Infrared Classroom Wireless System

IR-800 & IR-800+

New Features & Configuration Options

Enrich Your Students' Learning.
Experience Remarkably Clear,
Intelligible Classroom Communication.

IR-800 and IR-800 *Plus*

The IR-800 is designed to enhance educational performance and simplify installation in a typical 30' x 30' classroom setting. It provides excellent speech intelligibility, which studies have shown helps boost student achievement at all levels of school education. The **IR-800 *Plus*** now augments the IR-800 by offering improvements to the equipment with new operating capabilities for classroom communication.

Both of the Voice-lift Systems continue to utilize the integrated wide-dispersion speaker (with a built-in Class D Amplifier) that distributes uniform, quality sound throughout the classroom. The ***Plus*** system allows for the use of 2 wide-dispersion speakers within a larger classroom that exceeds the typical 30' x 30' size, along with the ability to operate over 2 different classrooms.

The IR-802T tuner, which controls the system, provides inputs for audio sources such as DVD Players, PC audio and also has an adjustable output for connection to other systems such an Assisted Listening, Recording or Remote classroom. A 25V/70V Mute Input is provided for override of classroom audio from school-wide priority paging signal. The IR-802T is compact enough to mount on a wall for convenient access or under the teacher's desk for greater security (mount kit optional). Both Voice-lift systems enhance the spoken word of the teacher in a small or medium classroom. However the ***Plus*** system now delivers the means to perform the same over a large classroom or 2 classroom scenario by adding a second tuner and a IR-801AF Audio Interface and doubling the coverage area. TOA's Engineers have designed an interface unit with two inputs and outputs so that this is possible.

A further difference between the two systems is the number of IR wireless microphones that can be used. Currently the IR-800, which is sold with 1 tuner, only has two channels available permitting the teacher to have the priority mic and one other mic for the students. With the ***Plus*** system the user receives 2 tuners along with an Audio Interface to unit to have the capabilities of 4 channels. With the ability to have 4 microphones for a large classroom or dual zone; the 1 priority mic is controlled by the teacher and the other 3 microphones can be distributed to students. There can also be set-up where two teachers have priority mics and the students have the other 2 mics. Not only is the new system more flexible and expandable; it facilitates more conversation in the classroom by offering more opportunity for students to speak and debate.

The IR-800 and **IR-800 *Plus*** systems are both simple to use and easy to install and are UL 2043 –rated for installation in air-handling plenum spaces.

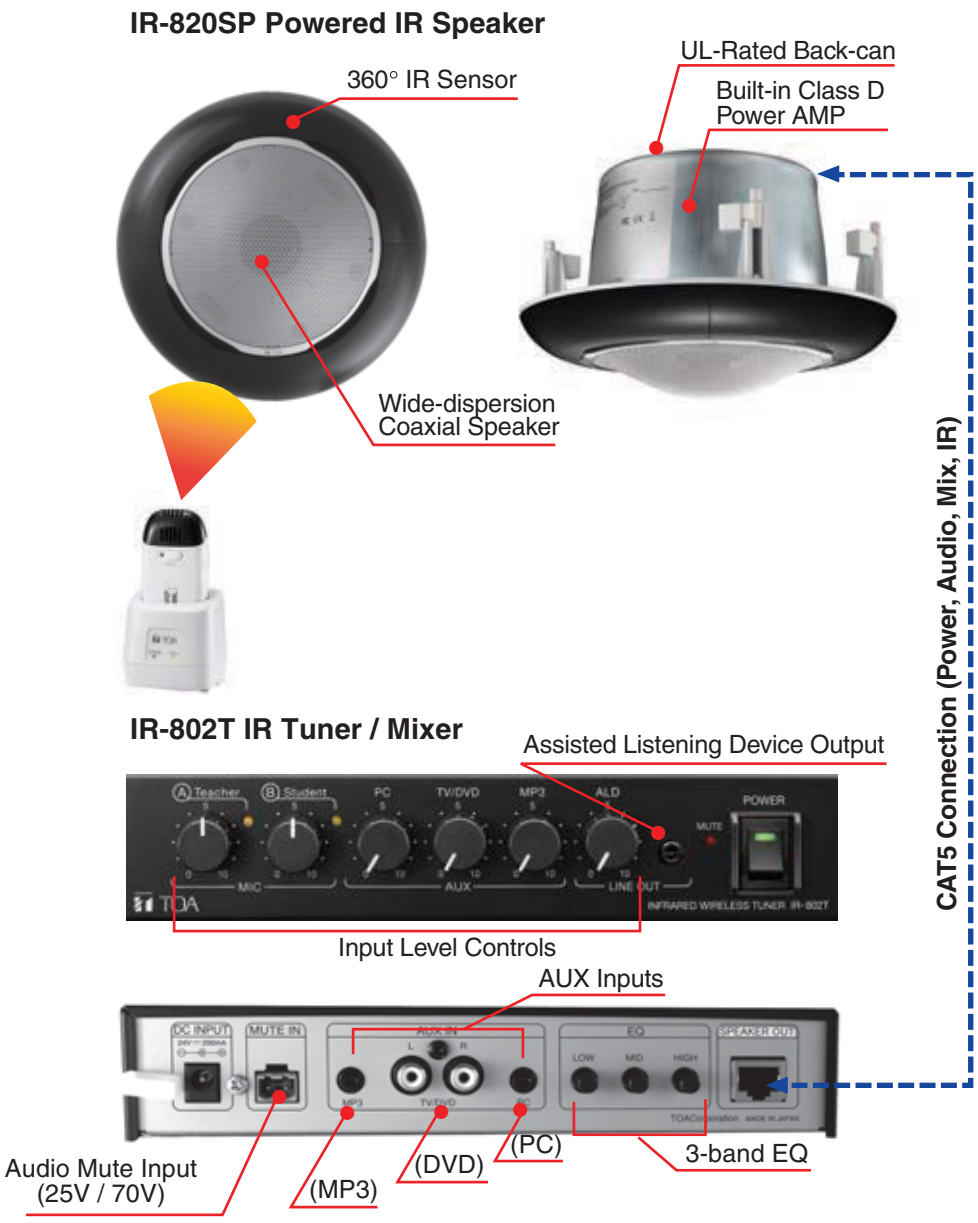
The IR-800 System

With two IR-800 systems now available the flexibility allows them to cover different classroom sizes. In the example below the wide-dispersion speaker provides ample 30 ft x 30 ft coverage, transmitting teachers' and students' normal speaking voices to everyone in the room, from front to back, with equal clarity and TOA's renowned superior sound quality. The resulting easy interactive communication stimulates students and improves their understanding of the course content.

TOA innovative all-in-one solution

- Uniform classroom-wide sound quality with single wide-dispersion speaker.
- Minimal system components (tuner, 2 microphones and integrated speaker).
- Quick, easy installation requiring just one CAT-5 cable.
- Selection of three TOA lightweight, low-fatigue IR wireless microphones.
- System expandable with optional interface unit.

ONE CLASSROOM EXAMPLE



> The IR-800 System Products

IR-802T IR Infrared Wireless Tuner / Mixer

- IR-802T CUAQ for Channel A / B, with Priority Control. +
- IR-802T CU1Q for Channel 1 / 2, with Priority Control for separate mode. +
- Built-in Feedback Suppression. +
- Integrated 2-channel IR Tuner for use with two IR Wireless Mic Transmitters.
- 5-input mixer (2 IR Mics, 3 x AUX in for PC, DVD Player & MP3 Player) w/ independent volume adjustment.
- ALD (Assisted Listening Device) Output with level control, provides audio feed to external systems.
- 3-Band EQ for tonal adjustment to suit different class environment or to compensate for feedback.
- Mute Input allows connection of school paging signal for priority override of classroom audio (25V / 70V).
- Simple CAT5 connection to IR-802SP ceiling Speaker for fast, easy installation

IR-801AF - Audio Interface Unit

- Audio Interface Unit, for use with IR-800 tuners & speakers
- Function button, allows the push button to act as a panic callback button to the office
- Analogue audio output and a contact output permits connecting with external equipment
- Connects between the IR-802T Tuner & IR-820SP speaker
- Simple CAT 5 connection to Speaker for fast, easy installation

IR-801AF DQ version - PLUS system kits

+

+

- Infrared & Audio signal distributor to combine and separate classrooms
- Use with 1-4 mics and 1-2 speakers

IR-802SP Infrared Wireless Speaker

- Possible to use with Channel A / B / 1 / 2. +
- Integrated speaker/Amplifier & IR sensor allows easy installation with a single CAT5 cable.
- Incorporates a highly efficient 20W Class D amplifier for compact size, minimal power consumption and low heat.
- 360° IR sensor has extremely wide pickup area for reliable reception.
- Ultra wide-dispersion (170°) 5 coax speaker provides even coverage and intelligible sound throughout the room, without dead spots.
- Easy In-ceiling mounting with supplied reinforcement ring or on-ceiling with optional back can.
- UL-2043 rated for plenum installation.

The IR-800 System Products

IR-310M Infrared Wireless Microphone (for Teacher/Student)

- Used with either Channel A or 1 (IR-801AF DQ version) +
- Toggle on side for mute, with 802T Tuner +
- Usable as hands-free or hand held microphone
- 8-hour operation with single AA battery
- Function Button for use in paging or external device control via IR-801AF US version
- Sturdy clothing clip to prevent wobbling during hands-free use

IR-310BC Battery Charger (for IR-310M)

- Dedicated battery charger for IR-310M
- Anti-overcharging design

IR-200M Infrared Wireless Microphone for Student (Hand-held)

- Possible to use with either Channel A / B / 1 / 2 +
- Hand-held microphone for speech use.
- PLL synthesized
- Infrared light emission intensity is adjustable at 2 levels (High/Normal).
- With rapid charging feature, up to 2 infrared microphones can be simultaneously charged in 3 hours (maximum)

IR-300M Infrared Wireless Microphone for Teacher (Hands-free)

- Easy-to-wear, neck-suspended design means unit can be ready for use quickly.
- Can be used with a built in mic or external mic.
- An external MIC input level adjustment function allows sensitivity adjustment if the connected external microphone has a different sensitivity.
- Infrared light emission intensity is adjustable at 2 levels (High/Normal).
- PLL synthesized.

IR-200BC Battery Charger

- Capable of charging up to 2 microphones (both hand-held and hands-free types) at time.
- Equipped with protective features for safety considerations (detection of battery irregularities and temperature monitoring for protection against overcharging).
- With rapid charging feature, up to 2 infrared microphones can be simultaneously charged in 3 hours (maximum).

Note: Can charge only IR-200M and IR-300M with IR-200BT-2

IR-210BT-2 2 x Rechargeable Ni-MH Batteries

- Batteries for IR-200M & IR-300M
- Ni-MH rechargeable battery (containing 2 pieces)
- 2400mAh

The IR-800 System Comparison

With the advent of the **IR-800 *Plus***, the chart below illustrates the key differences in the two systems. The two IR-802 Tuners come with a 4 Channel feature for increased microphone activity in the classroom. The IR-801AF Audio Interface Unit creates a combined or separated system for a large classroom or split dual zone classrooms. The Teacher's microphone is given priority and includes a built-in feedback suppressor for greater gain before feedback.

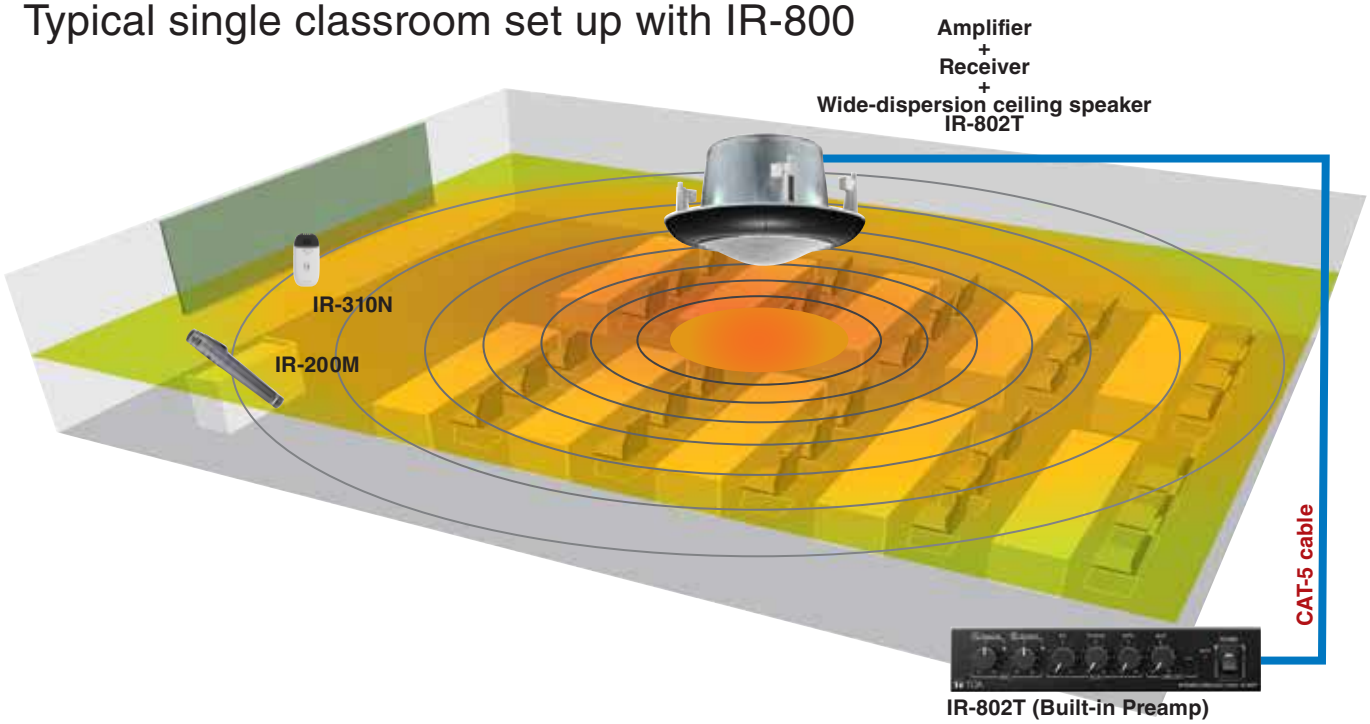
The update IR-800 *Plus* Offers the following over above the original IR-800 system

- Larger room coverage, i.e. 30x60 large classroom / library / music room
- Now possible to use in room combining; 2 connected 30x30 rooms or separation; 2 separate,unique 30x30 rooms,
- Up to 4 active microphones for a combination of teacher's, student's, assistant's.
- 1 or two speakers

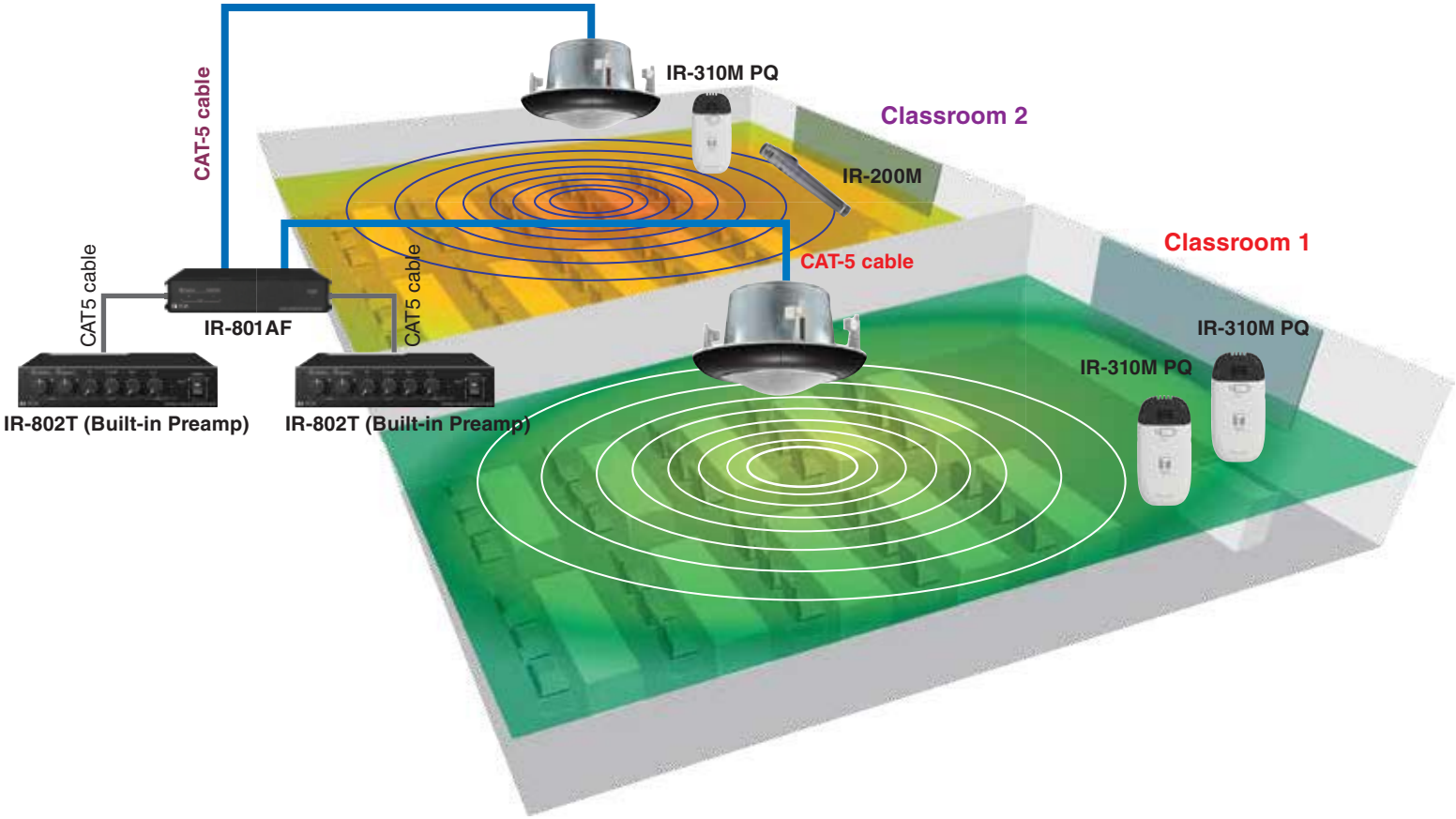
Device Type	IR-800	IR-800 +
Audio Interface	IR-801AF • Function button	IR-801AF US DQ • Infrared & Audio signal combiner & splitter,
Tuner (A/B)	IR-802T • Two Channel T / S	IR-802T CU AQ • Channel A / B • Built-in FBS • Priority control for separate mode
Tuner (1/2)	Not Available	IR-802T CU 1Q • Channel 1 / 2 • Built-in FBS • Priority control for separate mode
Speaker	IR-802SP • For Channel T / S	IR-820SP Y 4Q (x2) • For Channel A / B / 1 / 2
Teacher Mic	IR-310M • Teacher's Mic	IR-310M Y PQ • Channel A / 1, Priority function switch for Teacher
Student Mic	IR-200M • Student's Mic	IR-200M Y 4Q • Channel A / B / 1 / 2
Teacher Mic Charger	IR-310BC • Charger for IR- 310M, Teacher's handheld Mic	IR-310BC • Charger for 310M and IR-310M Y PQ
Student Mic Charger	IR-200BC • Charger for IR 200M Student Mic	IR-200BC • Charger for 200M
Batteries	IR-210BT • Rechargeable Batteries for IR-310M, IR-310 Y PQ, & IR-200M	IR-210BT • Rechargeable Batteries for IR-310M, IR-310 Y PQ, & IR-200M

Infrared Wireless set-up - examples

Typical single classroom set up with IR-800



New dual zone classroom set-up with IR-800 +

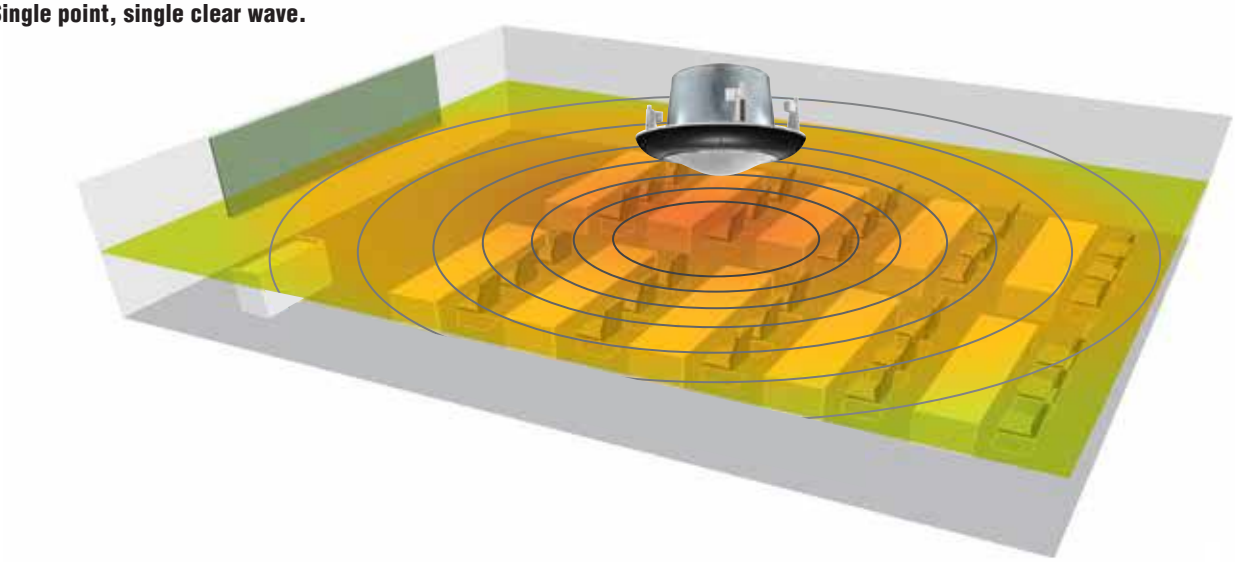


Infrared Wide Dispersion Speaker Technology

Expanded listening area coverage thanks to the extra-wide dispersion characteristics of TOA's ceiling speakers. The IR-802SP makes it possible to utilize only one speaker to cover 30ft x 30ft area, allowing more cost-effective installations.

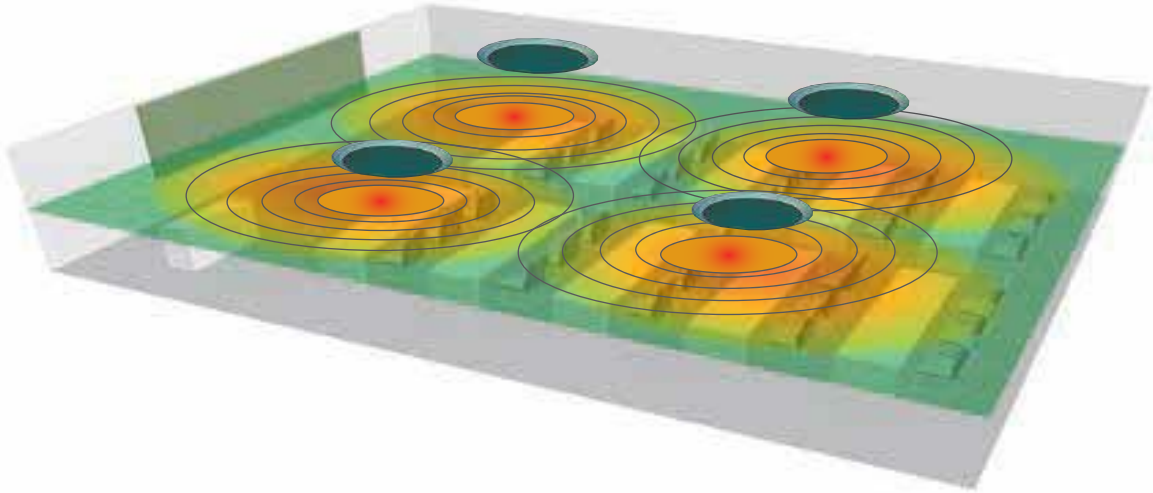
Wide-Dispersion Speaker

- **Uniform sound quality throughout the classroom from one speaker.**
- **Single point, single clear wave.**



Conventional Speaker

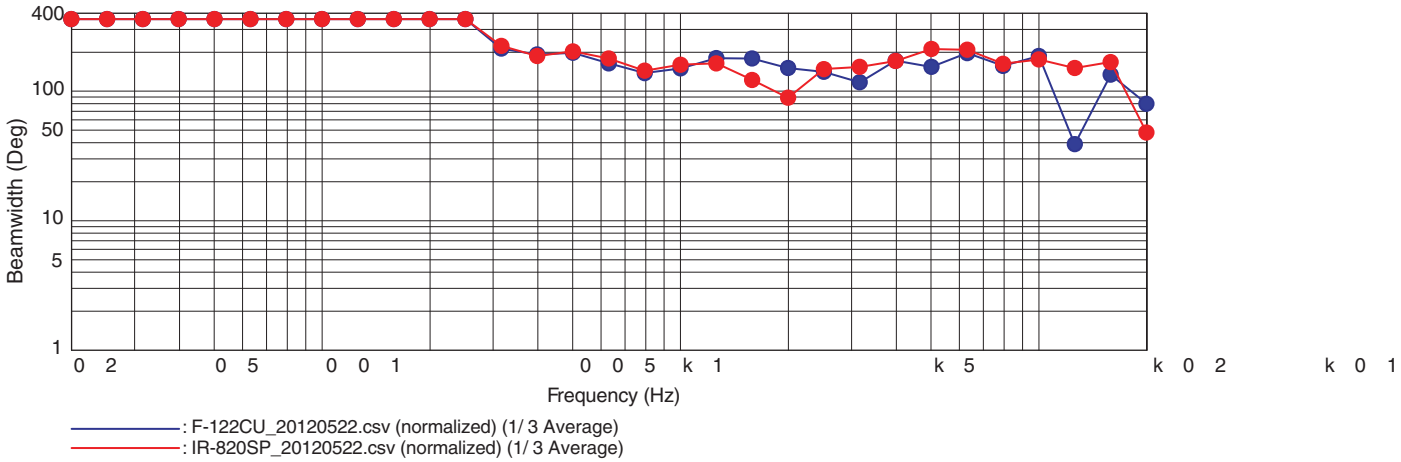
- **Multiple speakers, coverage becomes uneven and feedback can become an issue**
- **Waves interacting with other waves.**



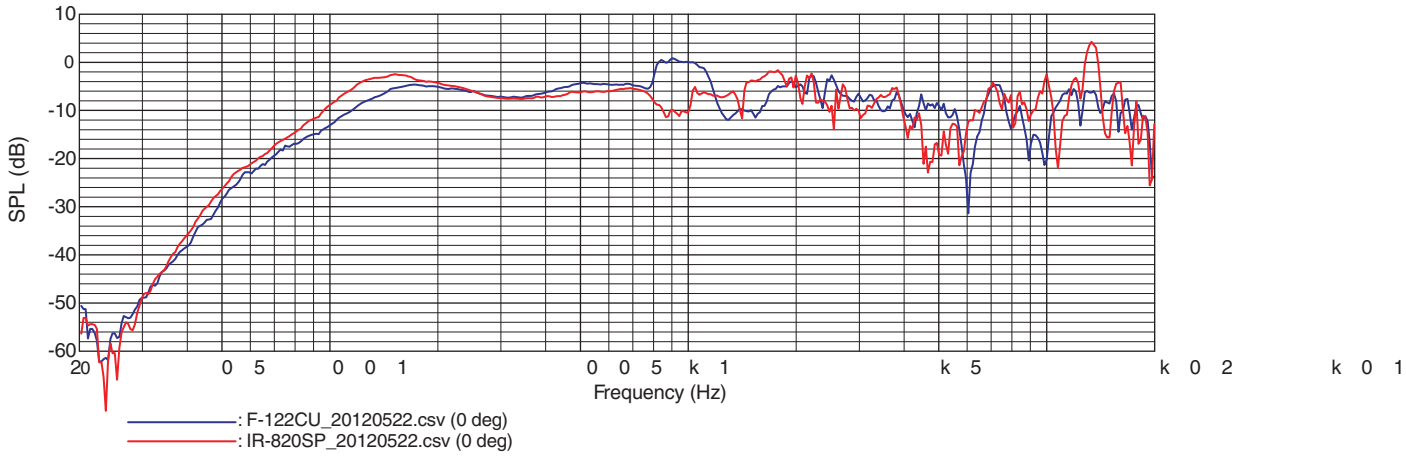
Infrared Wide Dispersion Speaker Technology

Characteristics Diagrams

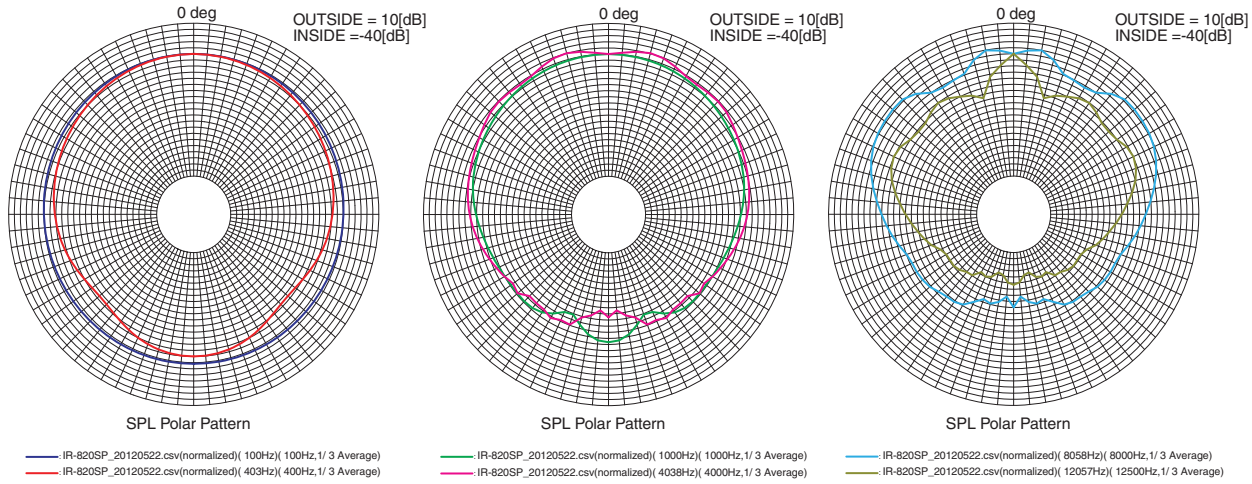
Beamwidth vs. Frequency



SPL vs. Frequency



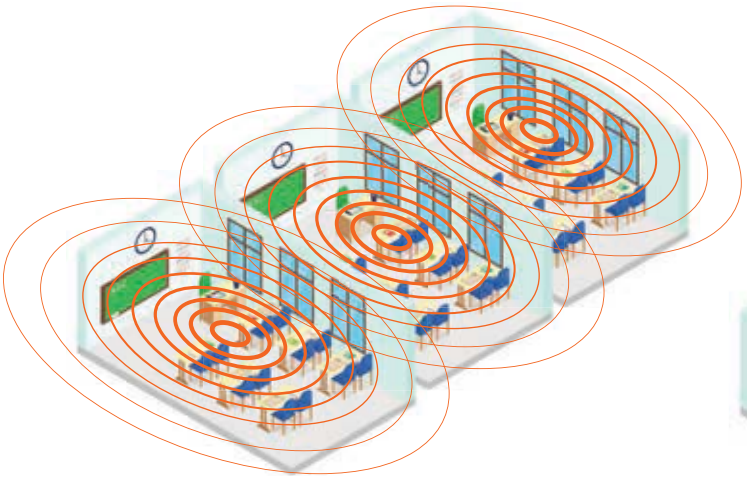
Polar Response



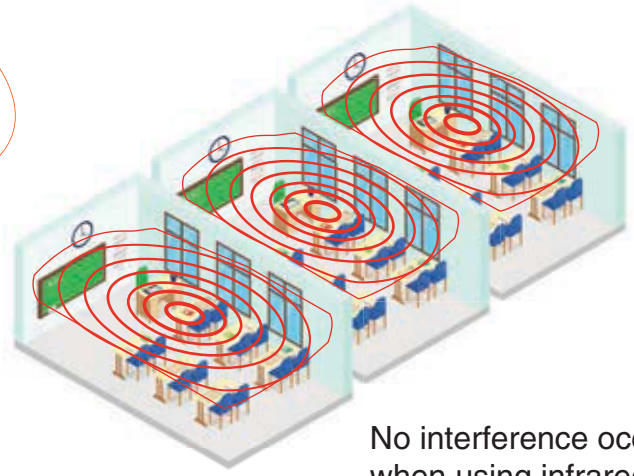
Infrared System Advantage

Repeated use in Adjacent Rooms

With walls providing a shield, microphones can be used without the worry of interference from adjacent rooms. For example, setting microphones for use on the same channel makes it possible for a single microphone to be used in any room.



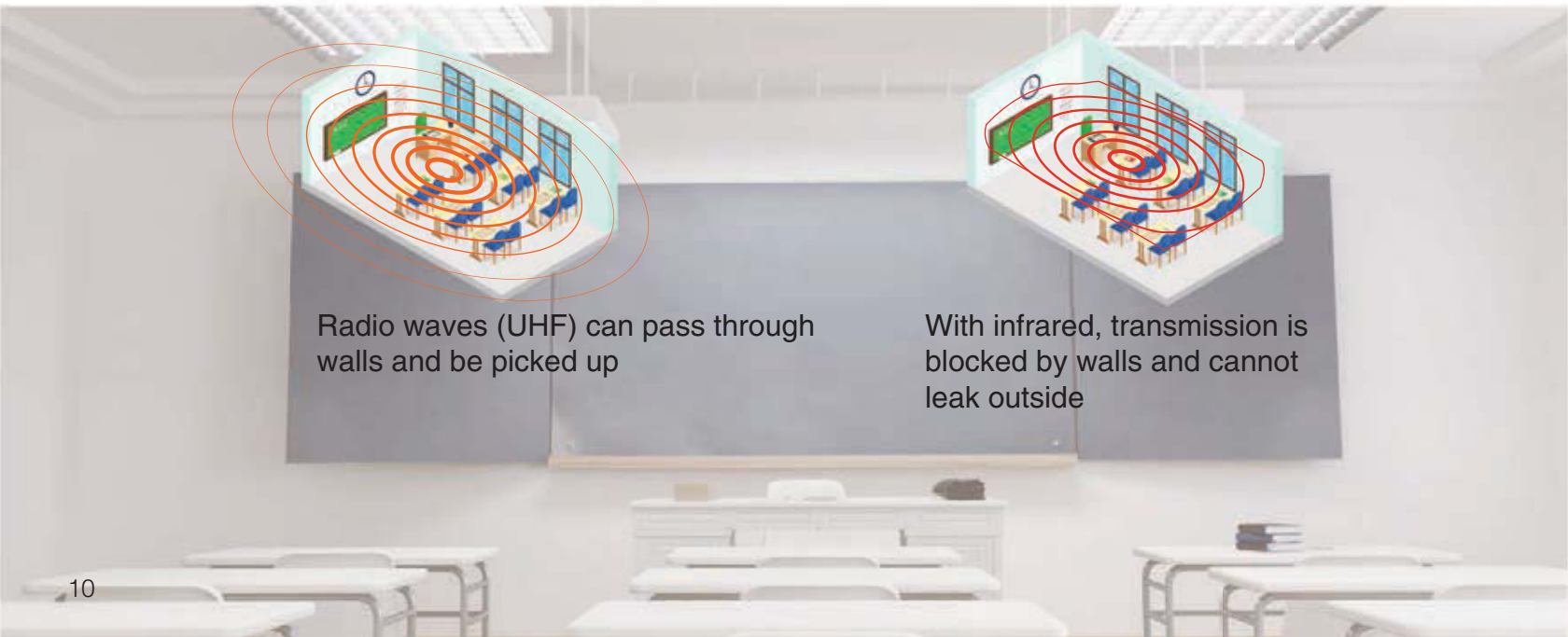
Interference occurs when using radio waves (UHF)



No interference occurs when using infrared

Prevents Close Vicinity Information Leaks

Unlike wireless microphones that use radio waves (UHF), there is no careless leaking of conferences or conversations, so the system can be used with peace of mind.
It's perfect for such places as courts, police affairs, executive boardrooms or places where important conferences are held.



Radio waves (UHF) can pass through walls and be picked up

With infrared, transmission is blocked by walls and cannot leak outside

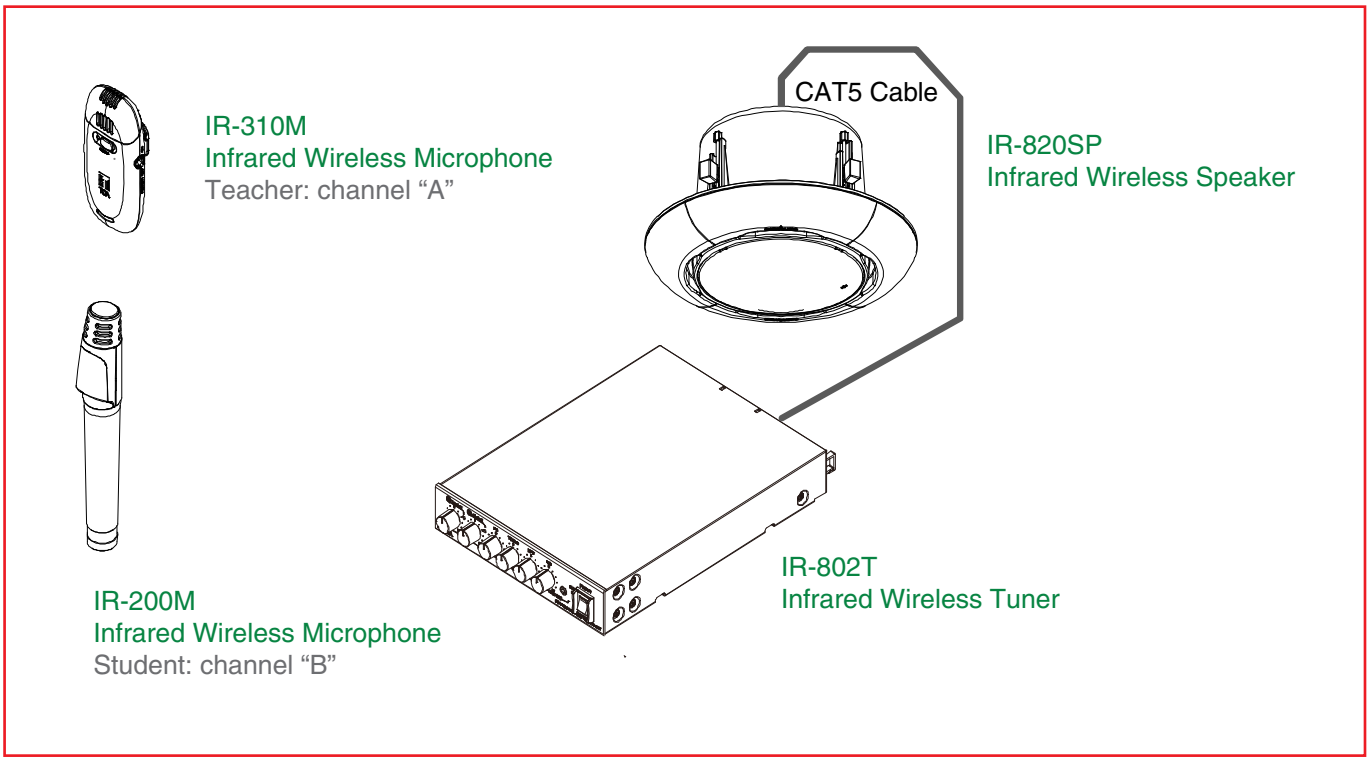
> The IR-800 and IR-800 *Plus* Configurations

TOA Canada is a leader in Infrared Wireless Classroom systems, however we continue to look for ways to improve upon the Classroom Voicelift system to enhance student learning. Over the last couple of years we have listened to our customers and have been advised by school administrators that although the IR-800 is great there are features that are missing or can be improved.
With their feedback in mind we now have the IR-800 *Plus* which satisfies the needs of schools.

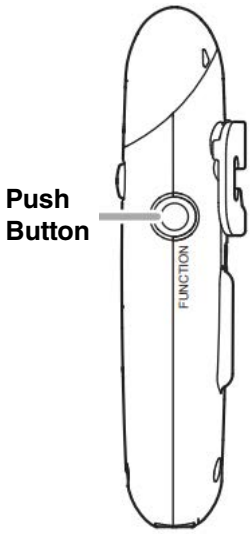
Configuration Example #1

2 channel system for typical class room

IR-800



*Ask for more details



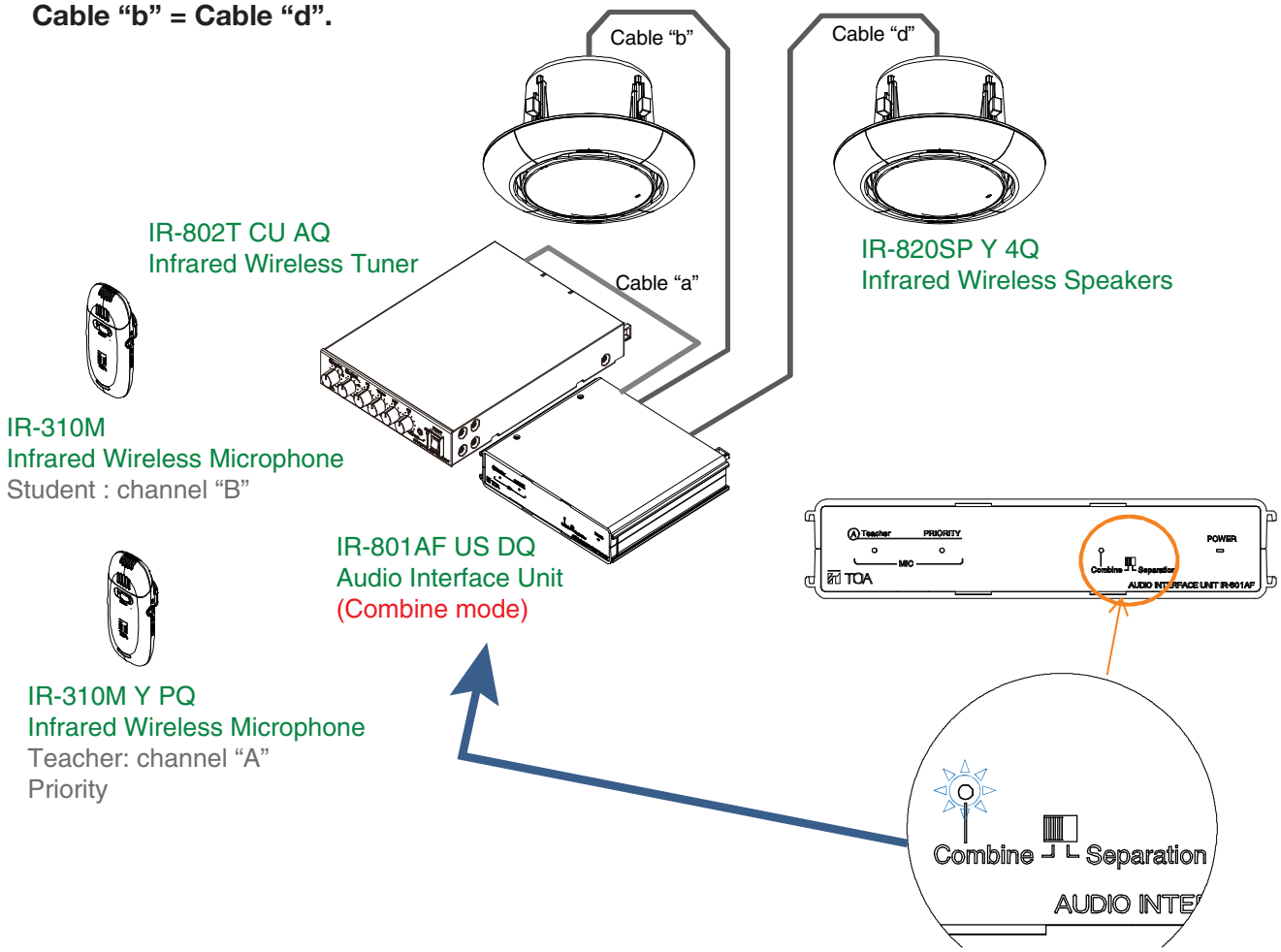
Function Button for use in paging or external device control via IR-801AF US version

Configuration Example #2

2 channel system for large classroom

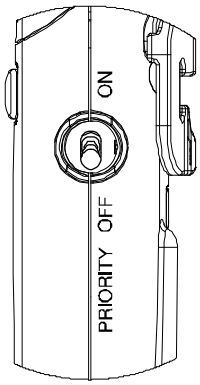
IR-800 +

Note
The cable length must be Cable “b” = Cable “d”.



*Ask for more details

Priority control 2 channel system



IR-310M Y PQ

Teachers Mic with Priority, (IR-310M Y PQ) on Channel “A” will mute student Mics, on Channel “B” from Tuner (IR-802T CU AQ).

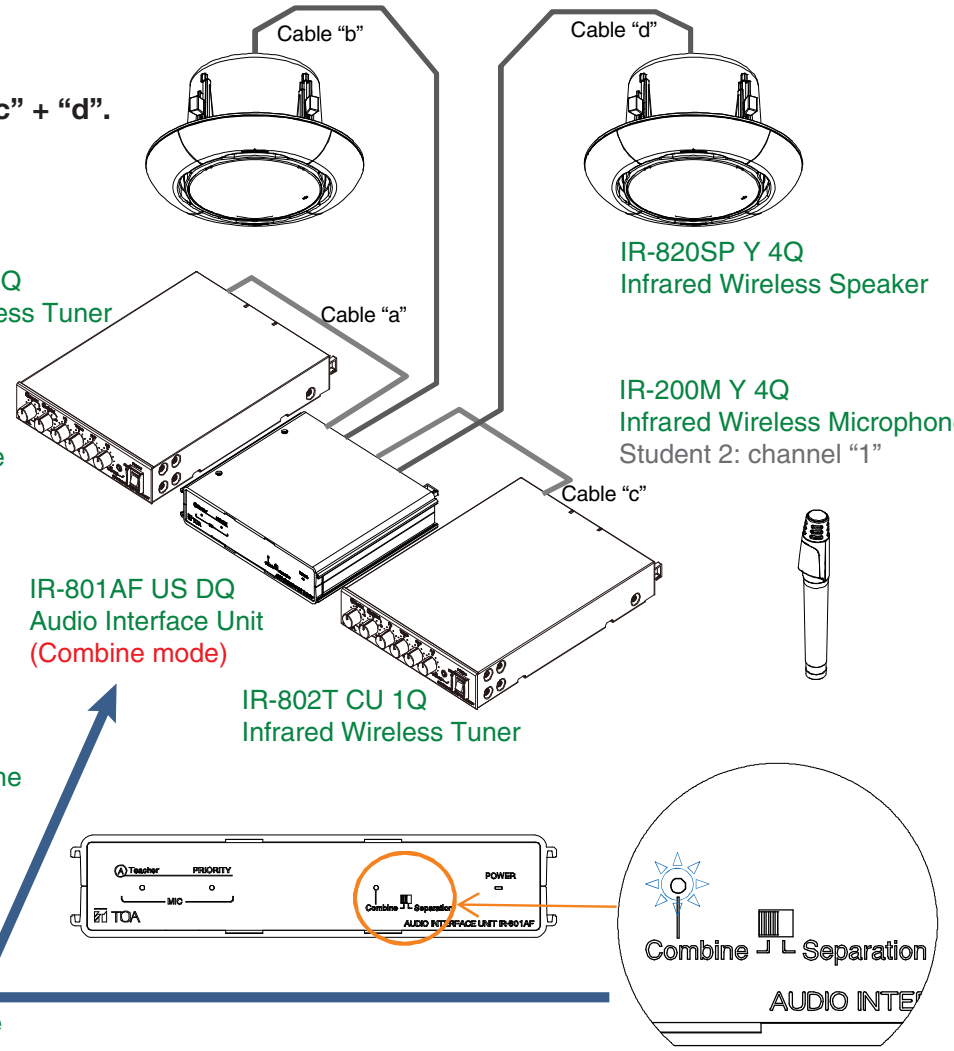
Toggle on the Priority function switch while speaking to mute other Mic.

Configuration Example #3

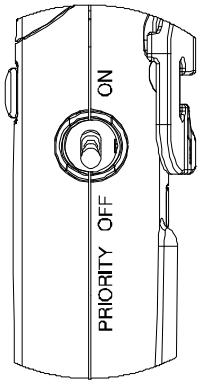
4 channel system for large classroom

IR-800 +

Note
The cable length must be
Cable “a” + “b” = Cable “c” + “d”.



*Ask for more details



IR-310M Y PQ

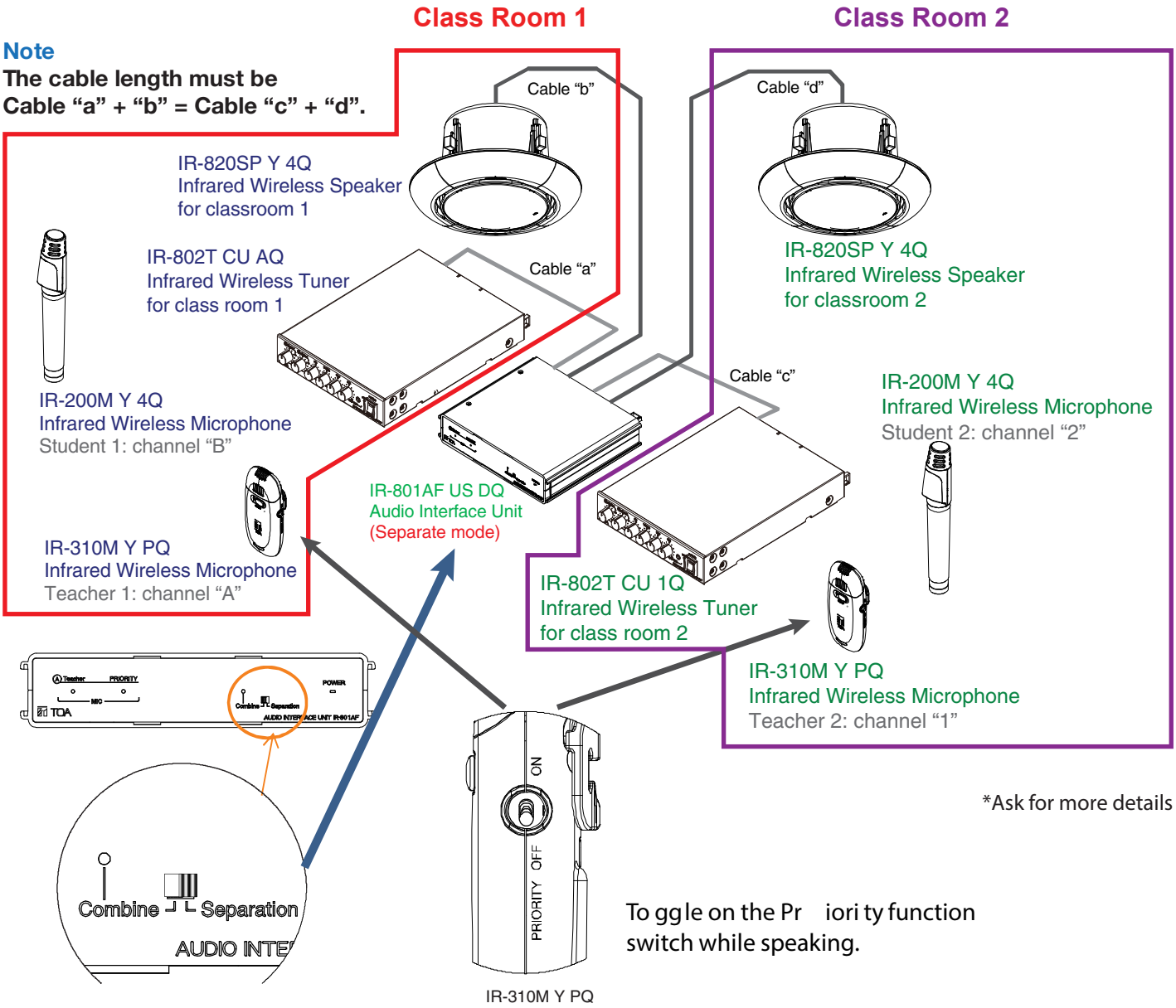
Teachers Mic with Priority, (IR-310M Y PQ) on Channel “A” will mute student Mics, on Channel “B” from Tuner (IR-802T CU AQ), and Channel “1” and “2” from second Tuner (IR-802T CU 1Q).

Toggle on the Priority function switch while speaking to mute other Mic.

Configuration Example #4

2 channel system for dual zone class rooms

IR-800 +



Priority control for dual zone of 2 channel system

Class room 1

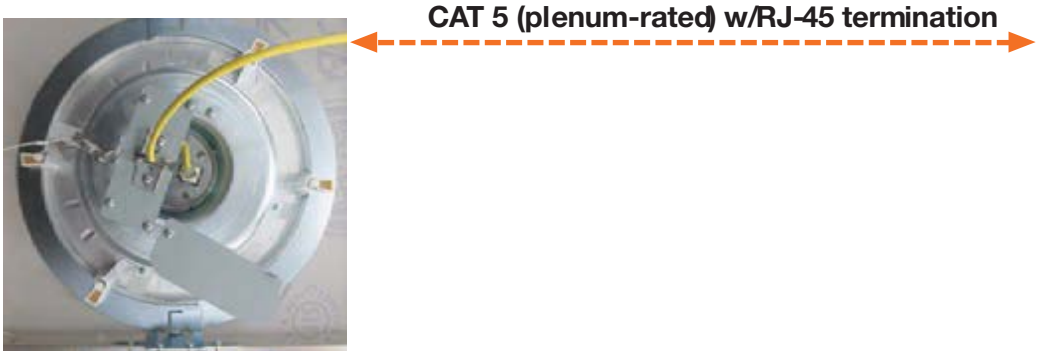
Teachers Mic with Priority, (IR-310M Y PQ) on Channel “A”, will mute student Mic, on Channel “B” from Tuner (IR-802T CU AQ).

Class room 1

Teachers Mic with Priority, (IR-310M Y PQ) on Channel “1”, will mute student Mic on Channel “2” from Tuner (IR-802T CU 1Q).

Speaker Installation

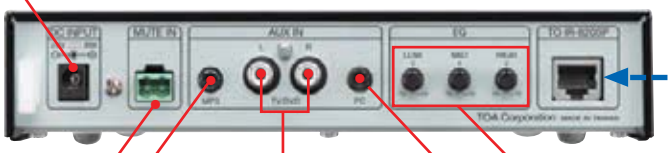
The IR-820SP is designed for installation in plenum ceilings and is UL-2043 rated. The integrated back-can may be mounted directly in the ceiling cut-out. A supplied reinforcement trim ring is used to brace the speaker in the cut-out. An optional tile bridge (HY-TB1) may be required for installations in ceiling tiles. The mounting clamps may be adjusted to fit the mounting ring (supplied) securely. For surface mounting, or situations where the speaker cannot be placed “in-ceiling”, a surface back-can should be used.



IR-800 Connection

CAT5 Wiring

(Rear Panel)



Supplied DC Power Supply

Audio Mute Input

MP3 player

DVD player

3-band EQ

PC audio

(Front Panel)

Assisted Listening Device Output

Transmitter>

<Receiver

Assisted Listening Device

*MUTE override is VOX signal (not contact closure) and will mute the main output as well as the ALD output

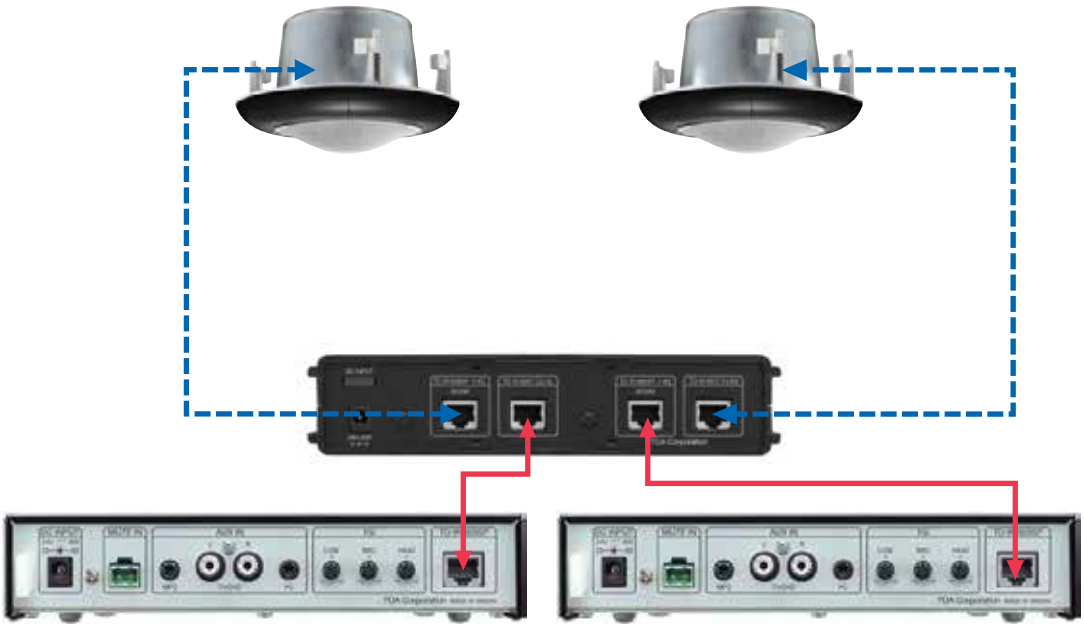
Operation

Recharging: When used with the rechargeable Ir-200BTbatteries, at the end of the day, the mics can be inserted directly into the charging cradle and be fully charged and ready for use the next day.

Tuning: Mics/Tuner can be set to either of two Infra-red frequencies.

The teacher may move from classroom to classroom (each equipped with a similar system) without having to reset the mic or tuner and without the need for coordinating frequencies

IR-800+ Connection (*dual zone*)



*MUTE override is VOX signal (not contact closure) and will mute the main output as well as the ALD output

Operation

Recharging:
at the end of the day, the mics can be inserted directly into the charging cradle and be fully charged and ready for use the next day.

Tuning:

The teacher may move from classroom to classroom (each equipped with a similar system) without having to reset the mic or tuner and without the need for coordinating frequencies

Precautions Regarding the Installation Environment

This system uses infrared transmissions and will not operate properly in an environment where external factors that obstruct infrared transmissions exist.
The following are some examples of the external factors that may obstruct infrared transmissions.

a. Plasma Displays (PDP)

When PDP screens emit light, they release extremely large amounts of infrared rays. When using an infrared microphone system in the same place as a PDP, the infrared wireless receiver may pick up the rays and not operate correctly.
For this reason, avoid using the system in conjunction with a PDP.

Note: LCD displays do not affect performance.

b. Parallel Use With Other Infrared Systems

Do not use this system at the same time as other equipment systems using similar infrared transmissions that regularly emit powerful infrared rays.
Such examples include
-infrared simultaneous translation systems,
-infrared hearing aid systems and
-infrared wireless LAN systems.

Note: Infrared remote controls barely affect performance.

c. Sunlight

Correct performance of the system cannot be guaranteed in the event of it being exposed to direct sunlight. For that reason, the system cannot be used outdoors.

Note: Follow construction precautions correctly when installing receivers indoors, and indirect sunlight should not affect their performance.

d. Lighting Equipment

Incandescent lighting (such as halogen lamps) emits components of near infrared rays. Therefore, if powerful spotlights or down lights directly reflect on a receiver, it may adversely affect transmission performance.
In environments such as large halls where large amounts of incandescent lighting is used and powerful rays emitted, it may affect the performance in such ways as shortening transmittable distances.

Note: Lighting forms such as fluorescent lights or mercury lamps have almost no effect on performance.

e. Specific Blackboard

The system may be unstable depending on blackboard types. Specific blackboard cannot reflect infrared rays.
Therefore, we recommend pre-installation trial of the system in a room with a blackboard.

IR-802T Infrared Wireless Tuner

Power Source	120 V AC, 50/60 Hz (supplied AC adapter must be used)
Power Consumption	8 W (based on UL standards) Max. 40.8 W (rated output of IR-820SP)
Receiving Frequency	Teacher (Channel A): 3.100 MHz Student (Channel B): 3.350 MHz
Receiver Sensitivity	50 dB or more, Signal-to-noise ratio (40 dBμV input, 1 kHz modulation, ±4.8 kHz deviation)
S/N Ratio	Tuner: 60 dB or more (60 dBμV input, 1 kHz modulation, ±4.8 kHz deviation, A-weighted, Equalization: Centered) AUX: 75 dB or more (A-weighted, Equalization: Centered)
Tone Squelch Frequency	32.768 kHz
Input AUX PC: AUX DVD/TV: AUX MP3: Mute:	line, -10 dB*, 10 kΩ, unbalanced, stereo mini jack (internal mixing) line, -10 dB*, 10 kΩ, unbalanced, 2P RCA jack (internal mixing) line, -10 dB*, 10 kΩ, unbalanced, stereo mini jack (internal mixing) 25 V line signals of telephone paging from a school intercom system
Output	ALD (Assistive Listening Device): line, -10 dB*, 10 kΩ, unbalanced, monaural mini jack Speaker: RJ45 (dedicated terminal for IR-820SP connection)
Equalization	High: ±10 dB at 10 kHz/Mid: ±10 dB at 1.3 kHz/Low: ±10 dB at 100 Hz
Mute Function	Muted by 25 V line signals
LED Indicator	Power (green) × 1, Infrared reception (yellow) × 2, Mute (red) × 1
Operating Temperature	14°F to 122°F (-10°C to 50°C)
Operating Humidity	90%RH or less (no condensation)
Finish	Panel: Aluminum, black/Case: Steel plate, black
Dimensions	8.27" (W) × 1.81" (H) × 12.28" (D)
Weight	3.97 lb
Accessories	AC adapter(DC cord length:5.91 ft) × 1, AC power cord (6.56 ft) × 1 Volume control cover × 6, Removable terminal plug (2 pins) × 1
Option	Half-width blank panel: MB-15B-BK

*0 dB = 1V

IR-820SP Infrared Wireless Speaker

Power Source	24 V DC (supplied from IR-802T)
Power Consumption	4.4 W (based on UL standard)
Rated Output	20 W
Frequency Response	100 Hz – 20 kHz (-10 dB) at installation in 1/2 free sound field (Measured by installing the unit in the center of a ceiling.)
Amplification System	Class D
Distortion	5% or less (rated output, A-weighted)
Speaker Component	12 cm (4.72") cone-type
Infrared Wireless Receiver	
Wavelength	870 nm
Carrier Frequency	Teacher (Channel A) : 3.100 MHz Student (Channel B) : 3.350 MHz
Reception Angle	360° (Horizontal)
Connection Terminal	RJ-45
LED Indicator	Power (green) × 1
Mounting Hole	ø11.81"
Connection Cable	CAT-5 UTP
Operating Temperature	14°F to 122°F (-10°C to 50°C)
Operating Humidity	90% RH or less (no condensation)
Finish	Enclosure : Steel plate, plating Baffle : Fire-resistant ABS resin (resin material grade: UL94V-0), white Punched net : Steel plate, white Filter section : Polycarbonate, optical cut filter
Dimensions	ø12.6" × 8.07" (D)
Weight	7.5 lb
Accessories	Safety wire × 1, Ceiling reinforcement ring × 1, Trim ring × 1, Paper pattern × 1
Option	Tile bar bridge: HY-TB1

*0 dB = 1V

IR-801AF US audio interface

Power Source	24 V DC (Supplied from IR-802T
Infrared Frequency Channel	Channel A: 3.100 MHz
Contact Output	Relay contact output, contact capacity: 30 V DC/2 - 500 mA, removable terminal block (2 pins)
Audio Output	-20dB*, electronically-balanced, removable terminal block (3 pins)
Operating Temperature	-10°C to +50°C (14°F to 122°F)
Operating Humidity	90% RH or less (no condensation)
Finish	Control section: ABS resin, black
Dimensions	210 (W) x 44 (H) x 181 (D) mm (8.27" x 1.73" x 7.13")
Weight	560g (1.23 lbs)

• Optional product
MB-WT3 Rack Mount Kit

IR-801AF US DQ audio interface and distributor

Power Source	24 V DC (Supplied from IR-802T or optional AC adapter)
Infrared Frequency Channel	Channel A: 3.100 MHz
Operating Temperature	-10°C to +50°C (14°F to 122°F)
Operating Humidity	90% RH or less (no condensation)
Finish	Control section: ABS resin, black
Dimensions	210 (W) x 44 (H) x 181 (D) mm (8.27" x 1.73" x 7.13")
Weight	560g (1.23 lbs)

• Optional product
MB-WT3 Rack Mount Kit

IR-310M Infrared Wireless Microphone

Battery		One piece of IR-200BT-2 rechargeable battery for the infrared wireless microphone (option)
Current Consumption		Typ. 215 mA (1.2 V)
Infrared Emitter	**Wavelength**	870 nm (AM: Brightness modulation)
	Modulation Method	Frequency modulation
	Carrier Frequency	Channel A: 3.100 MHz Channel B: 3.350 MHz
	Transmission Distance	Approx. 15 m or 50 ft (Power selector switch: N; In an unobstructed space.)
Tone Signal		32.768 kHz
Modulation Sensitivity		±4.8 kHz (1 kHz, when SPL of 84 dB is input)
Microphone Element		Electret condenser microphone, Uni-directional
Maximum Input Sound Pressure		120 dB SPL
Input Sensitivity Adjustment		Adjustment range: –9 dB to 0 dB (factory-preset: 0 dB)
Frequency Response		100 Hz – 12 kHz
Preemphasis		300μs
Input		External microphone input (3.5 monoaural mini jack, phantom powered)
Switch		Power Switch, Channel selector switch, Microphone sensitivity selector switch, Function button
Indicator		Power LED (combined with battery life indicator)
Battery Operation Time		Approx. 8 hours (when used with one piece of IR-200BT-2 rechargeable battery)
Operating Temperature		0 to 40 °C (32 to 140 °F)
Operating Humidity		90% RH or less (no condensation)
Finish		Control section: ABS resin, white Filter section: Polycarbonate, optical cut filter
Dimensions		54.2 (W) x 109 (H) x 27 (D) mm (2.13" x 4.29" x 1.06")
Weight		130 g or 0.29 lb (with alkaline batteries & strap) 140 g or 0.31 lb (with dedicated rechargeable batteries & strap)

Specifications

IR-200M Hand-held Microphone / IR-300M Hands-free Microphone

	IR-200M	IR-300M
Batteries	IR-200BT-2 rechargeable batteries for the infrared wireless microphone (option) or AA alkaline dry cell batteries (2 pieces)	
Current Consumption	typ.250 mA (2.4 V, Power selector switch: N)/ typ.340 mA (2.4 V, Power selector switch: H)	
Infrared Emitter Wavelength Modulation Method Carrier Frequency Transmission Distance	870 nm (AM: Brightness modulation) Frequency modulation Channel A: 3.100 MHz/Channel B: 3.350 MHz Approx. 65 ft (Power selector switch: H; In an unobstructed space)/ Approx. 50 ft (Power selector switch: N; In an unobstructed space)	
Tone Signal	32.768 kHz	
Modulation Sensitivity	±4.8 kHz (1 kHz, when SPL of 84 dB is input)	
Maximum Input Sound Pressure	120 dB SPL	
Input Sensitivity Adjustment	—	Adjustment range: -9 dB to 0dB (factory-preset: 0 dB)
Microphone Unit	Unidirectional electret condenser microphone	
Frequency Response	100 Hz – 12 kHz	
Preemphasis	300 µs	
Input	—	External microphone input (ø3.5 monaural mini jack)
Battery Operation Time	Approx. 8 hours (when IR-200BT-2 rechargeable batteries for the infrared wireless microphone are used; Power selector switch: N) Approx. 6 hours (when alkaline batteries are used; Power selector switch: N)	
Operating Temperature	32°F to 104°F	
Operating Humidity	30% to 85% RH	
Finish	Control Section: ABS resin, metallic gray, 50% gloss, paint/ Filter Section: Polycarbonate, optical cut filter	
Dimensions	ø1.46" x 9.52"	25.2" (W) × 3.59" (H) × 1.07" (D)
Weight	0.37 lb (with batteries)	0.29 lb (with batteries and strap)
Accessories	Screw driver (for setting) x 1, Color label (6 colors) x 1	

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Specifications are subject to change without notice. (201903) 8336110051-00