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Analog Interface

Installation/Operation Manual



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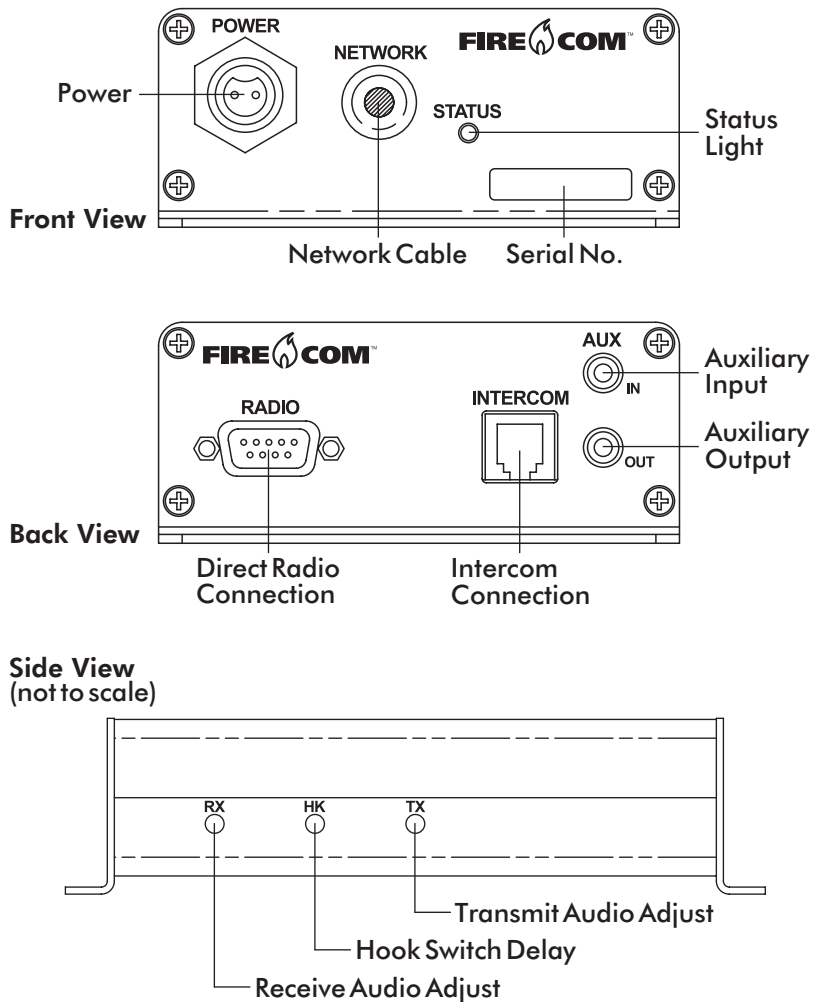
TABLE OF CONTENTS

Overview	4
Features	5
Operation	6
Installation	7
Wire Connections	8
System Wiring	
Radio Connection Via a 30xx Intercom (Cable or Deutsch Connector)	9
Radio Connection Via a 30xx Intercom (Quick Disconnect)	10
Direct Radio Connection (Cable or Deutsch Connector)	11
Direct Radio Connection (Quick Disconnect)	12
Network Cable Installation	13-14
Direct Radio Adjustments	15
Troubleshooting	16-17
Options and Accessories	18
Appendix A	
Modular Plug Installation	19
Warranty	Back Cover

OVERVIEW

The Analog Interface connects Firecom's two-wire digital network system, including panther series intercoms, to analog radios or Firecom's 30xx series intercoms. The interface provides clear, digital, full-duplex communication between the devices. In addition, the Analog Interface allows the panther series user to receive and transmit radio traffic from any location using the Firecom 10 series headset.

Features



FEATURES

Power

A 2-pin connector that plugs in the power cable assembly and connects the Analog Interface to the vehicle's power supply.

Network Cable

The network cable, with two pairs of conductors, connects the Analog Interface to the network and panther series intercoms.

Status Light

A status light indicating when the Analog Interface is operating properly. An internal diagnostic check is performed every time a unit is turned on.

Direct Radio Connection

A 9-pin D-sub connection for direct radio interface to the network and panther series intercoms.

Intercom Connection

A connection interface to the Firecom 30xx intercom (RJ connector, 6 position).

Auxiliary Input

A 3.5 mm stereo (3/2 conductor) jack used to receive miscellaneous audio, such as a CD or a cassette tape player, into the intercom.

Auxiliary Output

A 3.5 mm stereo (3/2 conductor) jack used to provide miscellaneous output audio from the intercom to a device such as a digital recorder.

Receive Audio Adjust

An adjustment for setting the level of audio received to the intercom from the mobile radio.

Hook Switch Delay

A switch used for adjusting the delay between the Push-To-Talk (PTT) on the headset and the keying of the radio.

Transmit Audio Adjust

An adjustment for setting the level of audio transmitted to an appropriate level for the radio.

OPERATION

Communication to the Firecom 30XX series intercom is possible from every unit on the network when an Analog Interface unit is installed on the two-wire network. When headset use is desired, use only Firecom 10 series headsets with the system.

If the Analog Interface is connected to a Firecom 30xx series intercom, audio from the 30xx will be heard on all panther series base station speakers, as well as panther series base and remote 10 series headsets, as long as no audio traffic is initiated by the panther series system. The audio includes radio traffic when a radio is connected to the Firecom 30xx series intercom. Audio from the panther series system will always be heard over the Firecom 30xx series intercom. For radio transmission, a panther series base or remote station user must speak through a Firecom 10 series headset microphone and depress the headset PTT button.

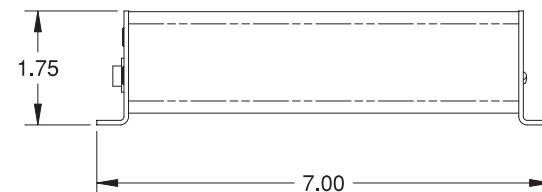
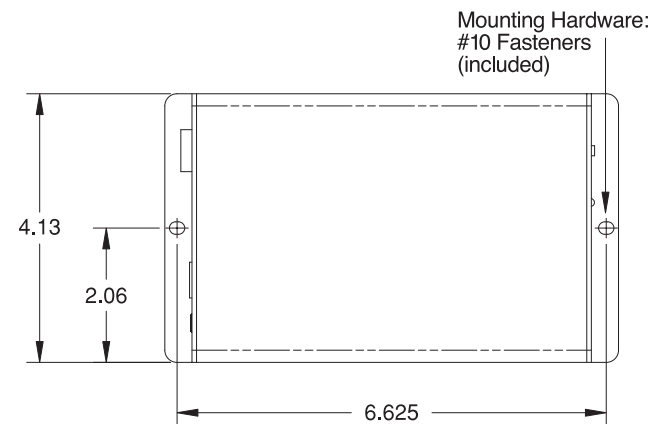
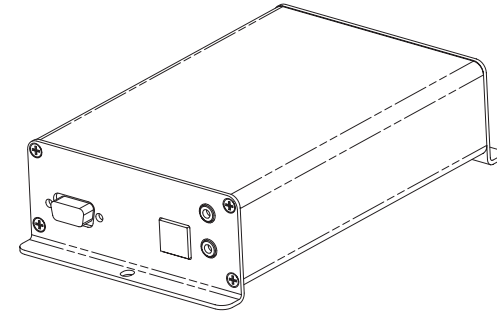
If the Analog Interface is connected directly to a radio (no Firecom 30xx is connected), audio from the radio will be heard on all panther series base station speakers, as well as panther series base and remote station 10 series headsets. Radio transmission is possible from a panther series base or remote station 10 series headset. The user must speak through the headset microphone and depress the headset PTT button to transmit.

The auxiliary in and out may be used to add other audio devices to the network, as well as record audio from the network. The auxiliary in and out can only be used when the Firecom 30xx interface is not being used. You may, however, use the auxiliary in and out on your Firecom 30xx series intercom while it is connected to the Analog Interface for the same purpose. When audio is provided to the auxiliary input on the Analog Interface, it will be heard on all panther series base station speakers, as well as both base station and remote station headsets. It will not be heard on remote station speakers or on radio transmissions. Audio recorded off the auxiliary out includes all audio from panther series base station headset microphones, as well as all radio audio transmitted or received.

The Firecom two-wire network of products is designed for high-noise environments and emergency applications. The Analog Interface connection to the network is a critical part of the communication system. All audio from the Analog Interface to panther series intercom units has a slightly lower sound level because it is secondary communications.

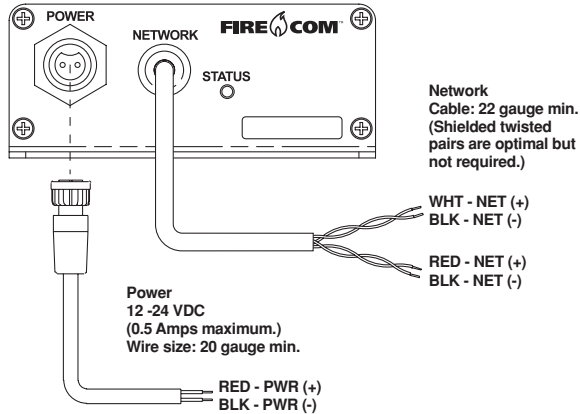
INSTALLATION

The Analog Interface unit must be installed on a flat surface, indoors or inside a vehicle. The Analog Interface unit is not designed for outdoor exposure. Mounting requires two #10 fasteners.

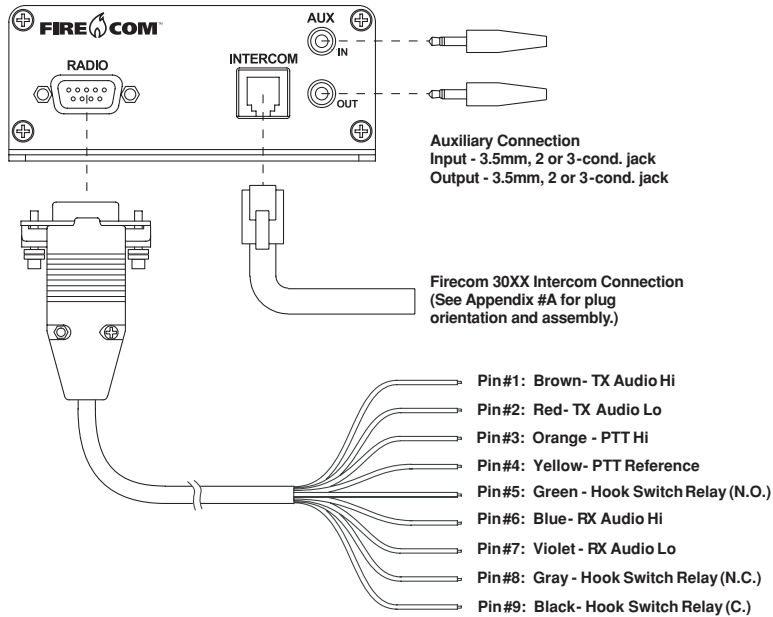


WIRE CONNECTIONS

Front View



Back View



Note: If a radio is connected to a Firecom 30xx intercom, a second connection is not required for radio function on the two-wire network. Simply connect the RJ connector, 6 position modular plug (see Appendix A for CA Cable Modular Plug Installation).

SYSTEM WIRING

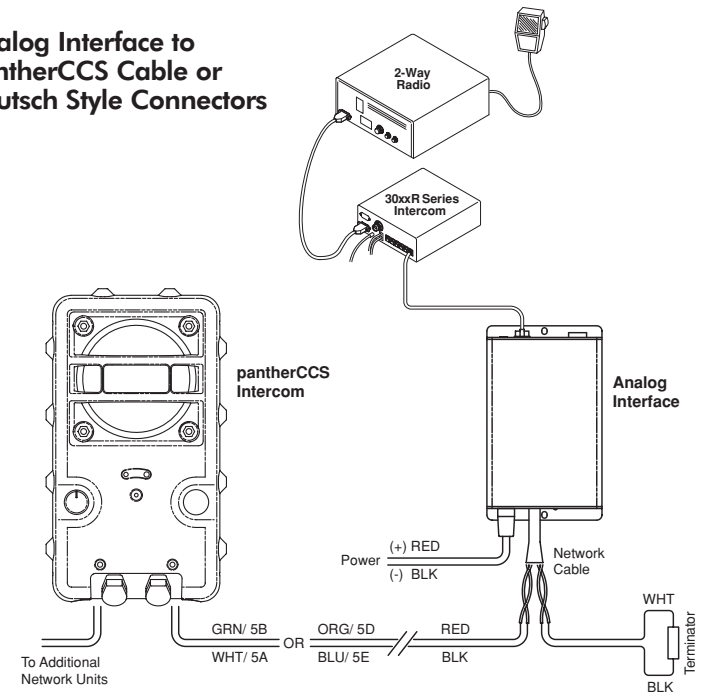
Radio Connection Via 30xx Intercom

To connect a panther series system to a radio via a Firecom 30xx intercom, simply install a Firecom CA cable between the Analog Interface and any of the intercom ports on the back of a 30xx. (See Appendix A for CA Cable Modular Plug Installation).

For the network connection, connect two of the Analog Interface network wires to two of the panther series system wires. The positive and negative orientation must be maintained and the second pair of network wires must be terminated if not used. (See figure below.) A terminator is provided.

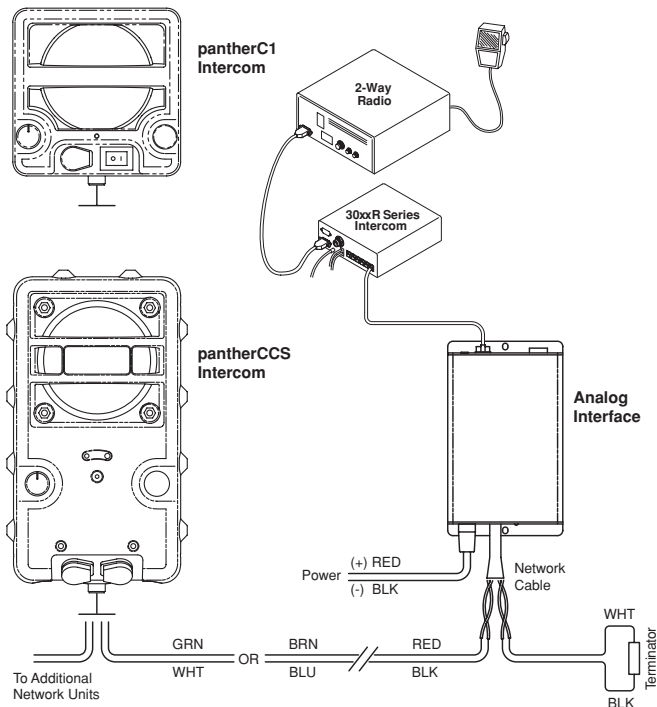
If you currently have a panther series system installed and are adding the Analog Interface, simply remove the terminator from one end of your current network and add the Analog Interface in series. If you are installing a new system, you may connect units in any sequence as long as they are in series and a terminator is placed at both ends of the network.

Analog Interface to pantherCCS Cable or Deutsch Style Connectors



SYSTEM WIRING

Analog Interface to pantherCCS or pantherC series with Quick Disconnect



SYSTEM WIRING

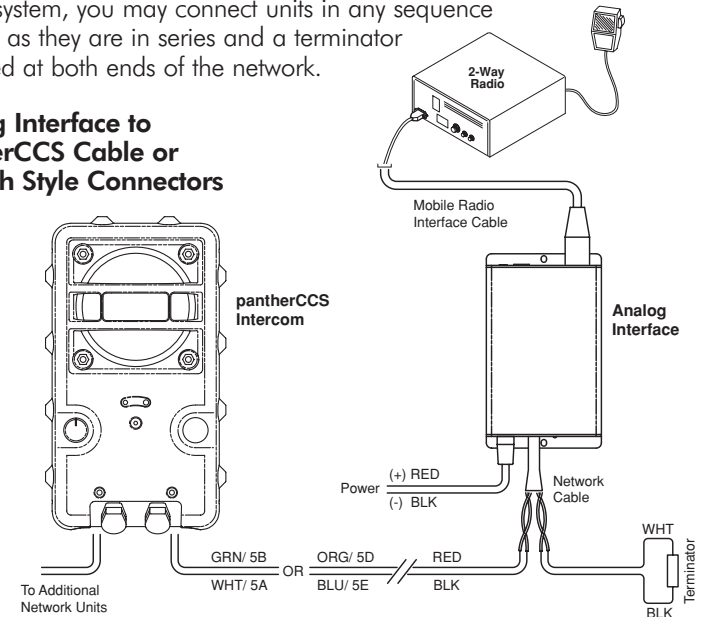
Direct Radio Connection

To connect a panther series system directly to a radio, simply install a mobile radio interface cable between the radio and the direct radio port on the back of the Analog Interface unit. There are numerous mobile radio interface cable (MR) assemblies available for different radio configurations. Contact your local Firecom dealer or sales representative for more information regarding an interface cable specific to your radio.

For the network connection, connect two of the Analog Interface network wires to two of the panther series system wires. The positive and negative orientation must be maintained and the second pair of network wires must be terminated if not used. (See figure below.)

If you currently have a panther series system installed and are adding the Analog Interface, simply remove the terminator from one end of your current network and add the Analog Interface in series. If you are installing a new system, you may connect units in any sequence as long as they are in series and a terminator is placed at both ends of the network.

Analog Interface to pantherCCS Cable or Deutsch Style Connectors

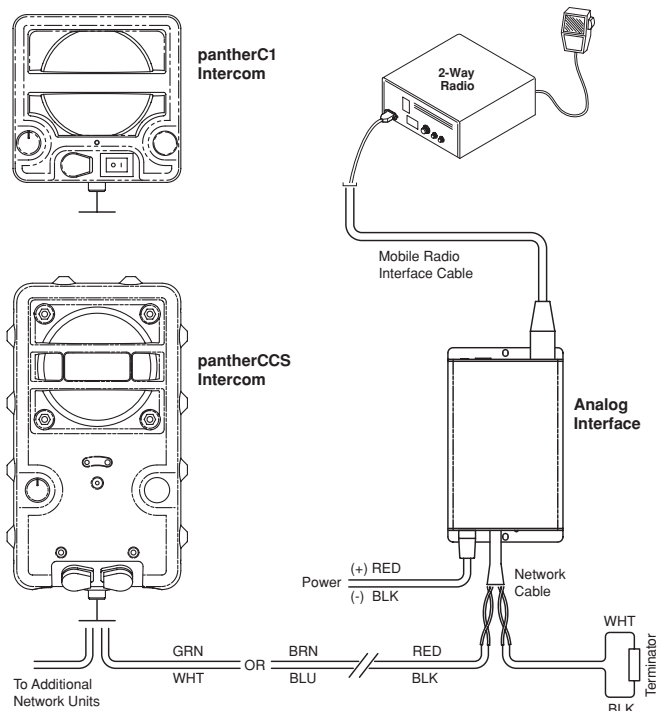


Terminators

Two terminators are supplied to complete a network circuit. The terminators are located at both ends of a network. For optimal performance, install terminators as close to the units as possible and no further than 6 feet in wire length. Spare terminators are available from Firecom (see Options and Accessories section of this manual).

SYSTEM WIRING

Analog Interface to pantherCCS or pantherC series with Quick Disconnect



NETWORK CABLE INSTALLATION

The panther series network system connects multiple units in series on a single paired cable. A terminator is required at each end of the network to complete the system. Please carefully review the guidelines below before installing.

1. Network wires must remain in pairs.

The most important item to remember when installing a panther series network system is to keep the network wires as a pair; retaining a close proximity between the two conductors. A twisted pair is preferred, but not required. When using a terminal block, connect the wire pair to terminals directly next to each other. When passing through collector rings or other similar devices, use conductors that are next to each other.

2. Network spurs are not permitted.

A network pair from one unit to the next, or to a terminator, should contain only the two wires running directly between units with no spur routes or additional wires spliced into the run. The units in a network are connected in series. When retrofitting a panther series system into a previously installed wiring system, it is important to trace the wiring and confirm that no additional wires have been spliced into the intended network wires.

3. Identical wire treatment.

Both wires of a network pair should be treated identically. The wires should be of equal length and terminated in the same manner. If one wire is connected at a block or in-line splice, the other wire of the pair should be connected at the same point and in the same manner, keeping the wires close together. When retrofitting a system into a previously installed wiring system, it is important to trace the wiring and confirm that both conductors of the wire pair are of equal length and treated identically.

4. Avoid non-essential splices.

When possible, avoid splices on the network. When splices or termination is required, make sure both wires of the pair are treated identically.

5. Ground shields at one end only.

Cable shielding is recommended but not required. When using shielded cable, ground the shield at one end of the cable only.

6. Avoid bundling excess wire.

Excess network wire should be removed and not bundled. Sharp bends or kinks in network wire can be harmful. Typical minimum bend radius for network wiring is in the 2 to 3 inches range. See cable manufacturer for recommended minimum bend radius.

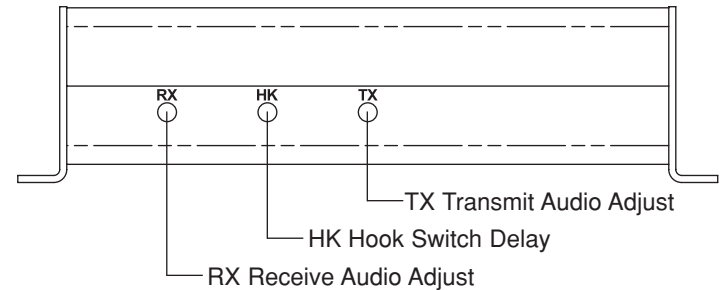
NETWORK CABLE INSTALLATION

7. **Avoid 3-phase power cables and fluorescent lights.**
Keep all network wires 1 foot away from 3-phase power and fluorescent lights.
8. **Impedance mismatches are harmful.**
The panther series network system is designed to handle imperfections, but repeated poor network treatment can cause communication failure. Every change in impedance along the network path causes a little degradation to the network. Minor impedance changes can be managed but large jumps in impedance or repeated changes can cause the system to not work correctly.
9. **Poor network wiring is accumulative.**
The panther series network system is designed to handle imperfections, but repeated poor network wiring treatment can cause communication failure. A network wiring problem that does not show up on a small system may cause a failure when additional units are added and the network is expanded. Whenever a system is modified, the entire network system should be reviewed per the above rules. Network runs can be several hundred feet when handled properly.
10. **Use Firecom 10 series headsets only.**
When using headsets with the panther series system, use Firecom's UH-10, UH-10S, FH-10, or FH-10S headsets. Headsets are ideal for troubleshooting in a high noise environment or enclosed building that can cause feedback between units.
11. **Continuity checks are not enough to verify network wiring.**
When troubleshooting a system or retrofitting using previously installed wiring, it is important to keep in mind that a continuity check is not a conclusive test of a network wire run. Each wire must have continuity, but that is not enough. Wiring must also follow the strict pairing rule outlined above.
12. **One network issue can affect everyone on the network.**
A poor network wire or network treatment can affect all units on the network, not just the unit closest to the problem.
13. **Bypassing a network wiring run is a quick way to isolate problems.**
Bypassing a suspected section of wire with an independent external network can often provide the fastest network wire test between units. When testing, make sure the suspect wiring is completely removed from the system. If the problem goes away after you have bypassed a section of network wire, then look for a wiring problem in that section.

DIRECT RADIO ADJUSTMENTS

When connecting a radio directly to the Analog Interface, it will be necessary to make some adjustments. Variable resistors, accessible through the side of the unit, may adjust the following.

Side View



Note: A qualified radio technician should perform these adjustments. Failure to perform these adjustments may cause problems when hearing and transmitting radio signals using the direct radio connection.

TX Transmit Audio Adjust

The transmit audio adjusts the gain of the audio broadcast through the radio. Adjust the radio transmit sound level with respect to other radio sound levels for quality audio mixing.

HK Hook Switch Delay

The Hook Switch is used by some radios to sense when the hand mic has been taken "off the hook." The hook switch is used for many different functions, including disabling a programmed or scanning function. If the radio is a multi-channel radio with a scanning mode, it may be necessary to make the proper hook switch connections and adjustments to the Analog Interface. A change to the radio programming may also be needed. The hook switch delay on the Analog Interface adjusts the delay time between pressing the PTT button on a headset and the keying of the radio. The minimum delay is 0.2 seconds and the maximum is 3.5 seconds. If it is not necessary for your radio to have a delay between pressing the PTT and keying the radio, make sure it is set to the minimum.

RX Receive Audio Adjust

The receive audio adjusts the gain of the audio received from the radio. Adjust the radio reception sound level with respect to other two-wire network sound levels for quality audio mixing.

TROUBLESHOOTING

When properly installed and powered, the Analog Interface unit will perform reliably and offer enhanced communications. If you believe the unit is malfunctioning, use the following troubleshooting information to locate the problem.

If the symptoms you are experiencing are not covered in this manual, or if you are having difficulty troubleshooting your system, contact your local Firecom dealer or sales representative for assistance.

Problem: Communications to or from the Analog Interface are not available.

- Check that the status light on the Analog Interface unit is on.

If status light is out:

- Check that the power connection is correct (see Wire Connections section of this manual).
- Check that the power to the Analog Interface is 12 to 24 vdc.
- Check to make sure that the network connection is correct (see Wire Connections and System Wiring sections of this manual).
- Check the terminator connections at both ends of the network and confirm that they are correct.

Problem: Communications to or from the Analog Interface are intermittent.

- Check to make sure that the network connection is correct (see Wire Connections and System Wiring sections of this manual).
- Check the terminator connections at both ends of the network and confirm that they are correct.
- Check the continuity of the network wires, including connectors and collector rings.

Problem: Sound from a Firecom 30xx series intercom cannot be heard.

- Confirm that the Firecom 30xx is operating properly (without the Analog Interface).
- Check the continuity of the CA cable and make sure the connections are correct (see Wire Connections and System Wiring sections of this manual).
- Check the orientation of the CA cable connectors (see Appendix A).

Problem: Sound to or from a radio is unacceptable.

If the radio is connected to a Firecom 30xx series intercom:

- Confirm that the Firecom 30xx is operating properly (without the Analog Interface).

TROUBLESHOOTING

- Check the continuity of the CA cable and make sure the connections are correct (see Wire Connections and System Wiring sections of this manual).
- Check the orientation of the CA cable connectors (see Appendix A).

If the radio is directly connected to the Analog Interface:

- Confirm that the radio is operating properly (without the Analog Interface).
- Check the radio interface cable and connections to make sure they are correct.
- Confirm that you have the right radio interface cable for your radio.
- Check the setting of the radio's volume control. The volume should be set at its normal setting without an intercom system present.
- Check the audio transmit adjustment (see Direct Radio Adjustments section of this manual). Too much gain may cause excessive background noise to be transmitted along with the voice.
- Check the receive audio adjustment (see Direct Radio Adjustments section of this manual).

Problem: The radio does not key.

- Check that the radio is capable of keying by itself.
- Check that the problem is not the headset by changing headsets.

Problem: Noise is introduced into the network when the Analog Interface is added.

- Check radio or intercom units plugged into the Analog Interface. Refer to their respective manuals for noise elimination.
- Check the Analog Interface network wires and terminator for proper installation (see Wire Connections section of this manual).
- Confirm proper TX and RX adjustments have been performed.

If one of the intercom units on a network is malfunctioning, refer to the troubleshooting section of its respective manual.

If a problem persists in the Analog Interface unit, contact Firecom and request an RMA number prior to returning the unit for replacement or repair.

Contact: Firecom
7340 SW Durham Road
Portland, OR 97224
USA
1-800-527-0555

OPTIONS & ACCESSORIES

Direct Radio Connection

There are numerous mobile radio interface cable assemblies available for different radio configurations. Contact your local Firecom dealer or Firecom sales representative for more information regarding an interface cable specific to your radio.

UH-10 P/N 105-0192-00

Under-helmet radio transmit headset. Adjustable volume, noise-canceling electret microphone, adjustable headstrap, flex-style boom rotates for left or right dress, comfortable liquid foam ear seals. 24dB NRR. (Red PTT located on dome.)

UH-10S P/N 105-0196-00

Under-helmet headset, one dome is slotted without a speaker. Radio transmit capable. Noise-canceling electret microphone, flex-style boom rotates for right or left dress. (Red PTT.)

Terminators, Standard P/N 108-0051-00

Network terminators used with panther series two-wire networks. Qty (2) per package.

Terminators, Deutsch Connector P/N 108-0052-00

Network terminators used with panther series two-wire networks incorporating Deutsch HD-10 style connectors. These terminators install into the unit's mating plug. Qty (2) per package.

HE-150 P/N 108-0675-15

15' coiled headset extension cable for use with any single-plug headset for greater mobility at pump panel position.

DR-1C P/N 108-0671-10

Dual radio selector switch allows you to monitor two radio channels at once, and transmit on either channel. Simultaneously provides continuous radio monitoring of two different inbound communication sources.

Network Cable

Part No. 108-0034-00 (50 feet)

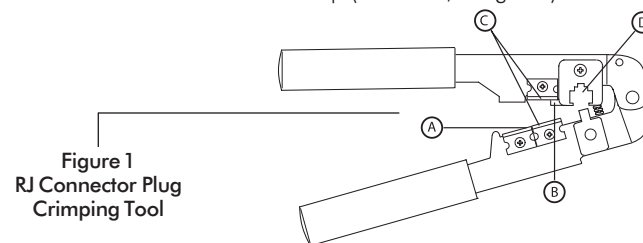
Two conductor, one twisted pair network cable for panther network systems.

APPENDIX A

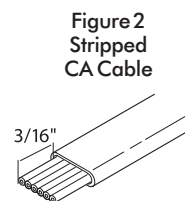
RJ Connector, 6 Position Plug Installation

To install the RJ 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).
6. Push a RJ 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.



Note: Always make sure the printed side of the cable is facing the release tab on the RJ connector plug (figure 3). This ensures proper orientation of the plug on each end of the cable.

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