Installation and Operation Manual

I/O Sentinel® 4

Web enabled four status/logic input, four relay output module

Manual update: 9/26/2011
For firmware versions equal to or greater than X_V1.13 / W_V1.09 / P_V1.02
If you need a firmware upgrade, contact Broadcast Tools®

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

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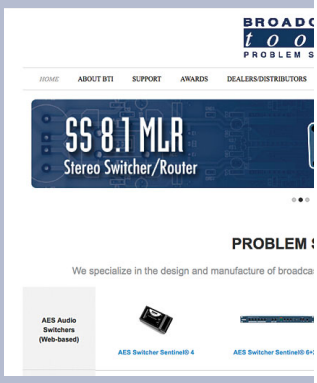

e-mail: support@broadcasttools.com **voice:** 360.854.9559 **fax:** 866.783.1742

INTRODUCTION

Thank you for your purchase of a Broadcast Tools® I/O Sentinel® 4 Web enabled four status/logic inputs, four relay output module (referred to as the I/O Sentinel® 4 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® I/O Sentinel® 4.

SAFETY INFORMATION

Broadcast Tools, Inc., is unable to support NON-Broadcast Tools® hardware/software or NON-Broadcast Tools® computer hardware/software problems. If you experience these problems, please research your hardware/software instruction manuals or contact the manufacturer's 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 98284-1540 USA
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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, Assembled and Supported in WA State, USA

CAUTION!

Only qualified technical personnel should install the I/O Sentinel® 4. 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 I/O Sentinel® 4 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 I/O Sentinel® 4.

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.

Product Overview

The I/O Sentinel® 4 is a robust, full-featured; Ethernet based data acquisition device with four optically-isolated status (logic) inputs and four programmable SPST relays. The I/O Sentinel® 4 was designed so all of the basic functionality you need is included to monitor and control your site equipment, including user programmable event action (macro) sequencer. Each input channel and all relays can be controlled and/or monitored over any IP network including private networks, IP-based industrial control network and the Internet. Users can operate the product using a web browser or web-enabled mobile device, while email notification may be configured to alert up to EIGHT recipients when alarms are detected. The user may also enable a sound effect to play on the monitoring PC when an alarm is generated. Logging of all user selected input status with site ID information which may be emailed from once an hour to once a day, along with hourly snap-shot functionality. We have also provided SNMP capabilities to allow multiple units to be monitored with any SMNP manager software package. SMTP username and passwords are also supported.

The I/O Sentinel® 4 is equipped with four optically isolated status/logic inputs that may be configured for 5 to 24 volts DC wet or dry (contact closures) status/logic monitoring. The four one-amp relays may be configured for either normally open or normally closed dry contacts. Each relay may also be configured for ON, OFF, pulsed or reboot operation.

The I/O Sentinel® 4 may be paired with a second I/O Sentinel® 4 to form a "4 Channel Bi-directional Status/Relay Extension Cord".

Features/Benefits

- Logging of all user selected input status with site ID information which may be emailed from once an hour to once a day, along with hourly snap-shot functionality.
- Plug-in euro-block screw terminals for status and relay connections.
- Nine front panel I/O activity LED indicators.
- Rear panel RJ-45, 10/100base-T LAN/Ethernet interface.
- Fully RFI proofed.
- Surge protected power supply. Domestic supply provided.
- Four units may be mounted on one RA-1 1-RU shelf.

Applications

- Web-enabled back-up transmitter ON/OFF control system.
- One end of a full-duplex four channel web-enabled I/O extension cord.
- Relay control and status monitoring via a web browser and/or user defined PC application.

Inspection

Please examine your I/O Sentinel® 4 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 I/O Sentinel® 4, this manual and/or CD, 7 foot BLUE straight-through CAT 5 cable, 7 foot GRAY crossover CAT 5 cable, and the 7.5, 8.0 or 9.0 VDC wall transformer. Manuals may also be downloaded from our web site.

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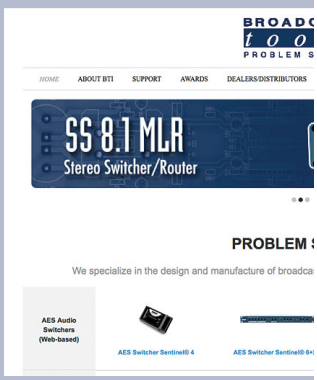
Visit our web site for product updates and additional information.



Installation

The I/O Sentinel® 4 interfaces to external equipment through removable euroblock screw terminals. The terminals accommodate wire sizes from 16 - 28 AWG solid or stranded wire. Before installing a wire, remove the euroblock 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.

Surge Protection

The I/O Sentinel® 4 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 I/O Sentinel® 4 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 I/O Sentinel® 4 to a UPS system. A UPS helps minimize the risk to the I/O Sentinel® 4 and provides power during a power outage.

"NET" network RJ45 connector

Connect one end of the supplied CAT5 (straight or crossover) cable to the desired ETHERNET (WAN/LAN) or PC port.

DC POWER connector

This is the connector used to power the unit. Never use any type of power supply other than the specified power supply.

Status / Logic input connections

Each optically isolated status/logic inputs can be configured to accept either a contact closure (DRY = default) or a (floating, WET) input. Attach your dry contacts to the desired status/logic channels StxA and STxB (where x is the status/logic input channel) terminals. Each input is equipped with a four-position header (please refer to the jumper layout in the appendix). JPR1 supports status/logic input one, JPR2 status/logic input two, JPR3, status/logic input three and JPR4, status/logic input four. Each jumper (JPRx, where x is the status/logic input) and the header pins 1,2,3,4 (pin 1 is labeled) are used to configure for wet or dry operation. The factory default is DRY. (Switch and relay contacts, open collector) with jumpers between 1 & 2 and 3 & 4. In the DRY configuration, the "A" terminal is ground while the "B" terminal is the cathode of the opto-isolator diode (pulled up to 5 volts through a 2.2K resistor).

To change the status/logic input to (floating) WET (user supplied voltage between 5 and 24 vdc), 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). ***Please refer to the appendix for configuration examples.***

NOTE: Please observe proper polarity.

Status LED's Illuminate when the appropriate status/logic input is activated.

CAUTION!

Installation of the I/O Sentinel® 4 in high RF environments should be performed with care. The station ground should be connected to the designated chassis ground terminal using a 20 to 24-gauge wire.

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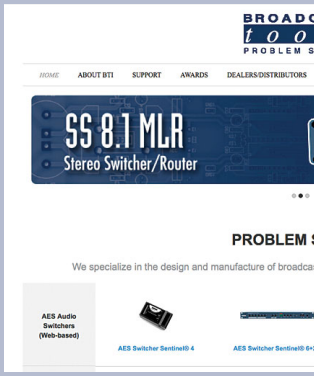


Relay Connections

Each of the four control relays are supplied configured as normally open dry contacts. To configure as normally closed contacts, follow the steps below.

a - Remove all connections from the unit.
b - Turn the unit over and remove the screw on each side of the unit.
c - Gently pull the top and bottom covers apart.
d - Locate the following jumpers: JPR5 for K1, JPR6 for K2, JPR7 for K3 and JPR8 for K4. The unit is shipped with all relay jumpers in the N.O. (normally open) position. To change the desired relay to normally closed, move the appropriate jumper from the N.O and C position to the N.C. and C position.
e - When finished, re-assemble the unit.
f - Re-connect all connections and apply power to the unit.

External equipment to be controlled should be connected to the terminals labeled Kx and Kx (where x is the control relay number) for relays one through four.

NOTE: If mechanical latching relays are required, we suggest the Broadcast Tools LR-5 (4PDT & SPST) mechanical latching relay.

Relay LED's Illuminate when the appropriate relay is activated.

Power/HB LED

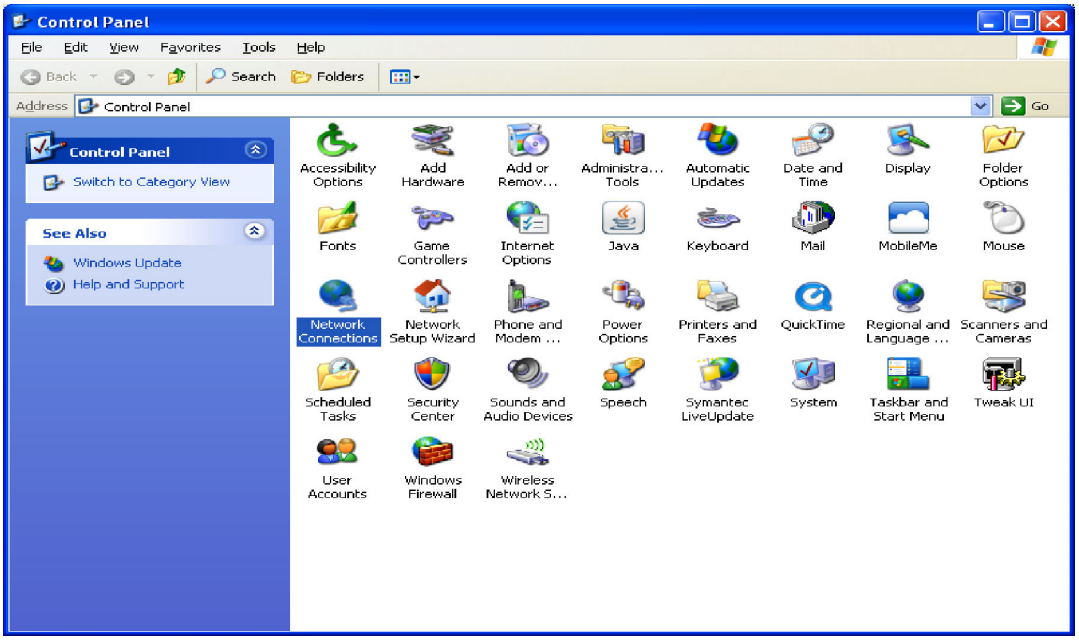
The flashing LED Indicates valid power and that the control processor is operating.

Web Setup/Operation

Ethernet "Quick Start" guide

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 help. Assigning an IP address already in use by another device may cause problems with your network! 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 XP 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. (Note that the control panel shown is in "Classic View". If control panel is in "Category View" select the "Classic View" option before proceeding.)



NOTE: We recommend the use of the latest version of Firefox, Safari for Windows or Chrome as your browser

CAUTION!

NEVER DOWNLOAD FIRMWARE UPDATES OR CHANGES TO THE XPORT WEB-SERVER UNLESS INSTRUCTED TO DO SO BY BROADCAST TOOLSR. DOING SO DELETES ALL SOFTWARE AND VOIDS ALL WARRANTIES FROM BROADCAST TOOLS, INC.

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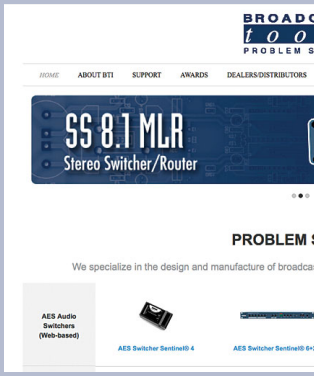
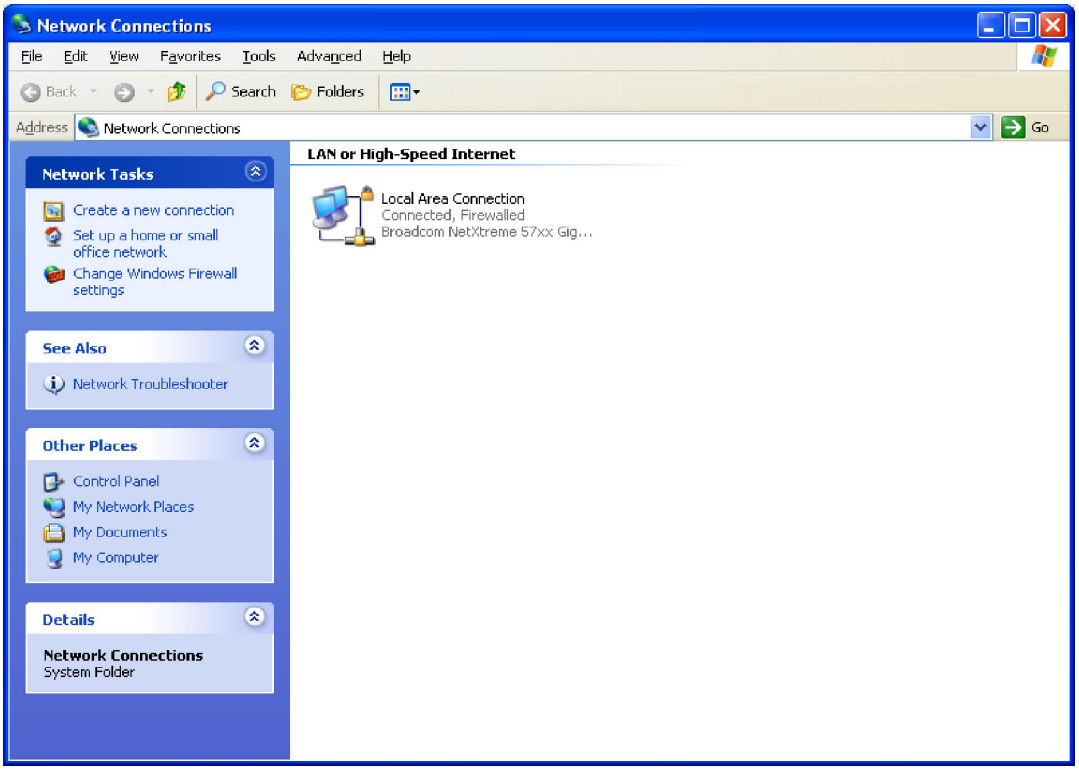
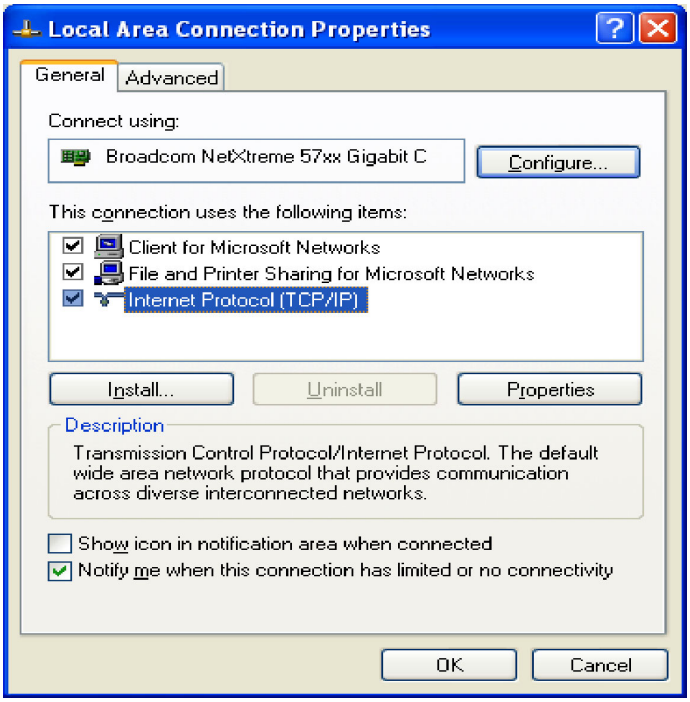


Step 2: Double click on the icon labeled Network Connections. The following menu will pop up.



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



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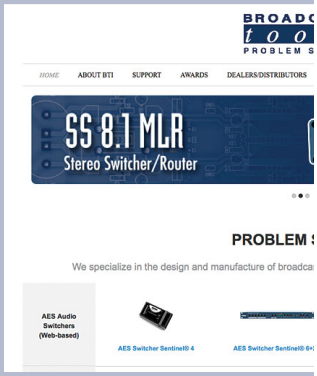
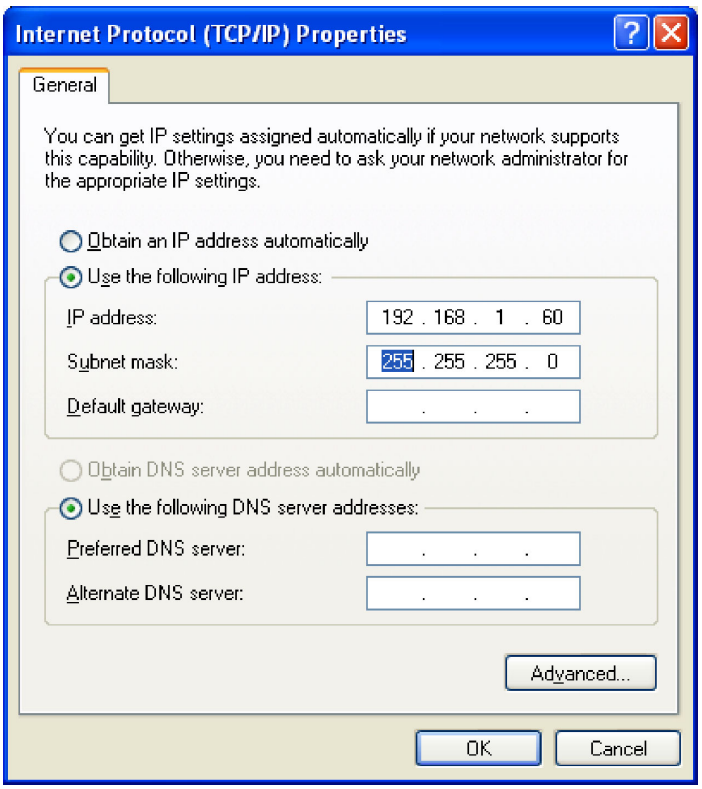


Step 4: On the Local Area Connection Properties page, double click on Internet Protocol (TCP/IP) to display properties.



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.

Opening the LOGIN Web Page

1. Connect the supplied GRAY colored XOVER cable between the PC's Ethernet port and the products NETWORK RJ45's jack.
2. Connect the supplied power supply to the product's power jack labeled Power. Verify that the green POWER LED and left "LINK" LED above the "NET" Network RJ-45 are illuminated

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

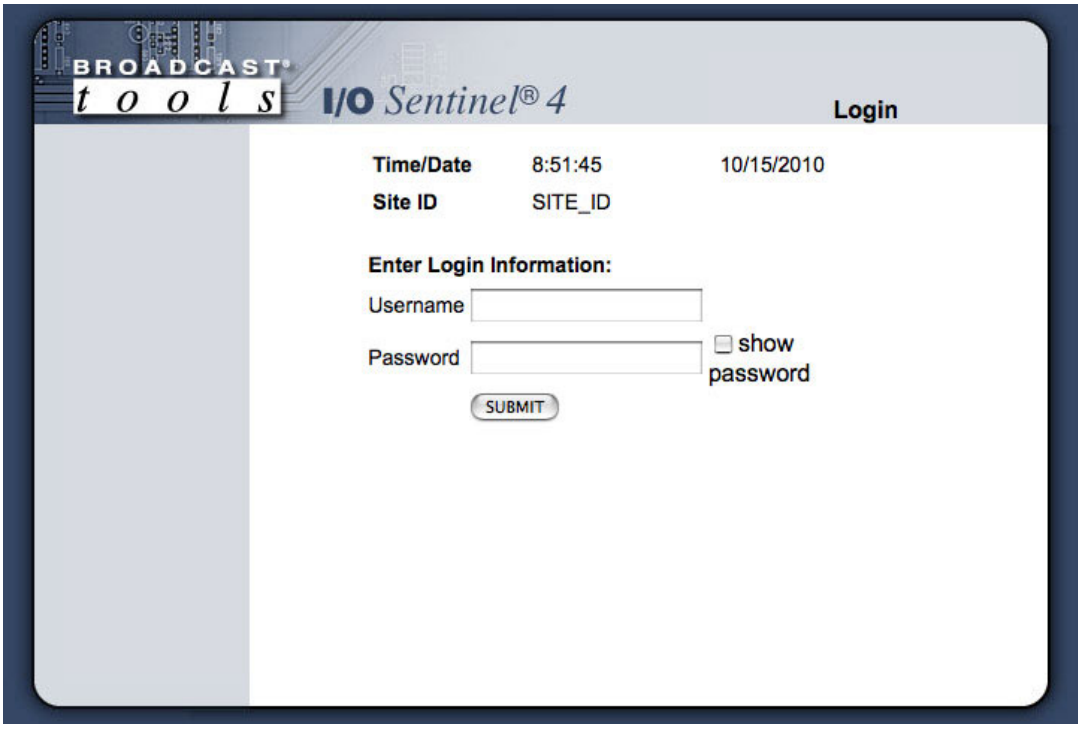
3. Open the product's login page by typing the following URL into the browser: http://192.168.1.55 A username and password is required to change any parameter and are case sensitive.

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

4. Once you are logged in, follow this manual for setup and/or operational information.

"Login" Web Page

The Login screen displays the username and password entry points.



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.

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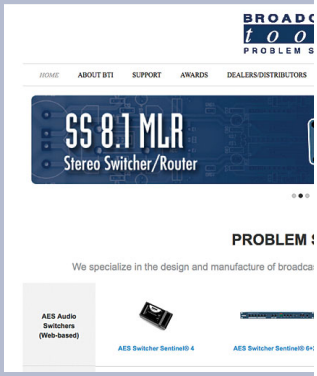
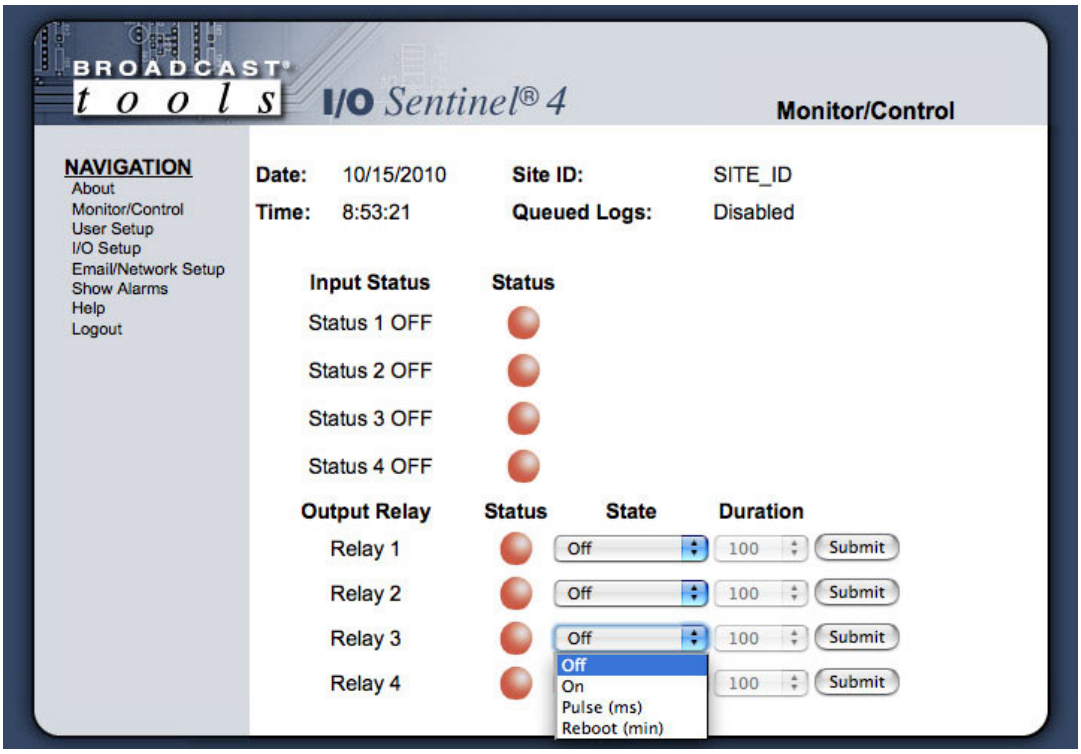


"Monitor/Control" Web Page



The Monitor/Control page allows the monitoring of each status/logic input and the control of all four relays. Input and relay status LED's display current status. The following is an explanation of each item on this page:

Queued Logs: Displays the available number of queued logs.

Status: Displays the condition of the four status/logic inputs.

Relays: Allows the user with admin or monitor/control access to control each relay for its displayed function.

Action/State: Determines how each relay will function. The relays may be configured for one of three states.
1 - ON and OFF operation.
2 - Pulse with user configured pulse length from 100 ms to 2000 ms in 100 ms steps.
3 - Reboot with user configured pulse length from 0 to 30 minutes in I minute steps.

To select other pages (if authorized), make your selection under the left hand Navigation column.

NOTE:

The user defined Site ID, Time, Date and Queued Logs are always displayed. Only "admin" level access can edit some of these items.

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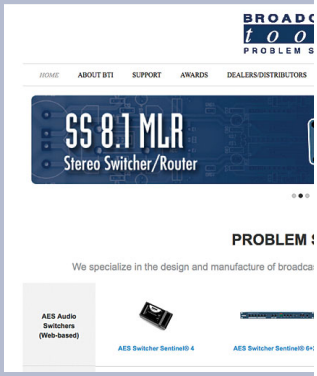

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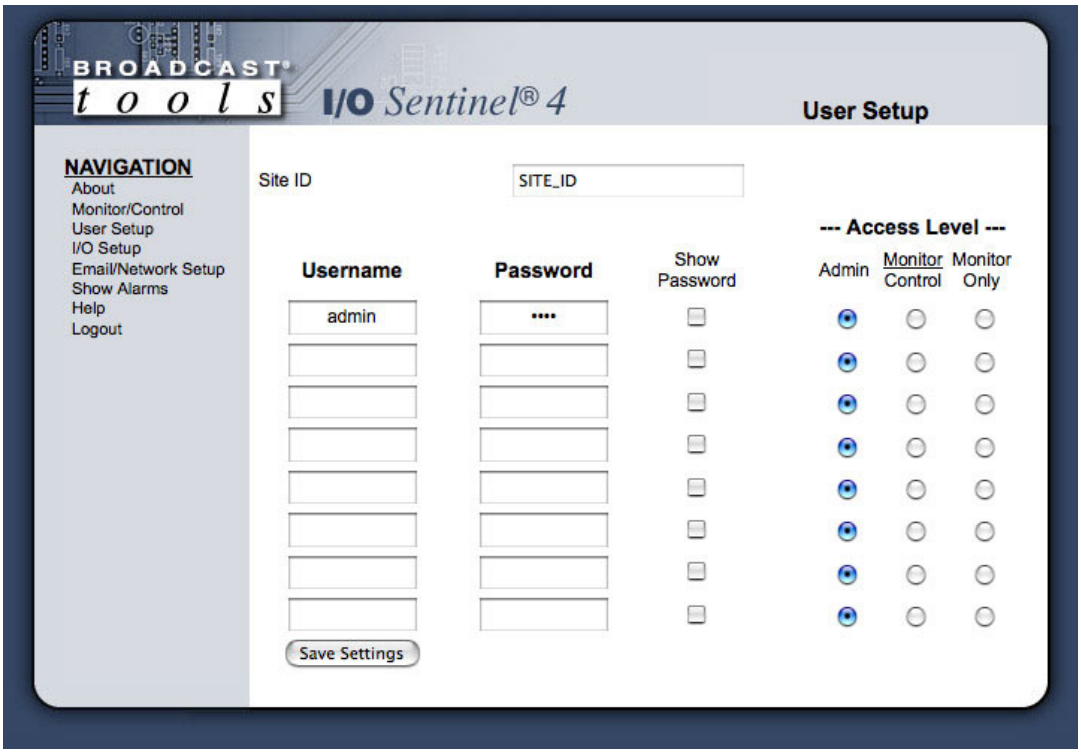
"User Setup" Web Page



This page can only be configured with (factory default) the "admin" access level.

The site ID may be used to display up to 29 numbers and/or characters labels.

Eight Usernames and Passwords may be configured for up to three access levels.

1. "admin" allows complete product configuration access.

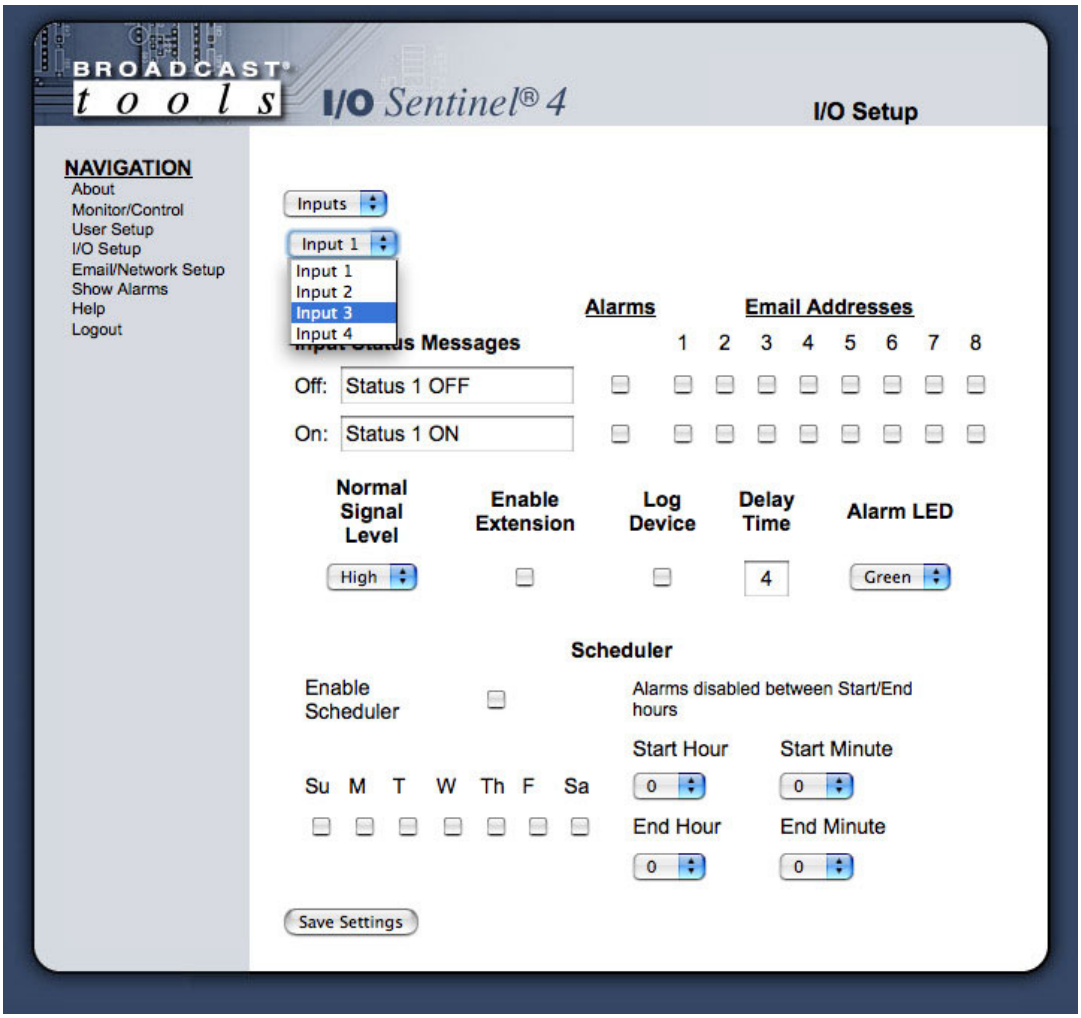
2. "Monitor/Control" allows the following access:
   About, Monitor/Control, Show log, Help, and Logout.

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

NOTE:

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

"Status Setup" Web Page



Input selection drop-down: Allows for the selection of each status/logic input.

Input Status Message: Used to identify each status/logic input.

OFF Alarms: This box must be checked to enable alarms when the input is OFF. The boxes labeled 1 thru 8 allow the user to enable up to eight different email addresses.

ON Alarms: This box must be checked to enable alarms when the input is ON. The boxes labeled 1 thru 8 allow the user to enable up to eight different email addresses.

Normal Signal Level: This drop-down allows the selection of current logic level. This normally set for High, but may be set to low.

NOTE: When the "Normal signal level" is set to High = When NO voltage is applied to the input, it's considered OFF, when voltage IS applied to the input, it considered ON.

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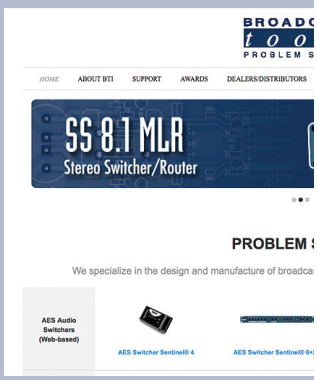


NOTE: When the "Normal signal level" is set to Low = When voltage IS applied to the input, it's considered OFF. When NO voltage is applied to the input it considered ON.

NOTE: By enabling the ON and/or OFF monitoring and NOT enabling an email box, the device will log the events, but not send an email. If the device is exiting a OFF alarm condition, then the email addresses used will be those notified when the OFF alarm condition was entered.

Enable Extension: Normally not checked. This box should be checked when paired with a second I/O Sentinel® 4 to form a "4 Channel Bi-directional Status/Relay Extension Cord".

Log Device: This enables the email logging of the status.

Delay Time: The delay is in seconds. This option specifies the wait time from when a status/logic input changes state before an alarm is activated. NOTE: Set to zero when paired with another I/O Sentinel® 4.

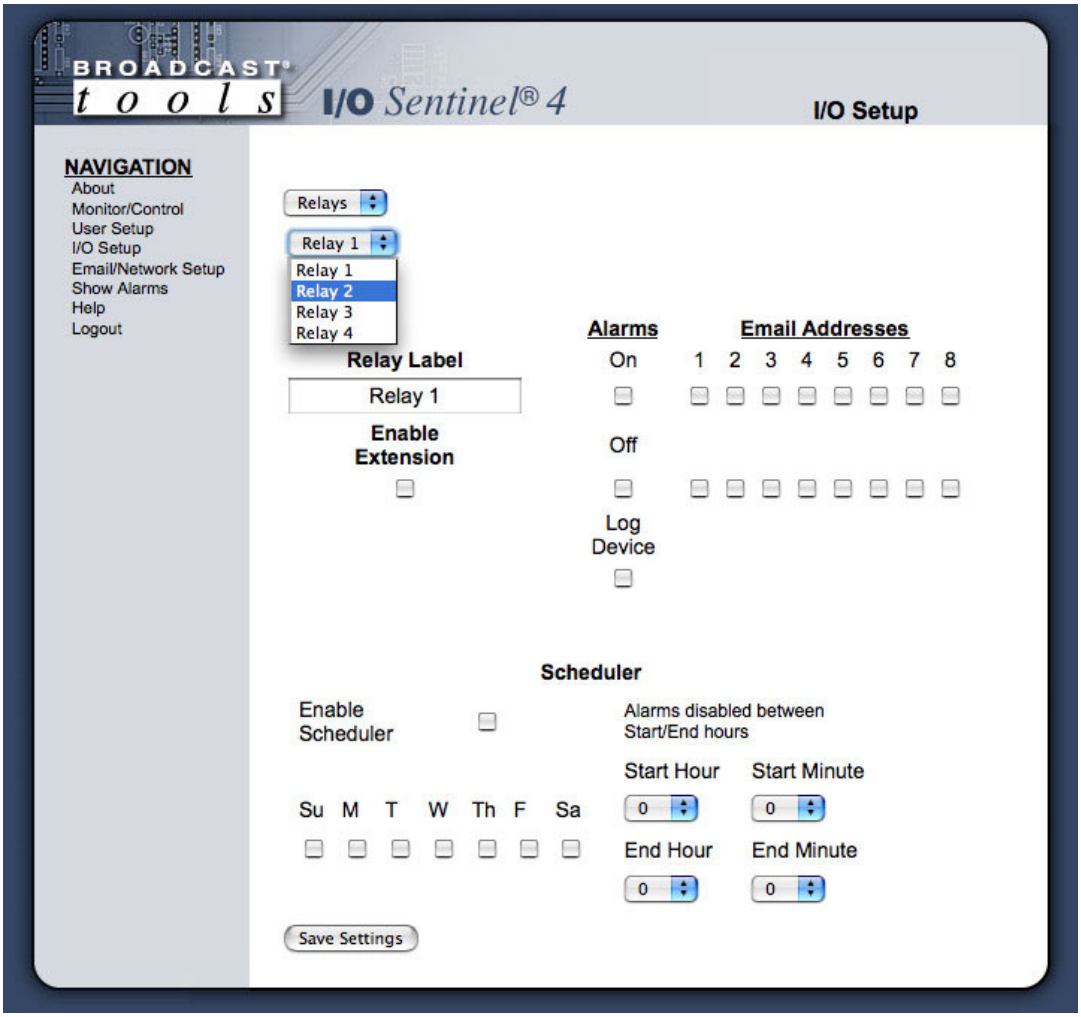
Alarm Led Status: Allows the user to configure the color of the web LED when in an alarm condition.

Scheduler: When enabled, the user may set each input alarm to be disabled or enabled by configuring the required day(s) of week and the start and end hours and minutes.

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

"Relay Setup" Web Page

Relays 1 - 4



I/O device selection:	Allows the user to select the I/O setup configuration pages.
Relay label:	Used to identify the device.
Alarms OFF:	This option enables email alarms with an "OFF" relay.
Email Addresses:	The "OFF" boxes labeled 1 thru 8 allow the user to enable up to eight different email addresses for off alarms.
Alarms ON:	This option enables email alarms with an "ON" relay.
Email Addresses:	The "ON" boxes labeled 1 thru 8 allow the user to enable up to eight different email addresses for on alarms.
Log Device:	This enables the email logging of the relay status.
Scheduler:	When enabled, the user may set each relay alarm to be disabled or enabled by configuring the required day(s) of week and the start and end hours and minutes.
Enable Extension:	Normally not checked. This box should be checked when paired with a second I/O Sentinel® 4 to form a "4 Channel Bi-directional Status/Relay Extension Cord".

NOTE:

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

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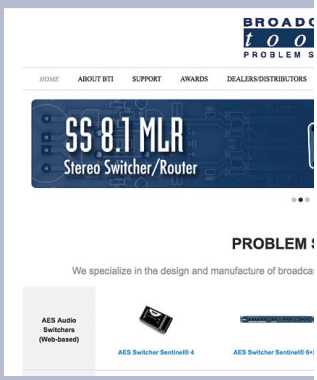

"Email/Network Setup" Web Page

BROADCAST tools I/O Sentinel® 4

Email / Network Setup

NAVIGATION
About
Monitor/Control
User Setup
I/O Setup
Email/Network Setup
Show Alarms
Help
Logout

Device Address 192 . 168 . 1 . 55
Device Netmask 255 . 255 . 255 . 0
Gateway Address 192 . 168 . 1 . 1
DNS Server Address 192 . 168 . 1 . 1
HTTP Port 80

SMTP Server Address
SMTP Port 25
SMTP Return Address
SMTP Host ID
SMTP Authentication
SMTP Username
SMTP Password
show password

Logging Email Address
Logging Email Snapshot Interval (Hours) 0
Logging Email Update Interval (Hours) 0
Email Alarms Immediatly
Daily
Daily Alarm Email Time (Hour) 0
Recipient Addresses 1
2
3
4
5
6
7
8

SNMP Manager IP Address 192 . 168 . 1 . 170
SNMP Manager Trap Port 162
SNMP Read Community public
SNMP Write Community private
SNMP Enable Traps

Extension IP Address 0 . 0 . 0 . 0
Extension Port 0
Enabled Extension

NTP Server Address pool.ntp.org
NTP Port 123
NTP Update Interval (Minutes) 30
NTP Enabled

Site ID SITE_ID
Monitor Refresh Time 1 Seconds
Time Zone Offset from UTC -8.0 hours

Enable Encryption with Relay
Encryption Key (16 hex bytes) 00000000000000000000

Enable Event Logging Login
Email
Reboot
Alarms Cleared

Save Settings | Reboot Device
Send Test E-mail | Reload Defaults
Clear Daily Logs | Send Daily Logs

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"Email/Network Setup" Web Page

Restoring Network Factory Defaults
The I/O Sentinel® 4 factory defaults may be restored by depressing the recessed front panel "default" push button for five seconds while powering up the unit.

"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: 192.168.1.1
HTTP Port:	Normally Port 80	Default: 80

"Email/Network Setup" Web Page – SMTP Settings

SMTP Server Address:	The user can enter either an IP address in the xxx.xxx.xxx.xxx format or a URI in the form: smtp.comcast.net. In order to resolve the URI, a working DNS server must be present or its IP address entered into the system.	
SMTP Port:	Normally Port 25	Default: 25
SMTP Return Address:	Enter your return email here. If an email cannot be delivered, a message stating why will be sent to this address.	

NOTE: The user must enter the following items before an email can be successfully sent: SMTP Server Address, SMTP Port, SMTP Return Address, SMTP Host ID, SMTP username and SMTP password must be supplied if authentication is turned on and the Recipient Address 1. The test email is sent to email recipient address 1.

The user should press the "Save Settings" button after entering the SMTP information before attempting an email test. If authentication fails, the email is not sent, please ensure that the username and password is correct.

SMTP Host ID:	Enter something here to identify the device.
SMTP Authentication:	When checked, Base64 SMTP authentication is supported by clicking on the checkbox.
SMTP Username:	Enter user name here.
SMTP Password:	Enter password here.

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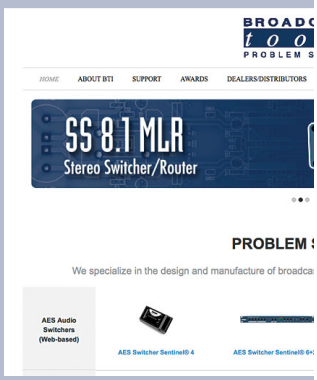

"Email/Network Setup" Web Page – Email Logging Settings

Logging Email Address: IP 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.

Logging Email Snapshot Interval: The period in hours that a snapshot is taken of the system. An email is not sent on this interval.

Logging Email Update Interval: The period in hours that the 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 the number of queued alarms is displayed on the Monitor/Control page.

Daily Alarm Email Time: The time 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 address correlate to the 8 email addresses selectable on each I/O Device.

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

SNMP Manager IP Address: This is the IP address of the SNMP manager. The system only accepts SNMP requests from this IP address, and will send traps to this IP address only.

SNMP Manager Trap Port: This is the port number that SNMP trap messages will be sent.

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

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

SNMP Enable Traps: When checked, trap messages will be sent. When unchecked, no trap messages will be sent.

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

Extension IP address:	Enter the IP of the other (mate) I/O Sentinel® 4.
Extension Port:	Enter the port of the other (mate) I/O Sentinel® 4. Normally 10001
Enable Extension:	Normally left blank unless paired with another I/O Sentinel® 4 to form a I/O Sentinel® 4 "extension cord".

"Email/Network Setup" Web Page – NTP Settings

NTP (Time) Server Address:	Enter the NTP address here.	Default: pool.ntp.org
NTP Port:	Normally 123.	Default: 123
NTP Update Interval (Min):	Time between timing updates.	Default: 30
NTP Enabled:	Must be enabled for correct timing.	Default: Enabled

"Email/Network Setup" Web Page – Other Settings

Site ID:	This is the Site Identifier that will be sent in each email.	
Monitor Refresh Time (Sec):	How many seconds the Monitor page refreshes. Shorter times may increase network traffic.	
Time Zone Offset from UTC:	Must be set for correct timing.	Default: -8
Enable Encryption with Relay:	When two IO Sentinels are setup to operate in pair mode (I/O extension), the communication can be encrypted. In order to enable encryption, both devices must have the same 16 hex byte encryption key.	
Encryption Key (16 hex bytes):	32 characters are required, inserting 0 where required (i.e. 0xA would be entered as 0A). The checkbox "Enable Encryption" must also be checked. It is important to verify that both devices are configured properly to operate as an extension before enabling encryption.	
Enable Event Logging:	Enabling these checkboxes will generate an alarm, but will not send an email. If the system is configured for Daily Alarm emails, then that Daily Alarm email will contain the Event Logging items as well.	
Login:	Whenever someone logs into the system, the username and date/time will be logged.	
Email:	Whenever an email is sent, the type of email and date/time will be logged.	
Reboot:	Whenever the device boots, the date/time will be logged.	
Alarms Cleared:	Whenever 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.	

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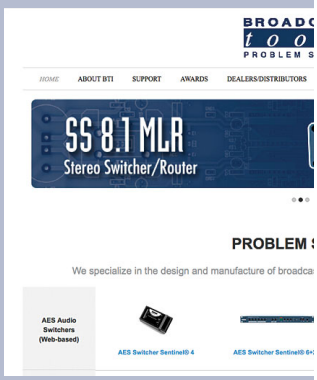

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"Email/Network Setup" Web Page – Controls

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 the web page will return to the login screen after the device reboots.

Reboot Device: When you press the "Reboot Device" button, the device resets, you must navigate your web browser to the new IP address.

Send Test Email: Press this button to send a test email. When the email has completed, an alert box will pop-up indicating the status of the email and an error condition if the email was not sent correctly. If an email was not sent correctly, please review your SMTP settings and correct as necessary.

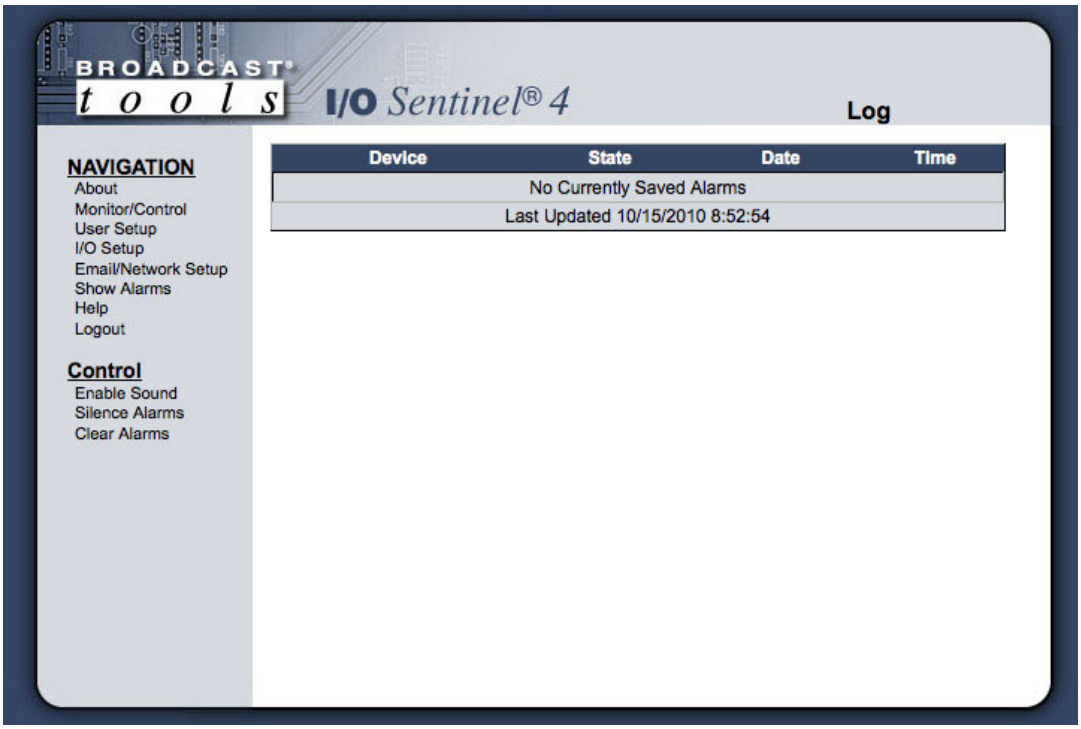
Reload Defaults: When you press the "Reload Defaults" button, the device resets, you must navigate your web browser to the new IP address (if the HTTP port was changed from port 80, be sure to add the new port number after the IP: xxx.xxx.xxx.xxx:port #).

Clear Daily Logs: When you press the "Clear Daily Logs" button, the daily logs stored in memory will be cleared. 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 then clear those logs as ifthe correct time has expired.

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

"Show Log" Web Page



This page displays current alarms.

With the "admin" access level, the user may control all functions.

With the "Monitor/Control" access level, the user may view the "Show Log", enable/disable PC speaker sound and silence alarms.

NOTE: Shock Wave "Flash" must be installed and operating properly on your PC for the "Alarm Sound" to work when enabled.

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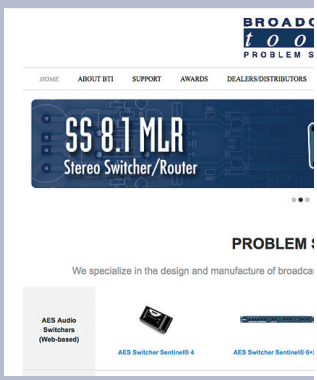

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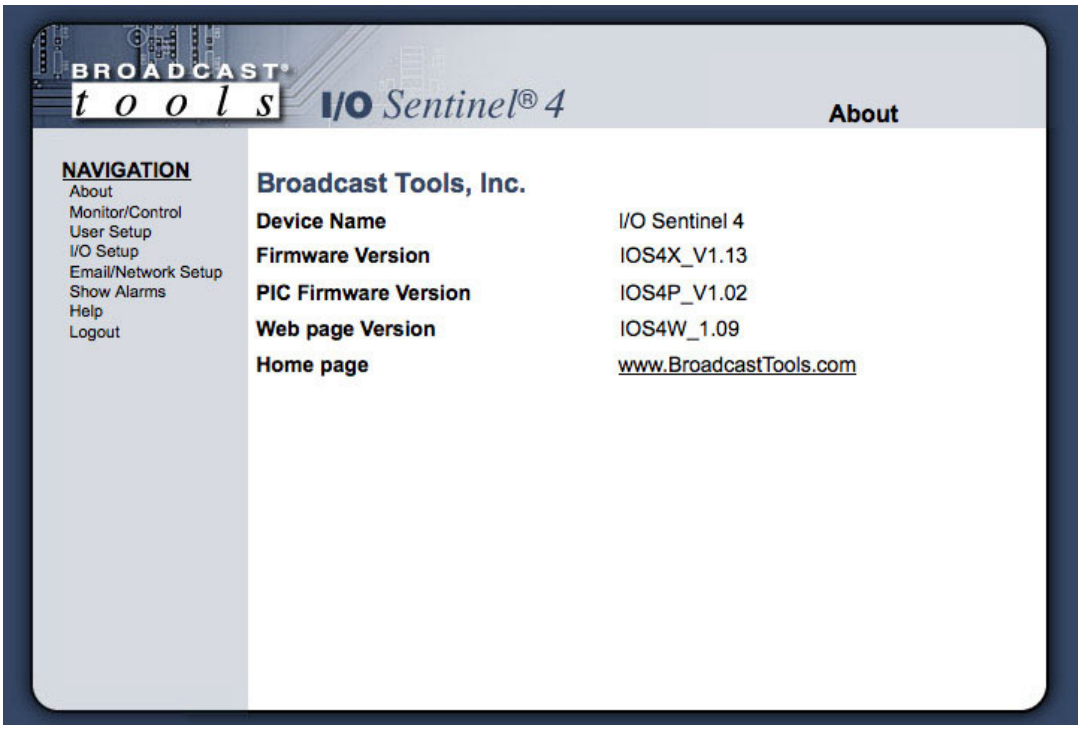
"About" Web Page



The "About" Web Page displays the product name, firmware version numbers, and Broadcast Tools® Web site link.

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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, TFTP, Telnet, DHCP, BOOTP, HTTP and AutoIP.
Status / Logic Inputs:	Four - Optically Isolated. Internal jumpers for (WET), floating) external 5 to 24 VDC (larger voltages with external current limiting resistor) or internal 5 VDC source (DRY). Open collector, contact closures to ground or external logic source.
Control Relays:	Four SPST normally open or closed (user defined) dry contacts, 30 VDC @1 Amp.
Connectors:	Removable euroblock screw terminals
EMI / FCC Compliance:	See the Declaration of Conformity page. Operation is subject to the following two conditions: 1) This device may not cause harmful interference, and 2) this device must accept any interference received, including that which may cause undesired operation.
Required power supply:	7.5 to 9.0 VDC only @ up to 1 amp. 2.1mm ID x 5.5mm OD coaxial connector. Surge protected. Domestic PS supplied.
Operating Temperature:	-40°F to +185°F (-40°C to +85°C)
Size:	6.18” x 3.70” x 1.42” (L,W,H)
Weight:	1.0 lb.
Options:	* CE certified universal power supply. * RA-1, 1-RU rack shelf. **Note: Velcro may be used to secure the product to the RA-1 shelf.**

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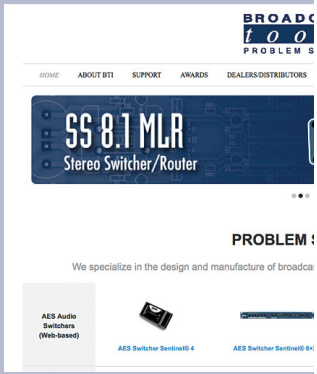

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131 State Street
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www.broadcasttools.com **website**

Declaration of Conformity

The XPORT Device contained in the I/O Sentinel®4 conforms to the following standards: (according to ISO/IEC Guide 22 and EN 45014)

Manufacturer's Name & Address:
I/O Sentinel®4: Broadcast Tools®, Inc.
131 State Street, Sedro Woolley, WA 98284-1503 USA

XPort: Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA
Declares that the following product:

Product Name Model: XPORT™ Device Server
Conforms to the following standards or other normative documents:

Electromagnetic Emissions:
EN55022: 1998 (IEC/CSPIR22: 1993) Radiated RF emissions, 30MHz-1000MHz
Conducted RF Emissions – Telecom Lines – 150KHz – 30MHz
FCC Part 15, Subpart B, Class B
IEC 1000-3-2/A14: 2000
IEC 1000-3-3: 1994

Electromagnetic Immunity:
EN55024: 1998 Information Technology Equipment-Immunity Characteristics
Direct ESD, Contact Discharge
Indirect ESD
Radiated RF Electromagnetic Field Test
Electrical Fast Transient/Burst Immunity
RF Common Mode Conducted Susceptibility
Power Frequency Magnetic Field Test

Manufacturer's Contact:
I/O Sentinel®4
Broadcast Tools®, Inc.
131 State Street
Sedro Woolley, WA 98284-1503 USA
Tel: 360 . 854 . 9559 Fax: 866 . 783 . 1742

XPORT™
Lantronix:
Director of Quality Assurance
15353 Barranca Parkway, Irvine, CA 92618 USA
Tel: 949 . 453 . 3990 Fax: 949 . 453 . 3995

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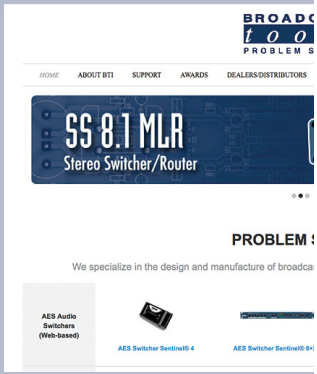

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Message structure via external control computer:

The IO Sentinel supports the monitoring and control of relays and status inputs via UDP messages. Under Email/Network Setup "Enable Extension" must be enabled and the Extension Port set. The Extension IP address must also be set to whatever IP address messages will be accepted from.

Relays can be turned on or off by sending a UDP packet to the device on the Extension Port using the following structure:

```
typedef struct
{
   BYTE Magic;
   BYTE RelayNumber;
   BYTE State;
   BYTE CS;
}UDP_MSG;
```

Magic should be set to 0x8B.
RelayNumber should be 0-3 for Relays 1-4.
State should be 0 for OFF and 1 for ON
CS should be calculated as Magic+RelayNumber+State

No reply is sent from the device after receiving this message; it is up to the calling application to make a query to ensure that the relay was set correctly.

Relays and Status Inputs can be queried as well. The following structure is used similar to the one above for setting a relay's state.

```
typedef struct
{
   BYTE Magic;
   BYTE RelayState[4];
   BYTE StatusState[4];
   BYTE CS;
}UDP_QUERY;
```

When querying the device's state you must send a UDP_MSG packet with the Magic set to 0x72, a UDP_QUERY packet is then returned. Send this packet on the Extension Port and the device will return a same sized packet containing the following information on the same port.

Magic should be set to 0x72
RelayState is an array of the 4 relay states with 0 being OFF and 1 being ON.
StatusState is an array of the 4 input status states with 0 being OFF and 1 being ON
CS = sum of the rest of the packet.

A Unicast packet is sent to the Extension IP address on the Extension Port.

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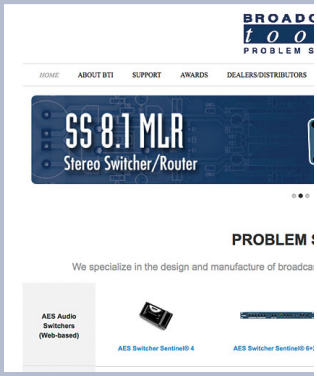

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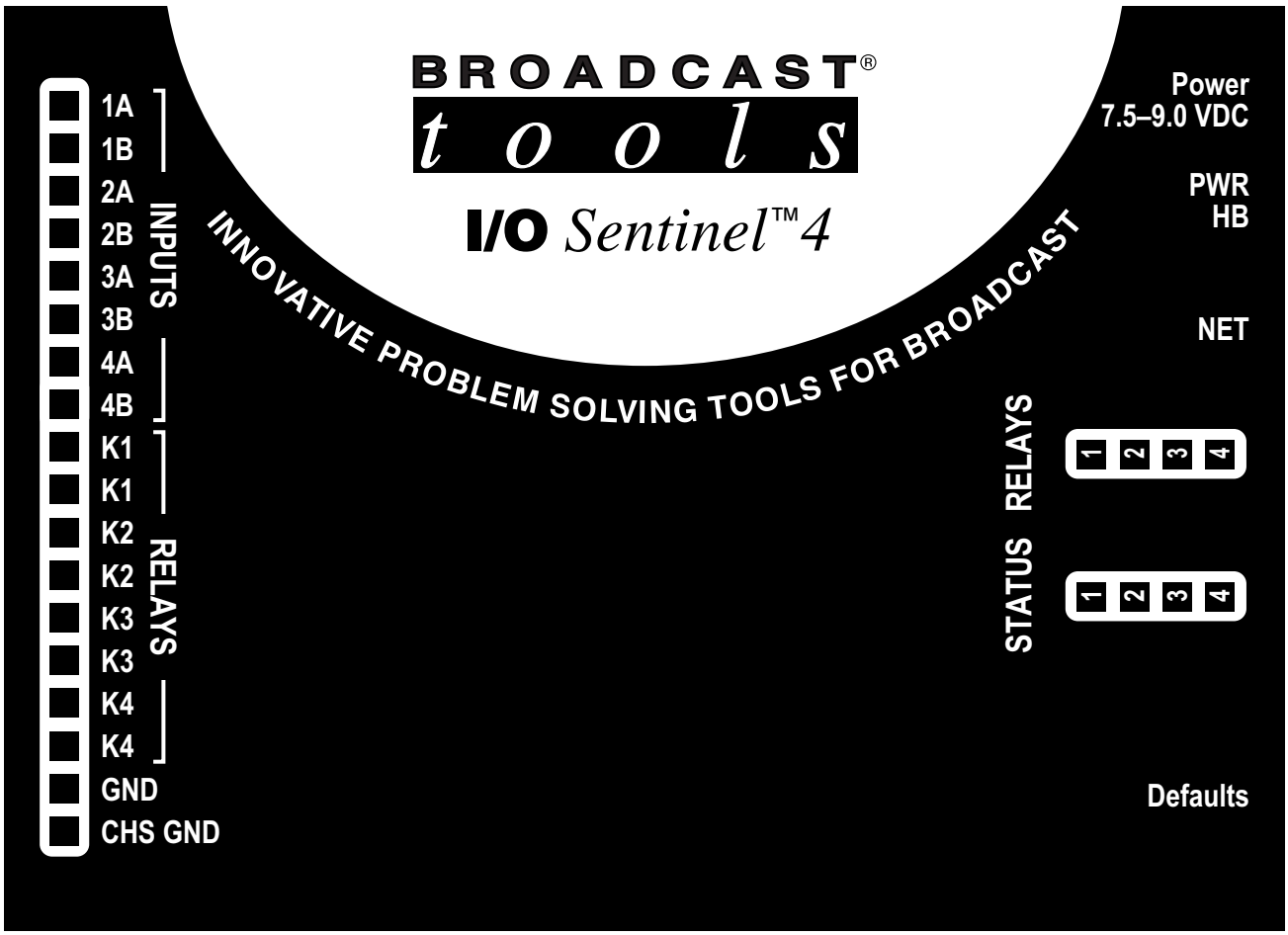

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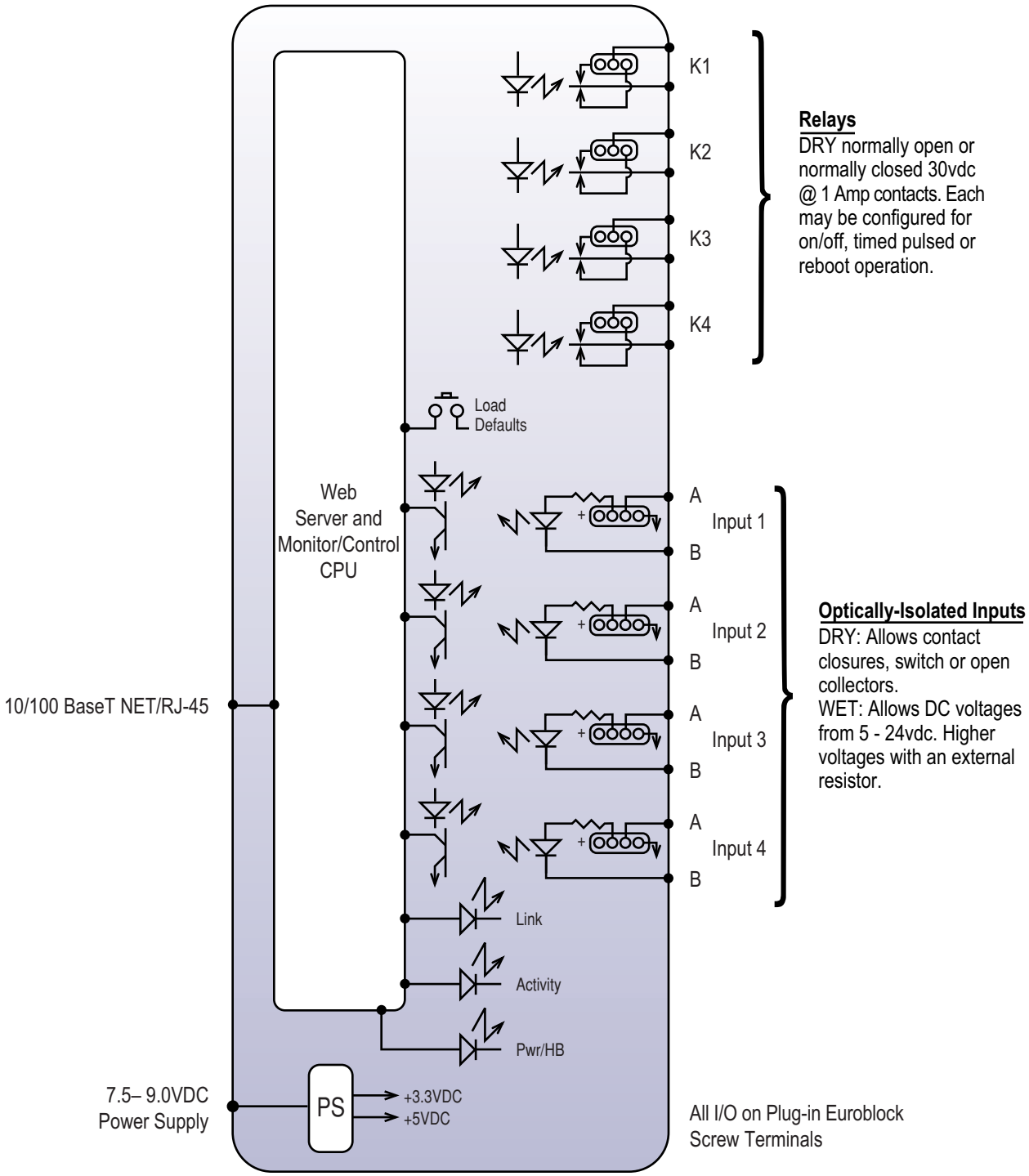
Functional Diagram



NOTE: May be paired to form a "four-channel bi-directional relay extension cord"

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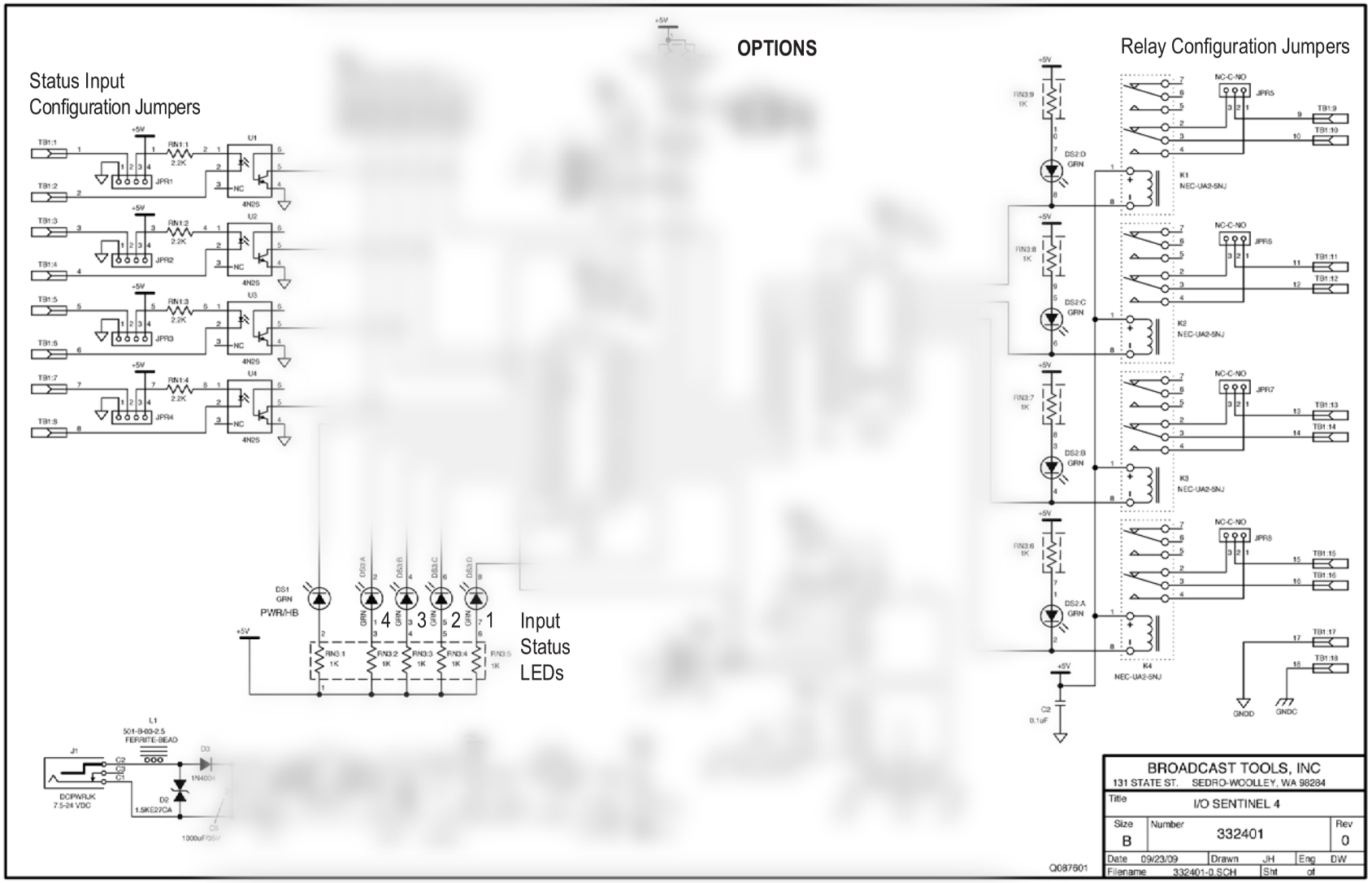
Fractional Schematic



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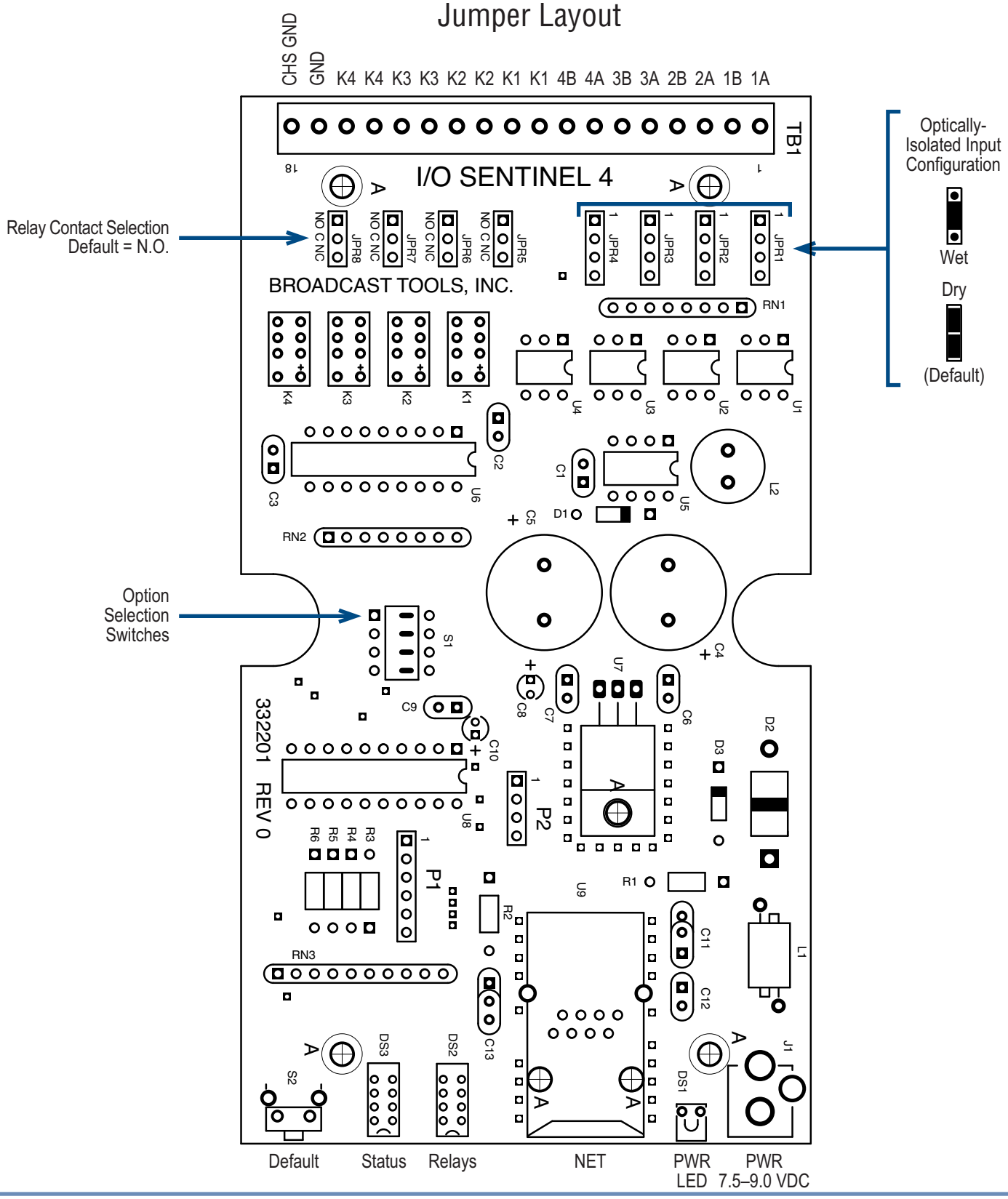
I/O Sentinel™ 4

Jumper Layout



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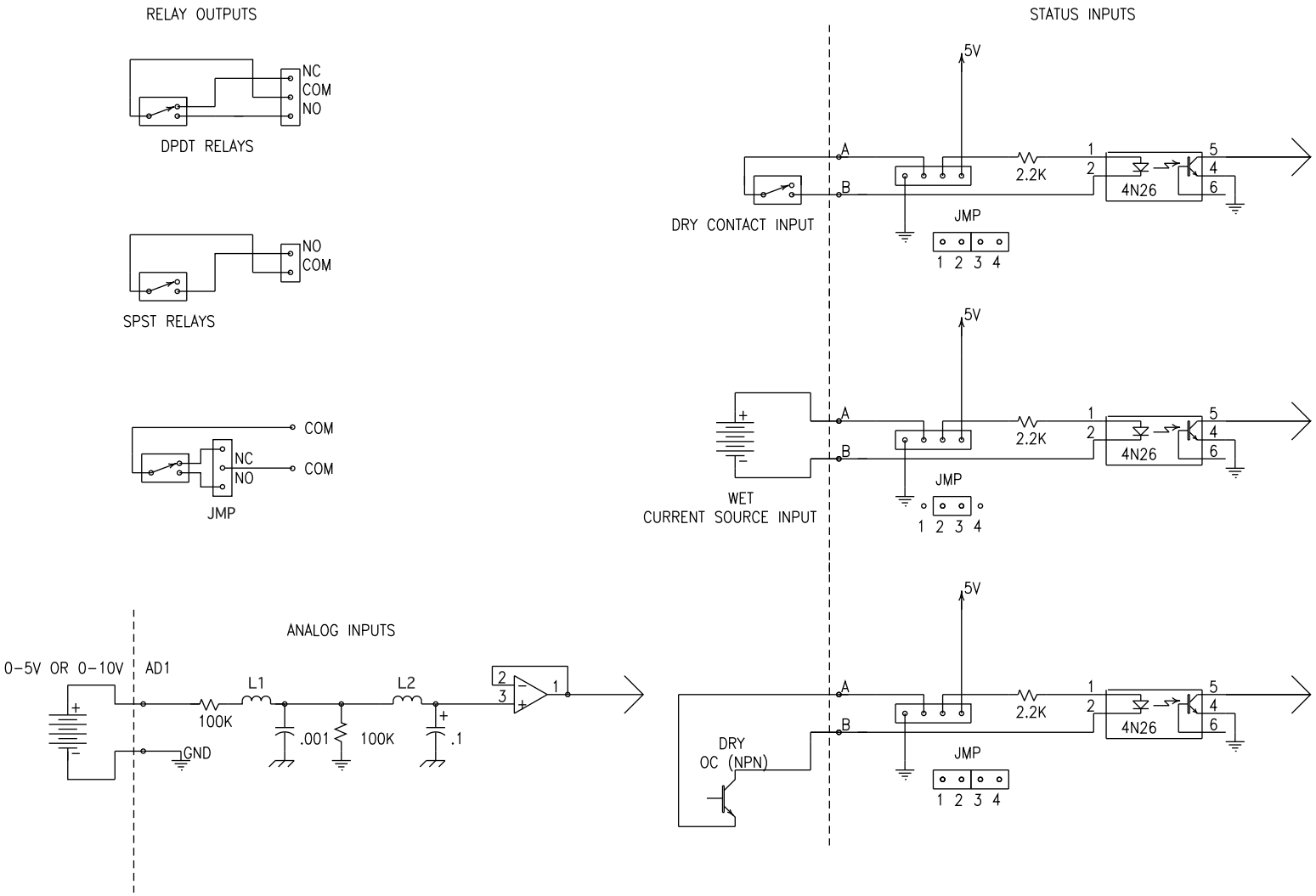
Modification Date: 10/12/09

Broadcast Tools¤ I/O Connection Information



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