BROADCAST tools INC

PROBLEM SOLVED

Installation and Operation Manual



AES Switcher Sentinel® 2+1

Web-enabled two channel AES/EBU and one channel analog to digital silence monitor/switcher.

Manual update: 9/12/2025
For firmware versions equal to or greater than 0.6.
If you need a firmware upgrade, contact Broadcast Tools®

No part of this document may be reproduced or distributed without permission.
ALL SPECIFICATIONS AND FEATURES FOR THIS PRODUCT ARE SUBJECT TO CHANGE WITHOUT NOTICE

NOTE: We recommend the use of Chrome, Firefox or Safari as your browser.

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.

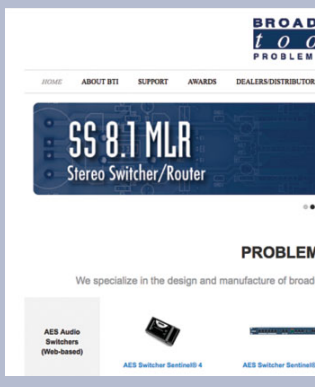
Broadcast Tools® is a registered trademark of Broadcast Tools,Inc.
All Sentinel® labeled products are registered trademarks of Broadcast Tools,Inc.
Copyright® 1989 - 2025 by Broadcast Tools,Inc. All rights reserved.
No part of this document may be reproduced or distributed without permission.

Visit **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 Overview	4
Inspection	5
Installation	5
Surge Protection	5
UPS Standby Power System	5
+/- 15 VDC POWER connector	5
LED Indicators	6
Front Panel Controls	6
XLR Connector Pinout/Cable Prep	7
AES/EBU Connections	7
ADC Analog Input	8
External Work Clock Input	8
Monitor Output	8
RJ45 Pinout	8
Remote Control Connections	9
LAN / NET Jack	9
Chassis ground	9
Operation	10
Reset to Defaults	10
Ethernet “Quick Start” Guide	11
Opening the LOGIN Web Page	14
Web Setup/Operation	14
“Login” Web Page	15
“Monitor/Control” Web Page	16
“User Setup” Web Page	18
“I/O Setup” Web Page	19
“Email/Network Setup” Web Page	23
“Show Logs” Web Page	29
“About” Web Page	30
Specifications	31
Warranty	32
Front and Rear Panel silkscreen views	Appendix
Connector Layout	Appendix
Fractional Schematic	Appendix
Internet Connectivity	Appendix

WEBSITE:
Visit our web site for product updates and additional information.



INTRODUCTION

Thank you for your purchase of a Broadcast Tools® AES Switcher Sentinel 2+1 Web-enabled two channel stereo silence monitor/audio switcher (referred to as the AES Switcher Sentinel 2+1® throughout this manual). We're confident that 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 Broadcast Tools® AES Switcher Sentinel 2+1®.

SAFETY INFORMATION

Only qualified technical personnel should install the AES Switcher Sentinel 2+1. Any 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 or damage to the AES Switcher Sentinel 2+1 or other equipment. Please ensure that proper safety precautions have been taken before installing this device. If you are unfamiliar with this type of equipment, please contact a properly qualified engineer to handle the installation and setup of the AES Switcher Sentinel 2+1.

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.

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 98284-1503 USA
Voice: 360.854.9559
Fax: 866.783.1742
Internet Home Page: www.broadcasttools.com
E-mail:support@broadcasttools.com

THANK YOU FOR CHOOSING
BROADCAST TOOLS® BRAND PRODUCTS!

Broadcast Tools is a Veteran Owned Business



Designed , Manufactured, and Supported in Washington State, USA.

CAUTION!

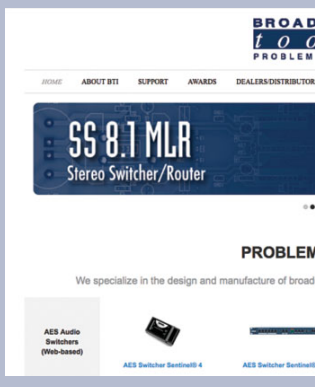
Broadcast Tools® Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.

NOTE:

This manual should be read thoroughly before installation and operation.

WEBSITE:

Visit our web site for product updates and additional information.



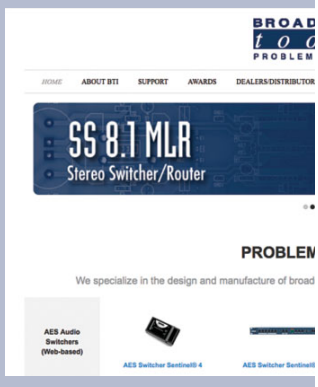
Product Overview

The AES Switcher Sentinel 2+1 is a web-enabled three channel AES/EBU silence monitor combined with an integrated 3x1 AES switcher. It is designed to monitor two AES audio sources and one analog to digital (ADC) audio source. When silence is detected on the primary AES input it can automatically switch to the back-up AES input or the backup ADC input. The AES Switcher Sentinel 2+1 can be configured and monitored locally and/or remotely over any IP network, including private networks, IP-based industrial control networks, and the Internet. Users can operate the product using a desktop web browser or web-enabled mobile device. Email notification may be configured to alert up to eight recipients when silence or out of phase audio is detected. SMTP username and passwords using STARTTLS or Base64 authentication are supported. SNMP traps and SET/GET are built in to allow multiple units to be monitored and configured with SNMP management software.

Features/Benefits

- Built-in web server provides simple web-based (HTML5) notification, monitoring, configuration, and control.
- Front panel, remote, and web-based (HTML5) switcher controls.
- Both AES inputs and analog input feature silence sensors/phase monitors with front panel activity and alarm LED indicators.
- ADC input can be configured to operate from an internal clock at sample rates of 44.1kHz or 48kHz or use an external word clock from 32 to 96kHz.
- Silence trip level detection from -15dB to -35dB in 1 dB steps for each stereo channel.
- Precise alarm time delay from 0(OFF) to 65535 seconds (18 hours, 12 min and 15 sec's). in one-second increments for each channel.
- Alarm restore time delay from 0(OFF) to 65535 seconds (18 hours, 12 min and 15 sec's). in one-second increments for each channel.
- Email notification may be configured to alert up to EIGHT recipients when alarms are detected.
- Email logging of system status, along with the site ID may be emailed in time spans from once an hour to once a day.
- Support for STARTTLS secure SMTP authentication (Gmail.)
- AES inputs and output feature XLR connectors.
- Analog input and output feature StudioHub+ compatible RJ45 jacks.
- Front panel ¼" headphone jack with level control and monitor source select button.
- Stereo LED level display.
- Fully RFI proofed.
- Includes PS-1515 universal switching +/-15VDC power supply with domestic connectors supplied. International AC connectors optional.
- Up to two units may be mounted on the optional RA-1 rack shelf. Desktop and wall mounting is also possible.

WEBSITE:
Visit our web site for product updates and additional information.



Inspection

Please examine your AES Switcher Sentinel 2+1® carefully for any damage that may have been sustained during shipping. If any damage is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package should contain the AES Switcher Sentinel 2+1®, a 7-foot BLUE straight-through CAT 5 cable, a 7-foot GRAY crossover CAT 5 cable and a +/- 15 volt DC @ 500mA universal switching (PS1515-IEC) desktop power supply with IEC inlet. Manuals may be downloaded from our web site.

Installation

CAUTION! Installation of the AES Switcher Sentinel 2+1® in high RF environments should be performed with care. The station ground should be connected to the "Chs Gnd" chassis ground screw.

Surge Protection

The AES Switcher Sentinel 2+1® has built-in resistance to voltage changes; we recommend that you use a power surge protector or line conditioner on the incoming AC line. Lightning strikes and/or other high voltage surges may damage your AES Switcher Sentinel 2+1® and connected equipment if it is not properly protected. For lightning protection devices, check out www.polyphaser.com and www.itwlinx.com.

UPS Standby Power System

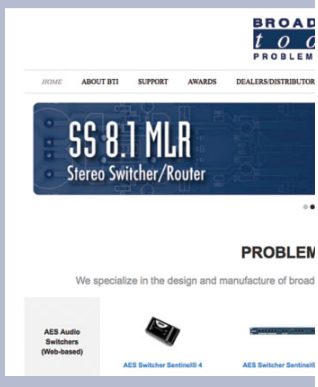
We recommend that you connect your AES Switcher Sentinel 2+1® to a UPS system. A UPS helps minimize the risk to the AES Switcher Sentinel 2+1® and provides AC power during a power outage.

POWER: +/- 15 VDC power connector

Connect the 3-pin AMP-style latching power connector to the unit and the included +/-15 VDC switching power supply with domestic connector into a 120 Vac 50-60 Hz power source. Never use any type of power supply other than the specified/supplied (PS-1515-IEC) power supply.

NOTE: Never use any type of power supply other than the specified/supplied power supply.

WEBSITE:
Visit our web site for product updates and additional information.



LED Indicators

- "Pwr/HB" LED: Illuminates when power is applied and flashes to indicate microprocessor operation. (Green)
- "Mon 1" LED: Lit when Input 1 audio is routed to the headphones/analog monitor outputs (Green)
- "Mon 2" LED: Lit when Input 2 audio is routed to the headphones/analog monitor outputs (Green)
- "Mon 3" LED: Lit when Input 3 audio is routed to the headphones/analog monitor outputs (Green)
- "Auto" LED: Lit when in Automatic backup switching mode. (Red)
- "On" LEDs: Lit when the Input is routed to the AES/EBU output. (Green)
- "Act" LEDs: Lit when an AES/EBU signal and valid analog audio is present on the input. (Yellow)
- "SS" LEDs: Silence Sensor alarm indicator, lit when silence is detected on the input. (Red)
- "P" LEDs: Phase alarm indicator, lit when out-of-phase stereo audio is detected on the input. (Red)
- "AES ERR" LEDs: AES Error indicator, lit if AES/EBU input signal is missing or invalid. (Red)

Front Panel Switching Controls

"AES 1" "AES 2" and "Analog" pushbuttons: Used to select which of the three inputs is routed to the output when in Manual mode. Each push button has a green "On" LED indicator, which will illuminate when that channel is selected and routed to the output. When a channel is selected, the previous channel is deselected (interlock). Only one input can be routed to the output at a time.

"Auto" pushbutton: Used to toggle between automatic backup and manual switching modes.

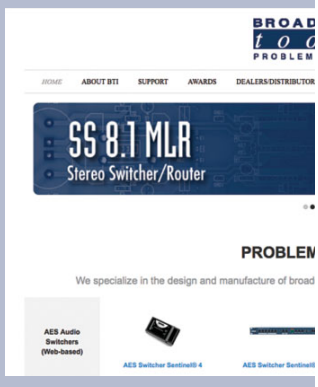
Front Panel Monitor Audio Controls

"Monitor Select" (Mon Sel) pushbutton: Used to select which input audio source is fed to the analog headphone and monitor outputs. See "Monitor Audio Switching Modes" for more information.

"HdPh lvl" knob: Headphone monitor output audio volume level adjustment knob.

"HdPh" jack: ¼" stereo headphone monitor output. Fed by the internal DACs.

WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

XLR Connector Pinout/Cable Preparation

The AES Switcher Sentinel 2+1® interfaces to external equipment through 3-pin XLR jacks and StudioHub+ compatible RJ45 jacks for audio signals. The input and output AES/EBU XLR connector pinouts conform to 3-pin XLR Wiring Standards: Pin 1 = Ground. Pin 2 = Positive. Pin 3 = Negative.
For AES/EBU signals please use AES/EBU qualified digital audio cable.

CAUTION! Installation of the AES Switcher Sentinel 2+1® in high RF environments should be performed with care. The station ground should be connected to the designated "Chs Gnd" ground terminal.

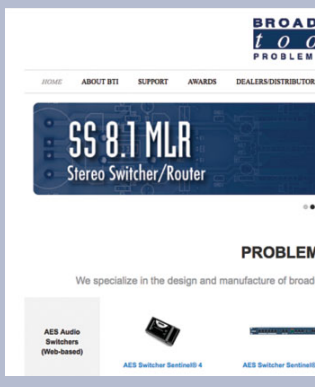
AES/EBU Inputs and Outputs

The AES Switcher Sentinel 2+1's two AES/EBU inputs and output have 3-pin XLR jacks.

AES In 1 = Primary AES input (AES Silence Sensor 1) XLR-F
AES In 2 = Backup AES input (AES Silence Sensor 2) XLR-F
AES Output = AES Switcher Output XLR-M

AES/EBU signal switching is accomplished via mechanical latching gold contact relays, which means that the unit will keep routing the lasted selected signal even after losing power. Input 3, the analog-to-digital input, will only operate while the unit is powered up.

WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

ADC Analog Input "Analog In" (Input 3) RJ45

The AES Switcher Sentinel 2+1 features an RJ45 balanced line level analog audio input with analog-to-digital converter as Input 3. Input attenuation may be adjusted via the Analog Input Level Adjust pots. See below for pinout.

SW7	ADC Options switch
SW7-1 OFF:	External Word Clock
ON:	Internal Clock (factory default).
SW7-2 OFF:	External clock range: 30 to 59 kHz.
ON:	External clock range: 44.1 to 96 kHz (factory default).
SW7-3 OFF:	44.1 kHz sample rate (factory default).
ON:	48 kHz sample rate.
SW7-4	Unused

Analog Input Level Adjust (L/R)

Adjust these 10-turn pots, labelled Left and Right, to the desired AES output level with Input 3 selected. Set to +4 dBu = -20dbFS at the factory.

External Word Clock Input "Ext Clk"

Balanced 75-ohm word clock input for Input 3 AD. Accepts all standard digital audio sample rates from 32 to 96kHz. Enabled via SW7-1.

Analog Stereo Monitor Output "Monitor Out" RJ45

The AES Switcher Sentinel 2+1 features an RJ45 fixed level (+4 dBu nominal) balanced line level analog monitor audio output that can switch between Input 1 (AES 1), Input 2 (AES 2), and Input 3 (Analog) audio via front panel, web and remote control. See below for the RJ45 pinout.

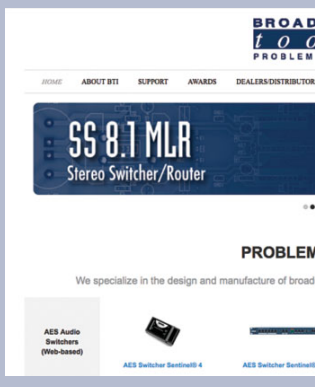
RJ45 Connectors

The analog input and monitor output RJ45 jacks conform to the StudioHub+ wiring standards. Please use shielded twisted pair Cat5e or Cat6 cables and connectors (STP).

RJ45 Pinout:

Function:	Wire Pair:	RJ45 Pins:
Left+	White/Orange	1
Left-	Orange/White	2
Right+	White/Green	3
Right -	Green/White	6
n/c	White/Blue	5
GND	Blue/White	4
-15V	White/Brown	7
+15V	Brown/White	8
GND	Shield	Shield

WEBSITE:
Visit our web site for product updates and additional information.



Remote Control Connections

The AES Switcher Sentinel 2+1® has three SPST Normally Open (NO) relay contact closure remote control outputs located on the top 6-position pluggable screw terminal block (TB2 top). When a relay is active it will make connection between its NO contact and its common (CM). All three relay commons are isolated from one-another. The relay outputs can be configured to close on input silence, AES error, or switch position (activity). The operation of K4, K5, and K6 is determined by the configuration assigned on the "I/O Setup" page.

(Top row, TB2)

K4NO	K4CM	K5NO	K5CM	K6NO	K6CM
CH1	CH2	CH3	RMT4	RMT5	DGND
(Input 1)	(Input 2)	(Input 2)			(Ground)

(Bottom Row, TB2)

The AES Switcher Sentinel 2+1® has five remote control inputs labelled "CH1" "CH2" "CH3" "RMT4" and "RMT5" located on the first five pins of the bottom 6-postion pluggable screw terminal blocks (TB2 bottom).

CH1 =	Momentary closure to ground switches Input 1 to the Output.
CH2 =	Momentary closure to ground switches Input 2 to the Output.
CH3 =	Momentary closure to ground switches Input 3 to the Output.
RMT4 =	EXTernal sustained trigger or Auto/Manual toggle mode. Closure to ground triggers.
RMT5 =	Analog Out /Headphone Monitor Audio Toggle. Closure to ground triggers.
RMT4 Input Modes:	Auto/Manual Toggle: Pulsing the RMT4 input toggles unit between Auto and Manual switching mode.
EXTernal Sustained:	Holding the RMT4 input low switches the unit to the backup input, releasing returns to the primary input.

The terminals blocks accommodate wire sizes from 16 - 28 AWG solid or stranded. Before installing a wire, remove the euro-block screw terminal plug and turn each capture screw fully counterclockwise. Strip each conductor to a length of 0.25" and insert the conductor fully into the terminal. Turn the capture screw fully clockwise to secure the conductor. Verify that no bare wires are exposed.

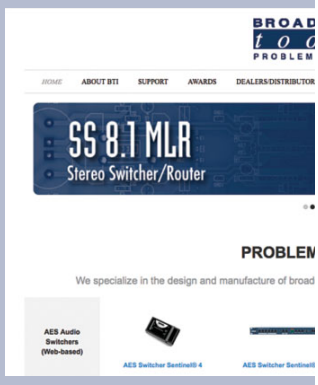
LAN / NET Jack

RJ45 Ethernet jack for 10/100baseT LAN/WAN connection.

Chassis Ground (Chs Gnd)

#4-40 screw for connection to the station/site ground system.

WEBSITE:
Visit our web site for product updates and additional information.



Operation

The AES Switcher Sentinel 2+1® can be controlled from a web browser, front panel controls, and/or remote-control connections. The slow blinking front panel "PWR/HB" LED indicates valid power and proper operation. The front panel is equipped with push button controls and indicator LEDs.

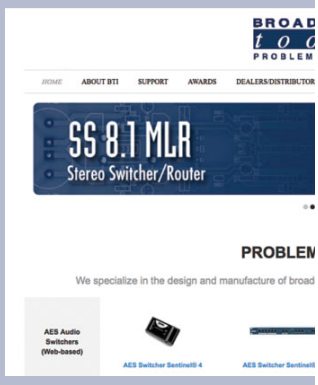
The AES Switcher Sentinel 2+1® has two primary modes of operation: Automatic Mode, where silence/out of phase and/or AES loss/error on the Input 1 will cause the unit to automatically switch to the next backup input and Manual Mode where switching control must be performed manually via the front panel controls, web controls, or remote-control inputs. Email and SNMP alarm notifications function in both modes.

By default, in Automatic mode, when the primary input, Input 1 fails, it will switch to Input 2. If Input 2 is also silent or fails, it will switch to Input 3. If valid audio returns to Input 1 or 2 the switcher will automatically switch back (restore) to those inputs following the restore delay time. This feature is called Switcher Bounce and it can be disabled from the Switcher Bounce control Monitor & Control web page.

Reset to Defaults

Factory default settings may be restored by depressing the recessed front panel "Defaults" push button for five seconds after waiting for the unit to power up. The PWR/HB led will rapidly blink two to three times when loaded. Holding this button during power up will place the unit into a special bootloader mode, do not do so without being instructed to be Broadcast Tools.

WEBSITE:
Visit our web site for product updates and additional information.



Ethernet "Quick Start" Guide

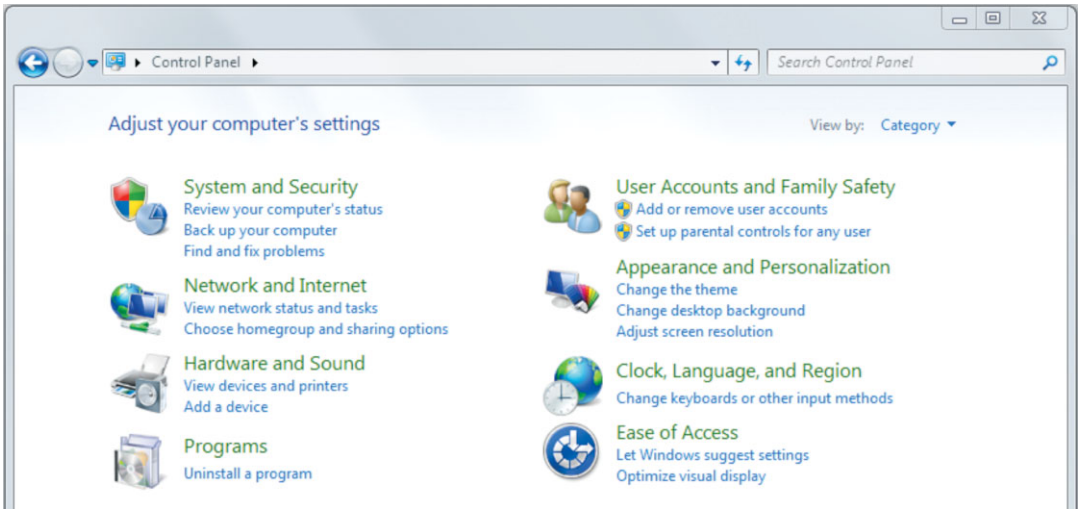
CAUTION! NEVER DOWNLOAD FIRMWARE UPDATES OR CHANGES TO THE BNET WEBSERVER UNLESS INSTRUCTED TO DO SO BY BROADCAST TOOLS®. DOING SO DELETES ALL SOFTWARE AND VOIDS ALL WARRANTIES FROM BROADCAST TOOLS, INC.

CAUTION! If you are not familiar with Ethernet enabled equipment, it may be useful to contact your IT department, network administrator or network consultant for assistance. Assigning an IP address already in use by another device may cause problems with your network!

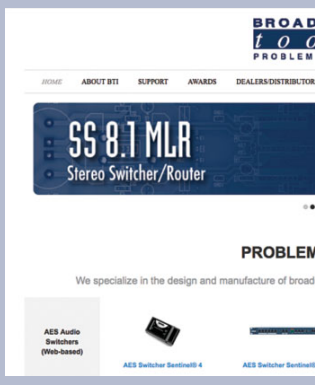
CAUTION! Network scanning utilities such as Nmap, Tenable Nessus®, and RapidFire Tools can disrupt the operation of your Ethernet enabled device. Please remove the device's IP address from the scanner or whitelist it.

Instructions for changing the IP address of the computer that will be used for the configuration of this product are given here. Note that these instructions are specifically for computers with the Windows 7 operating system. For setup using other operating systems, refer to the appropriate OS user's manual.

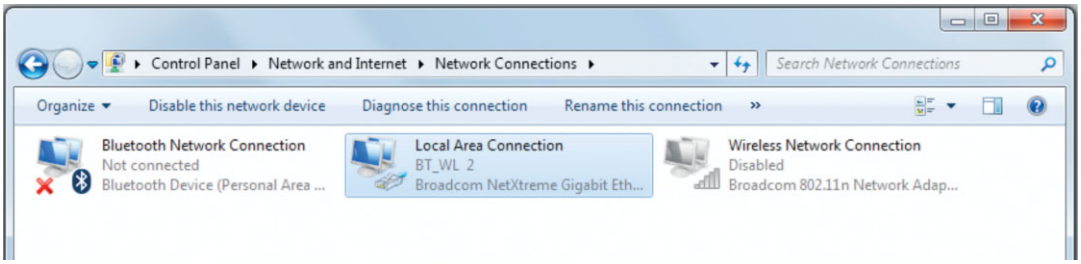
Step 1: Open the control panel by clicking on the Start Menu, click on settings, then click on Control Panel. Click on View network status and tasks under Network and Internet.



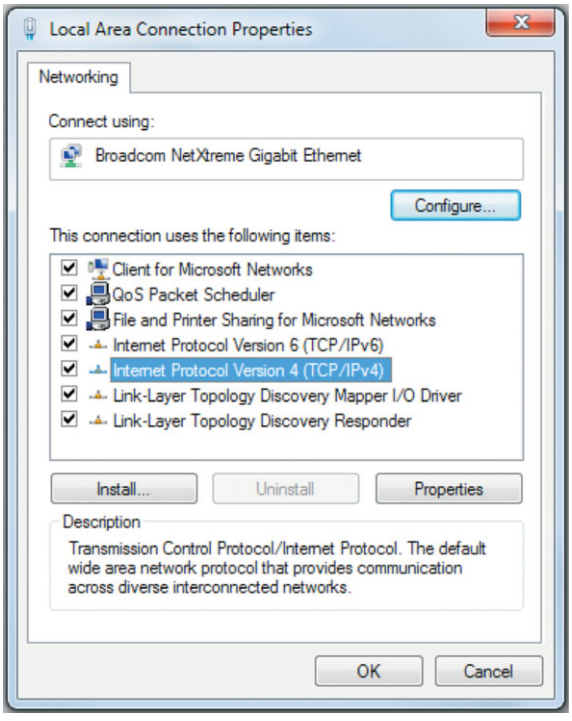
WEBSITE:
Visit our web site for product updates and additional information.



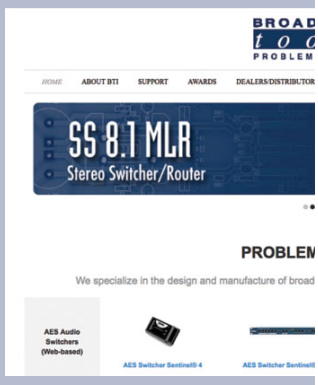
Step 2: Click on the sidebar labelled Change adapter settings. The Network Connections windows will pop up, as shown below.



Step 3: Right click on the icon labeled Local Area Connection or Ethernet. A menu will appear. Select the option at the bottom of the menu labeled Properties. The Local Area Connection Properties window will appear.

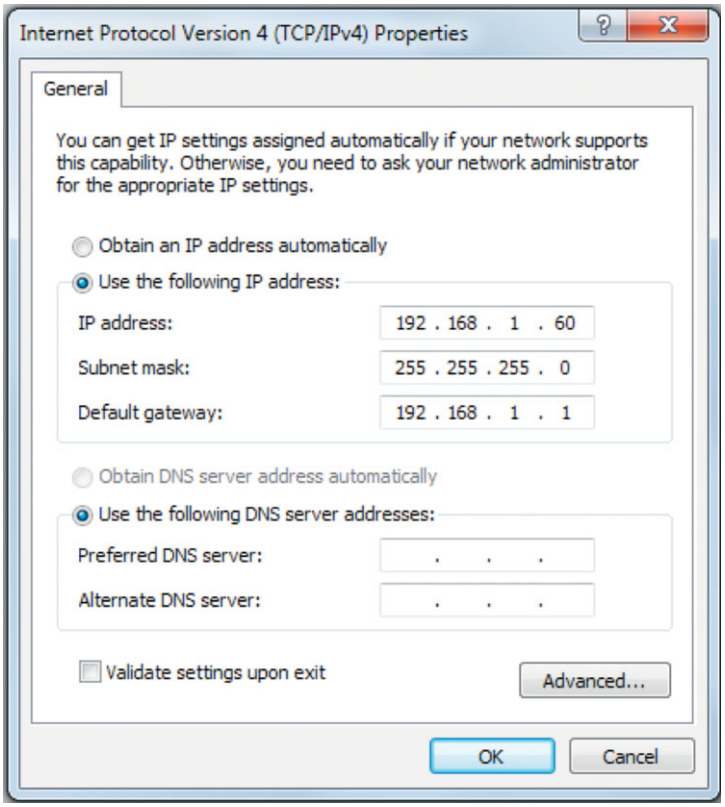


WEBSITE:
Visit our web site for product updates and additional information.



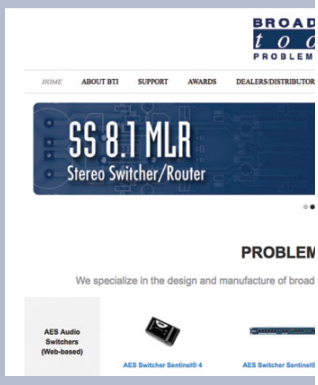
e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

Step 4: On the Local Area Connection Properties page, double click on Internet Protocol (TCP/IPv4) to display properties.



Step 5: Before making any changes to the network settings, write down the current settings (or screen capture the page and print) so that they can be restored once the unit is configured. Next, select the radio button labeled "Use the following IP address" and type in the IP address 192.168.1.60. Type in the subnet mask of 255.255.255.0. Leave the default gateway field blank. Click OK to apply the new settings.

WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

Web Setup and Operation

Ethernet (NETWORK) port LED indicator functions

Link LED Left Side	
Color	Meaning
Off	No Link
Amber	10 Mbps
Green	100 Mbps

Activity LED Right Side	
Color	Meaning
Off	No Activity
Amber	Half Duplex
Green	Full Duplex

n NOTE: We recommend the use of Chrome, Firefox, or Safari for as your browser.

Opening the LOGIN Web Page

1. Connect the supplied GRAY colored XOVER cable between the PC's Ethernet port and the products "NET" network RJ45's jack.

2. Connect the supplied PS-1515/IEC power supply. Wait 20 seconds. Verify that the green PWR/Heartbeat LED is blinking and the left "LINK" LED above the "NET" Network RJ45 is illuminated

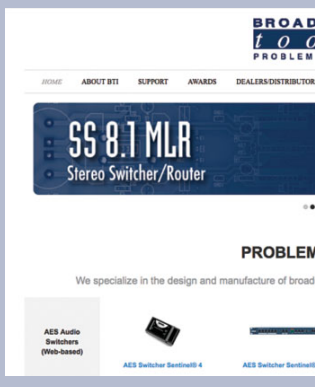
3. Open the product's login page by typing the following URL into the browser: http://192.168.1.55 The username and password is required to change any parameter and the fields are case sensitive.

Factory "login" defaults: username: admin (lower case)
password: 1234

NOTE: You may view the password by checking the "Show Password" box.

4. Press the "Submit" button to login in. Once you are logged in, follow this manual for setup and/or operational information.

WEBSITE:
Visit our web site for product updates and additional information.



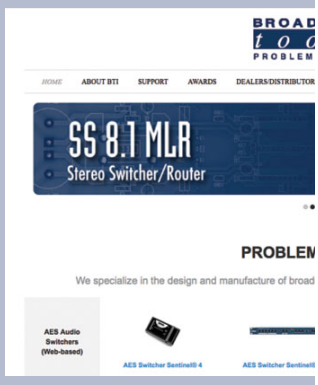
e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"Login" Web Page

The Login screen displays the Username and Password entry points.



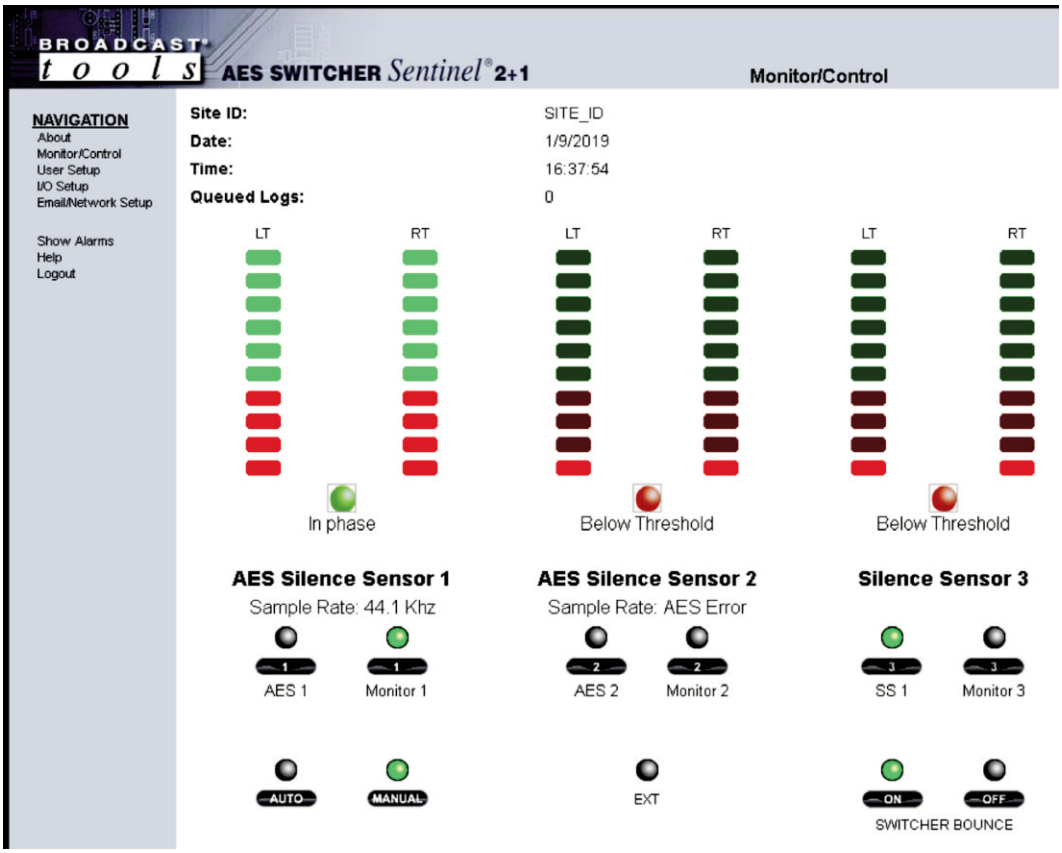
WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

After you have successfully logged in, the Monitor/Control page will be displayed. Depending on your access level, you may or may not be able to control or modify the product's configuration.

"Monitor/Control" Web Page

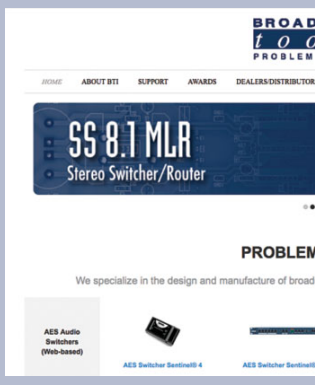


The Monitor/Control page allows the monitoring and or control of the AES Switcher Sentinel 2+1. The following is an explanation of each item on this page:

User defined Site ID, Time and Date are always displayed.

Queued Logs: Displays the number of queued logs.

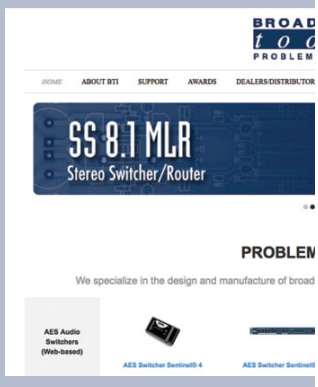
WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

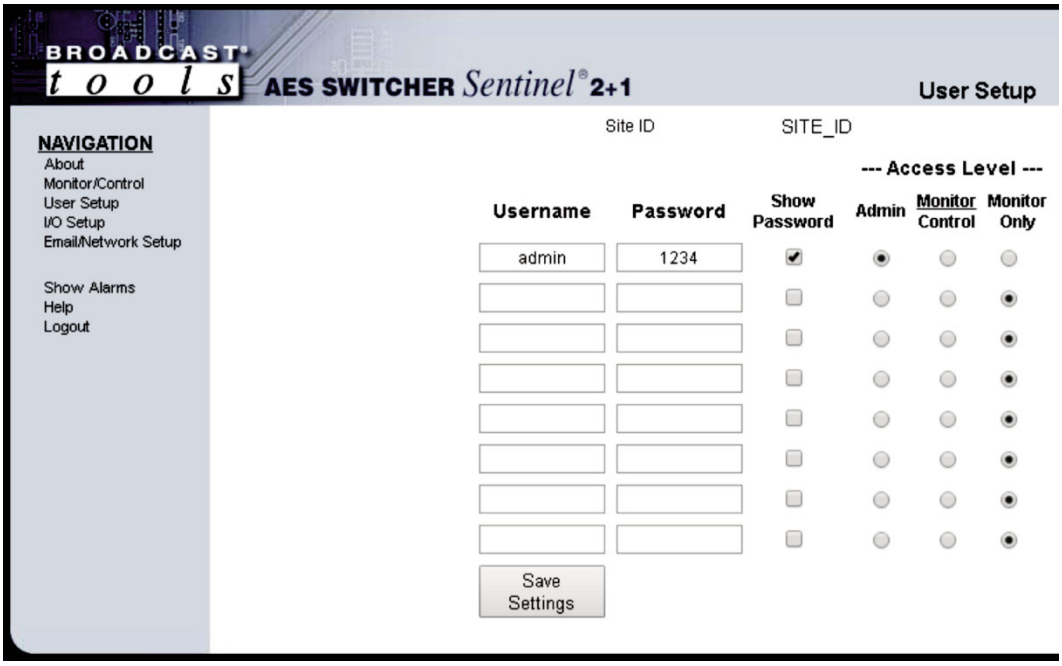
Left/Right Level Meters:	Display the left and right input audio levels for inputs one, two and three, respectively.
In Phase/Below Threshold:	Indicates if the input audio is Above Threshold/In Phase, Out of Phase, or Below Threshold.
Input Labels:	Input channel labels. Can be changed on the I/O Setup page.
Sample Rate:	Indicates sample rate detected on input, or AES error.
AES Input:	AES switch position indicators. If the unit is in manual mode, the user may switch between each input by placing the cursor on the black button labelled "1" "2" or "3" and clicking. The desired input is selected as denoted by the LED being illuminated.
Monitor Input:	Monitor audio switch position indicators. If the unit is Independent Monitor Audio Switching mode the user may switch between inputs by placing the cursor under each input LED, then click. The desired input is selected as denoted by the LED being illuminated. If the "Monitor Audio Switching Mode" setting is set to "Follow AES" these controls are disabled.
AUTO:	When this mode is selected, any time input ONE fails, the unit will switch to input TWO. Manual and remote operation of the unit is disabled except for "SUSTAINED" operation. The LED is illuminated when selected. Click on the black "AUTO" button to enable auto mode.
MANUAL:	Manual mode allows the user to select either input one or two as well as remote control operation. The manual LED is illuminated when selected. Click on the black "MANUAL" button to enable auto mode.
SWITCHER BOUNCE:	Allows the switcher to automatically restore from Input 2 or 3 to Input 1 when audio returns while in AUTO mode. Enabled by default.
EXT Indicator:	Illuminates when the "External" input is triggered.

WEBSITE:
Visit our web site for product updates and additional information.



WEB SETUP

"User Setup" Web Page



NOTE: You may view a password by checking the "Show Password" box.

Eight Usernames and Passwords may be configured for one of three access levels:

1. "Admin" allows complete configuration access and control.

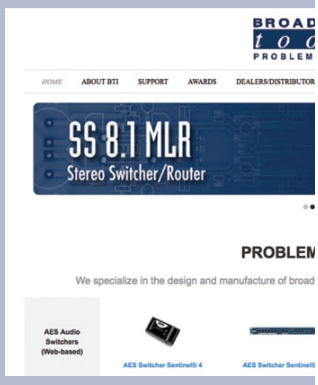
2. "Monitor/Control" allows the following access:
   About, Monitor/Control, Show Alarms, Help, and Logout.

3. "Monitor Only" allows the following access:
   About, Monitor only, Help, and Logout.

Only users with "admin" access can make changes to this page.
The site ID is displayed and can be changed on the Email/Network Setup page.

NOTE: After any item has been changed, you MUST press the "Save Settings" button for your changes to be saved.

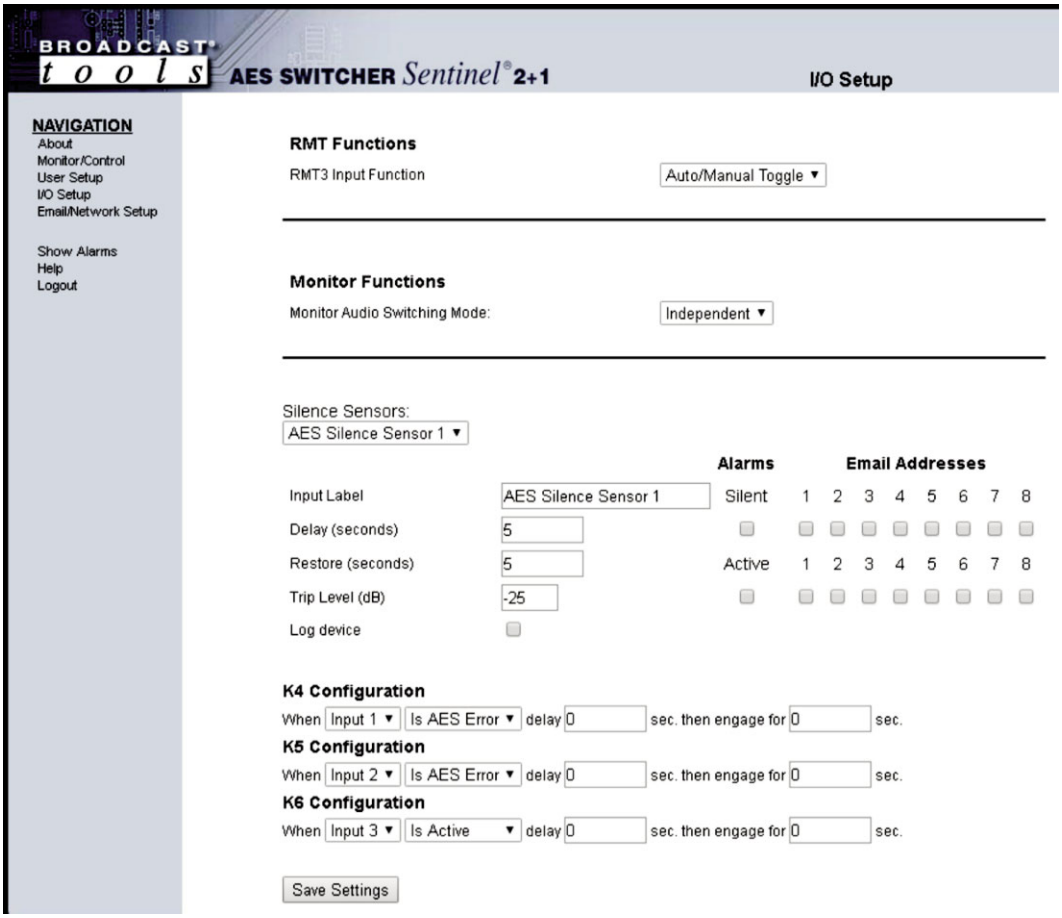
WEBSITE:
Visit our web site for product updates and additional information.



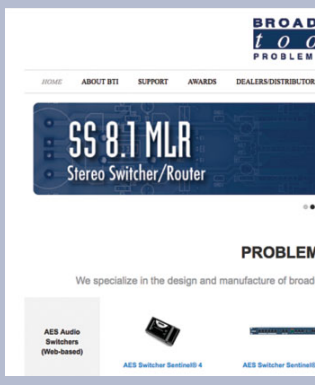
e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"I/O Setup" Web Page

The I/O setup page allows you to label and configure all three inputs/silence sensors, as well as configure the relay output and remote-control inputs.

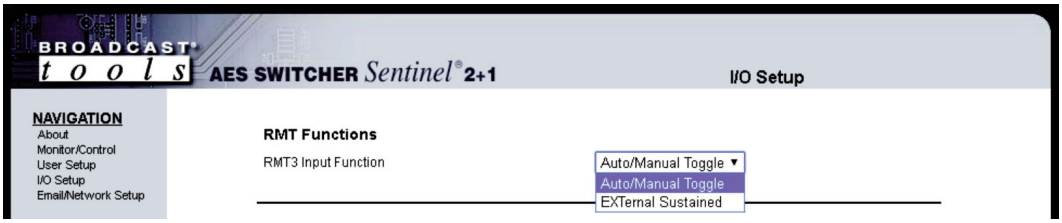


WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"I/O Setup" Web Page (cont.)



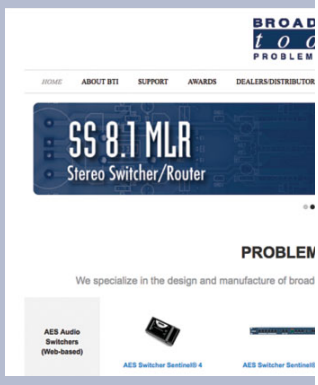
RMT4 Input Function: Auto/Manual Toggle: Pulsing the RMT4 input toggles unit between Auto and Manual mode.
EXTernal Sustained: Holding the RMT4 input low switches the unit to the backup input, releasing returns to the primary input.



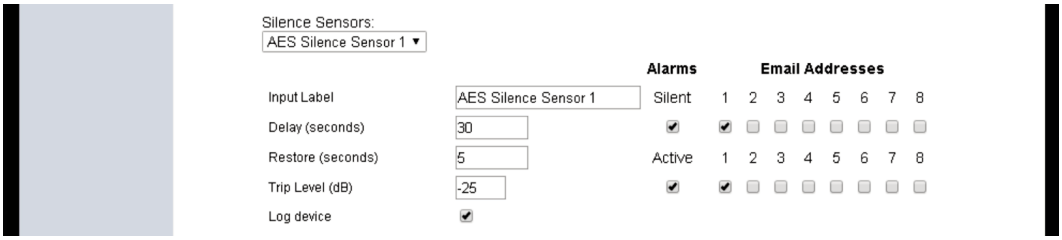
Monitor Audio Switching Mode: Follow AES: Analog monitor audio outputs follows AES switching.
Independent: Analog monitor audio is switch separately from AES switching.

NOTE: Press the "Save Settings" button to save your changes.

WEBSITE:
Visit our web site for product updates and additional information.



"I/O Setup" Web Page (cont.)



Silence Sensors:

Input Label: Up to 20 characters may be entered to describe the input.

Delay (Sec): When the input goes below threshold or out of phase the delay timer starts, if the input remains below threshold or out of phase for the duration of the delay then an alarm is generated and, if in automatic (bounce) mode, backup switching occurs.

Restore Delay (Sec): This is the time required for valid stereo audio to return and remain present before the unit clears the alarm and, if in automatic (bounce) mode, restore switching occurs.

Trip Level (dB): The left, right or both input levels below which input audio is considered below threshold.

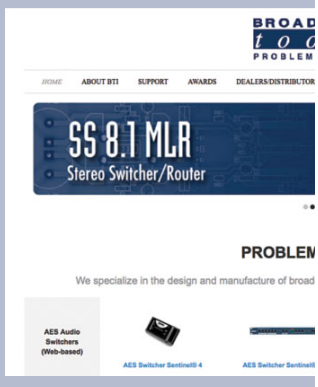
Alarms: When checked, the unit logs an alarm when the silence sensor enters or exits an alarm condition.

Email addresses: The boxes labeled 1-8 allow the user to assign up to eight different email addresses for alarm notification.

NOTE: The delay and restore timing range for both channels is 0 (OFF) to 65535 seconds (18 hours, 12 minutes and 15 seconds).

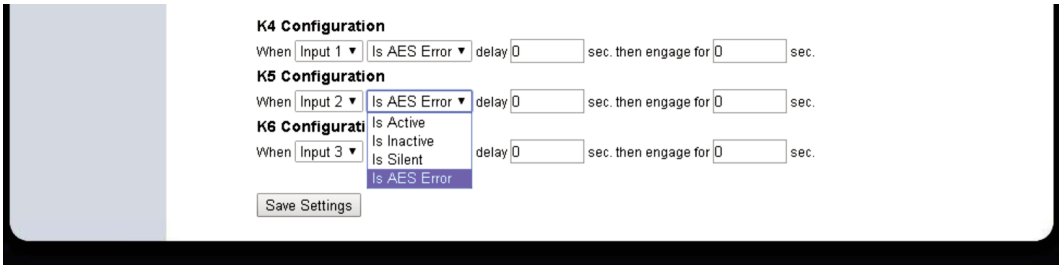
NOTE: Press the "Save Settings" button to save your changes.

WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"I/O Setup" Web Page (cont.)



K4, K5 and K6 Configuration: Each relay, labelled K4, K5, and K6, respectively, may be programmed to operate when an input is silent, active (switched to) or inactive (not switched to). The logic for each relay is as follows:

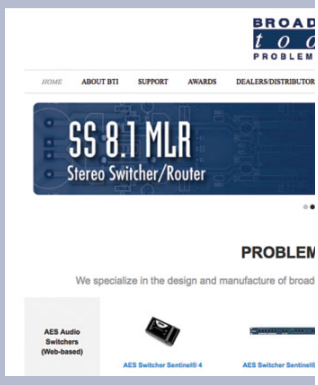
When [input 1, input 2, or input 3] [Is Active, Inactive, Silent, or AES Error] delay [X] seconds then [Engage] for [X] seconds.

NOTE: Delay timing = 0 (OFF) to 65535 seconds (18 hours, 12 min and 15 sec's).

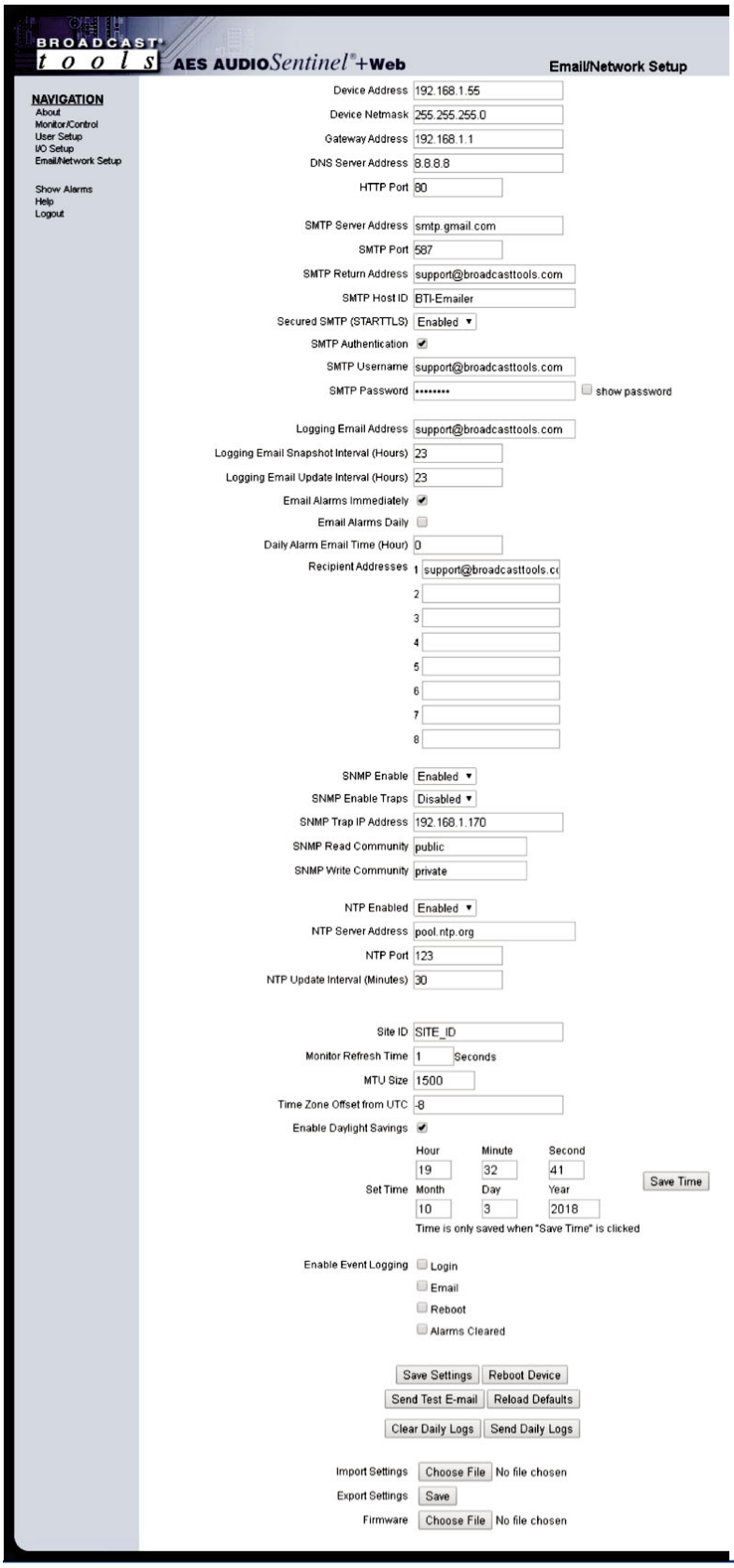
NOTE: To enable relay latch/sustained type operation, the [Engaged] delay should be set to 0.

NOTE: Press the "Save Settings" button to save your changes.

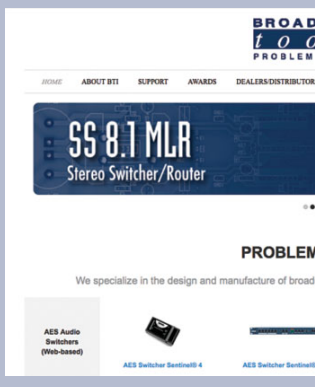
WEBSITE:
Visit our web site for product updates and additional information.



"Email/Network Setup" Web Page



WEBSITE:
Visit our web site for product updates and additional information.



WEB SETUP

"Email/Network Setup" Web Page – Device Network Settings

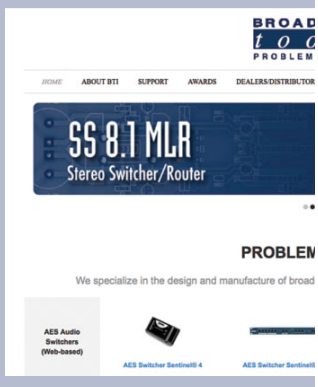
Device Address:	Enter a static IP address here.	Default: 192.168.1.55
Device Netmask:	Enter the Netmask here:	Default: 255.255.255.0
Gateway Address:	Enter the Gateway IP here:	Default: 192.168.1.1
DNS Server IP Address:	Enter your DNS address here.	Default: 8.8.8.8
HTTP Port:	Normally Port 80	Default: 80

"Email/Network Setup" Web Page – SMTP Settings

SMTP Server Address:	SMTP (Simple Mail Transfer Protocol) server address. Used to send emails.
SMTP Port:	Normally Port 25, 587 or 2525. Default: 25
SMTP Return Address:	Enter your return email address here. Emails from the AES Switcher Sentinel will indicate they are from this address. If an email cannot be delivered, a message stating why will be sent to this address.
SMTP Host ID:	Enter string here to identify the device. No spaces or special characters allowed.
Secured SMTP:	STARTTLS secure authentication is supported by most providers. This must be enabled for many SMTP servers, like Gmail. Leave disabled for standard Base64 authentication.
SMTP Authentication:	When checked SMTP authentication (username/password) is used. Most SMTP servers require authentication.
SMTP Username:	Enter SMTP server username here.
SMTP Password:	Enter SMTP server password here.

NOTE: Required for successful email: SMTP Server Address, SMTP Port, SMTP Return Address, SMTP Host ID. If the SMTP server requires authentication: SMTP username and SMTP password must be supplied, and authentication turned on. A valid email address must be entered into Recipient Address field #1.

WEBSITE:
Visit our web site for product updates and additional information.



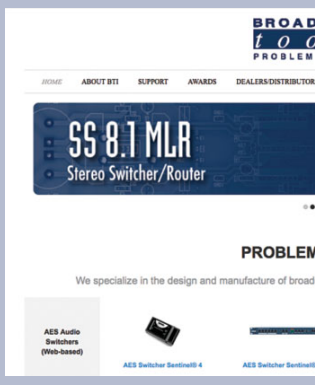
"Email/Network Setup" Web Page – Email Logging Settings

Logging Email Address:	Email address for the "Logging" email recipient (may be different from the 8 "Alarm" Recipient Addresses. Logging emails and Daily emails are sent to this address only.
Logging Email Snapshot Interval:	The period in hours that a snapshot is taken of the system. The logging email is not sent on this interval.
Logging Email Update Interval:	The period in hours that snapshots are emailed. This email may contain multiple snapshots if the Snapshot Interval is less than the Update Interval. Each snapshot will be identified by the date and time.

"Email/Network Setup" Web Page – Email Alarm Settings

Email Alarms:	Choose Immediate and/or Daily. If Immediate is selected, then an email will be sent out as soon as an alarm is generated. If Daily is selected, then each alarm is queued and emailed as a digest every 24 hours. Both can be used at the same time. The number of queued alarms is displayed on the Monitor/Control page.
Daily Alarm Email Time:	The hour of the day that queued alarms are sent. Queued alarms are sent to the Logging Email Address only.
"Alarm" Recipient Address:	Email addresses for up to 8 addresses. These addresses correlate to the 8 email addresses selectable on the I/O Setup page.

WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"Email/Network Setup" Web Page – SNMP Manager Settings

SNMP Enable: Enables or disables SNMP functionality, enabled by default.

SNMP Enable Traps: When enabled, SNMP trap messages will be sent. When disabled, no trap messages will be sent to the manager IP.

SNMP Trap IP Address: This is the IP address of the SNMP manager. The system will send traps to UDP port 162 at this IP address.

SNMP Read Community: This is the community name used for Read-Only access.

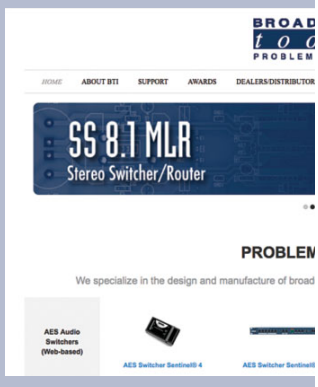
SNMP Write Community: This is the community name used for Read-Write access.

NOTE: A cold-start trap will be sent when the unit boots up if the SNMP Enable Traps are enabled and trap messages will be sent when a device enters or exits an alarm condition, depending on whether or not alarms are enabled.

"Email/Network Setup" Web Page – NTP Settings

NTP Enabled:	Enable for NTP network time sync.	Default: Enabled
NTP (Time) Server Address:	Enter the NTP address here.	Default: pool.ntp.org
NTP Port:	Port used to connect to NTP server.	Default: 123
NTP Update Interval (Min):	Interval between time updates.	Default: 30

WEBSITE:
Visit our web site for product updates and additional information.

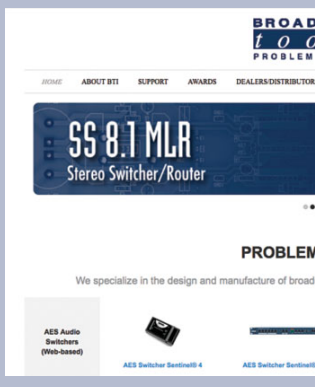


e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"Email/Network Setup" Web Page – Other Settings

Site ID:	This is the Site Identifier that is displayed on the web and in email.
Monitor Refresh Time (Sec):	Interval at which the Monitor page refreshes. Shorter times may increase network traffic. Default: 1
MTU Size:	Sets the network interface's Maximum Transmittable Unit. 1400 by default. If a VPN or hotspot is being used this may need to be reduced to 1296 to account for added overhead.
Time Zone Offset from UTC:	Sets the time zone used by the internal clock. Default: -8
Enable Daylight Savings:	Adjusts the clock for daylight savings time.
Set Time:	The hour, minute, second, month, day and year boxes can be used to set the time of the real time clock. The time is only updated if you click "Save Time" and not when you "Save Settings".
Enable Event Logging:	Event logging will generate an alarm, but it will not send an email. If the system is configured for Daily Alarm emails, then that Daily Alarm email will contain the event logging alarms as well as the alarms configured on the I/O Setup page.
Login:	When someone logs into the unit, the username and date/time will be logged in the alarm log.
Email:	When an email is sent, the type of email and date/time will be logged in the alarm log.
Reboot:	When the device boots the date/time will be logged in the alarm log.
Alarms Cleared:	When the Daily Logs or Normal Alarms are cleared, the type of log cleared and date/time will be stored. When Daily Logs are sent, the Daily Logs are also cleared; this will cause an event log as well.

WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"Email/Network Setup" Web Page – Controls

Save Settings: After pressing the "Save Settings" button, the device will reboot (If you changed the IP address, you must navigate your web browser to the new IP address (if the HTTP port was changed from port 80, be sure to add the new port number after the IP: xxx.xxx.xxx.xxx:port #). If you didn't change the IP address, then you will be returned to the login screen after the device reboots.

Reboot Device: When you press the "Reboot Device" button, the internal web server restarts.

Send Test Email: This button sends a test email to recipient address 1.

NOTE: After you are done making changes to the Email/Network Setup page, you MUST press the "Save Settings" button to save your changes.

Reload Defaults: This button resets all settings to factory defaults.

Clear Daily Logs: This button clears the daily que/memory. Keep in mind that if the Alarms Cleared Event is enabled, this event will post after the logs are cleared.

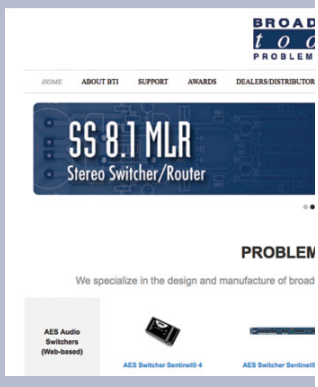
Send Daily Logs: When you press the "Send Daily Logs" button, the system will send the daily logs email and clear the log queue.

Import Settings: Browse to locate and import a previously saved .ncs settings file.

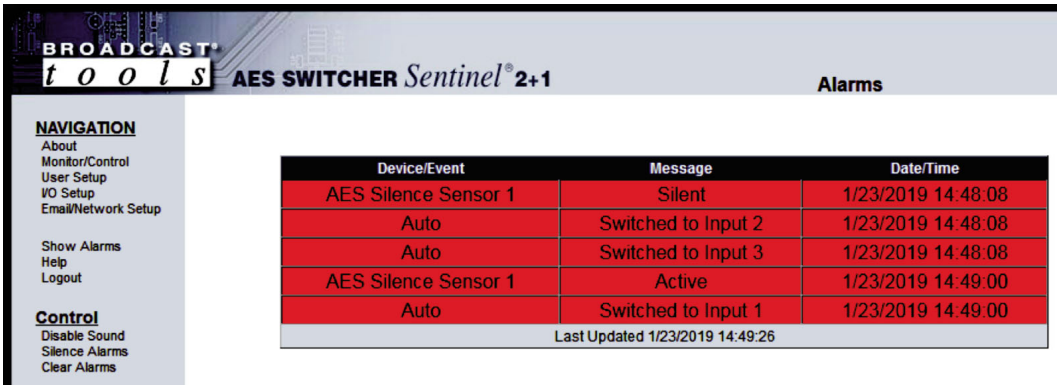
Export Settings: Clicking save will allow you to download a backup copy of the settings entered into the unit as a .ncs file.

Firmware: Browse to locate and apply a firmware update file saved on your computer. Be sure to follow the update instructions provided by Broadcast Tools.

WEBSITE:
Visit our web site for product updates and additional information.



"Show Log" Web Page



This page displays current alarms.

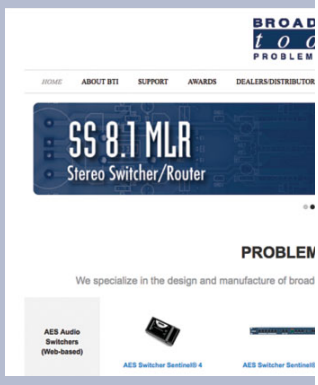
Alarm Messages

Active:	Audio above silence alarm threshold.
Silent:	Audio below silence alarm threshold.
In Phase:	Stereo audio exited out of phase alarm.
Out of Phase:	Stereo audio entered out of phase alarm.
AES Error:	Error flag from AES receiver; AES signal error or loss.

Controls

Disable Sound:	Mutes the alarms sound.
Silence Alarms:	Marks active alarms as acknowledged.
Clear Alarms:	Erases all alarms in the Alarm Log.

WEBSITE:
Visit our web site for product updates and additional information.



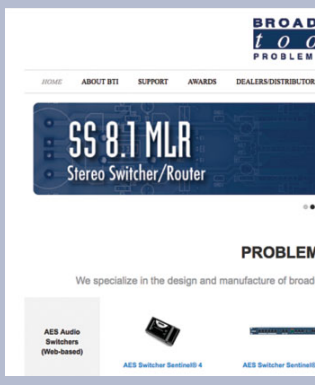
e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

"About" Web Page



The "About" web page displays the product name, firmware version numbers, and Broadcast Tools® web site link. For firmware updates please contact Broadcast Tools® Technical Support: http://broadcasttools.com/support/

WEBSITE:
Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

Specifications

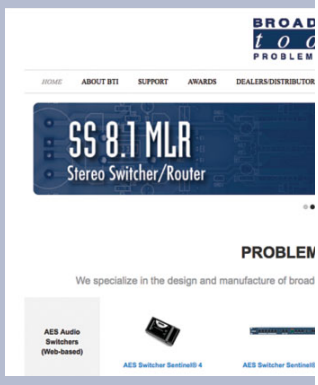
Ethernet Interface:	RJ-45, 10base-T or 100base-TX, auto sensing with link & activity LED indicators - Full/half duplex.
Protocols:	TCP/IP, UDP/IP, ARP, ICMP, SNMP, DHCP, HTTP, SMTP, ESMTP (Gmail.)
AES Program Switcher:	Via mechanical latching sealed relays utilizing 2-form-C bifurcated – crossbar silver alloy with gold overlay contacts.
DACs:	(2) 24-bit stereo delta-sigma DACs.
ADC:	(1) 24-bit stereo delta-sigma ADC. Internal sample rate dip-switch selectable between 44.1khz and 48khz.
ADC External Word Clock Input:	Female BNC jack. 75 Ω, balanced. 5V nominal signal level. Enabled via dipswitch. 32 to 96kHz range.
Silence Sense Level:	-15 to -35 dB below normal level, in 1dB steps.
Alarm Delay, Restore Delay Time:	0 to 65535 seconds (18 hours, 12 minutes and 15 seconds).
Remote Control Inputs:	Closure to ground (Sustained or momentary depending on mode). Internally pulled up to 5 VDC.
Relay Outputs (K4, K5. K6):	K4, K5, K6 = STST,NO. Dry contacts, 30 VDC @ 1 Amp maximum rating.
Connectors:	AES/EBU = XLR. Analog = RJ45. StudioHub+ compatible. All other I/O, removable euro-block screw terminals. Mating plugs supplied.
Included power supply:	PS-1515-IEC universal switching power supply with IEC inlet and domestic AC cable. 95-235 VAC 50-60hz input, +/-15 VDC 500mA output with 3-pin AMP-style latching power connector.
Size:	8.50” x 7.10” x 1.576” (WDH)
Weight:	3.0 lb.
Options:	* RA-1, 1-RU 19” rack shelf. Accommodates 2 units.

CAUTION!

For safety, never connect 120 Vac circuits to the above relays!

WEBSITE:

Visit our web site for product updates and additional information.



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

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

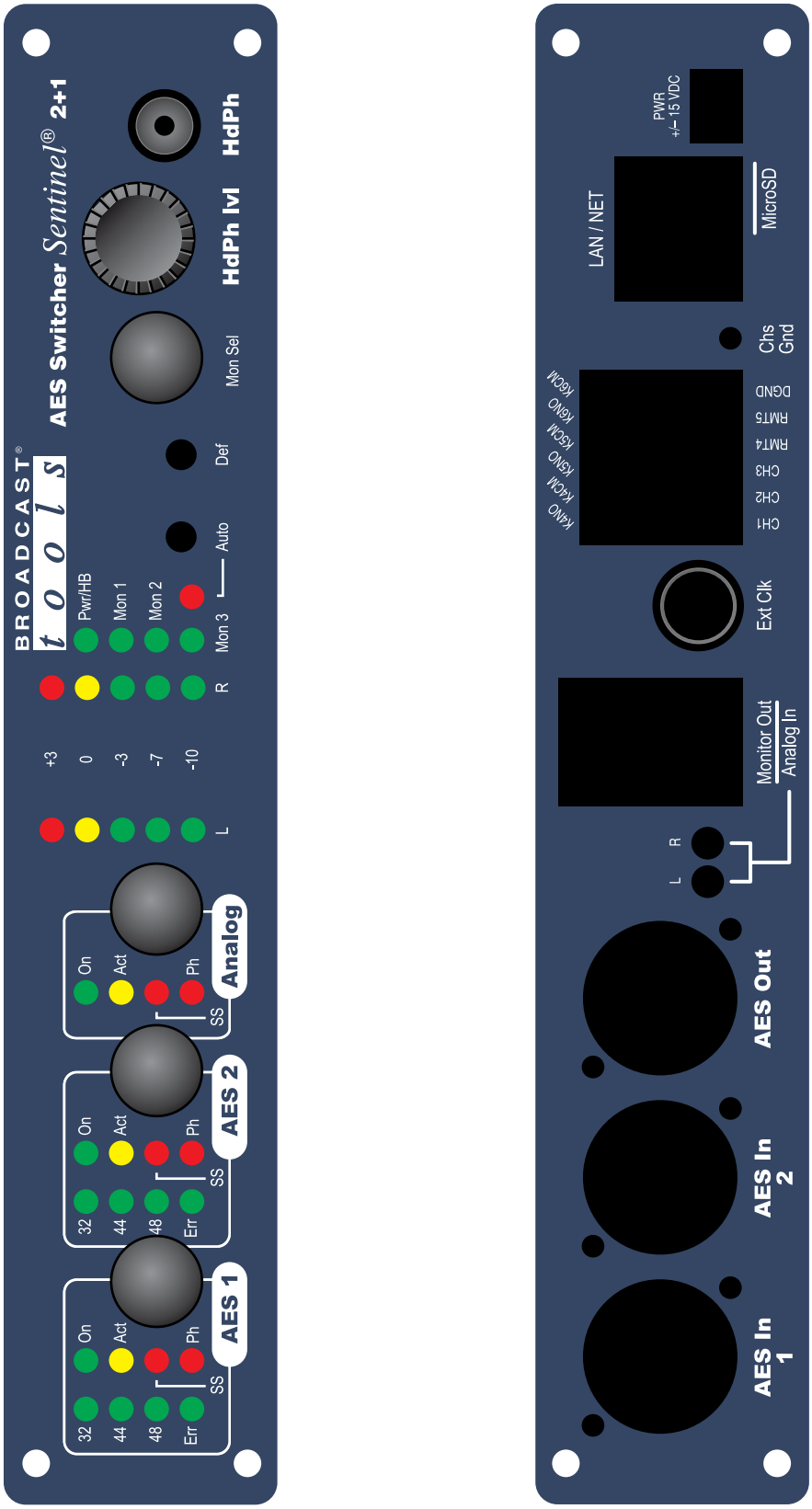
TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, BROADCAST TOOLS AND ITS SUPPLIERS DISCLAIM ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE; AND THE FOREGOING ALTERNATIVE REMEDIES SHALL BE EXCLUSIVE 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

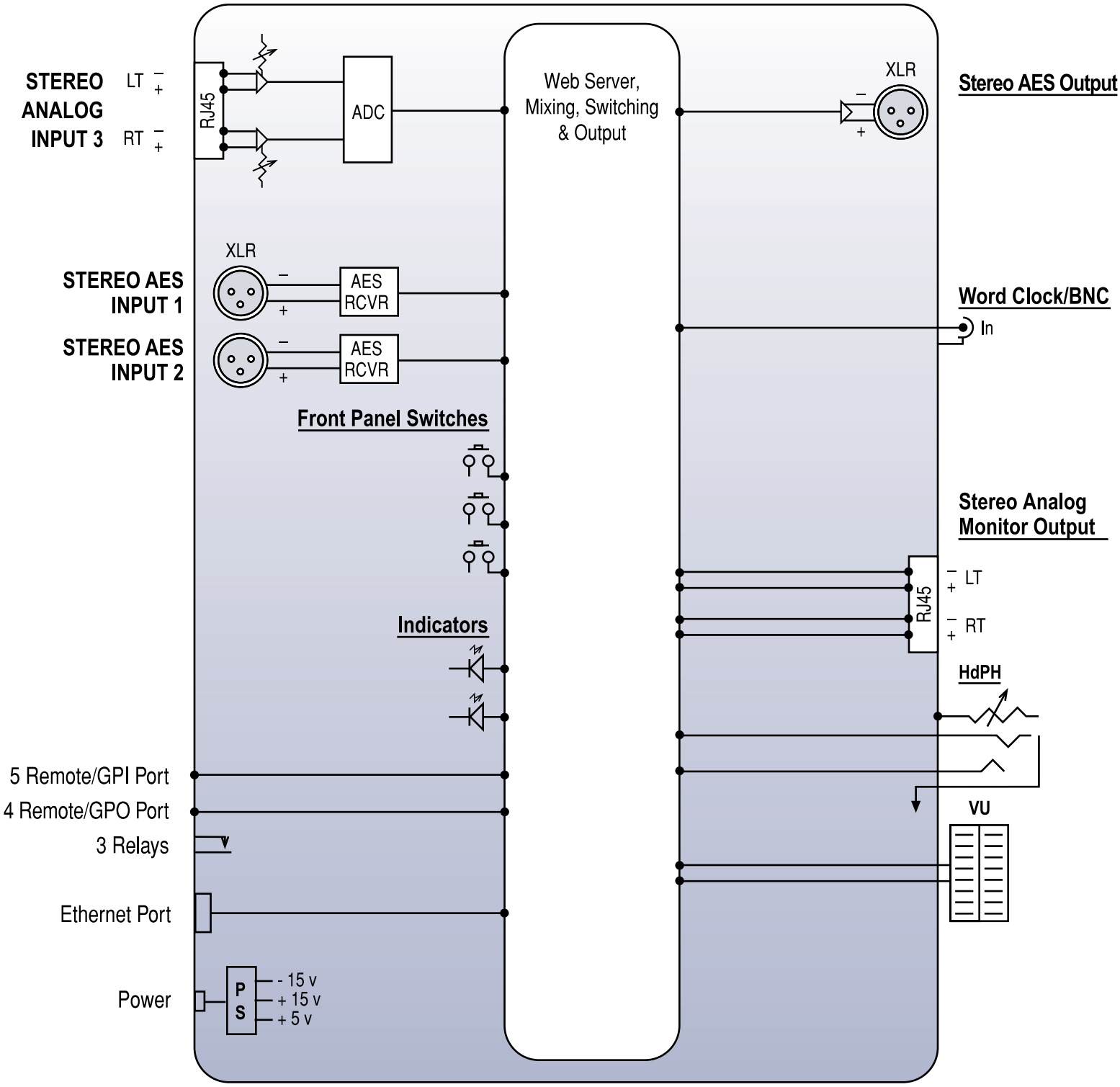
360.854.9559 **voice** • 866.783.1742 **fax**
support@broadcasttools.com **e-mail**
www.broadcasttools.com **website**



e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

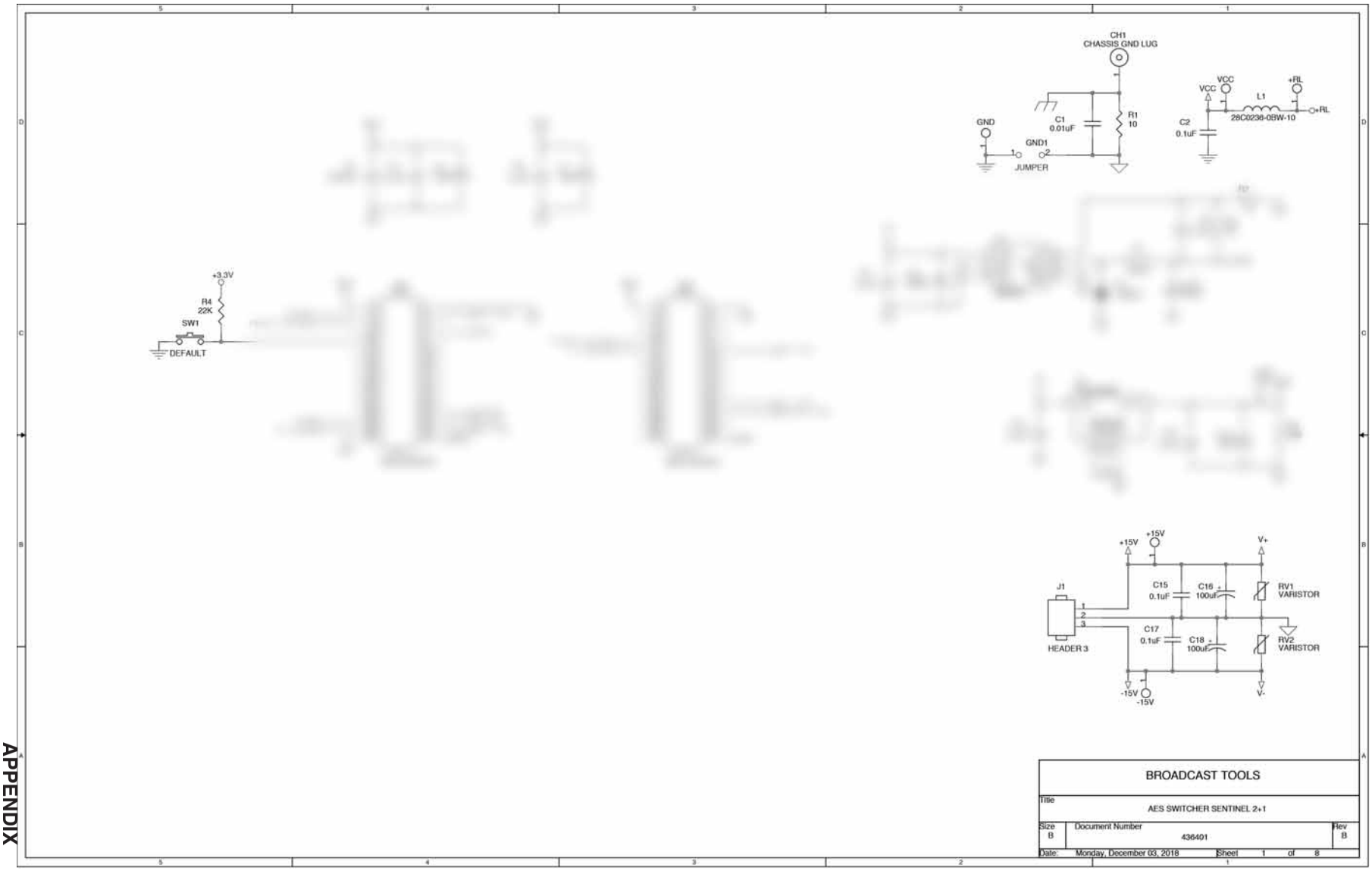
Functional Diagram

A signal flow diagram of the AES Switcher Sentinel 2+1 is shown below:



e-mail: support@broadcasttools.com voice: 360.854.9559 fax: 866.783.1742

FRACTIONAL SCHEMATIC

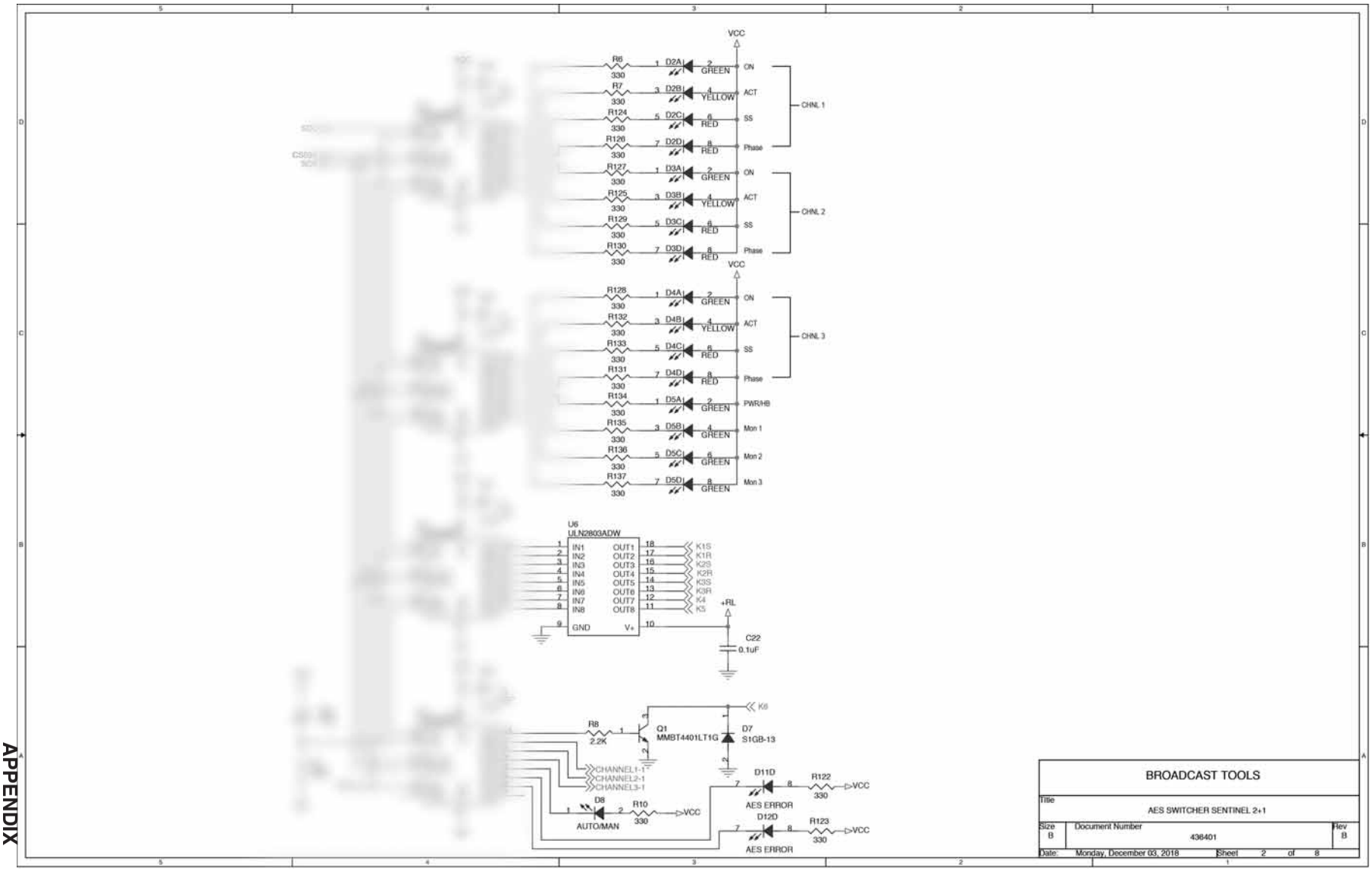


Modification date: 01/25/19

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com

Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.

FRACTIONAL SCHEMATIC

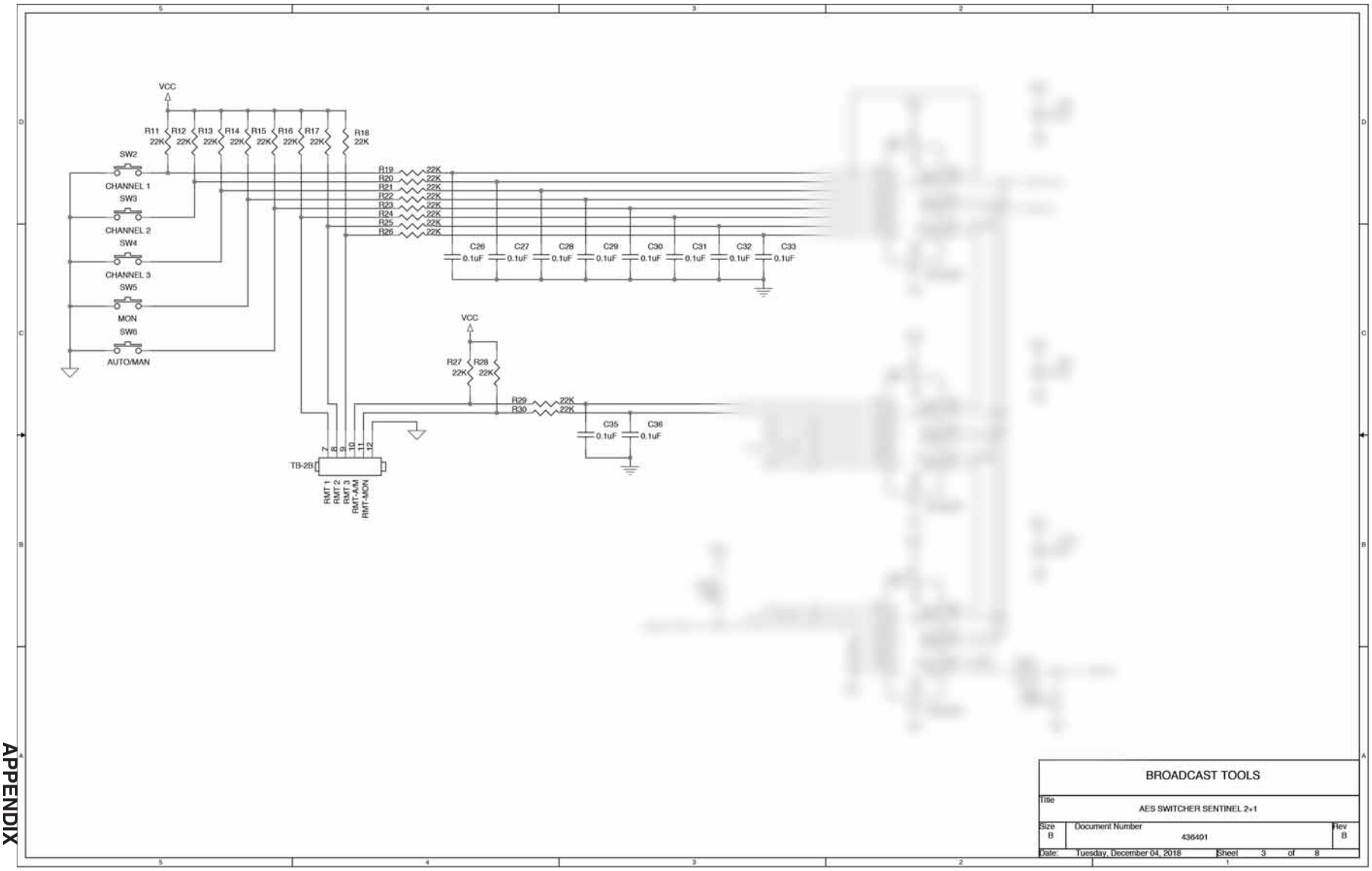


Modification date: 01/25/19

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com

Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.

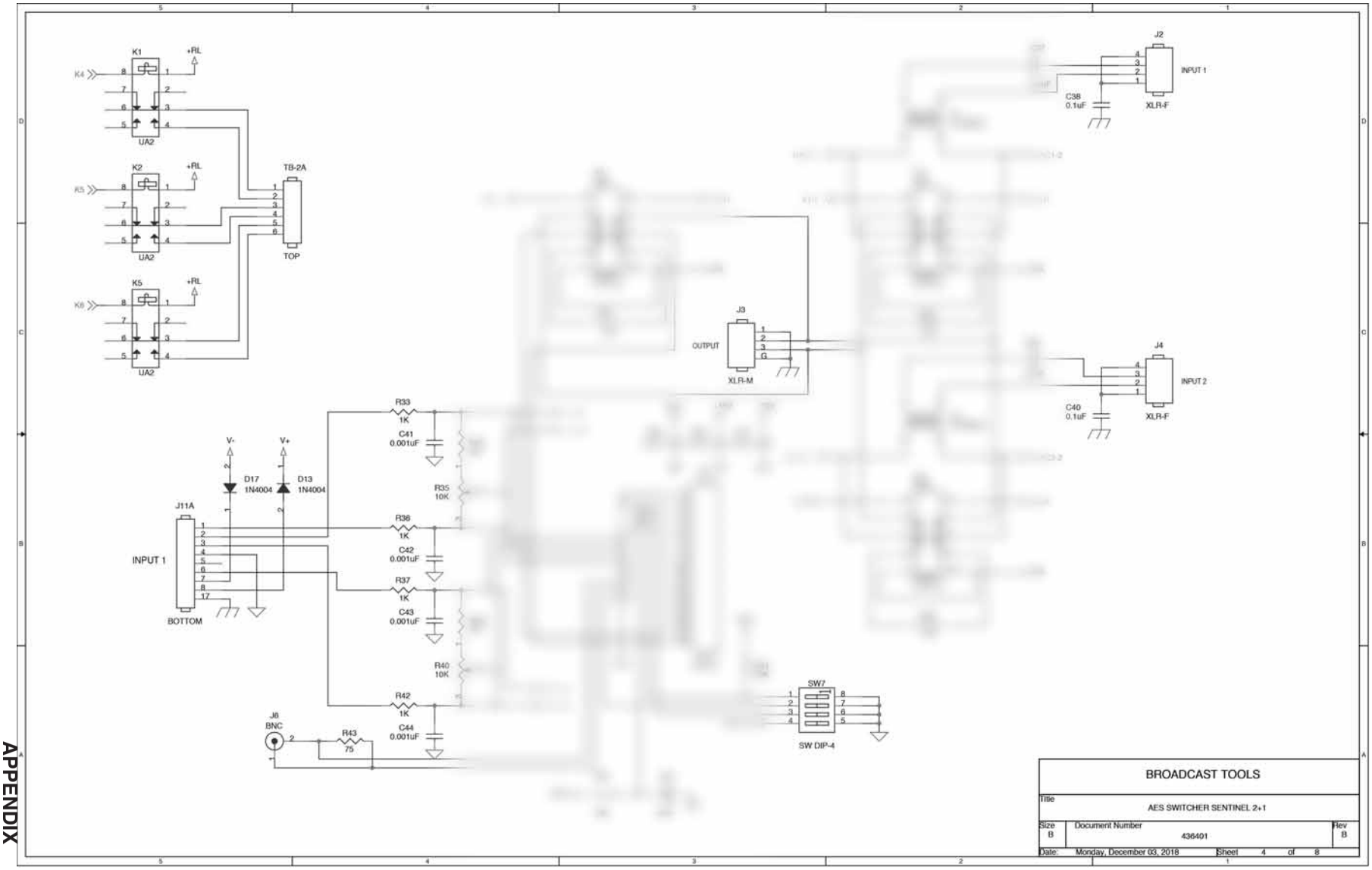
FRACTIONAL SCHEMATIC



131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com

Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.

FRACTIONAL SCHEMATIC

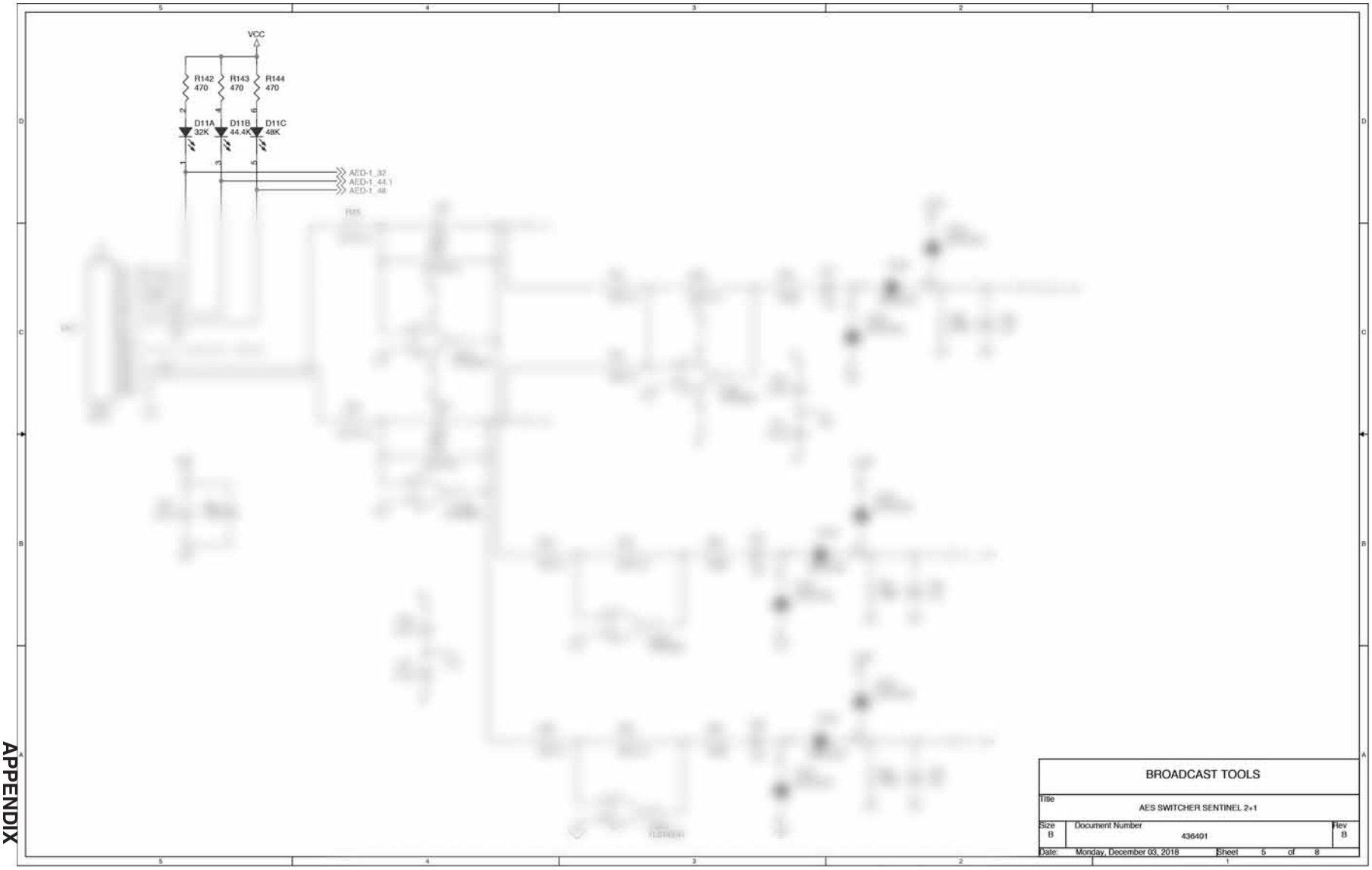


Modification date: 01/25/19

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com

Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.

FRACTIONAL SCHEMATIC

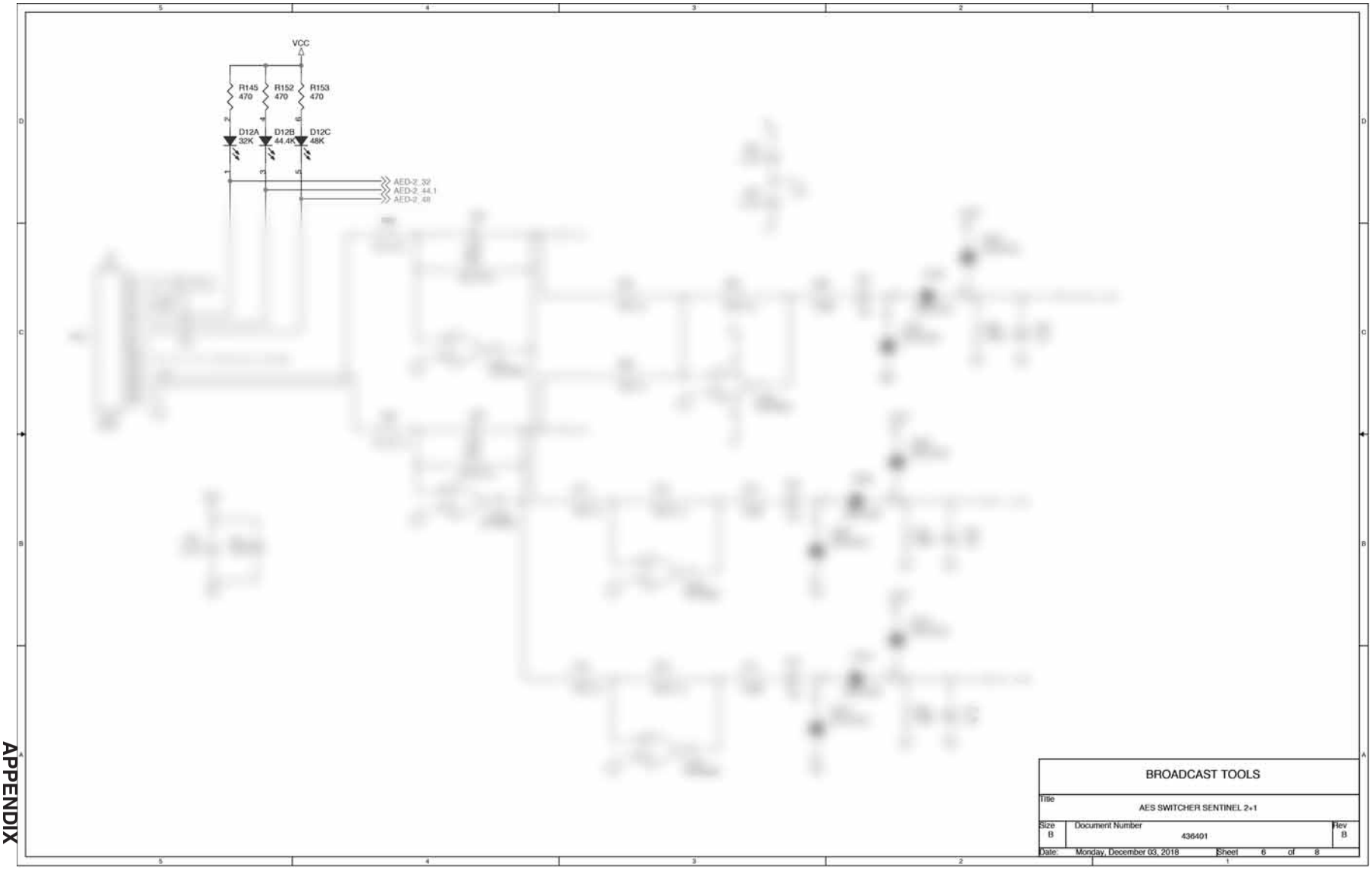


Modification date: 01/25/19

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com

Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.

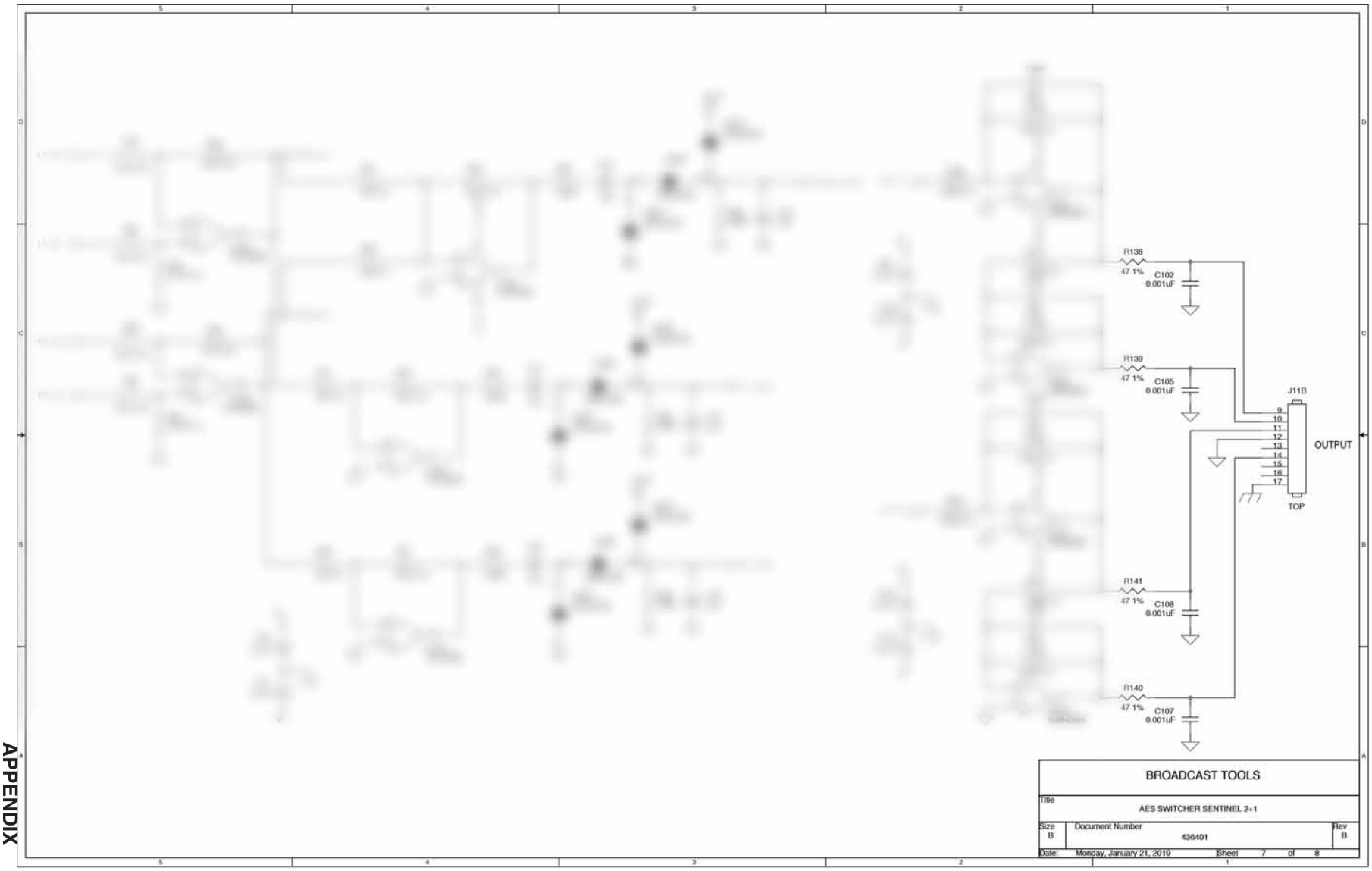
FRACTIONAL SCHEMATIC



Modification date: 01/25/19

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com
Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.

FRACTIONAL SCHEMATIC

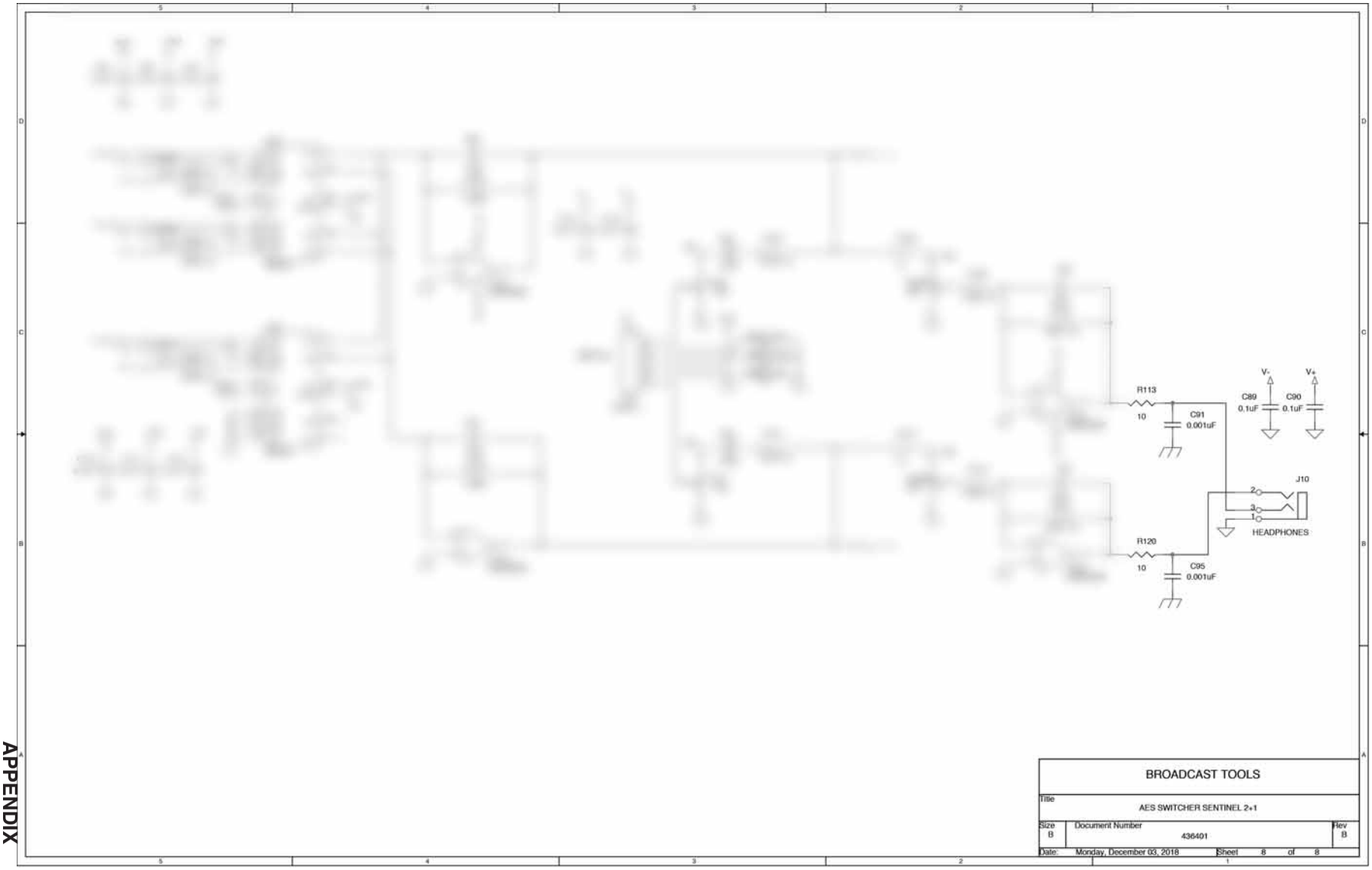


Modification date: 01/25/19

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com

Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.

FRACTIONAL SCHEMATIC



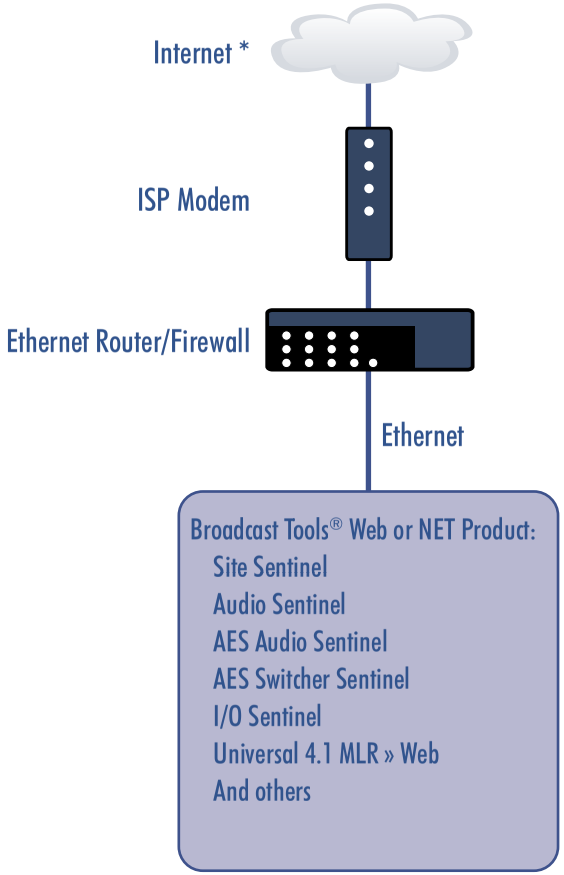
Modification date: 01/25/19

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com

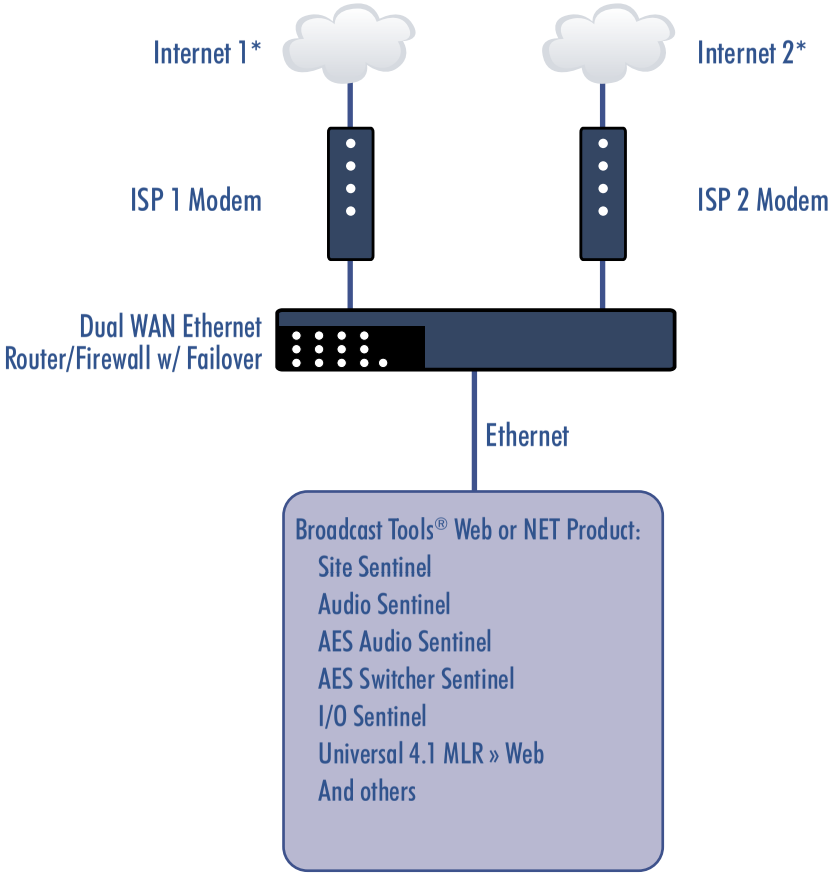
Copyright © 1989-2019 by Broadcast Tools, Inc. All Rights Reserved.



Internet Connectivity



*StarLink recommended



*StarLink recommended

Modified 09/02/25

131 State Street, Sedro-Woolley, WA 98284 • 360.854.9559 • Fax 866.783.1742
Visit us online at www.broadcasttools.com
Copyright © 1989-2025 by Broadcast Tools, Inc. All Rights Reserved.