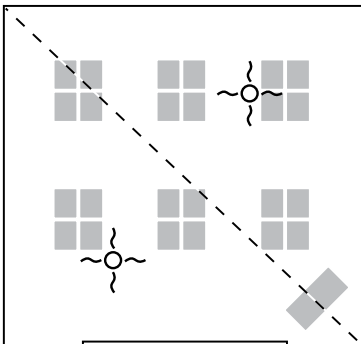


### Installing two ceiling sensors

Mentally divide the room into half and locate the center of each half as shown.

Use a piece of tape to mark the spots in each half of the room.

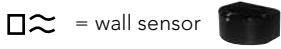
**NOTE:** The sensor must be able to "see" the entire room — do not block the sensor with projector mounts, lighting, hanging art, or other obstructions. If the teacher can see the sensor from all parts of the room, you've probably chosen a good spot.



# Plan Your Sensor Installation (cont.)

## 2. Positioning wall sensors

Sensor symbols:

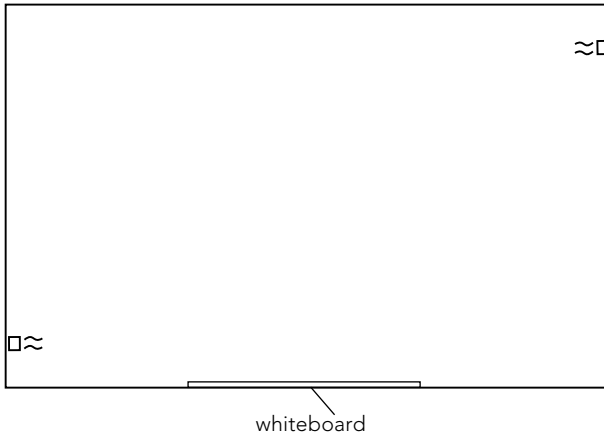


### Installing 2 wall sensors

Use a piece of tape to mark a spot for each sensor as shown below. One near the back corner, one near the front corner.

The sensors should be positioned on the side walls relative to whiteboard/main lecture area at right angles to the board

Be sure they are in a position such that the teacher can see at least one sensor from all parts of the room

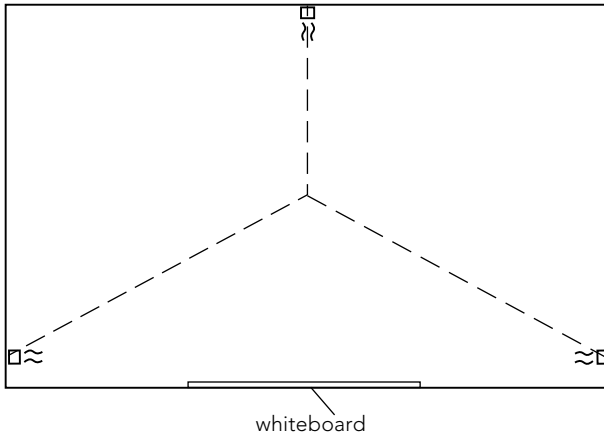


## Installing 3 wall sensors

Mentally divide the room into 3 sections as shown.

Use a piece of tape to mark a spot for each of the wall sensors. The spot you choose should be:

- on a wall
- in a position such that the teacher can see at least one sensor from all parts of the room
- two of the sensors should flank the whiteboard/main lecture area at right angles to the board

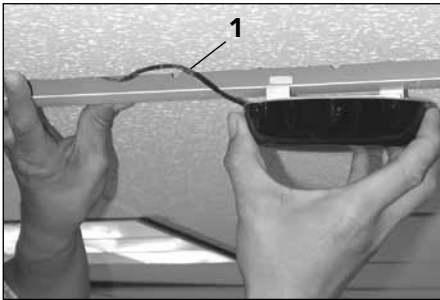


# 5 Install the Ceiling Sensor

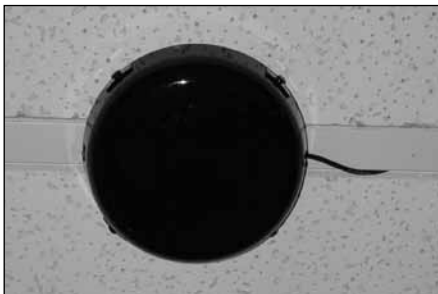
## Mounting style #1: Suspended ceiling T-bar rail mount



1. Lift ceiling tiles away from T-bar support
2. Route ceiling sensor pigtail cord above ceiling tiles and connect sensor cable
3. Twist ceiling sensor & bracket so the bracket tabs are resting on top of the T-bar. Drop ceiling tiles in place.
4. Connect the IR sensor cable to the ceiling sensor pigtail above the ceiling tiles
5. Route sensor cable above ceiling tiles toward your receiver location, following guidelines in chapter 4 and all applicable building and electrical codes.



**NOTE:** Ensure cables are installed in adherence to local and national electric codes. Sensor cables should not rest on the ceiling. Lift them off the ceiling and use cable/zip ties to secure them loosely to beams, anchor bolts, or other support structures in the ceiling (do not attach them to ductwork, plumbing, or other secondary work).



### IMPORTANT!

#### DO NOT ALTER THE IR SENSOR CABLE

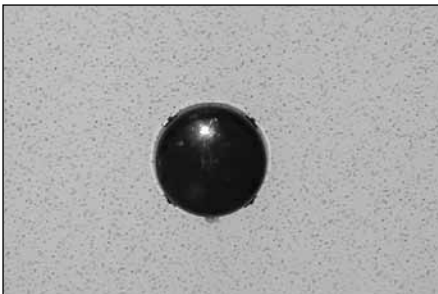
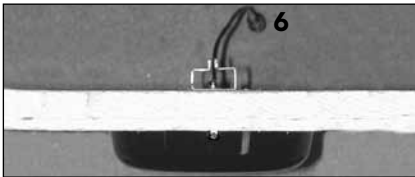
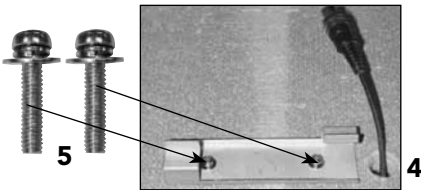
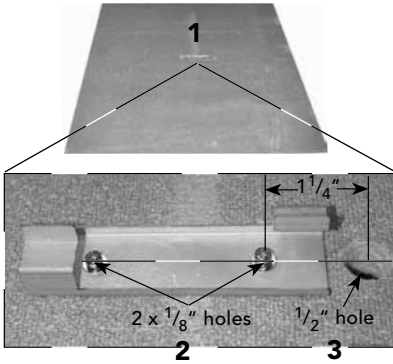
Read the FrontRow Installer Guide thoroughly before installing sensor cable. The cable has been rigorously tested and qualified to work with your FrontRow IR sensors.

- Do NOT shorten
- Do NOT alter or replace the RCA connectors
- Do NOT "splice" or split the cable
- Do NOT use a "Y" adaptor
- Do NOT use any other type of cable

Altering the cable in any way will result in decreased performance of your system and will void your Manufacturer's Limited Warranty.

# Install the Ceiling Sensor (cont.)

## Mounting style #2: Suspended ceiling tile mount



1. Locate the center of the ceiling tile and mark holes using the mounting bracket as a template
2. Drill two  $\frac{1}{8}$ " mounting holes through the tile
3. Drill a  $\frac{1}{2}$ " sensor cable hole inline with the two mounting holes at  $1\frac{1}{4}$ " away
4. Insert the sensor cable through the  $\frac{1}{2}$ " hole
5. Insert the two long machine screws (2 x M3 x 25mm Phillips) through the bracket and ceiling tile. Tighten the screws into rear of ceiling sensor, as shown above
6. Connect the IR sensor cable to the ceiling sensor pigtail above the ceiling tiles
7. Route sensor cable above ceiling tiles toward your receiver location, following guidelines in chapter 4 and all applicable building and electrical codes.

**NOTE:** Ensure cables are installed in adherence to local and national electric codes. Sensor cables should not rest on the ceiling. Lift them off the ceiling and use cable/zip ties to secure them loosely to beams, anchor bolts, or other support structures in the ceiling (do not attach them to ductwork, plumbing, or other secondary work).



### IMPORTANT!

#### DO NOT ALTER THE IR SENSOR CABLE

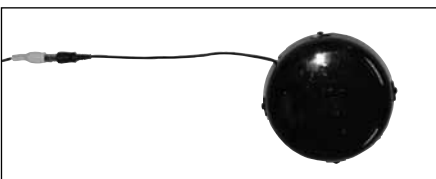
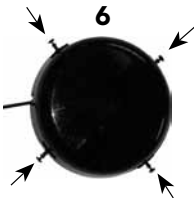
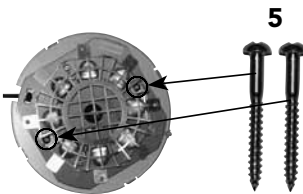
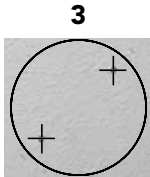
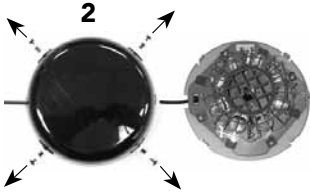
Read the FrontRow Installer Guide thoroughly before installing sensor cable. The cable has been rigorously tested and qualified to work with your FrontRow IR sensors.

- Do NOT shorten
- Do NOT alter or replace the RCA connectors
- Do NOT "splice" or split the cable
- Do NOT use a "Y" adaptor
- Do NOT use any other type of cable

Altering the cable in any way will result in decreased performance of your system and will void your Manufacturer's Limited Warranty.

# Install the Ceiling Sensor (cont.)

## Mounting style #3: Sheetrock ceiling mount



1. Remove pre-installed tile bridge mount
2. Remove the plastic ceiling cover from the sensor by removing the (4) push pins and (4) rivets by hand
3. Place the ceiling sensor metal chassis against the ceiling and mark the mounting holes (2 largest holes in chassis)
- 4a. If mounting holes are directly under a wood beam, drill two pilot holes  $\frac{1}{16}$ " by  $\frac{1}{4}$ " deep
- 4b. If mounting holes are in bare sheetrock, install plastic sheet rock anchors (anchors not provided)
5. Using the two wood mounting screws (2 x M3.5 x 32 mm Phillips head wood screws), mount the ceiling sensor chassis to the ceiling
6. Reinstall the ceiling sensor plastic cover with the four push pins/plastic rivets
7. Connect the IR wall sensor cable to the pigtail on the sensor
8. Route sensor cable along ceiling toward your receiver location, following guidelines in chapter 4 and all applicable building and electrical codes

**NOTE:** Ensure cables are installed in adherence to local and national electric codes. Sensor cables should not rest on the ceiling. Lift them off the ceiling and use cable/zip ties to secure them loosely to beams, anchor bolts, or other support structures in the ceiling (do not attach them to ductwork, plumbing, or other secondary work).



### IMPORTANT!

#### DO NOT ALTER THE IR SENSOR CABLE

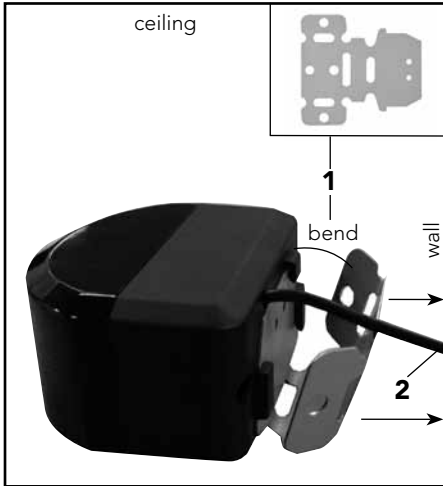
Read the FrontRow Installer Guide thoroughly before installing sensor cable. The cable has been rigorously tested and qualified to work with your FrontRow IR sensors.

- Do NOT shorten
- Do NOT alter or replace the RCA connectors
- Do NOT "splice" or split the cable
- Do NOT use a "Y" adaptor
- Do NOT use any other type of cable

Altering the cable in any way will result in decreased performance of your system and will void your Manufacturer's Limited Warranty.

# Install the Wall Sensor

wall sensor features



**1** wall sensor bracket (bent)

**2** sensor connector

If you're installing wall sensors:

1. Locate the spots you marked in chapter 4 for sensor placement.
2. Bend sensor bracket so that when placed on the wall, the sensor will face the center of the section of the room it's serving (see chapter 4).
3. Slide bracket onto the back of the sensor.
4. Attach the sensor to the cable leading to the receiver.
5. Press the bracket onto the wall firmly. Use mounting screws provided to secure bracket to wall.

# 6 Install the Receiver

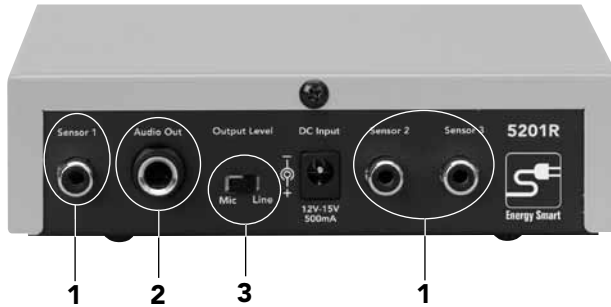
1. Place the receiver near the amplifier to reduce cable length as much as possible.
2. Ensure the receiver is installed to comply with ADA or other standards.
3. Connect power supply to receiver and plug into wall outlet.

**DO NOT** bundle the FrontRow power supply (or any power supply) along with the sensor cable.

**DO NOT** bundle the FrontRow power supply (or any power supply) directly next to OR on top of the receiver.

## 1. Connect cables to receiver

1. Connect all sensor cable(s) to sensor input(s)
2. Connect patch cord (not included) from Audio Out (1/4" mono) on receiver to Aux In on amplifier
3. In most cases the Line/Mic switch should be set to Line. (See your amplifier user instructions for proper input level).



# Install the Receiver (cont.)

## 2. Install raceway (optional)

You can neatly conceal all cables running between the receiver and the ceiling space using widely-available plastic raceway.

Cut enough raceway to extend from just behind your mounted receiver to the ceiling.

Using a level or tape measure to ensure straightness, attach the raceway to the wall.

Route sensor cables in raceway and close.

## 3. Support cables

Ensure cables are installed in adherence to local and national electric codes. Sensor cables should not rest on the ceiling. Lift them off the ceiling and use cable/zip ties to secure them loosely to beams, anchor bolts, or other support structures in the ceiling (do not attach them to ductwork, plumbing, or other secondary work).





# 8 Product Specifications

## Symbio Receiver: 5201R



Receiver frequency: 2.3MHz & 2.8MHz  
(2 simultaneous channels)  
Operating range: 18.5m/60ft line-of-sight  
(typical)  
Frequency Response: 50Hz to 10kHz  
THD: < 1% @ 1kHz  
Signal to Noise: > 65dB (system)  
Power Supply: 12V @ 600mA  
Mic level out: 0V to 100mVrms at maximum  
volume & maximum deviation, typical  
Line level out: 0V to 1Vrms at maximum  
volume & maximum deviation, typical  
Size (wxhxd): 14 x 3.8 x 18 cm/5.5 x 1.5 x 7 in  
Weight: 766g/1.7lbs.

## Pendant Mic Transmitter: 940TM



Transmitting frequency: 2.3MHz & 2.8MHz  
(switchable)  
Transmission type: Infrared  
Operating range: 18.5m/60ft line-of-sight  
(typical)  
Transmission angles: 160° horizontally;  
40° vertically (1/2 power)  
Microphones: dual uni-directional cardioid  
(directivity index 6.0@500Hz)  
Use controls: On/off/mute/channel  
Inputs/outputs: 2.5mm mic input; 3.5mm aux  
input; 1.3mm DC charge jack  
Battery life: minimum 8 hour (single AA,  
2500mAH rechargeable NiMH)  
Size (wxhxd): 11 x 6 x 2.5 cm/4.5 x 2.5 x 0.9 in  
Weight: 85g/3.0oz (with battery)

# 9 Troubleshooting

## **Receiver won't turn on (power light doesn't turn on)**

- Verify that the power supply is plugged into both the receiver and a working wall outlet

## **'Dead spots' or microphone crackling/ noise**

- Verify that you are not blocking either the emitters on the microphone or the sensors mounted around the room
- If reception is interrupted or noisy when facing a certain direction, install an additional sensor in that area of the room (see *pages 9-13*)
- If using more than one microphone, verify that they are not on the same channel
- Recharge or replace the microphone batteries

## **No signal reception (channel indicator light on receiver is red)**

- Check that the microphone is on
- Check that the microphone is not muted (940TM only)
- Verify that you are not blocking either the emitters on the microphone or the sensors mounted around the room
- If reception is interrupted when facing a certain direction, install an additional sensor in that area of the room (see *pages 9-13*)
- If using more than one microphone, verify that they are not on the same channel
- Recharge or replace the microphone batteries

## **Feedback (squealing)**

- Lower the Microphone A or B volume control(s) on the receiver
- Make sure that speakers are mounted as close as possible to the ceiling and to the listening area; avoid mounting speakers in the teacher's primary lecture area
- Position the microphone closer to mouth

## **Weak or no output from speaker(s)**

- Increase the Microphone A or B volume control(s) on the receiver, or audio device
- Position the microphone closer to mouth
- Verify that the speakers have been properly installed

## **High or low pitched whine or hum coming through speakers**

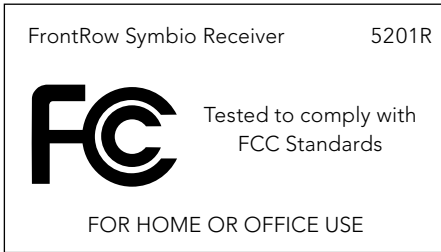
- There may be a ground loop with the system. Install a ground loop isolator on the audio output.
- There may be "noisy" electrical wiring. Install an AC line filter

## **Distorted/gurgling/buzzing**

- Microphones are on same channel. If you are using two microphones, set one to channel A and the other to channel B

# 10 Regulatory

## receiver: part 15, subpart B




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.

### FCC notes

The FrontRow Symbio system is approved by the FCC (Federal Communications Commission). The use of the system may be governed by specific FCC rules and FCC licensing or notifications may be required. Consult your local FCC office for detailed information.

Phonic Ear receivers and transmitters, when required, are approved by the Federal Communications Commission (FCC) in the U.S. and Industry Canada. Other government approvals are available upon request. (Other international regulations may also apply.)

Any changes or modifications made to any government-approved element of this instrument, without the express approval of Phonic Ear, Inc. in writing, could void the user's authority to operate those elements of the system.

 This product conforms with the essential requirements of European Union Directive /EU Directive 2004/108/EC EMC Directive and 2002/95 ROHS Directive. This product can be subject to interference at our operational frequency bands of 2.3 and 2.8 MHz.



*Electrical and electronic equipment (EEE) contains materials, components and substances, that could be dangerous or detrimental to human health and the environment if waste electrical and electronic equipment (WEEE) is not disposed of correctly. Products marked with the crossed-out dustbin shown here are electrical and electronic equipment. The crossed-out dustbin indicates that waste electrical and electronic equipment may not be disposed of with unsorted household waste and that it must be collected separately.*

*In developing and manufacturing your Phonic Ear product, we used high-quality materials and components that can be reused. Thus, when disposing of your waste electrical and electronic equipment, you must use a collection system designated for this purpose, regardless of whether you dispose of your waste at your local waste site or it is collected from your home. Please contact your local authority for further information.*

### IC notes

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.

The term "IC:" before the radio certification number only signifies that Industry of Canada technical specifications were met.

# frontrow™

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