

SON104 Radio Communication System

Installation & Operation Manual



Sonetics[®]
CORPORATION

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P/N: 600-0240-00 Rev. B

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conditions which exclude coverage under the warranty, customer will be so advised. Customer may then authorize paid repair service or other disposition of the product. Notwithstanding any other provision of this warranty, if you sell or otherwise transfer ownership of your covered product, this Sonetics Standard Limited Warranty shall automatically terminate.

6. This warranty does not apply: (a) to consumable parts such as batteries, ear seals, intercom bags, cables, external power supplies, parts listed as accessories to a system, or other parts designed to diminish in function over time unless a failure is due to a defect in materials or workmanship; (b) to cosmetic damage or to defects caused by normal wear and tear or aging of the product; (c) to damage caused by use with non-Sonetics products; (d) to damage caused by operating the product outside the permitted or intended uses or environments described by Sonetics; (e) to damage caused by service performed by anyone who is not a representative of Sonetics or an Sonetics Authorized Service Provider; (f) to a product or part that has been modified without the written permission of Sonetics; (g) if any Sonetics serial number has been removed or defaced.
7. This warranty does not extend to any other equipment, apparatus, vehicle, air craft, or watercraft to which this product may be attached or connected.

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Subject to the terms and limitations of this Sonetics Standard Limited Warranty, this warranty covers any new covered product found to be defective within the applicable warranty period. Sonetics reserves the right to examine the alleged defective covered product to determine whether this Sonetics Standard Limited Warranty is applicable, and final determination of warranty coverage lies solely with Sonetics. If Sonetics determines that warranty coverage applies, Sonetics reserves the right to either repair or replace a covered product or any part thereof, as determined by Sonetics in its sole discretion. If the product has been subjected to

Overview

The Sonetics SON104 intercom is designed for use in rugged, demanding environments. The SON104 enables clear communication between up to four occupants and a 2-way radio. It is ideal for mobile equipment with complex internal and external communication requirements and high-noise environments. When used with noise attenuating Sonetics headsets, the system provides protection from hearing loss that occurs when exposed to high noise levels. The SON104 intercom is a durable solution for vehicles requiring occupant and radio communication. Individual headsets determine audio transmission with the push of a button, as well as independent volume control. All headsets hear intercom traffic and are capable of intercom transmission. When a radio is connected to the system, all participants hear the radio, but only those with radio transmit headsets can transmit over the radio.

Features

Modular Jacks - The modular jacks are the connection points for the CA cables leading from the intercom to the wireless bases.

A radio transmit priority "PR" port is identified as one of the modular jacks. When a mobile radio is connected to the system, the intercom user on this port will have priority when transmitting. Other users will not be able to transmit over the radio during this user's transmission.

Radio Interface Connector - The 9-pin D-Sub connector is an attachment point for the included mobile radio (MR) interface cable.

Power Connector - The 3-pin connector is the attachment point for vehicle power. A power connection cable is provided.

Receive Audio Adjust - A rotational adjustment for setting the level of audio received to the intercom from a mobile radio.

Transmit Audio Gain Jump / Intercom Audio Gain Jump - Two dip switches are provided for incremental gain increases of both the radio transmit audio and the intercom audio. Refer to the Settings section for additional detail.

Transmit Audio Adjust - A rotational adjustment for setting the level of audio transmitted to an appropriate level for a mobile radio.

Specifications

Dimensions:

Length: 4.16" (106mm)

Width: 2.75" (70mm)

Height: 1.29" (33mm)

Weight: 5.9oz (167g)

Power Requirements:

Minimum: 9.5 VDC @ 83mA

Maximum: 28.0 VDC @120mA

Fuse: 2 amp

Sonetics Standard Limited Warranty

Sonetics Corporation ("Sonetics") warrants to the original purchaser of its products that products will be free from defects in materials and workmanship under normal and proper use for the period of one (1) year from date of purchase.

Sonetics Corporation will repair or replace, at its option, any products showing factory defects during this warranty period, subject to the following provisions and obligations:

1. This warranty applies only to a new product sold through authorized channels of distribution.
2. All work under warranty must be performed by Sonetics Corporation.
3. All returned products must be shipped to our address, freight prepaid and Sonetics will return products to customer via ground freight. Any expedite fees or additional freight charges will be charged to customer.
4. Any attempt to repair, service, or alter the product in any way voids this warranty.
5. This warranty does not apply in the event of accident, abuse, misuse, liquid contact, improper installation, unauthorized repair, tampering, modification, fire, earthquake, or damage from other external sources – including damage caused by user-replaceable parts.

6. Push a RJ-12 connector into the plug holder on the crimping tool (**labeled D, in Figure 1**) until the release tab on the plug locks into position.
7. Holding the cable so that the printed side of the cable is toward the release tab on the plug, push the cable into the plug as far as it will go.
8. Note: Always make sure the printed side of the cable is facing the release tab on the RJ-12 connector plug (Figure 3). This ensures proper orientation of the plug on each end of the cable.

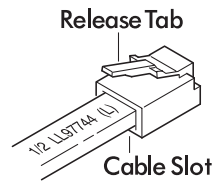
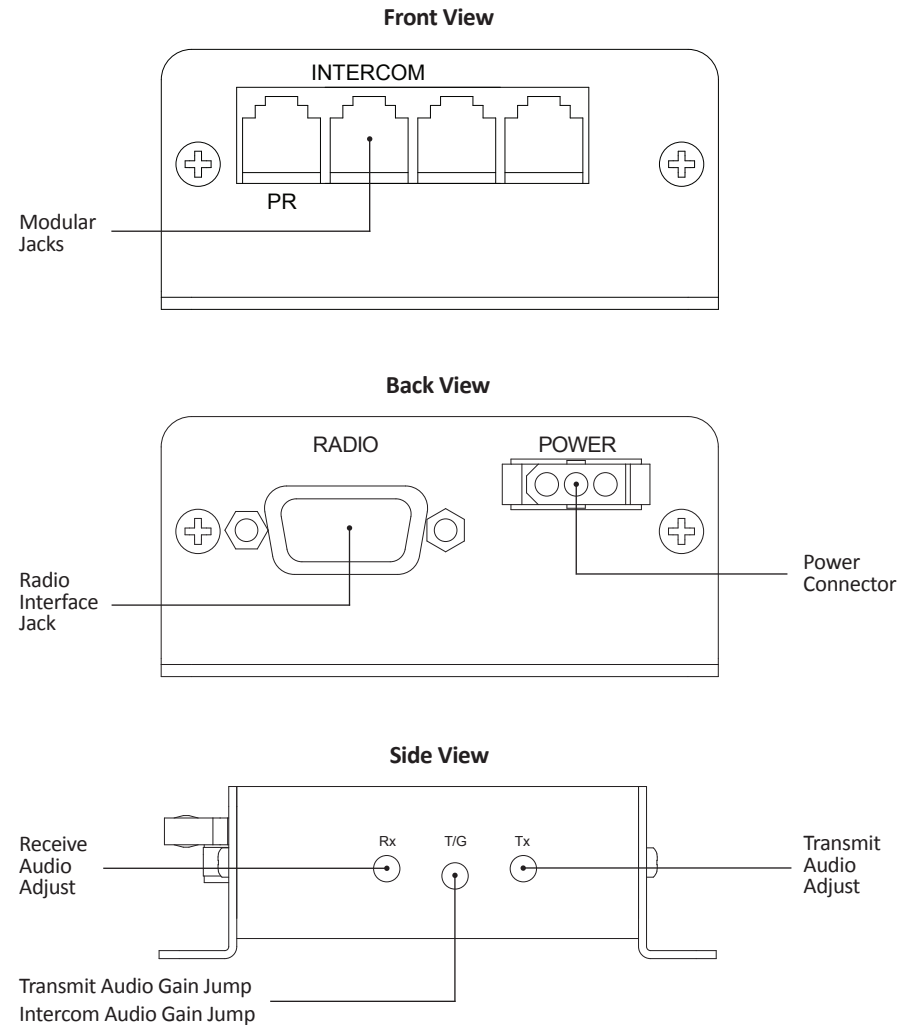
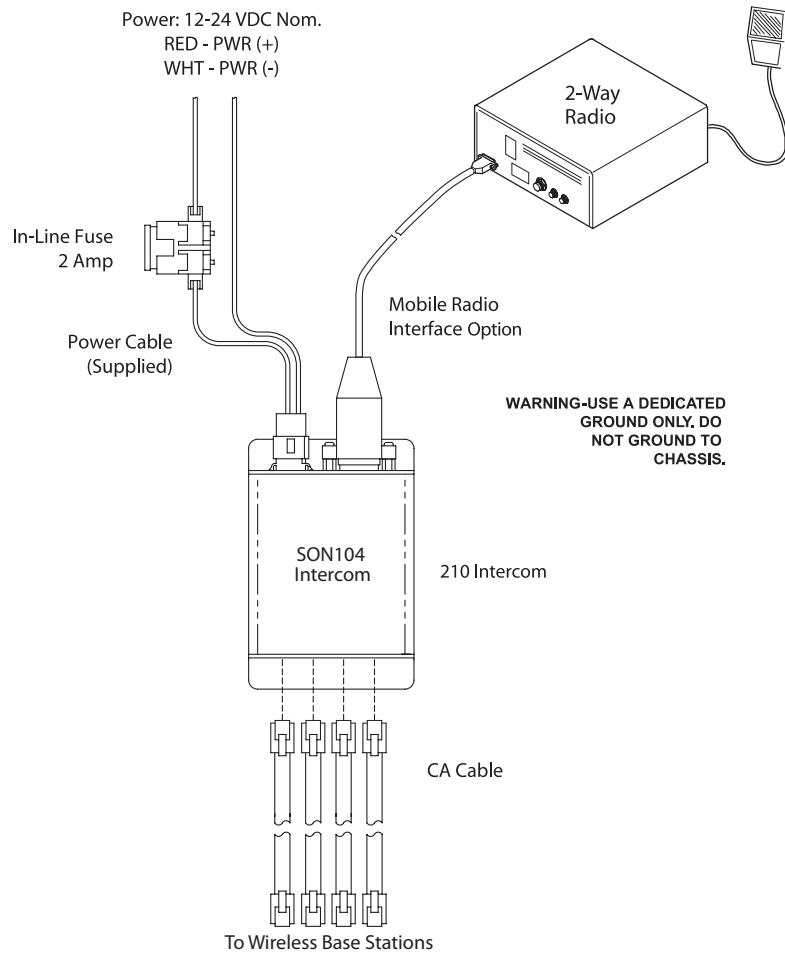


Figure 3

9. Squeeze the tool handles completely together. You may feel the crimper finish punching the contacts through the insulation on the wires.
10. Let the handles spring open.
11. Push down on RJ-12 connector release tab (Figure 3) and remove the RJ-12 connector from the crimping tool.
12. Inspect the plug to ensure that the cable is held securely in place.
13. Repeat this procedure as necessary to install a RJ-12 connector plug on each end of each CA cable.



System wiring



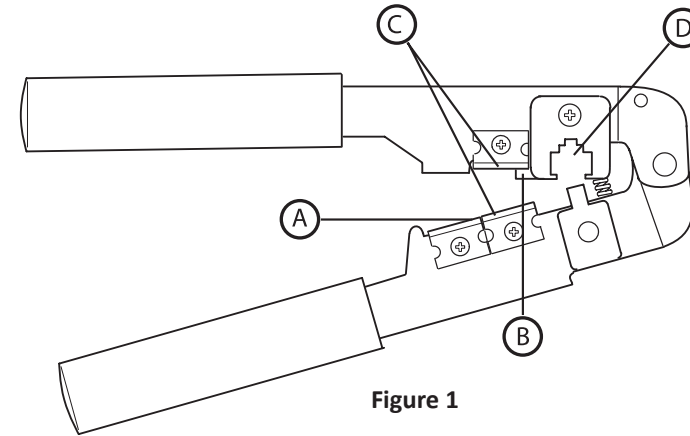
Overview - Once the intercom is installed, the system is ready for wiring. Headset modules are connected to the intercom port using RJ-12 connectors and CA cables as shown in the Figure above. See "CA Cable Routing" in the System Wiring section of this manual before wiring. A 2-way radio may be added using the 9-pin D-Sub connector.

Appendix B - RJ-12 Connector Assembly

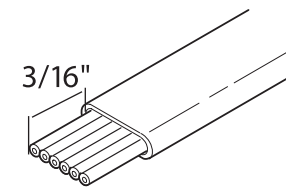
RJ Connector, 6 Position Plug Installation

To install the RJ-12 connector plug onto the flat CA cable:

1. Using the cutter blade on the crimping tool (**labeled A, in Figure 1**), cut the CA cable so the cut is clean and at a 90-degree angle to the side of the cable.
2. Fully insert one end of the CA cable between the stripping blades (**labeled C, in Figure 1**) until the end of the cable hits the stop (**labeled B, in Figure 1**).

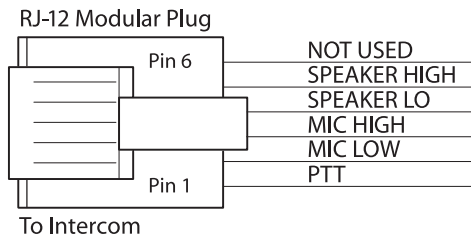


3. Squeeze the handles of the crimping tool together until the tool bottoms out.
4. While holding the handles together, pull the cable out of the tool.
5. The stripped insulation should expose approximately 3/16" of wire (**Figure 2**).

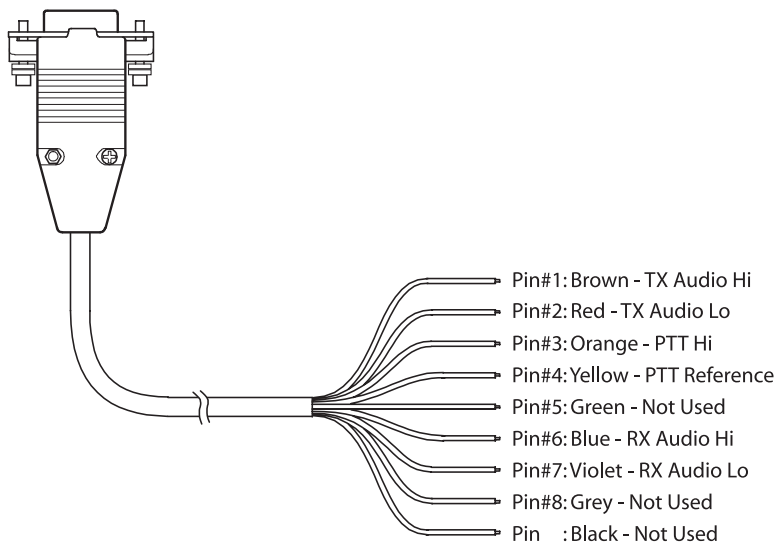


Appendix A - Wiring Diagrams

CA Cable



Mobile Radio Interface Cable



Power Connections - **Power is wired to the intercom using the power supply cable with in-line fuse (included).** When routing the power cable, the in-line fuse should be easy to access.

Warning - Before making power connections, make sure the power source is turned off.

Important - Use a dedicated ground for the (-) power connection. Do not ground to the chassis.

Important - We recommend connecting the intercom power to the same power busses as the 2-way radio.

CA Cable Routing - There are several important considerations when routing the CA cable:

- Do not bundle extra cable. The cable should be cut to length at installation, especially when radios are used.
- Do not route or bundle CA cables with coax cable from the 2 way radios.
- Route CA cables away from hot surfaces including vehicle exhaust systems.
- When routing CA cables through bulkheads or other sheet metal, use a grommet in the hole to prevent damage to the cable.
- A radio transmit priority "PR" port is identified on the front of the intercom. When a radio is connected to the system, the intercom user on this port will have priority when transmitting over the radio. Other users will not be able to transmit over the radio while this user is transmitting.

Radio Connections - A mobile radio may be connected to the intercom by using the radio port on the back of the unit. A MR interface cable, with an un-terminated end, is supplied with the intercom. For independent wire descriptions, see Appendix A.

Warning - To ensure proper operation, the connection to the radio should be performed by a qualified radio technician.

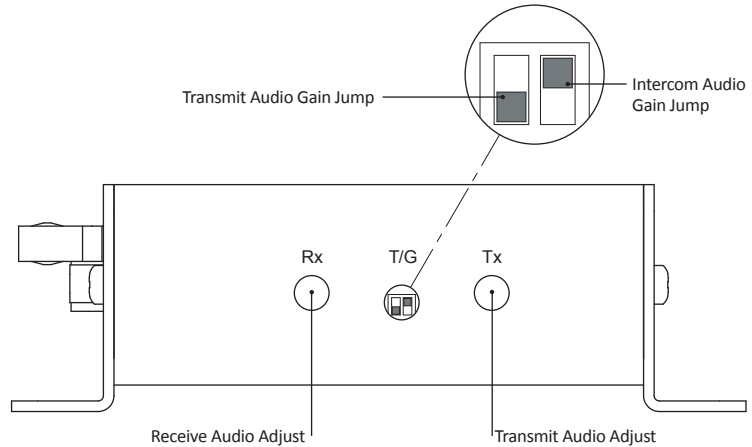
Some radio specific interface cables are available for common model radios. For a list of interface cables, please visit www.soneticscorp.com and click on the Product Support section of our web site or contact our service department at 800-527-0555.

When installing an MR cable, tighten the two screws on the plug of the cable.

Warning - If the screws are not properly tightened, the 9-pin plug may vibrate and cause problems with transmission, reception, or other radio functionality.

Settings

Setting Options - Several adjustments to the SON104 intercom are required. When connecting to a mobile radio it will be necessary to make both transmit and receive audio adjustments.



Warning - These adjustments must be performed by a qualified radio technician. Failure to perform these adjustments may result in problems hearing or transmitting radio signals when using the intercom system.

RX - The Receive Audio "Rx" Adjust is a rotational adjustment of the audio gain from the radio. When making this adjustment, set your mobile radio volume to the normal volume level used without an intercom installed. The audio level should be adjusted with other intercom users for quality audio mixing.

Transmit Audio Gain Jump - The Transmit Audio Gain Jump switch is an incremental gain increase of the audio broadcast through the radio. The gain is increased when the switch is in the "up" position and decreased in the "down" position. The Transmit Audio "Tx" should be used initially for adjustment and the Transmit Audio Gain Jump used only if required.

The radio keys but no audio is transmitted or the radio transmitted audio is weak

- Check the affected wireless base station location for faulty connections or components.
- Adjust the Transmit Audio setting. See the Settings section in this manual.
- Check the MR cable between the radio and the intercom. Make sure the screws on the 9-pin D-sub connector are tight. See Appendix A for wire connection details.
- For multiple base systems; determine if the problem is with the wireless base station or the intercom system by swapping the wireless base station.
- Substituting suspect components in the system may be helpful in tracking down problems.

The radio doesn't key

- Check the affected headset location for faulty connections or components.
- Check the CA cable and RJ-12 connector installation.
- Check the MR cable between the radio and the intercom. Make sure the screws on the 9-pin D-sub connector are tight. See Appendix A for wire connection details.
- For multiple base systems; determine if the problem is with the wireless base station or the intercom system by swapping the wireless base station.
- Substituting suspect components in the system may be helpful in tracking down problems.

If a problem persists in a headset or intercom unit, contact Sonetics for a Return Merchandise Authorization (RMA) number. Return the headset or intercom for replacement or repair.

You can hear others on the intercom, but they cannot hear you

- Confirm that you have the headset microphone close to your mouth; within 1/8 inch is recommended.
- If you have an intercom only headset, press the PTT button on your headset. See the Operation section of this manual for PTT activation details.
- Check wire connections at the wireless base station.
- Check wire connections at the intercom.
- Check the CA cable and RJ-12 connector installation.12
- For multiple base systems; determine if the problem is with the wireless base station or the intercom system by swapping the wireless base station.
- Substituting suspect components in the system may be helpful in tracking down problems.

You can't hear others on the intercom, but they can hear you

- Check the headset volume control setting.
- Check wire connections at the wireless base station.
- Check wire connections at the intercom.
- Check the CA cable and RJ-12 connector installation.
- For multiple base systems; determine if the problem is with the wireless base station or the intercom system by swapping the wireless base station.
- Substituting suspect components in the system may be helpful in tracking down problems.

The headset speaker has sound from the intercom but not the radio or the radio receive audio is weak

- Check the radio volume
- Adjust the Receive Audio setting. See the Settings section in this manual.
- Verify that receive audio is present by listening to the radio's speaker.
- Check the MR cable between the radio and the intercom. Make sure the screws on the 9-pin D-sub connector are tight. See Appendix A for wire connection details.

Intercom Audio Gain Jump - The Intercom Audio Gain Jump switch is an incremental gain increase of the intercom sound level. Each headset is also equipped with an independent volume control. If an overall higher intercom sound level is desired, the Intercom Audio Gain Jump switch may be used. The gain is increased when the switch is in the "up" position and decreased in the "down" position.

TX - The Transmit Audio Adjust is a rotational adjustment of the audio broadcast through the radio. Adjust the radio transmit sound level to eliminate clipping and provide quality audio mixing.

After these adjustments are made, the holes may be sealed using plugs (provided).

Operation

The SON104 intercom is designed to offer clear, full-duplex communication between participants. In addition, mobile radio communication is possible when connected to the Sonetics SON104 intercom.

Before testing the intercom, make sure the power supplied to the intercom is turned on. If a radio is connected to the intercom, confirm that it has power as well.

When a mobile radio is connected to the intercom, radio traffic will be heard in the headset speakers. The volume level of the radio traffic should be similar to the intercom audio volume level – see the Settings section of this manual for adjustment.

One of the four intercom ports on the intercom is a radio transmit priority “PR” port – see the “CA Cable Routing” in the System Wiring section in this manual. When a mobile radio is connected to the system, the intercom user on this port will have priority when transmitting out the radio. Other users will not be able to transmit over the radio once this user is transmitting.

Sonetics offers many different styles of headsets for use with the SON104 intercom system using the Sonetics wireless base stations.

Radio-Transmit Headsets - These headsets receive both intercom and radio communications at all times. The mic is typically active for intercom communications, while the PTT button is used to transmit over the radio. When you speak into the microphone you will hear yourself in the headset speakers. Volume is adjusted on the ear dome. You will hear other participants on the intercom as well as radio traffic when a radio is installed with the system.

Intercom-Only Headsets - These headsets typically receive both intercom and radio communications at all times, but are not capable of radio transmission. When the PTT button is activated and you speak into the microphone, you will hear yourself in the headset speaker. Volume is adjusted on the ear dome. You will hear other participants on the intercom as well as radio traffic when a radio is installed with the system.

Troubleshooting

If the intercom system does not operate as expected, check the following items:

- Check for power at the intercom and confirm that the fuse is not blown or the circuit breaker is not tripped.
- Confirm that a dedicated ground is used for the intercom power and not a chassis ground.
- Check headset controls.

Alternator whine and other distracting noises

- Connect both the intercom and radio to the cleanest power source possible, without sirens, strobes, flashers, and motors (i.e. wipers, heater, etc.).
- Check the power and ground connections for both the intercom and the radio. Make sure they are clean and tight.
- Ensure that power and ground wires for the radio and intercom are no smaller than 18 AWG.
- Check MR cable for proper wiring connections.
- Make sure that all battery connections are clean and free from dirt and corrosion.
- Use separate noise filters on radio and/or intercom power as needed.
- Use a robust common ground for both the radio and the intercom.
- Check the power to the intercom for an AC signal. There should be less than 300mVAC present on power lines.

Intermittent crackling in headset speakers

- Check wire connections at the intercom.
- Check the CA cable and RJ-12 connectors.
- Check wire connections at the wireless base.

No sound in headset speakers

- Check the volume control on the headset.
- Confirm that the intercom has adequate power.
- Check wire connections at the wireless base.
- Check wire connections at the intercom.
- Check the CA cable and RJ-12 connector installation.
- Determine if the problem is with the wireless base station or the intercom system by swapping the wireless base station.
- Substituting suspect components in the system may be helpful in tracking down problems.