



## *Installation and Operation Manual*



### **VAD - 2 Plus** ***Voice/Pager Alarm Auto Dialer*** **with Dual Status Inputs, Integrated Stereo Silence Sensor, Temperature Sensor and Power Failure Input**

Firmware version 1.16 and above

Manual update 07/13/2011

Due to the dynamic nature of product design, the information contained in this document is subject to change without notice. Broadcast Tools, Inc., assumes no responsibility for errors and/or omissions contained in this document. Revisions of this information or new editions may be issued to incorporate such changes.

*Broadcast Tools® is a registered trademark of Broadcast Tools, Inc.  
tiny TOOLS™ is a trademark of Broadcast Tools, Inc.  
All Sentinel® labeled products are registered trademarks of Broadcast Tools, Inc.  
Copyright® 1989 - 2011 by Broadcast Tools, Inc. All rights reserved.  
No part of this document may be reproduced or distributed without permission.*

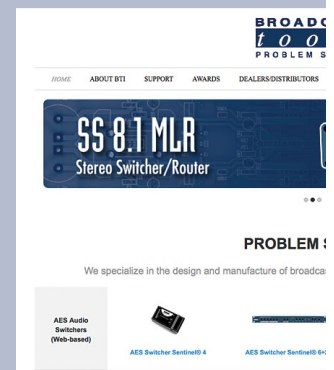
Visit [www.broadcasttools.com](http://www.broadcasttools.com) for important product update information.

## Table of Contents

Section Title	Page #
Introduction . . . . .	3
Safety Information . . . . .	3
Who to Contact for Help . . . . .	3
Product Description . . . . .	4
Applications . . . . .	5
Inspection . . . . .	5
Programming . . . . .	5
Data setup . . . . .	6
Recording voice messages . . . . .	8
Restoring factory defaults . . . . .	9
DIP switch set-up . . . . .	9
Installation . . . . .	10
Connecting you equipment . . . . .	10
Status inputs . . . . .	10
Silence sensor inputs . . . . .	10
Power failure input . . . . .	11
Temperature probe . . . . .	11
External power supply output . . . . .	11
Relays . . . . .	11
Telco “Caller” audio output . . . . .	11
Power supply input . . . . .	11
Telephone line RJ111 jack . . . . .	11
DTMF guard time setting . . . . .	11
Unit mounting . . . . .	11
Operation . . . . .	12
Voice dialing . . . . .	12
Alarms . . . . .	12
Control codes . . . . .	13
Status led descriptions . . . . .	14
Specifications . . . . .	15
Warranty . . . . .	16
Front and Rear Panel Labels . . . . .	Appendix
Programming Examples . . . . .	Appendix
Connection Suggestion . . . . .	Appendix
Usage Example . . . . .	Appendix

### WEBSITE:

*Visit our web site for  
product updates and  
additional information*



### INDEX

## INTRODUCTION

Thank you for your purchase of the tiny TOOLS™ VAD-2 Plus, Voice/Pager Alarm Auto Dialer with Integrated Stereo Silence Sensor, which we will refer to through out the manual as the VAD-2 Plus. We're confident this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the product.

## SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

Broadcast Tools, Inc., will NOT support NON-Broadcast Tools software or hardware or NON-Broadcast Tools computer or hardware/software problems. If you experience these problems, please research your hardware/software instruction manuals or contact the manufacturers technical support department.

## WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

### **Broadcast Tools, Inc.**

131 State Street

Sedro-Woolley, WA 98284 USA

Voice: 360.854.9559

Fax: 866.783.1742

Internet Home Page: [www.broadcasttools.com](http://www.broadcasttools.com)

E-mail: [support@broadcasttools.com](mailto:support@broadcasttools.com)

**THANK YOU FOR CHOOSING  
BROADCAST TOOLS® BRAND PRODUCTS!**

Broadcast Tools is a Veteran Owned Business



Designed, Assembled and Supported in WA State, USA



**Broadcast Tools®** Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.



This manual should be read thoroughly before installation and operation.

### Product Description

The tiny TOOLS™ VAD-2 Plus is a user programmable dual status input multi-number voice/pager auto dialer with integrated stereo silence sensor, temperature sensor and power failure port designed for dial out paging and/or voice message notification. The VAD-2 Plus is equipped with two optically isolated status inputs, temperature sensor port, power failure input and stereo silence sensor, which when tripped, will sequentially dial a pager and/or up to four different phone numbers and play back a user recorded message corresponding to the tripped input. The VAD-2 Plus is also provided with two SPDT one amp relays for the control of external equipment.

The VAD-2 Plus can store up to four 32 digit phone numbers and one 32 digit pager phone number which may be associated with any or all of the five mixed inputs.

The VAD-2 Plus is capable of remote or local configuration and message recording. The two SPDT relays may be programmed for momentary, latching or tone duration operation.

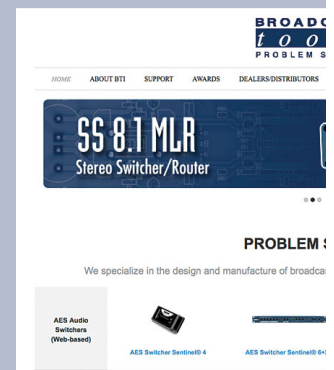
\* An additional feature of relay K2, is the ability to be programmed for normal operation or configured to close when an alarm is activated.

### Features

- Two user programmable wet or dry optically isolated status inputs.
- Optional Fahrenheit/Celsius temperature sensor probe
- Stereo Silence Sensor with remote telco audio monitoring.
- Two SPDT one amp relays with momentary, latching or tone duration operation.
- Power failure alarm input port.
- Balanced telco caller output port
- Independent regulated five volt power supply to drive user supplied external devices
- Local and remote programming and recording. The VAD-2 Plus is supplied with spoken words and phases in English, while the user is free to record words and phases in their language.
- Front panel LED indicators for most operational activities
- Front panel program switch with LED indicator
- Front panel RJ-11 TT telephone jack used for programming and user voice response recording
- Remote security and program access codes.
- Stores up to four 32-digit phone numbers and one 32-digit pager number with up to 16 digits of pager data.
- Pager compatible
- CPC (WINK/COD) detection
- Non-Volatile Memory
- User programmable message repeat and global lap counter
- User programmable ring delay
- Phone line and power supply with built-in surge protection
- 120 VAC (optional 220V CE) wall transformer
- Plug-in euroblock screw terminals for status inputs, relays, power failure input, external 5 volt regulated supply, telco audio balanced output and stereo unbalanced silence sensor inputs.

### WEBSITE:

*Visit our web site for product updates and additional information*



### DESCRIPTION

### Applications

Silence Monitor III. DMS III and/or LOV II alarm notification, Tower Light malfunction and/or operation, Transmitter, Translator and/or LPFM site and Studio security/burglar/fire/equipment alarm notification, Inexpensive remote control system and/or remote reset (ac power reboot) of file servers, computers, etc. Back-up program switching with optional customized firmware and hardware.

### Inspection

Please examine your VAD-2 Plus carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package should contain the VAD-2 Plus, this manual, 7 foot modular telephone cable and the 12 VAC @ 500 ma or 1 amp wall transformer.

### Programming

The VAD-2 Plus can be programmed either locally using the front panel recessed PGM button or remotely using the program access code. To program locally, please following the steps below:

- 1 - Locate the front panel modular RJ-11 jack labeled "Phone Pgm" and plug in a standard TT telephone
- 2 - Press the recessed front panel "PGM" button; the front panel "PGM" led will illuminate.
- 3 - Enter the command code of the desired operation, followed by the data to be stored or the message to be recorded. Note: Refer to pages 6 through 9
- 4 After entering the data or recording voice messages, press the recessed front panel "PGM" button to exit programming mode. The "PGM" led should extinguish.

When programming remotely, you must call the VAD-2 Plus and enter the access code. If you call and enter the un-lock security code, you cannot then enter the access code and perform programming functions. Terminate each item programmed with the "#" (pound) key. The access code can only be entered when the VAD-2 Plus is in a locked condition, and only programming can be done. You must hang up to exit program mode. Multiple parameters and voice messages can be programmed remotely in one session.

The following is a list of data items that can be programmed along with the 2 digit programming code and the maximum number of digits that can be entered, along with the factory default data. To program any of these items, press the program button, enter the two-digit address, followed by the data. If you enter more than the maximum allowed, the excess characters will be ignored.

### Programming



<u>Item</u>	<u>Address</u>	<u>Max Digits</u>	<u>Default</u>
-------------	----------------	-------------------	----------------

Dial Out Phone Number	11	32	8549559
-----------------------	----	----	---------

**Example: 1113608549559**

Dial Out Phone Number 2	12	32	Empty
-------------------------	----	----	-------

Dial Out Phone Number 3	13	32	Empty
-------------------------	----	----	-------

Dial Out Phone Number 4	14	32	Empty
-------------------------	----	----	-------

Pager Dial Out Phone Number	15	32	Empty
-----------------------------	----	----	-------

Pager Data	16	16	Empty
------------	----	----	-------

**Example: 163605551212 (This may be the phone number where the VAD-2 Plus is located)?**

**NOTE:** You can use the # (pound) key as a 3 second wait. Pager data will be sent immediately after the pager number is dialed out.

<b>Security (Un-Lock) Code</b>	21	16	123
--------------------------------	----	----	-----

The code used to un-lock the VAD-2 Plus for control and polling.

<b>Access Code</b>	22	16	456
--------------------	----	----	-----

The code used to enter the remote programming mode. You must call the VAD-2 Plus and enter the remote access code.

**Dial List** is a list of the Dial-out phone numbers that will be dialed for a particular alarm. The numbers correspond to the dial-out address, i.e. 1 = dial-out 1, 2 = dial out 2, etc, with 5 being the pager dial out number. Pager data will automatically be appended to the pager dial out number. There are dial lists for input 1, input 2, Silence monitor, Power fail monitor and over/under temperature monitor.

Input 1 Dial List	23	5	1
-------------------	----	---	---

**Example: 23514 (When input 1 changes state, the VAD-2 Plus will dial the pager number stored in location 15 followed by the paging data stored in 16, then dial out in sequence the phone number stored in location 11, then location 14)**

Input 2 Dial List	24	5	1
-------------------	----	---	---

Input 3 SS (Silence Sensor) Dial List	25	5	1
---------------------------------------	----	---	---

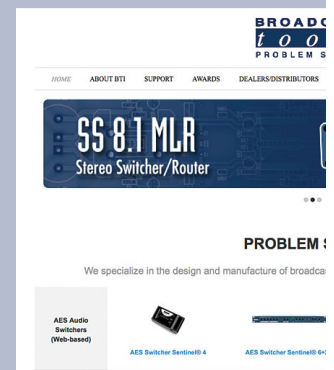
Input 4 PF (Power Failure) Dial List	26	5	1
--------------------------------------	----	---	---

Temperature 5 Dial List	27	5	1
-------------------------	----	---	---

<u>Item</u>	<u>Address</u>	<u>Max Digits</u>	<u>Default</u>
-------------	----------------	-------------------	----------------

## WEBSITE:

*Visit our web site for product updates and additional information*



## PROGRAMMING

## Temperature Alarm High Set Point 28 4 0100

Example: High set point consists of a 4-digit number. The first digit tells the VAD-2 Plus if the set point is expressed in degrees Fahrenheit or Celsius. If it is "0", then degrees in Fahrenheit is assumed. Use a "1" to enter degrees Celsius. For example, to enter a set point of 95 degrees Fahrenheit, enter 0095. To enter a set point of 36 degrees C, enter 1036.

## Temperature Alarm Low Set Point 29 4 0032

Example: Low set point consists of a 4-digit number. The first digit tells the VAD-2 Plus if the set point is expressed in degrees Fahrenheit or Celsius. If it is "0", then degrees in Fahrenheit is assumed. Use a "1" to enter degrees Celsius. For example, to enter a low set point of 0 (max low) degrees Fahrenheit, enter 0000. To enter a low set point of 0 (max low) degrees C, enter 1000.

## Ring Count 30 1 2

The number of rings from 1 to 9 before the VAD-2 Plus answers an incoming call.

**Note:** Entering a ZERO disables the auto answer feature.

## Silence Sensor Delay Timer 31 1 3

The delay time is programmed with a value of 1 to 9 with values as follows: 1 = 10 secs, 2 = 30 secs, 3 = 60 secs, 4 = 90 secs, 5 = 2 mins, 6 = 2.5 mins, 7 = 3 mins, 8 = 4 mins and 9 = 5 mins.

## Power Fail Delay Timer 32 1 3

The delay time is programmed in 10 second increments with a value between 1 and 9. Example, 1 = 10 seconds of delay before a power failure alarm is generated.

## Hang Up Timer 33 1 2

The value refers to the number of minutes the VAD-2 Plus will remain off-hook after answering the call before hanging up automatically. Normally a CPC signal is sent from the Telco central office to signal it to hang up. If you are connected to a standard phone line, you can set the HU to 0 and it will remain off-hook until the CPC signal is received. If the VAD-2 Plus is connected to a PBX system that does not pass the CPC signal, then a value of 1 to 9 minutes should be set into HU to keep it from remaining off hook and constantly causing a busy signal when called. The HU timer will be reset each time a valid DTMF is decoded when off-hook. Once there is no more activity, it will time out after the HU time value and force a hang-up.

Input 1 Enable	34	1	1
Input 2 Enable	35	1	1
Silence Sensor Alarm Enable	36	1	0
Power Fail Alarm Enable	37	1	0
Temperature Enable	38	1	0
<b>Item</b>	<b>Address</b>	<b>Max Digits</b>	<b>Default</b>

**Repeat Count** 39 1 3  
The number of times a call-out alarm voice message will be repeated.

**Input 1 NO / NC** 40 1 0

**Input 2 NO / NC** 41 1 0  
Sets the status inputs for Normally Open or Normally Closed. Use a "0" for NO and a "1" for NC.

**Lap** 42 1 2  
The number of times a call-out will be attempted without getting an acknowledgment.

## Recording Voice Messages

Press the program button followed by the 2-digit address of the voice message to be recorded. Record the new message using the programming phone. When done, press the PGM button again or wait for the time-out. When recording remotely, you must first dial in and enter the remote access code. The VAD-2 Plus will then go into program mode. Terminate each enter with the # (pound) key or wait for the time out.

Message	Address	Record Time
0	50	2.5
1	51	2.5
2	52	2.5
3	53	2.5
4	54	2.5
5	55	2.5
6	56	2.5
7	57	2.5
8	58	2.5
9	59	2.5
Temperature	60	2.5
Degrees Celsius	61	2.5
Degrees Fahrenheit	62	2.5
Input1 Description	63	10
Input 2 Description	64	10
Input 3 (Silence Sensor) Description	65	10
Input 4 PF (Power Failure) Description	66	10
Temperature Alarm Description	67	10
Greeting Message	68	10
Call out ID message	69	10
ON	70	2.5
Message	Address	Record Time
OFF	71	2.5
Enabled	72	2.5



Disabled	73	2.5
Relay 1	74	5
Relay 2	75	5
Remote Program enabled	76	10
Access Accepted	77	5
Minus	78	2.5

The “Call out ID” message is used to identify the source of an alarm call-out, for example, WXYZ will be played prior to “Input 1 Alarm” being spoken.

### Restoring to factory defaults:

Remove the power plug. Hold in the recessed front panel “PGM” button. Plug in the power connector and then release the “PGM” button a second or two later. You will hear 4 beeps in the programming telephone indicating the defaults have been restored.

**NOTE: Factory recorded voice responses are not restored.**

### DIP switch setup

DIP 1 – OFF = Normal operation

DIP 1 - ON = BOTT mode. The BOTT function can be activated either by using input 1 or with the silent sensor, but not both at the same time. If the Silent Sensor is enabled, then input 1 will be ignored. If the Silent Sensor is disabled then when input 1 closes, the VAD-2 Plus will dial out the number assigned to the Dial List 1 location. If the input remains closed for 15 seconds, relay 1 will close and caller audio output will be turned on. If input 1 opens for 1 minute, then the VAD-2 Plus will hang up, open relay 1 and turns off the caller audio output. If the telco line is lost due to a CPC event, then the VAD-2 Plus will hang up and repeat the dial out process if input 1 is still closed.

If the Silent Sensor is enabled and DIP-1 is ON and program audio is lost for the programmed time period, then the VAD-2 Plus will dial out the number located in Dial List 1, turn on both relay 1 and caller output. If program audio is restored, then the VAD-2 Plus will hang up, turn OFF Relay 1 and the caller audio output

DIP 2 – OFF = Degrees Fahrenheit / ON = Degrees Celsius for polling only. Temperature set points are determined by program entries 28 and/or 29.

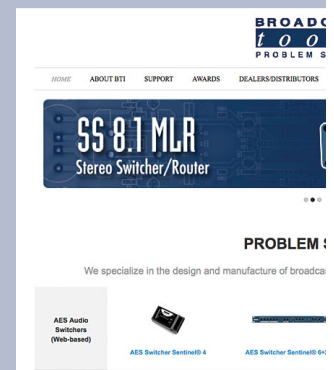
DIP 3 – OFF = Normal relay operation for K1 & K2 / ON = K2 closes on all alarms

DIP 4 thru 7 = Feature creep

DIP 8 – OFF = Alarms enabled / ON = Alarms disabled

### WEBSITE:

*Visit our web site for product updates and additional information*



### Installation

Installation of the VAD-2 Plus in high RF environments should be performed with care. Shielded cable is suggested for all control and audio I/O. All shields and station ground should be tied to the “Chs Gnd” terminal. It is recommended that all cables connected to the VAD-2 Plus be looped through ferrite cores to suppress RF. Surge protection with RF filtering such as the Tripp Lite “ISOBAR 4 or 6” is also suggested for the wall transformer. The purchase of an inexpensive UPS will provide back-up power in case of a power outage.

### Connecting your equipment:

The VAD-2 Plus interfaces to your equipment through the rear panel plug-in euroblock screw terminals. Follow the chassis labels for the desired temp probe, power failure input, relays, inputs and audio connections. Remove about 1/8” of insulation, insert the wires into the plugs, and tighten the screws. Be certain that no bare wires are exposed. The terminals accommodate wire sizes from 18 - 28 AWG solid or stranded wire.

### Status Inputs:

Each status inputs can be configured to accept either a contact closure (dry, default) or a (wet). Each input is equipped with a four-position header. The IN-1 jumpers support status input one, while IN-2 supports status input two. Each input is labeled IN-x (where x is the status input) and the header pins are labeled from left to right 1,2,3,4 as viewed from the rear. The factory default is for a DRY input (switch, relay contact) with jumpers between 1 & 2 and 3 & 4. Attach your dry contacts to the desired status channels StxA and STxB (where x is the status input) terminals.

**Note: In the dry configuration, the “A” terminal is ground while the “B” terminal is the cathode of the opto diode (pulled up to 5 volt through 2.2K resistor). To change the status input to WET (with user supplied voltage between 5 and 24vdc and may be increased with a user provided external resistor), remove both jumpers and place ONE jumper over pins 2 & 3. Connect the positive voltage to terminal “A” (anode) and ground or minus voltage to terminal “B”(cathode).**

**NOTE: Please observe proper polarity.**

### Silence Sensor inputs:

The stereo 10 k ohm unbalanced inputs are summed together and monitored for silence. BOTH channels MUST go silent to trip an alarm. The alarm threshold is set at -20dBu. Connect your unbalanced source equipment to either or both inputs (SSL) and/or (SSR) and tie the ground to the GND terminal. If your source equipment is balanced, use the “+” and GND terminal from the source. Your source equipments “-” (negative) terminal should never be grounded. Shields should be tied to the “Chs Gnd” terminal.

The SS LED is illuminated when you have audio applied to the inputs. When the SS is in an alarm condition, the SS LED will flash. **NOTE:** The SS led will be extinguished with no audio input. The time delay is user programmable for 10, 30, 60 (seconds) 1.5, 2, 2.5, 3, 4, & 5 minutes. Factory default is (0) OFF.

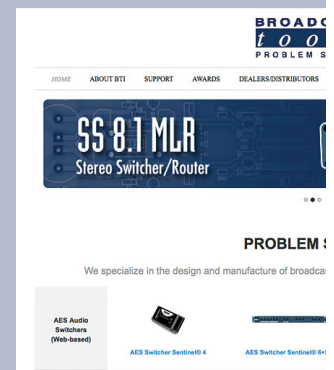


### CAUTION!

Some features may require the removing of the chassis cover. Caution should be observed. Hazardous voltages may be present on the printed circuit board!

### WEBSITE:

*Visit our web site for product updates and additional information*



### INSTALLATION

### Power Failure input:

Connect a user supplied 6 to 12 volts DC only power source to the power failure input connector labeled PF+ and PF-. An inexpensive 6 to 12 volt DC wall transformer of any current of 50ma or more will do. **NOTE:** The primary (120vac) of the wall transformer should be connected to the utility company side of your service. An UPS is suggested to power the VAD-2 Plus during power outages.

### Temperature Probe (optional):

Insert the temperature probes (25 foot cable) mini (3.5mm) plug in to the left rear panel jack labeled "TEMP" (0°F to +190°F (0°C to +85°C)). **NOTE:** Please limit the total length of cable to 50 feet. **NOTE: The Probe should only be installed or removed with power disconnected from the VAD-2 Plus.**

### External five volt supply

Used to supply power to external equipment between this terminal and ground. Limit load to 100 ma **MAX.**

### Relays:

Connection for relay one is between the **K1NO, K1NC and K1CM** terminals. Relay two is between terminals **K2NO, K2NC and K2CM**. Limit contact current to 1 amp at 30 vdc.

**! Note: For safety, never connect 120 Vac circuits to these relays!**

### Telephone "CALLER" line output:

Balanced CALLER telephone line audio output is available between the CLR- and CLR+ terminals. For unbalanced loads, use the "CLR +" and GND terminals only. **Do not connect the "CLR -" terminal to ground.** Shields should be tied to the "Chs Gnd" terminal.

### PWR (Power):

The 12 VAC wall power supply is connected to the 2.1mm coaxial connector.

### Telephone Line RJ-11 Jack:

Connect your central office "Loop Start" ONLY POTS line here. **This line SHOULD be equipped with CPC (Calling Party Control, WINK or COD) to function properly.**

### Guard Time Setting:

This feature allows you to set how fast the DTMF tones are detected. JP3 header selections:

**Fast – 50 ms                      Medium – 100 ms(default)                      Slow – 150 ms**

**Note:** JP 3 can be found inside the VAD-2 Plus near the center cover screw hole.

### Mounting:

The VAD-2 Plus may be set on a desktop, mounted on a wall or as part of the new RA-1 mounting shelf. Up to four units may be installed on one RA-1. Filler panels are provided. RA-1 (filler panel is provided).

## Operation

### Voice Dialing:

When any of the five inputs (status input one, status input two, silence sensor, temperature sensor or power failure), if enabled have been triggered for the programmed debounce (delay) time, the VAD-2 Plus will begin dialing the first telephone number programmed for that input.

Five seconds after dialing a telephone number, the VAD-2 Plus will begin repeating the recorded message associated with the tripped input. The message will be repeated for the number stored in the “repeat” count location.

After speaking a greeting message that may identify the source of the call, the VAD-2 Plus then speaks a unique message for each input. Each message comes factory programmed, but may easily be re-recorded locally or remotely with your own customized messages.

The alarm message will be played the number of times that is programmed into the “repeat” memory. If there isn’t a user entered (\*) (asterisk) acknowledgment, the VAD-2 Plus will go on to the next number and so on until all numbers stored in the alarming input’s dial list have been called. This process will then be repeated for the number of times stored in the “lap” memory. The lap and repeat memories are global for ALL inputs.

After reporting, the VAD-2 Plus is ready to receive commands after the security (un-lock) code is entered through your telephone keypad. Functions include telling the VAD-2 Plus to report on the input state of any of the five inputs, commanding the VAD-2 Plus to pulse any one of its two SPDT relays for 1 second and/or turning any one of the relays on or off. When a relay command is given, the VAD-2 Plus will speak the condition of the relay(s).

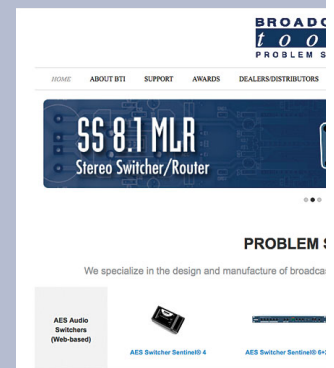
In addition to initiating a call out when any input changes, the VAD-2 Plus monitors its telephone line to receive a call-in from a remote location. When a call is received, the VAD-2 Plus speaks a greeting message, and is then ready to receive the security (un-lock) code and execute commands to report on inputs, or changes to the two relays.

### Alarms:

When an alarm is generated, the VAD-2 Plus will call the first number on the call out list, play the message and wait for a DTMF (\*) (asterisk) as an acknowledgment. If no (\*) (asterisk) is received, it will hang up and call the other numbers on the calling list. Once an alarm has been acknowledged it will beep and remain off hook for relay control or input/output polling. If another alarm is generated while it is off hook, the VAD-2 Plus will wait until the current session is finished, disconnect, then dial out the new alarm. The call will be disconnected after the calling party hangs up and the CPC (wink) is received from the central office or will hang up after pre-programmed minutes of inactivity.

### WEBSITE:

*Visit our web site for product updates and additional information*



### Control Codes

All Control codes are two digits long and will be active after the VAD-2 Plus has received its security (un-lock) code.

Code	Function
03	Caller out Audio ON
04	Caller out Audio OFF
07	Silence Sensor Audio to telco ON
08	Silence Sensor Audio to telco OFF
11	Enable Input 1 alarm
12	Disable Input 1 alarm
13	Poll Input 1 Enable status
17	Poll Input 1 State status
18	Poll Relay 1
19	Steady Relay output (for duration of DTMF tone)
10	Relay 1 – 1-second pulse
1*	Relay 1 latched
1#	Relay 1 un-latched
21	Enable Input 2 alarm
22	Disable Input 2 alarm
23	Poll Input 2 Enable Status
27	Poll Input 2 State Status
28	Poll Relay 2
29	Steady Relay output (for duration of DTMF tone)
20	Relay 2 – 1-second pulse
2*	Relay 2 latched
2#	Relay 2 un-latched
31	Enable Silence Sensor Alarm
32	Disable Silence Sensor Alarm
33	Poll Enable State of Silence Sensor Alarm
37	Poll Silence Sensor Alarm Input
41	Enable Power Fail Alarm
42	Disable Power Fail Alarm
43	Poll Enable State of Power Fail Alarm
47	Poll Power Fail Alarm
51	Enable Temperature Alarm
52	Disable Temperature Alarm
53	Poll Enable State of Temperature Alarm
57	Poll Current Temperature
90	Speak Firmware Version number
99	Force Manual Hang up

### Status LED descriptions:

**SS** led ON with valid audio.

**SS** led OFF with NO audio.

**SS** led flashes if enabled and in an alarm condition.

**Pwr** led ON if powered.

**Pwr** led flashes if PF is enabled and in an alarm condition.

**Pwr** led OFF during a valid DTMF tone.

**Pwr** led OFF in voice record mode.

**Hook** led ON when in an off-hook condition.

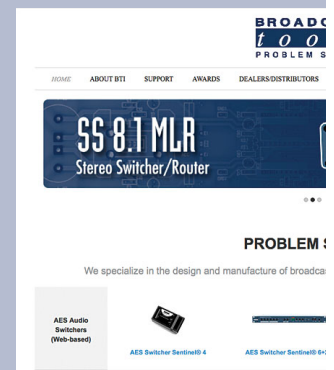
**K1** led ON when K1 is closed or energized.

**K2** led ON when K2 is closed or energized.

**PGM** led ON when in programming mode.

### WEBSITE:

*Visit our web site for  
product updates and  
additional information*



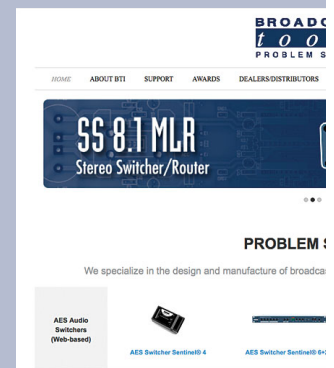


### Specifications

Control Logic:	Flash Microprocessor with non-volatile memory
Relays:	Two – SPDT Contacts, 30 Vdc @ 1 Amp.
<b>CAUTION! For safety, never connect 120 Vac circuits to these relays!</b>	
Status inputs:	Optically Isolated, RFI protection. Internal jumper for (wet) external 5 to 24 VDC (higher voltages with external resistor) or internal 5 VDC source (dry). Open collector, contact closures to ground or external source.
Power Failure Input:	5 to 12 volts DC at 6 ma (user supplied).
Temperature Sensor (optional):	Sensor with 25-foot cable and 3.5mm T/R/S plug. -40°F to +190°F (-40°C to +85°C)
Stereo Silence Sensor:	Stereo unbalanced 10K ohm inputs. Trip level -20dBu. Silence sensor level to Telco adjustable.
Balanced caller audio output:	0 dbu @ 100 ohms. Gain may be changed to increase output.
Telephone Line Connector:	RJ-11. Cable supplied. Fused and surge protected
Program TT Phone Connector:	RJ-11. Talk battery provided.
Connectors:	Plug-in euroblock screw terminals for status inputs, relays, power failure input, external 5 volt regulated power output, balanced telco audio output and stereo unbalanced silence sensor inputs.
FCC Information:	Complies with FCC parts 15 & 68.
Power:	12 Vac @ 1 amp. 2.1mm coaxial jack. Surge protected. 120 vac 60Hz wall transformer supplied.
External Power output:	Regulated 5 volt DC@100ma Max.
Size:	4.20" x 6.00" x 1.55", Painted chassis w/ 4 – 6-32 mounting holes
Weight:	2.0 lb.
Options:	RA-1, Rack Shelf. 1 RU. (Holds four VAD-2 Pluses). CE 220 Vac Wall transformer. TempSensor, Temperature Sensor.

### WEBSITE:

*Visit our web site for product updates and additional information*



### SPECIFICATIONS

### **LIMITED WARRANTY**

The term "Buyer" as used in this document refers to and includes both (but only) (a) any person or entity who acquires such an item for the purpose of resale to others (i.e., a dealer or distributor of an item), and (b) the first person or entity who acquires such an item for such person's or entity's own use.

Broadcast Tools warrants to each Buyer of any item manufactured by Broadcast Tools that the item will be free from defects in materials and workmanship at the time it is shipped by Broadcast Tools if the item is properly installed, used and maintained.

### **EXCLUSIVE REMEDIES**

If Broadcast Tools is notified, in writing, of a failure of any item manufactured by Broadcast Tools to conform to the foregoing Limited Warranty within one (1) year following the date of the Buyer's acquisition of the item, and if the item is returned to Broadcast Tools in accordance with Broadcast Tools' instructions for confirmation by inspection of the defect (which at Broadcast Tools' election may include, without limitation, a requirement that the Buyer first obtain a Return Authorization number from Broadcast Tools, that the Buyer furnish proof of purchase in the form of an invoice and/or receipt, and that the Buyer prepay all freight charges associated with any return of the item to Broadcast Tools using such freight service as Broadcast Tools reasonably may specify), Broadcast Tools will repair or replace the defective item, or will refund the purchase price paid by the Buyer for the item. Broadcast Tools shall have the exclusive right to choose between these alternative remedies.

### **NO OTHER WARRANTIES OR REMEDIES**

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, BROADCAST TOOLS AND ITS SUPPLIERS DISCLAIM ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE; AND THE FOREGOING ALTERNATIVE REMEDIES SHALL BE EXCLUSIVE OF ALL OTHER REMEDIES. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY HAVE OTHER RIGHTS, WHICH VARY FROM STATE/JURISDICTION TO STATE/JURISDICTION.

### **NO LIABILITY FOR CONSEQUENTIAL DAMAGES**

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, NEITHER BROADCAST TOOLS NOR ANY OF ITS SUPPLIERS SHALL HAVE ANY LIABILITY FOR ANY SPECIAL, INCIDENTAL, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ANY DAMAGES FOR LOST PROFITS, BUSINESS INTERRUPTION, LOSS OF DATA OR INFORMATION, COST OF CAPITAL, CLAIMS OF CUSTOMERS, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF OR THE INABILITY TO USE ANY ITEM SUPPLIED BY BROADCAST TOOLS, EVEN IF BROADCAST TOOLS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES HAVE ANY LIABILITY FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY OR PUNITIVE DAMAGES. THIS LIMITATION OF LIABILITY APPLIES WHETHER A CLAIM IS ONE ALLEGING BREACH OF A CONTRACT OR WARRANTY, NEGLIGENCE OR OTHER TORT, FOR THE VIOLATION OF ANY STATUTORY DUTY, THE FAILURE OF ANY LIMITED OR EXCLUSIVE REMEDY TO ACHIEVE ITS ESSENTIAL PURPOSE, OR ANY OTHER CLAIM OF ANY NATURE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, THIS LIMITATION MAY NOT APPLY TO YOU.

#### **Broadcast Tools, Inc.**

131 State Street  
Sedro-Woolley, WA 98284 • USA

360.854.9559 **voice** • 866.783.1742 **fax**  
support@broadcasttools.com **e-mail**  
www.broadcasttools.com **website**

SS led ON with valid audio  
 SS led OFF with NO audio  
 SS led flashes if enabled and in an alarm condition

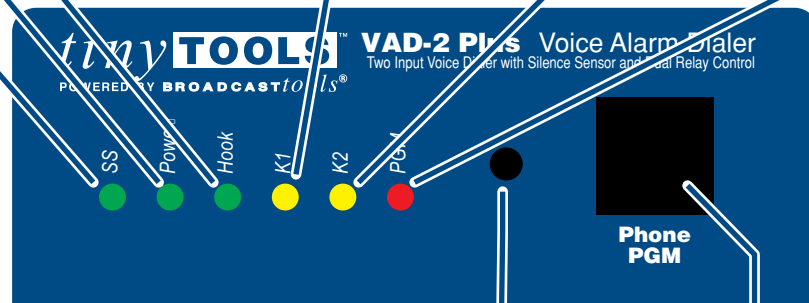
Pwr led ON if powered  
 Pwr led flashes if PF is enabled and in an alarm condition  
 Pwr led OFF during a valid DTMF tone  
 Pwr led OFF in voice record mode.

Hook led ON  
 when in an off-  
 hook condition

K1 led ON when  
 K1 is closed or  
 energized

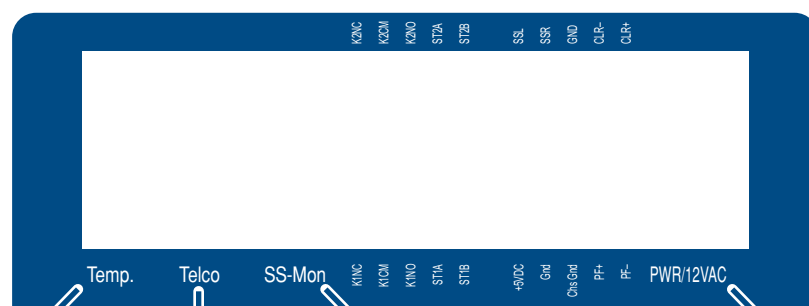
K2 led ON when  
 K2 is closed or  
 energized

PGM led ON when  
 programming the  
 VAD-2 Plus



Recessed Program Switch

Voice/Program TT  
 Telephone Receptacle



Optional  
 Temp Probe

Telephone  
 Line

Silence Sensor (send)  
 audio to telco level trimmer

12 VAC wall  
 transformer  
 receptacle

### Programming Examples

- 1 - Power up the VAD-2 Plus.
- 2 - Plug your TT phone into the unit's front panel "Phone PGM" RJ11 and go "OFF-HOOK" with the TT telephone.

NOTE: The "program mode" (recessed) program push button shall be depressed both prior to, and also subsequent to, each individual programming instruction. In other words, only one program instruction may be entered at a time, surrounded by depression of the "program mode" recessed push button. The "PGM" LED will illuminate when in programming mode.

- 3 - Press the front panel (recessed) program push button to enter programming mode.
- 4 - Enter the memory location you need to program.  
Example: Phone number 1 = 113994001234 then press the front panel (recessed) program push button to exit programming mode.
- 5 - Press the front panel (recessed) program push button to enter programming mode.

- 6 - Enter the memory location you need to program.  
Example: Phone number 2 = 123994005678 then press the front panel (recessed) program push button to exit programming mode.

- 7 - Press the front panel (recessed) program push button to enter programming mode.
- 8 - Enter the memory location you need to program.  
Example: Phone number 3 = 13994009012 then press the front panel (recessed) program push button to exit programming mode.

- 9 - Press the front panel (recessed) program push button to enter programming mode.
- 10 - Enter the memory location you need to program.  
Example: Phone number 4 = 143994003456 then press the front panel (recessed) program push button to exit programming mode.

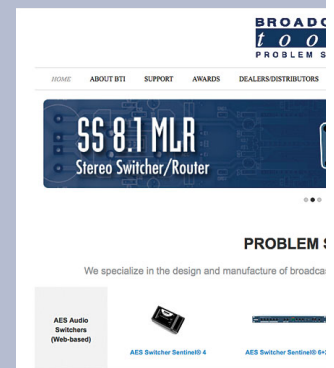
- 11 - Press the front panel (recessed) program push button to enter programming mode.
- 12 - Enter the memory location you need to program.  
Example: Access code = 21123 then press the front panel (recessed) program push button to exit programming mode.

- 13 - Press the front panel (recessed) program push button to enter programming mode.
- 14 - Enter the memory location you need to program.  
Example: Silence Sensor Dial list = 251234 then press the front panel (recessed) program push button to exit programming mode.

- 15 - Press the front panel (recessed) program push button to enter programming mode.

### WEBSITE:

*Visit our web site for product updates and additional information*



16 - Enter the memory location you need to program.

Example: Ring count = 303 then press the front panel (recessed) program push button to exit programming mode.

17 - Press the front panel (recessed) program push button to enter programming mode.

18 - Enter the memory location you need to program.

Example: 10 second Silence Sensor delay = 311 then press the front panel (recessed) program push button to exit programming mode.

19 - Press the front panel (recessed) program push button to enter programming mode.

20 - Enter the memory location you need to program.

Example: Hang-up timer = 331 then press the front panel (recessed) program push button to exit programming mode.

NOTE: (I would keep this at 1 (minute), as the CO may not always send the CPC signal or if your PBX doesn't supply CPC (Telco auto hang-up signal, referred to CPC, WINK or COD).

21 - Press the front panel (recessed) program push button to enter programming mode.

22 - Enter the memory location you need to program.

Example: Silence Sensor ENABLE = 361 then press the front panel (recessed) program push button to exit programming mode.

23 - Press the front panel (recessed) program push button to enter programming mode.

24 - Enter the memory location you need to program.

Example: Number of LAPS = 423 then press the front panel (recessed) program push button to exit programming mode.

25 - Press the front panel (recessed) program push button to enter programming mode.

26 - Enter the memory location you need to program.

Example: Record Silence Sensor message (10 seconds) = 65 then press the front panel (recessed) program push button to exit programming mode.

27 - Press the front panel (recessed) program push button to enter programming mode.

28 - Enter the memory location you need to program.

Example: Record greeting message = 68 then press the front panel (recessed) program push button to exit programming mode.

The silence sensor inputs are unbalanced. Connect your unbalanced source equipment to either or both inputs (SSL) and/or (SSR). The shield tied to the GND terminal. If your source equipment is balanced, use the "+" and GND terminal from the source. Your source equipments "-" (negative) terminal should never be grounded. Shields should be tied to the "Chs Gnd" terminal.

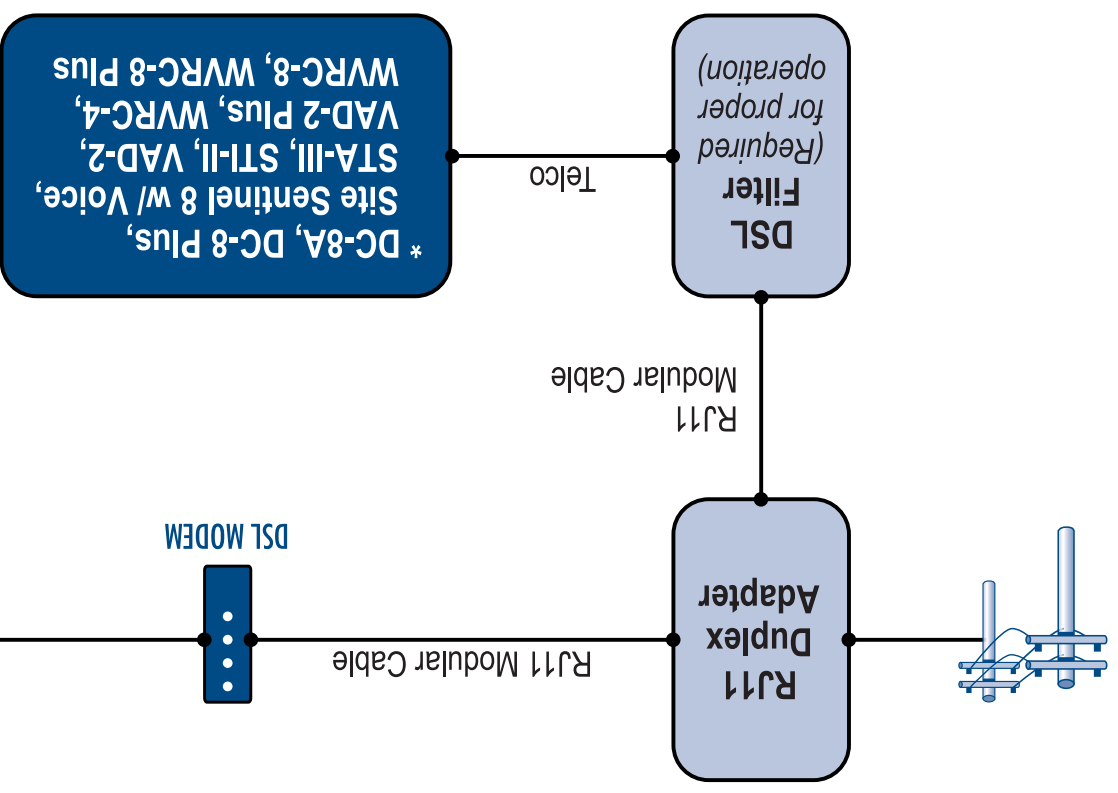
The SS LED is illuminated when you have audio applied to the inputs. When the SS is in an alarm condition, the SS LED will flash. NOTE: The SS led will be extinguished with no audio input.





# Broadcast Tools®

Connection suggestion when using listed \* equipment with DSL/Telco





## Using Multiple AUDIO (Silence) *Sentinel*® »BASIC'S on the VAD-2 Plus or other devices.

