Audio Failsafe

Model AFS-2

– INSTALLATION AND OPERATION –

This documentation is valid for
Audio Failsafe hardware version 1.00

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Section 1 — Safety Information

1.1 Safety Information

WARNING!

The AFS-2 Audio Failsafe should be installed only by qualified technical personnel. An attempt to install this device by a person who is not technically qualified could result in a hazardous condition to the installer or other personnel, and/or damage to the AFS-2 or other equipment. Please ensure that proper safety precautions have been made before installing this device.

The purchaser and user of the Sine Systems AFS-2 Audio Failsafe bears the sole responsibility for determining suitability of this equipment for their intended use.

The AFS-2, as any electronic device, can fail in unexpected ways and without warning. Do not use the AFS-2 in applications where a life-threatening condition could result if it were to fail. Sine Systems, Inc. cannot be held responsible for damages, either direct or indirect, resulting from use of this equipment.

Even though the AFS-2 is powered by 12 volts AC from a "wall plug" transformer, failure of this transformer could cause dangerous and potentially lethal voltages to become present. Only the supplied transformer should be used.

If the AFS-2 is connected so that loss of audio turns a transmitter off, the return of audio could turn a transmitter back on. Operating and maintenance personnel should be mindful of this possibility and be sure the transmitter is rendered inoperable before servicing the transmitter, antenna, or associated equipment.

The AFS-2 is designed for indoor use in a dry location. Installation and operation in other locations could be hazardous.

Section 2 — System Descriptions

2.1 General Description

The AFS-2 monitors one or two audio signals and provides a relay contact closure as long as at least one of the audio signals is present. When no audio is present for a preset period (adjustable from 7 seconds to 4.5 minutes), the relay contact opens and remains open until one or both of the audio signals return.

A typical application of the AFS-2 is to provide alternate control for a remotely controlled broadcast transmitter. When appropriately installed, the AFS-2 can be used to turn off a transmitter by silencing the audio feed to the transmitter. This procedure would normally be used only when the normal remote control device has failed.

2.2 Physical Description of the System

The AFS-2 is contained in a 19 inch wide rack mounted case, 1.75 inches high. The front panel contains indicator LED's and a switch to force closure of the relay contacts and defeat operation of the AFS-2. The rear panel contains "pluggable" screw-terminal connectors for connecting the audio inputs, power, and relay connections.

The audio sensitivity and relay timing of the AFS-2 are factory set to values which will be satisfactory for most applications. These values are easily adjusted. Instructions on how to accomplish this are located in the "Modifying Operating Parameters" paragraph in Section 5 of this manual.

2.3 Electrical Description of the System

2.3.1 Front-Panel Indicators

The front panel of the Audio Failsafe contains four LED indicators:

- "Power" illuminates when the AFS-2 has power
- "Audio Present" illuminates when the AFS-2 detects audio
- "Relay Closed" illuminates when the control relay activates
- "Enabled" illuminates when the Normal/Bypass switch is in the Normal position

2.3.2 Normal/Bypass Switch

The front panel of the Audio Failsafe contains a pushbutton switch. In the Normal position the switch allows the relay to follow the audio. When audio is present the relay closes (NO and C contacts are connected). When audio is absent for the preset delay period, the relay opens (NC and C contacts are connected). In the Defeat position, the NO and C contacts are closed by the switch effectively defeating the NO contact from breaking. However, in the Defeat position the NC contact still follows the normal audio switching of the relay.

Section 3 — Installation

WARNING!

The AFS-2 Audio Failsafe should be installed only by qualified technical personnel. An attempt to install this device by a person who is not technically qualified could result in a hazardous condition to the installer or other personnel, and/or damage to the AFS-2 or other equipment. Please ensure that proper safety precautions have been made before installing this device.

3.1 System Includes

The Audio Failsafe package contains these items:

- Audio Failsafe model AFS-2
- 12 volt AC wall-plug transformer
- Operation Manual

3.2 Installing the Unit

The Audio Failsafe is designed to be placed almost anywhere. It generates little heat and can be mounted in just about any convenient location where the ambient temperature does not exceed 120°F.

3.2.1 Screw-Terminal Connectors

All electrical connections to the Audio Failsafe are made with two jacks on the rear panel. Screw-terminal connectors for these jacks are supplied. Note that these can be removed from the panel by pulling them straight out. This makes wiring to these connectors considerably easier.

3.2.2 Power Supply Connection

The Audio Failsafe is powered by 12 volts AC. The included wall-plug power transformer should be used. The leads of this transformer should be stripped and connected to the terminals marked "12 VAC" on the rear panel of the AFS-2. If the supplied transformer is of the type that has a connector on the end of the cord, simply cut the connector off and discard it.

3.2.3 Audio Inputs

Audio connections are made to the AFS-2 through the screw-terminal connector on the left hand side of the rear panel. There is an "A" channel input and a "B" channel input. Either one or both channels may be used. If two stereo channels are fed to the inputs, note the polarity of the audio connections or cancellation of the signals will result in the AFS-2. If only one audio source is used, connect it to either input and leave the other input disconnected. The optional "G" terminal is connected to the internal circuit ground and it is not connected to the case.

Generally, the most desirable location to "tap" the audio signal for use by the AFS-2 is a point where the signal level is somewhere between 0 dBm and +10 dBm. This could be the output of a discrete STL, the output of audio processing equipment, or the transmitter's audio input terminals. Note should be made of installations using telephone lines for program audio sources. Since the audio level of incoming telephone lines is generally in the range of -30 dBm, the output of a processing device would be a good monitoring point in such installations. The audio input impedance of the AFS-2 is approximately 60 KΩ so bridging the AFS-2 across a program source usually has no significant effect.

After installing the AFS-2 be sure to test that the "Audio Present" LED does in fact go off if audio is lost. Otherwise the timing interval will never begin and the AFS-2 will not work as intended.

3.2.4 Relay Connection

The contacts of the internal relay are accessed by the terminals marked "RELAY" on the rear panel. When audio is present the NO and C terminals are connected and after an adjustable period of time without audio (7 seconds to 4.5 minutes) the NC and C terminals are connected.

WARNING!

Although the relay contacts are rated at 120 volts AC, it is not recommended that 120 volts AC be connected to the AFS-2. The screw-terminal connectors have several exposed points that could produce a dangerous or even lethal shock if they were contacted. Low voltage AC or DC is much safer and eliminates the potential for a shock hazard.

3.2.5 Loss of Power to the AFS-2

It should be noted that if power is lost to the AFS-2, the control relay will open. If it is necessary to disconnect power to the AFS-2 without opening the relay contacts, place the switch on the front panel in the "Defeat" position before disconnecting power. Note: This will connect all three relay terminals since there will be no power to the unit.

3.2.6 Safety Considerations

If the AFS-2 is connected so that loss of audio turns a transmitter off, the return of audio could turn a transmitter back on. Operating and maintenance personnel should be mindful of this possibility and be sure the transmitter is rendered inoperable before maintenance is begun on the transmitter, antenna, or associated equipment.

3.2.7 Adjusting the Delay

The AFS-2 operating parameters can easily be modified to suit special applications. The period of time required after the loss of audio before the relay contact opens is set at the factory to approximately 4.5 minutes. This can be adjusted with the 22 turn potentiometer located on the AFS-2 main board. The adjustment range is approximately 7 seconds to 4.5 minutes.

Section 4 — Circuit Description and Repair

4.1 Circuit Description

The first two sections of U1 are balanced audio input stages of the "A" and "B" audio inputs. Overall, these have a gain of 0.33 (loss). The next stage combines the two channels and has a gain of 10. Capacitors C1 through C12 provide high frequency roll-off and RFI immunity. A rectifier, short term integrator (about 1 second), and comparator follow. When audio is present, the "Audio" LED is turned on by this comparator. R8 and C14 form the network which determines the timing interval. The following comparator drives the output relay and the "Relay Closed" LED.

The 12VAC input is rectified and filtered by BR1, VR1, and C15 to produce 18VDC unregulated output. R9 provides a low impedance "mid-point" connection for the various circuit elements.

4.2 Factory Service Policy

These policies are effective August 1999 and are subject to change without prior notice.

4.2.1 Factory Warranty

Sine Systems, Inc. guarantees our products to be free from manufacturing defect for a period of one year from the original date of purchase from Sine Systems, Inc. This warranty covers the parts and labor necessary to repair the product to factory specifications. This warranty does not cover damage by lightning, normal wear, misuse, neglect, improper installation, failure to follow instructions, accidents, alterations, unauthorized repair, damage during transit, fire, flood, tornado, hurricane or acts of God and/or nature.

4.2.2 Factory Return Policy

The factory return policy only applies to equipment purchased directly from Sine Systems, Inc. Equipment purchased through a third party (dealer) is subject to the return policy of the dealer and arrangements for return or exchange must be handled through the dealer.

Sine Systems policy on returns and exchanges with the factory is broken down according to the following schedule:

30 days “no questions asked”

During the first thirty days from the date that equipment ships from our factory we will accept it back for a full refund less shipping charges provided that the equipment is still in new, resellable condition with no cosmetic damage. This does not constitute an evaluation program. It is for legitimate purchases only.

less than 60 days, may be returned less 15% restocking fee

Between 31 and 60 days from the time we ship the equipment, we will accept unmodified equipment back for a refund less shipping charges and 15% of the invoice cost. This is to cover the cost of restocking the items which must then be sold at a discount as reconditioned instead of new.

no return after 60 days

We will recondition the equipment for you according to our repair rates but we will not accept it for refund or exchange after 60 days from the initial purchase.

4.2.3 Factory Service Policy

Sine Systems is proud to offer same day repair service on all of our products. When we receive damaged equipment, we will repair it and ship it back the same day it arrives. Because we offer immediate service, we do not send loaner equipment. If we cannot immediately repair equipment and return it, we may ship a loaner unit at our discretion.

While we do not require prior authorization on repairs, we suggest that you verify our shipping address before returning equipment for repair. Sine Systems is not responsible for items lost in transport or delivered to the wrong address. Emergency service may be made available on weekends or holidays, at our discretion, if arrangements are made with us in advance.

4.2.4 Warranty Service

There is no charge for repair service on items covered under warranty. You are responsible for shipping charges to return damaged equipment to us for repair. Damage due to negligence, lightning or other acts of nature are not covered under warranty.

4.2.5 Service Rates

For service not covered under warranty we have a flat rate repair fee. Flat rate repairs cover only components that fail electrically. Mechanical damage will be assessed on a per repair basis. Repair charges typically fall into one of these categories. Shipping fees are not covered in the repair rate.

Minor programming adjustments or no damage, $50 plus shipping

Sometimes a system works exactly like it is supposed to when we get it or it can be fixed through a simple adjustment in firmware. We will do our best to identify intermittent hardware problems and correct them. The fee covers the time it takes our technician to thoroughly inspect and test the equipment.

Minor repairs are up to $150 plus shipping

Five or fewer defective components are replaced in a minor to moderate repair. This accounts for most of our repairs. These repairs may cost less depending on the components replaced and the amount of time required to complete the repair.

Moderate repairs are $250 plus shipping

Six to ten defective components are replaced in a major repair. Again, we may charge less depending on the components replaced and the amount of time required to complete repairs.

Major repairs cost more than $250 plus shipping

This occurs rarely but it can happen. If the equipment has blown traces and scorch marks from burned components, it's a safe bet that it will take several components and quite a bit of bench time to repair. We assess this type of repair on a per incident basis.

Damaged beyond recognition, assessed on a per case basis

Hopefully you have insurance. In cases where the board is so badly damaged that it is not worth repairing we may, at our discretion, offer to replace the destroyed circuit board. The options and costs vary widely in these cases so we will call with options.

Section 5 — Specifications

5.1 General

Operation Output relay contact closes (NO and C connected) within one second after audio becomes present and remains closed as long as audio is present. Output relay contact opens (NC and C connected) at the end of an adjustable delay period after audio becomes absent.

Delay Range 7 seconds to approximately 4.5 minutes (factory adjusted to highest setting)

Indicators Power (Green LED)
Audio Present (Green LED)
Relay Closed (Green LED)
Enabled (Red LED)

Ports Power/Output
Audio In

Switches In the Normal (out) position it allows the relay to switch according to the audio. In the Defeat (in) position it connects the NO and C terminals.

Power 12 Volts AC, 0.55 amps

Dimensions 19” (w) x 6.5” (d) x 1.75” (h)

Weight 1.5 lbs.

5.2 Audio Input

Inputs 2
Type Actively Balanced
Impedance 60 K Ohms
Sensitivity -16 dBv

5.3 Relay Output

Contacts Form C contacts rated at 120 volts AC, 5 amps resistive / 2 amps inductive