TSC 4092A IRIG-B Autosense Fault Switch

Operations and Maintenance Manual

TIMING SOLUTIONS™

TSC 4092A IRIG-B Autosense Fault Switch Operations and Maintenance Manual

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DOC04092A Rev A

Revision History

Revision	Description	Date	Approved
A	Initial release.	5/8/05	TLE

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1: Introduction

Note
FIRST READ THIS MANUAL THOROUGHLY.
This is especially true for the sections regarding **Safety** and **Operation.**

1.1 Symbols

These symbols (icons) appear throughout the manual as well as on the unit itself.

Symbol	Definition
Note	This symbol means the following information is a note that gives you important information that may affect how you use the 4092A.
	Caution, refer to manual. Read all instructions in this manual before using this product.
	Caution - Risk of electrical shock
	Fuse symbol.
	LAN port, network. DO NOT CONNECT TO TELECOM CONNECTIONS THAT CARRY HAZARDOUS VOLTAGES.
	Chassis ground.
	CE marking attesting compliance with applicable European Directives.
	Earth terminal symbol: used to indicate an earth ground connection to chassis.

1.2 About This Manual

This manual tells you how to install, set up, monitor, and troubleshoot the 4092A.

"Chapter 1, Introduction" on page 1 explains symbols that appear in the manual and on the unit as well as documentation conventions. The chapter also briefly describes the 4092A.

"Chapter 2, Installing and Setting Up the 4092A" on page 5 contains important safety information and describes how to install the 4092A, assign a fixed IP address, select the active channel, and set the autoswitching mode.

"Chapter 3, Monitoring the 4092A" on page 11 describes how to check status and monitor alarms.

"Chapter 4, Troubleshooting the 4092A" on page 17 describes how to troubleshoot the inputs and outputs, replace power supplies, and replace fuses.

"Chapter 5, Warranty and Shipping Information" on page 23 explains how to contact Timing Solutions Corporation for warranty service and provides shipping guidelines.

"Appendix A, Specifications" on page 25 contains the detailed specifications for the 4092A.

1.2.1 Conventions

This manual uses several typographical conventions to help explain how to use the 4092A.

Convention	Definition
Bold	Words in **bold** show: ■ Buttons and icons to click ■ Menu options to select ■ Commands to type ■ Non-variable information displayed in response to commands
Italics	Words in *italics* show: ■ Names of windows and dialog boxes ■ Variable information displayed in response to commands

1.3 4092A Overview

The TSC 4092A IRIG-B Autosense Fault Switch is a 1U (1.75") high, 19-inch, rack-mount, autosense, fault switch that accepts two IRIG-B inputs and produces eight outputs (chosen from the two inputs). The unit can be configured with redundant hot swappable AC or DC power supplies. The TSC 4092A can also be configured to accept two 1-200 kHz sinewave signals but traditionally would be used as an IRIG-B Fault Switch.

The front panel provides green/red LED status for the inputs and for all output signals, as well as indicating the active input signal. A green/red LED on the front panel also provides power status. The front panel also has a locking toggle control switch that you can use to manually switch between input signals or to configure the unit to switch automatically upon input signal failure.

An Ethernet port on the rear panel provides the capability to remotely monitor the status of the power supplies, input, and all output signals. Any failure in the unit will immediately provide an alarm to this port.

Figure 1 shows the 4092A's front panel, and Figure 2 shows the 4092A's rear panel.

POWER–Green when power is on. One unlit LED shows unit has one power supply. Red shows a power supply failure.

INPUT SELECT–Lit LED shows active input. Use toggle switch to select active input and set autoswitch mode.

INPUT–Green when connected to input and receiving a signal. Red when not receiving an input signal.

OUTPUT STATUS–Green during normal operation of output signals. All red when unit has no input signal on the active channel.

Figure 1: Front panel

Chassis ground connection point.

Chassis ground connection point.

AC POWER– connector.

ETHERNET PORT–1 RJ-45 connector.

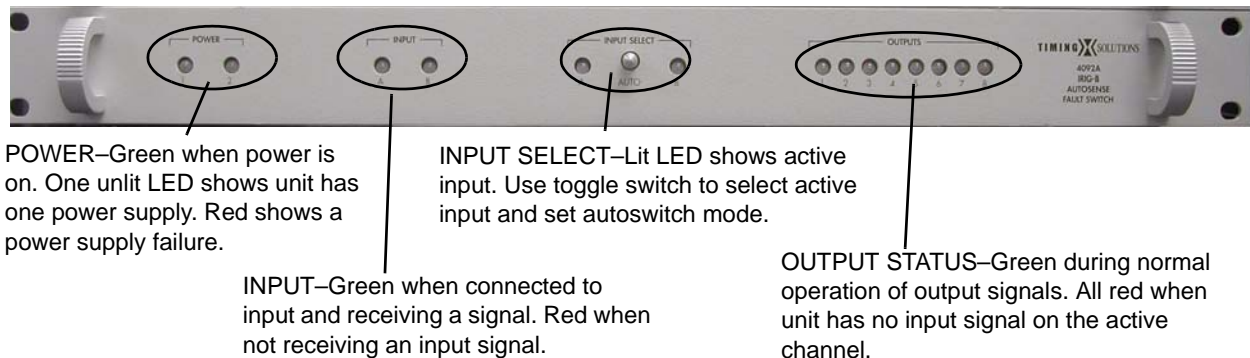INPUT A and B–Connect IRIG-B or 1 kHz - 200 kHz sinewave.
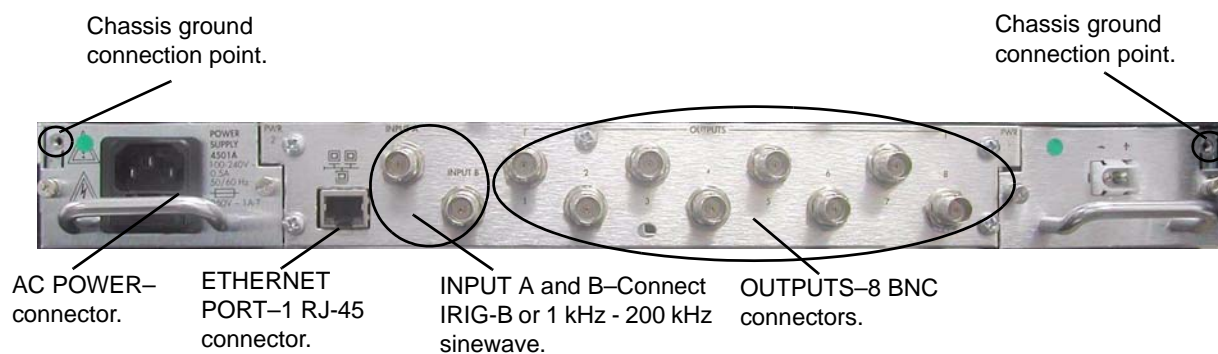
OUTPUTS–8 BNC connectors.

Figure 2: Rear panel

2: Installing and Setting Up the 4092A

2.1 Safety Information

⚠️ **Warning**

This unit is for INDOOR USE ONLY. It is not sealed to prevent moisture from entering the enclosure.

Do not attempt to install or operate this equipment if you have not first acquired proper training.

Equipment is intended for installation in an enclosed- or open-type equipment rack.

Ensure that all cables are properly connected. The power cord must be easy to remove from the back.

Verify that input line voltage and current capacity are within specifications before turning on the unit.

Disconnect all sources of input power before removing the top cover of this unit.

Operating and maintenance personnel must receive proper training before installing or maintaining electrical equipment.

2.2 Installing the 4092A

The 4092A ships ready for installation into a standard 19" (48.3 cm) rack. You can mount the unit using General Devices slides with part numbers C-300-S-126, -128 and -130.

Required for installation:

- North American or European IEC power cord. One or the other will be supplied with the unit.
- #1 Phillips screwdriver.
- One #6-32 x 5/8" pan head screw with lock washer.
- Customer-supplied, double-shielded RG223 cables with BNC connectors from source and to next devices in system.
- Customer-supplied, shielded LAN cable for network connection (RJ-45).
- Rack-mount slide kit from General Devices, C-300-S-126, -128 or -130 (Optional)

- Rack mounting screws.
- Screwdriver for the rack mount screws and slide, as needed.

⚠ **Caution**

Since the unit does not have a AC mains power switch, both the appliance inlet connector and the plug on the detachable power supply cord are considered to be suitable disconnect means for disconnecting the unit from the AC mains supply. If the rear of the unit is not accessible after installation in the instrument rack, you must provide a suitable external AC disconnect means for the unit.

To set up the 4092A:

1. Unpack carefully and inspect the 4092A.
2. Check for physical damage.
   - If you observe physical damage, immediately contact Timing Solutions and the carrier.
   - We recommend saving the shipping container for submitting any necessary claims to the carrier.
3. Using a #1 Phillips screwdriver and a #6-32 pan head screw, connect a safety ground wire to the safety ground point next to one power supply.
4. Plug the female end of the power cord into the male IEC-320 plug on the rear of each power supply.
5. Plug the male end of each power cord into a 100–240 VAC, 50/60 Hz power source.

   ⚠ **Caution**

   Ensure that this power supply cord is connected to a properly grounded mains receptacle.

6. Connect the input signal cables from the desired signal source to the INPUT A and INPUT B BNC connectors on the rear panel.
7. Connect up to eight cables to the OUTPUT BNC connectors on the rear panel to supply users with a copy of the input signal.
8. (Optional.) Connect a shielded LAN cable to the Ethernet port on the rear panel of the 4092A.
   - For information about configuring the network connection, see "2.3 Assigning a Static IP Address" on page 6.

2.3 Assigning a Static IP Address

The 4092A contains a Lantronix® Xport™ Ethernet to RS-232 converter, which provides the 4092A's Ethernet connection.

The 4092A ships from the factory with a default IP address of 0.0.0.0, which enables DHCP. If the network has a DHCP server, it will assign each unit an IP address, gateway address, and subnet mask when the unit starts up.

To monitor multiple 4092A units remotely through their Ethernet connections, you must assign each unit a fixed IP address. You identify which unit is the source of an alarm by its IP address. Follow the instructions in this section to assign a unit's IP address.

Note

For more detailed information, see the *Xport User Manual.* Section 3.3 discusses several different ways that you can assign IP addresses. Chapter 4 explains how to permanently configure the IP address. You can download the *Xport User Manual* from the Lantronix® Web site as an Adobe® Acrobat® PDF file. Go to:
http://www.lantronix.com/

If you want to permanently configure the IP address, you must install the Lantronix DeviceInstaller software. This software is available only by downloading from the Lantronix Web site. Go to: http://www.lantronix.com

You can also assign the IP address using Telnet.

Note

If you move the 4092A to a different network hub after setting up the static IP address, the host computer may not be able to make a connection. You may need to release the IP address lease on your operating system.

To assign the static IP address using the Lantronix DeviceInstaller software:

1. Obtain the following network information from your system administrator for each 4092A you want to install:

   IP Address: _____ _____ _____ _____

   Subnet Mask: _____ _____ _____ _____

   Gateway: _____ _____ _____ _____

2. Connect a Windows® PC to the same local subnet as the 4092A.

3. Install and start the Lantronix® DeviceInstaller software.

4. Click the **Search Network** icon and search for XPORT devices connected to the network, then click **Save** and **Exit**.

5. Click the **IP** icon or select **Assign IP Address** on the **Tools** menu.

   ■ The hardware device number and IP address appear in the *Assign IP Address* dialog box.

6. Type the new IP address and click **OK.**

   ■ The new IP address appears in the Lantronix DeviceInstaller window.

7. Test the IP address by pinging the 4092A's Xport on the Lantronix Xport Installer window.

   ■ Click the **Ping** icon or select **Ping Device** on the **Tools** menu.

   ■ The *Ping Device* window should show the IP address of the 4092A's Xport device, and it should show successful replies if the IP address has been configured correctly.

8. Exit the browser.

To assign the static IP address using Telnet:

1. Telnet to the assigned address, port 9999.

2. Press **Enter** within five seconds to enter the setup mode.

3. Select Option 0.

4. Set the IP address and follow the on-screen instructions to save the setting.

5. Telnet to the new IP address.

6. Type **I**

   - You do not need to type a carriage return or line feed.

   - The system returns **I4092A-00\r\n**, where the 00 is the hardware version, and turns on the front panel input LEDs for two seconds before returning to normal operation.

   - If you see these responses, you know you are communicating with the unit.

2.4 Selecting the Active Input Channel

You can select the active input channel using either the toggle switch on the front panel or remotely using the Ethernet connection.

To select the active input channel from the front panel:

1. Move the toggle switch by pulling the switch out, then moving it to the channel you want to use.

   - The LED for the selected channel should be solid green.

2. If you want the unit to automatically switch to the other input channel in the event of a failure, move the toggle switch back to the center position.

   - This puts the unit into autoswitch mode.

To select the active input channel remotely:

1. Telnet to the 4092A's IP address.

   - No prompt displays in the Telnet window.

2. Type either **A** or **B**, depending on which channel you want to select.

   - You do not need to type a carriage return or line feed.

   - The LED on the for the selected channel flashes green, showing that the channel has been selected remotely. It continues to flash green until you select the channel using the toggle switch on the front panel or set the unit to autoswitch mode.

3. If you want the unit to automatically switch to the other input channel in the event of a failure, type: **C**

   - The LED for the selected channel changes to solid green, showing that the channel is active and the unit is in autoswitch mode.

2.5 Setting the 4092A to Autoswitch Mode

As long as the 4092A is in autoswitch mode and has two input signals connected, the unit will automatically switch to the other input channel if it stops receiving a signal on the active channel.

You can set the 4092A to autoswitch mode using either the switch on the front panel or remotely using the Ethernet connection.

To set the 4092A to autoswitch mode from the front panel:

- Move the toggle switch to the center position.

To set the 4092A to autoswitch mode remotely:

Note

The toggle switch on the front panel must be in the center position for this command to work properly.

---

1. Telnet to the 4092A's IP address.

   - No prompt displays in the Telnet window.

2. Type: **C**

2.6 Cleaning

Warning

Do not spray or use too much liquid when cleaning the unit. Liquid can enter the unit and damage sensitive electronic components.

- Clean the main chassis with a soft cloth dampened with a mild soap and water solution.

3: Monitoring the 4092A

3.1 Accessing the System

You access the 4092A system remotely by connecting to its Command-And-Response (CNR) Port through the Ethernet connection. The CNR port (Port 10001), which uses TCP/IP, lets you input commands, displays results of the commands, and publishes alarms as they occur.

When you Telnet to the CNR port, the system does not display a prompt.

3.2 Checking System Information

3.2.1 Checking Status and Alarms

The system can report status and alarms that occurred since the last status check.

To check system status:

- Type: **S**

  You do not need to type a carriage return or line feed.

The system returns **S***abcde,fghij***\r\n** where

- *abcde* is current status.

- *fghij* is latched alarms and changed status since the last status request.

  Both *abcde* and *fghij* are hexadecimal numbers, with each bit position representing one output. LSB (farthest right) is output 1. MSB is the input. Bits 0–12 are latched alarms. Bits 13–19 are change in status bits.

  Latched alarms remain active in the current status field and latched status field until the problem is corrected. Changed status bits are cleared upon next status request.

Example: S0A001,00001

This example shows that input B was selected using the front panel toggle switch, channel B is active, and output 1 had a failure since the last status request.

Table 1 defines each status or alarm bit position.

Table 1: Status or alarm binary codes

Status or alarm character position	Bit position	Bit value and description
a or f	19	Not used
	18	Not used
	16 and 17	Remote control bits: 0:0 = Autoswitch/don't care 0:1 = Channel A selected 1:0 = Channel B selected 1:1 = Not used
b or g	15 and 14	Front panel switch control bits: 0:0 = Autoswitch/don't care 0:1 = Channel A selected 1:0 = Channel B selected 1:1 = Not used
	13	0 = Channel A active input 1 = Channel B active input
	12	1 = Cannot lock to input B
c or h	11	1 = Cannot lock to input A
	10	1 = Autoswitch occurred
	9	1 = Power supply 2 fault
	8	1 = Power supply 1 fault
d or i	7	1 = output 8 failed
	6	1 = output 7 failed
	5	1 = output 6 failed
	4	1 = output 5 failed
e or j	3	1 = output 4 failed
	2	1 = output 3 failed
	1	1 = output 2 failed
	0	1 = output 1 failed

Table 2 shows an example Telnet session of command sent to the 4092A and the response from the 4092A.

Table 2: Example Telnet session

Command sent	4092A response
S Status command	S00000,00000 4092A set to A and autoswitch, no active alarms
B Make channel B active command	ALARM22000 Alarm output shows change in active input; 4092A set to B with active input set to B.
S Status command	S22000,22000 4092A set to B with active input set to B. Current status should match last alarm output (ALARM22000). No latched alarms. Changed status (remote control bit changed from autoswitch to B and active input changed from A to B).
S Status command	S22000,00000 4092A set to B with active input set to B. Current status should match last alarm output (ALARM22000). No latched alarms. Changed status bits cleared upon status request.
C Autoswitch command	ALARM02000 Alarm output shows change in status. 4092A set to autoswitch with active input set to B.
S Status command	S02000,20000 4092A set to autoswitch with active input set to B. Current status should match last alarm output (ALARM02000). Changed status (remote control bit changed from B to autoswitch).
S Status command	S02000,00000 4092A set to autoswitch with active input set to B. No latched alarms. Changed status bit cleared upon status request.
None sent; input A lost signal	ALARM02800 Alarm output shows change in status. 4092A set to autoswitch with active input set to B. Input A has a fault.
S Status command	S02800,00800 4092A set to B with active input set to B. Current status should match last alarm output (ALARM02800). Input A has a latched fault (latched fault will not clear until input A failure is corrected and subsequent status command is sent).
S Status command	S02800,00800 Input A still has fault.
S Status command	S02800,00800 Input A still has fault.
None sent; input A fixed and has valid signal	ALARM02000 Alarm output shows change in status. Input A current status changed to OK.
S Status command	S02000,00800 4092A set to autoswitch with active input set to B. Current status should match last alarm output (ALARM02000). Input A OK in current status. Input A has a latched fault.

Table 2: Example Telnet session (Continued)

Command sent	4092A response
S Status command	S02000,00000 4092A set to autoswitch with active input set to B. Input A latched fault cleared.
A Make channel A active command	ALARM10000 Alarm output shows change in status. 4092A set to A with active input set to A.
S Status command	S10000,12000 4092A set to A with active input set to A. Current status should match last alarm output (ALARM10000). No latched alarms. Changed status (remote control bit changed from B to A and active input changed from B to A).
S Status command	S10000,00000 4092A set to A with active input set to A. No latched alarms. Changed status bits cleared upon status request.
C Autoswitch command	ALARM00000 Alarm output shows change in status. 4092A set to autoswitch with active input set to A.
S Status command	S00000,10000 4092A set to autoswitch with active input set to A. Current status should match last alarm output (ALARM10000). No latched alarms. Changed status (remote control bit changed from A to autoswitch).
S Status command	S00000,00000 4092A set to autoswitch with active input set to A. No latched alarms. Changed status bit cleared upon status request.

3.2.2 Checking Model Number and Software Version

Both commands are case sensitive. You do not need to type a carriage return or line feed.

To check the TSC model number:

- Type: **I**
  - The system returns **I4092A-00\r\n**, where the 00 is the hardware version.

To check the software version

- Type: **V**
  - The system returns **V***xx***\r\n** where *xx* is the software version.

Example: V00.

3.3 Understanding Alarm Output

The 4092A automatically publishes alarms to the CNR port as they occur.

The alarms appear in the format **ALARM***fghij* where *fghij* is the summary status of the input and output signals. The format of the alarm status is identical to the "S" command response defined in Table 1 on page 12.

Example: ALARM00003

This example shows that outputs 1 and 2 have active faults.

4: Troubleshooting the 4092A

Perform all of the following procedures before returning the unit for service. If the unit still appears to have a problem, call Timing Solutions Corporation and request technical support. Have the serial number of your unit ready to give to a technical representative.

4.1 Troubleshooting Input Problems

As long as the 4092A is in autoswitch mode and has two valid input signals connected, the unit will automatically switch to the other input channel if it stops receiving a valid signal on the active channel.

If the unit loses the active input signal, the LED for the that input turns red until you correct the problem. To correct the problem, you must ensure that the channel is receiving a valid signal and reset to the autoswitch mode.

Table 3 shows the INPUT LED states, their definitions, and actions required. Table 4 shows the INPUT SELECT LED states, their definitions, and actions required.

Table 3: INPUT LED troubleshooting

Input LED status	What it means	What do to
One or both LEDs solid red	The red LED shows that the channel is not receiving a valid signal.	1. Check that the input cable is connected. 2. Check that the input signal meets the following specifications for modulated signals: • Signal type: IRIG-B • Input level: > 2.8 V Peak to Peak into 50 Ω. 3. Check that the input signal meets the following specifications for unmodulated signals: • Signal Frequency: 1- 200 kHz • Input level: > 1.5V Peak to Peak into 50 Ω. 4. Check that the impedance and signal type jumpers are set correctly. See "4.4 Configuring for Input Signal and Impedance" on page 19. 5. If the LED remains red, contact TSC. • See "5.1 Warranty Information" on page 23.

Table 4: INPUT SELECT LED troubleshooting

INPUT SELECT LED status	What it means	What do to
One LED solid green and one not lit	The green LED shows the active channel and that the unit is in autoswitch mode, if the toggle switch is in the center position. The unlit LED shows the inactive channel.	No action required.
One LED flashing green and one not lit.	The flashing green LED shows: ■ The channel is the active channel. ■ The channel was selected remotely. ■ The unit is *not* in autoswitch mode. The unlit LED shows the inactive channel.	No action required, but you can make the LED solid by moving the toggle switch on the front panel to toward the flashing LED until the LED is solid. If you want to unit to be in autoswitch mode, move the toggle switch back to the center position.
A green and B red	Autoswitch occurred due to an intermittent input or input failure.	Check input level on channel B.
A red and B green	Autoswitch occurred due to an intermittent input or input failure.	Check input level on channel A.

4.2 Troubleshooting Output Problems

If all of the OUTPUT LEDs are red, the unit is not receiving a valid input signal on the active channel. Look at the INPUT LEDs and resolve the input problem. For more information, see "4.1 Troubleshooting Input Problems" on page 17.

If one OUTPUT LED is red, return the unit to TSC for repair. The output circuits have no user-serviceable parts. For contact information, see "5.1 Warranty Information" on page 23.

4.3 Troubleshooting Power Supply Problems

Table 5 shows the POWER LED states, their definitions, and actions required.

Table 5: INPUT LED troubleshooting

POWER LED status	What it means	What do to
Power supply 1 green and power supply 2 red.	Power supply 2 failure or no power supply installed into power supply 2 slot.	Replace the failed power supply or set power supply jumper to one power supply. For more information, see "4.5 Configuring for Dual Power Supplies" on page 19.
Power supply 1 green and power supply 2 not lit.	Power supply jumper is set for one power supply.	No action required if only one power supply is installed. If two power supplies are installed, see "4.5 Configuring for Dual Power Supplies" on page 19.

4.4 Configuring for Input Signal and Impedance

The Input Signal and Impedance settings are configured at the factory for a modulated input and low Z input and output impedance. If the signal sources have a high Z output impedance, then

⚠️ **Caution**

When opening the top cover and changing the power supply settings, use proper ESD precautions. This includes ensuring that you are properly grounded before touching the internal PWA of the unit to change the jumper settings.

Required for this procedure:

- #1 Phillips screwdriver

To change the jumper settings:

1. Disconnect both power supplies from their power source.

2. Using a #1 Phillips screwdriver, remove the top cover.

3. Move the jumper one position to the left to the 2S position.

4. Replace the top cover.

5. Reconnect the power supplies.
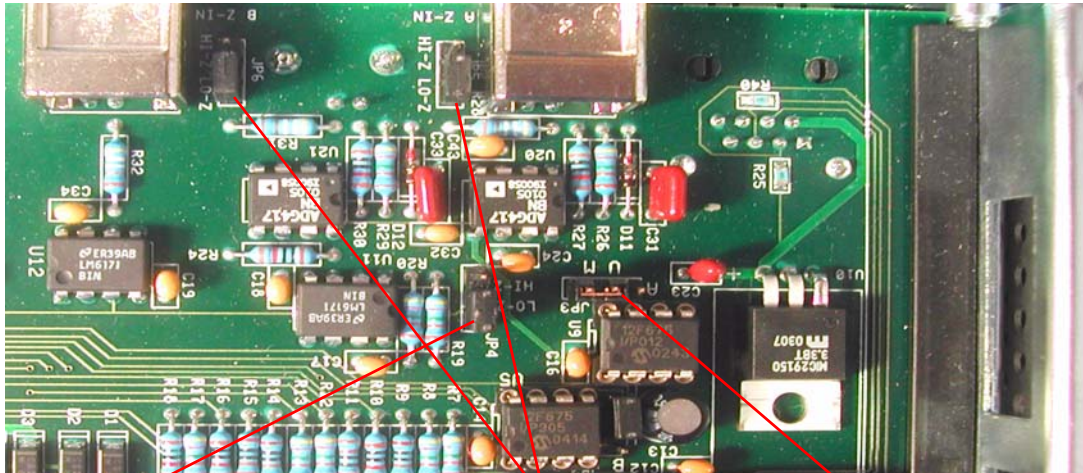
Gain setting for selected input impedance. Must follow Input impedance.

Inputs A & B impedance jumpers configured for the LO-Z (50 Ω).

Signal Type jumper configured for modulated (IRIG-B).

4.5 Configuring for Dual Power Supplies

The power supply setting is configured at the factory based upon single or dual power supply configuration. If you are adding a second power supply to a unit that was originally configured for a single power supply, you should change the internal jumper setting. The jumper setting ensures that the power supply LEDs reflect the proper configuration and that the second power supply is monitored.

> ⚠️ **Caution**
>
> When opening the top cover and changing the power supply settings, use proper ESD precautions. This includes ensuring that you are properly grounded before touching the internal PWA of the unit to change the jumper settings.

Required for this procedure:

- #1 Phillips screwdriver

To change the jumper setting:

1. Disconnect both power supplies from their power source.
2. Using a #1 Phillips screwdriver, remove the top cover.
3. Move the jumper one position to the left to the 2S position.
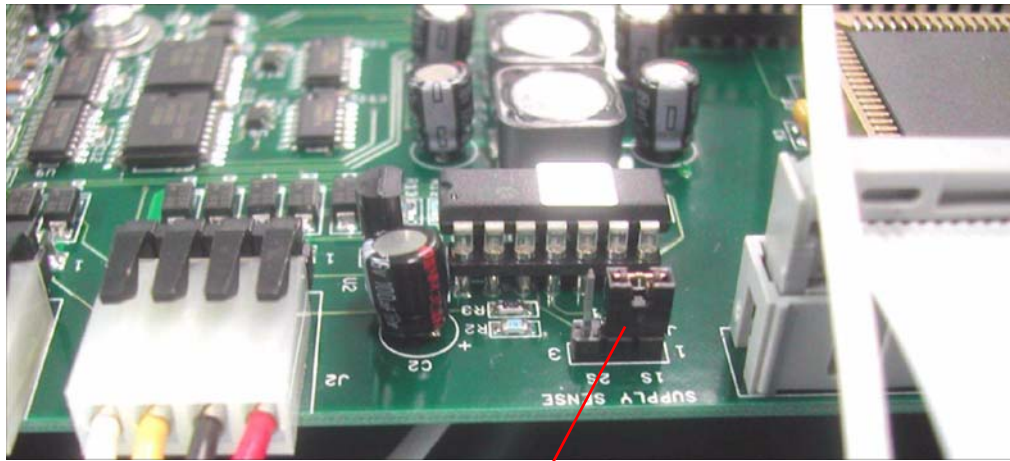
Power supply jumper configured for
one power supply (in the 1S position).

4. Replace the top cover.
5. Reconnect the power supplies.

4.6 Replacing Power Supplies

For units with a single power supply, the normal LED state is for one LED to be green and the other not lit. For units with dual power supplies, the normal LED state is for both LEDs to be green.

If a power supply LED is red, check that the affected power supply is connected to a properly functioning 100–240 VAC, 50/60 Hz power source. If the LED remains red, you should replace the power supply.

For AC power supplies, use only TSC 4501A power supplies. For DC power supplies, use only TSC 4502A power supplies.

In a unit with dual power supplies, you can hot swap the power supplies. This means you can leave the working power supply connected to power and all input and output devices connected when you replace the failed power supply.

Required for this procedure:

- #1 Phillips screwdriver

To replace a power supply:

1. Disconnect the power cord from the failed power supply.
2. Using a #1 Phillips screwdriver, remove the two screws from the failed power supply.
3. Using #1 Phillips screwdriver, remove the ground screw.
4. Slide the power supply out of the chassis.
5. Slide the new power supply into the chassis, making sure it clicks into place.
6. Replace the two screws in the power supply.
7. Replace the ground screw in the power supply.
8. Reconnect the power cord to the new power supply.

4.7 Replacing Fuses

If you know that a local event caused blown fuses throughout a rack, you can replace the fuses in each 4501A power supply. The AC power supplies have two fuses.

The DC power supplies do not have any customer-serviceable fuses.

Required for this procedure:

- Small flat-head screwdriver
- Replacement fuses for a standard IEC 320 power entry module with fuse (5 x 20 mm, 1 amp, 250 volt fuse)

To replace a fuse:

1. Disconnect the power cables from the power supplies.
2. Using a small screwdriver, open the fuse cover on the power supply.
3. Replace the old fuses as necessary in each power supply.
4. Close the fuse covers.
5. Reconnect the power cables to the power supplies.

4.8 Verifying Operational Problems

If the unit does not operate properly after you have checked the following:

- Troubleshot the inputs as described in "4.1 Troubleshooting Input Problems" on page 17
- Checked that the correct power is applied to the power supplies
- Checked that the fuses are good

return the unit to TSC for repair. For contact information, see "5.1 Warranty Information" on page 23.

5: Warranty and Shipping Information

This chapter provides information on how to contact Timing Solutions Corporation for warranty service, as well as shipping guidelines for the 4092A.

5.1 Warranty Information

The 4092A carries a warranty from Timing Solutions Corporation for a period of 1 year from date of shipment.

For repairs, contact Timing Solutions Corporation:

- Phone (303) 939-8481
- Fax (303) 443-5152

Address written correspondence to:

Timing Solutions Corporation
4775 Walnut Street, Suite 1B
Boulder, CO 80301
USA

5.2 Shipping Information

If you need to ship this unit for any reason, including returning equipment to Timing Solutions for warranty service, follow these shipping instructions. Failure to follow these instructions may damage your system.

5.2.1 Packing Instructions

- Always ship the 4092A appropriately packaged to protect it from damage.
- No cables or connectors may be attached to the rear of the chassis.
- Wrap the chassis in plastic to protect against moisture.

Appendix A: Specifications

A.3 Electrical Specifications

Table 3 lists the electrical specifications for the 4092A.

Table 3: Electrical specifications

Item	Specification
Protection Class	Class I (Grounded Type)
Power Input Voltage	100–240 V ~ 50/60 Hz 0.5 A, power dissipation ~20 Watts **Note:** Fluctuations not to exceed ± 10% of nominal supply voltage.
Power Inlet Type	IEC 60320 sheet C14
AC Power Supply Cord Set	18 AWG (0.75 mm^2 minimum)
DC Power Supply	The external wiring to this connector must be at a minimum 1.5 mm² (14 AWG) with a 15 A fuse or circuit breaker. A 20 A circuit breaker may be used if the external wiring is jacketed 14 AWG, with maximum length of 20 feet. An internal fuse mounted on the power supply carrier board is included to protect this input but is not field replaceable. Mating connector for the DC power supply is a AMP 1-350344-0 and 2 sockets are required, AMP 350388-1.
Power Supply Part Numbers	AC: TSC 4501A DC: TSC 4502A
Power Mains Fuse	AC: (2) - 250V~1A time lag 5 x 20 mm. Initial shipments will have one fuse. DC: No customer-serviceable fuses.
Unmodulated Signal Input	■ Frequency: 1–200 kHz ■ Lo-Z Impedance: 50 Ω ±5 Ω ■ Hi-Z Impedance: 600 Ω ±10 Ω ■ Input level: > 1.5 V peak to peak into 50 Ω
Modulated Signal Input	■ Code Format: IRIG-B ■ Frequency: 1 kHz (IRIG-B) ■ Lo-Z Impedance: 50 Ω ±5 Ω ■ Hi-Z Impedance: 600 Ω ±10 Ω ■ Input level: > 2.8 V peak to peak into 50 Ω
Connectors	■ Input: 2 BNC ■ Output: 8 BNC ■ LAN: RJ-45
Gain	0 dB
Isolation	> 70 dB

A.3.1 Environment Specifications

> ⚠️ **Warning**
>
> This unit is for **INDOOR USE ONLY.** It is not sealed to prevent moisture from entering the enclosure. Equipment intended to be installed in an enclosed- or open-type equipment rack.

- Pollution Degree II per EN61010-1
- Installation (Over-Voltage) Category II for transient over-voltages per EN 61010-1
- Equipment suitable for continuous operation

Table 4 lists the environmental specifications for the 4092A.

Table 4: Environment specifications

Item	Temperature	Relative Humidity	Altitude
In Use	15°C to 40°C	10% to 85% (non-condensing)	3,000 meters (9,843 feet)
Storage	–40°C to 70°C	5% to 95% (non-condensing)	
Transportation	–40°C to 70°C	5% to 95% (non-condensing)	

A.4 Physical Specifications

Table 5 lists the physical specifications for the 4092A.

Table 5: Physical specifications

Item	Specification
Width	Standard 19-inch rack mount
Height	Standard 1U (~1.75 inches or 4.44 cm)
Depth	12.75 inches or 31.875 cm
Weight	Approximately 4.1 kg

Glossary

\n	Line feed
\r	Carriage return
CNR	Command and Response
DHCP	Dynamic Host Configuration Protocol
ESD	electrostatic discharge
LED	light-emitting diode
LSB	least significant bit
MSB	most significant bit
PDF	portable document format
PWA	printed wiring assembly
RF	radio frequency
TSC	Timing Solutions Corporation

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