

1.0 PRODUCT DESCRIPTION

The RF Intercom Doorbell (RI-D) is a five-channel intercom unit, which allows half-duplex conversation over either a 467.6875 MHz or a 467.5625 narrow band FM signal. Key features include:

15 house codes to reduce interference from units in other systems.

2 station codes: front door/ back door (programmable via a switch).

A Call/Talk button to turn the unit on and send the bell tones/voice over RF.

A Program button to program a house code into the unit.

Power on LED.

Digital Calling to activate the unit only when the house and station codes match.

Tone squelch.

Internal volume control.

Internal speaker & microphone.

Internal antenna.

2.0 HARDWARE/SOFTWARE SPECIFICATIONS

2.1 MECHANICAL

All electronics shall be contained in a plastic enclosure with the dimensions 5.5 x 3.75 x 1.75 inches. The body and button colors shall be PMS 427 and PMS 432, respectively.

2.2 ELECTRICAL

2.2.1 DC CHARACTERISTICS

Input Power:

9VDC supplied by battery on board

Input Current:

50 mA receive, 120 mA transmit

2.2.2 RF CHARACTERISTICS

System Frequency:

467.6875 MHz or
467.5625 MHz (+/- 2.5 PPM)

Modulation Type:

Narrow Band FM

Receiver Sensitivity:

-90 dBm minimum

Transmitter Power Output:

100 mW nominal

2.3 REGULATORY AGENCIES

The unit shall comply with FCC part 95 regulations (FRS) and Part 15 for unintentional radiators.

2.4 ENVIRONMENTAL

Temperature:

-20°C to +60°C

2.5 USER INTERFACE

2.5.1 CALL/TALK BUTTON

The Wireless DoorBell unit is normally powered down when not in use. At the press of the Call/Talk button, the unit powers up and sends out the house code, the station code ("5" or "4"), the receiving stations code (All Call). Then the bell tones are sent out. The bell tones consist of a 550 Hz ("ding") and a 450Hz ("dong") signals. Each bell tone is faded over a one-second period. If the station code is "4", "dong" is sent out only. The bell tones will be sent once per button press and release. The unit shuts off automatically after 20 seconds of inactivity.

If there is an answer from the residence, the button will then function as a Press-to-Talk. The user may press the Talk button to initiate RF data and voice transmission. At the press of the button, with the microphone disabled, the unit sends out the house code, the station code ("5" or "4"), and the receiving stations code (All Call) continuously. The unit enables the microphone and allows the user to transmit voice over RF. When the button is released, the unit disables voice transmission and sends out subaudible tone sequence to tell the receiving station to shut off its speaker. The unit then goes into a Receive Mode and waits for a response. The unit shuts off automatically after 20 seconds of inactivity.

2.5.2 STATION CODE JUMPER

The station code is programmable via a slide switch on-board. If the switch is in position 1, the station code will be "5". Otherwise, the station code will be "4". The two station codes are used to differentiate between the units installed at the front door and back door.

2.5.3 POWER ON LED

A green LED is used to indicate that the power is on.

2.5.4 VOLUME CONTROL POTENTIOMETER

An internal potentiometer is used to adjust the speaker volume.

2.5.5 POWER INPUT

The power to the unit is supplied via two 9V batteries on-board.

2.6 MICROCONTROLLER

All programming and control functions are performed via a microcontroller on-board.

2.7 RF TRANSMITTER

The RF Transmitter Circuitry transmits FM data and audio over either a 467.6875 MHz or a 467.5625 MHz carrier signal. The Transmitter is disabled when its supply is shut off by the microcontroller.

2.8 RF RECEIVER

The RF Receiver Circuitry receives FM signals and converts them to audio and data that is usable by the microcontroller.

2.9 MICROPHONE

An internal microphone, which is enabled or disabled by the microcontroller, is used for audio input.

2.10 SPEAKER

An internal speaker, which is enabled or disabled by the microcontroller, is used for audio output.

2.11 SQUELCH

To reduce the noise that is generated on the speaker when either the Talk button or the DoorBell button is released, the unit sends out a subaudible tone sequence to the receiver before it shuts off RF. The receiver disables its speaker before RF goes away. If the tone gets corrupted for some reason, a squelch signal that is generated by the RF Receiver is sent to the microcontroller.

2.12 CALLING STATION DATA FORMAT

The transmitting station sends out a continuous subaudible tone sequence when the Press-to-Talk or All Call is pressed. The code consists of the following:

House Code first digit (1 - 5)

House Code second digit (6 - 8)

Calling station number (1 - 5)

Called station number (1 - 6) (6 is for an All Call)

3.0 PROGRAMMING

The default station code at the factory, will be "5". To change the code to "4", the slide switch on the back of the unit must be toggled by the user.

To program the house code, the unit must be in the program mode. To place the unit in Program Mode, with the power to the unit off, the user must press and hold the Program button until the unit beeps the house code. Then the Program button must be released. The unit will then be in Program Mode. The Talk button is pressed until the desired house code is set. The unit will beep the house code after each press of the Talk button. The Program button may be pressed to exit the Program Mode or the unit will power down after 20 seconds.

4.0 TRANSMITTER ALIGNMENT / MICROPHONE / TRANSMIT DATA TEST

Pressing the Call/Talk button will cause the unit to transmit a carrier on the selected RF frequency (slide switch) with the microphone enabled.

4.1 RECEIVER ALIGNMENT / SPEAKER / SQUELCH / DATA RECEIVE TEST

Releasing the Call/Talk button will place the unit into the Receive Mode allowing the receiver section to be aligned. The speaker shall be turned off if RF is not detected. If valid data is received, then the power LED will be illuminated.