



## INTRODUCTION

Thank you for your purchase of the **Broadcast Tools® Dual Sub-Audible Tone Detector**, which we will refer to throughout the manual as the **DSD-2**. 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., is unable to support NON-Broadcast Tools software, hardware or NON-Broadcast Tools computer/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:

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

Broadcast Tools is a Veteran Owned Business



Designed, Assembled and Supported in WA State, USA



### CAUTION!

**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.

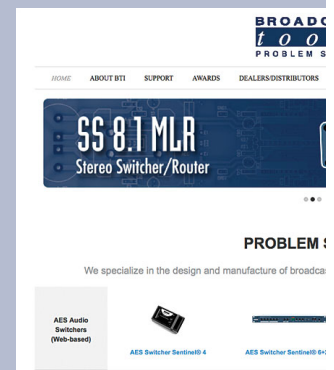


### NOTE:

This manual should be read thoroughly before installation and operation.

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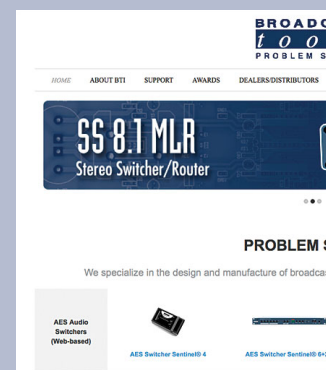


## Product Description

The DSD-2 is a 25/35 Hz sub-audible detector with a single channel 50-hertz high pass filter. The DSD-2's unique detection algorithm virtually eliminates false triggering due to level variations. Features include; SPDT relays and front panel LED's for each detected tone and a third for combinational tone detection; detection enable/disable optically isolated input with front panel LED indicator; balanced input and output termination via T/R/S jacks and plug-in euroblock screw terminals; RS-232 tone detection port; front panel input audio presence and overload LED's and level control. The DSD-2 is powered by a surge protected internal bipolar 15vdc power supply affording superior headroom and high definition audio. The DSD-2 may be set on a desktop, mounted on a wall or up to three units may be mounted on the optional RA-1, Rack-Able mounting shelf.

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### DESCRIPTION

## Installation

Please examine your DSD-2 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 contains the DSD-2, 16 VAC @ 600 ma wall power transformer, modular cable with S9 adapter and this manual.

Installation of the DSD-2 in high RF environments should be performed with care. Shielded cable is suggested for all audio connections. All shields should be tied to the “G” Ground terminals. The station ground should be connected to the chassis ground screw located on the far right side of the DSD-2 as viewed from the rear or the “EGND” euroblock screw terminal. It is recommended that all cables connected to the DSD-2 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.

## Input

Hi Z, active balanced. Connect your source equipment to the Input - and + terminals on the euroblock connector or the Tip and Ring IN ?” jack.

## “OP”, Output

High pass filter, Low Z balanced output. Connect your equipment to this euroblock connector or the Tip and Ring OP ?” jack. This output should be used to remove the 25/35 Hz sub-audible tones from your program.

## Output level (OP Lvl)

The front panel “OP Lvl” control may be used to adjust the output from off to unity. This control does not effect level detection.

## RS-232 serial port

This connector provides data representing valid 25, 35 or combinational tone detection. The protocol is 9600, 8,N,1. This port may also be used to enable and disable tone detection and verify operational status.

## Relay connections

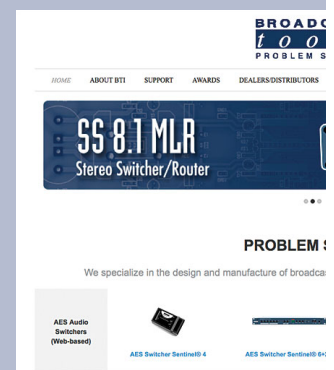
The three relays are SPDT dry contacts. The relay closes for the duration of the detected tone. Make your connections to the desired relay K1 (25Hz), K2 (35Hz) or K3 (combo). These relays are labeled NO for normally open, CM for common and NC for normally closed with no tone detection. The front panel led indicates when a relay is active.

## Enable

The enable terminals allow the disabling of the DSD-2’s tone detection function. Applying a closure across these terminals will disable tone detection. The terminals are labeled ISO1 and ISO2. JP1 is used to configure the opto-isolator for either wet or dry operation. The factory setting is DRY, which accepts dry contact closures, open collectors, etc. In this configuration, ISO1 is ground and ISO2 is the cathode of the opto-led. To configure for wet operation (5 to 24vdc), move the jumpers on JP-1 to pins 2 & 3. The front panel “enable” led illuminates when the DSD-2 is disabled.

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## Programming

### Dipswitch setting

- DIPSwitch-1**      **OFF:** The DSD-2 detects 25 and 35 hertz tones, along with combinational tones.  
                         **ON:** Optional frequency detection
- DIPSwitch-2**      **OFF:** Tone detection disabled with a closure (active low).  
                         **ON:** Tone detection disabled without a closure (active high).
- DIPSwitch-3**      **OFF:** 200ms to 300ms tone detection time.  
                         **ON:** 100ms tone detection time.

## Operation

### Power

Insert the power plug into the power jack on the DSD-2 and the wall transformer into the proper AC outlet. Verify that the power LED is lit.

### Act

The Activity LED is set to trip at levels above -30dBu. For reliable tone detection, feed the DSD-2 with program levels above 0dBu. The DSD-2 was designed to detect tone levels down to -20dBu.

### Clip

This led is set to illuminate when the input level is at +20dBu. The clip led should never flash with normal program activity.

### RS-232

Each detected tone will respond with a ASCII string via the RS-232 serial port at 9600,8,N,1.

25 hertz detection response: 25N<cr> = ON or 25F<cr> = OFF.

35 hertz detection response: 35N<cr> = ON or 35F<cr> = OFF.

Combination response: CDN<cr> = combo ON or CDF<cr> = Combo OFF.

The DSD-2 may be **disabled** via the serial port by sending the ASCII string; \*DD<cr>, or **enabled** by sending a \*ED<cr>

You may verify if the DSD-2 is enabled or disabled by sending \*SD<cr>

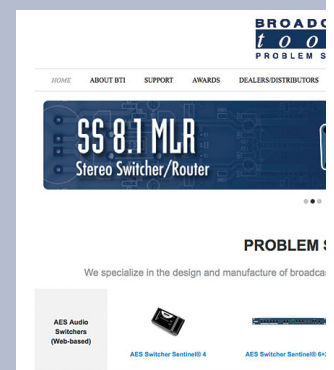
The DSD-2 will respond with DD<cr> for disabled or ED<cr> when the DSD-2 is enabled.

## Specifications

Input Level	-20dBu to +24dBu
Input Impedance	10K $\Omega$ balanced.
Frequency Response	50 to 20kHz +/- 0.5dB (High-Pass filter).
Distortion	<.01%HD / IMD
Noise	<85dB Ref
Output Impedance	100 $\Omega$ , balanced
Tone detection trip level	-20dBu, minimum, adjustable via R43.
Opto-Isolated disable input	Dry, 5 volt @ 6ma. Wet, 5 to 24vdc.
Relays	3 - DPST, 30Vdc/1 amp.
RS-232 Serial	9600, 8,N,1 / 6P4C modular, cable and S9 adapter supplied.
Connectors	Audio Inputs/Outputs connections – Plug-in euroblock screw terminals
Power Requirement	16 Vac, 600 ma, wall transformer, Supplied. Surge protected power supply.
Size:	1/3" rack space, Painted chassis w/ 4 – 6-32 mounting holes.
Weight:	2.0 lb.
Options:	1, Rack Shelf. 1 RU. / 220 Vac 50-60 Hz CE wall transformer.

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### **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.

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**Functional Diagram**

