



# Installing New 1394 Analog Servo System Firmware

Catalog Number 1394x-SJTxx-A

## Introduction

This publication provides installation instructions for firmware upgrades in your 1394x-SJTxx-A system module. Use this document in conjunction with the *1394 Digital AC Multi-Axis Motion Control System User Manual* (publication 1394-5.0).

**Important:** Although your existing 1394 system configuration will not change after a firmware upgrade, parameters new to this version firmware are configured with default values. Refer to the applicable 1394 release notes for specific changes.

## What this Kit Contains

This kit contains the following items:

- Two EPROMs programmed with the current firmware
- Firmware upgrade instructions
- One firmware upgrade label
- One disposable ESD wrist strap
- Applicable 1394 release notes

## Installation Instructions

Follow the procedures below to install your new firmware.



**ATTENTION:** The 1394 system module contains ESD (Electrostatic Discharge) sensitive parts and assemblies. Static control precautions are required when installing, testing, servicing, or repairing this device. Component damage can result if ESD control procedures are not followed. If you are not familiar with static control procedures, refer to *Guarding Against Electrostatic Damage* (publication 8000-4.5.2), or any other applicable ESD Protection Handbook.

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## Removing the Input Wiring Board



**ATTENTION:** This product contains stored energy devices. To avoid hazard of electrical shock, verify that all voltage on the system bus network has been discharged before attempting to service or repair this unit. Only qualified personnel familiar with solid state control equipment and safety procedures in publication NFPA 70E or applicable local codes should attempt this procedure.

To gain access to the EPROMs on the control board, you must first remove the input wiring board. To remove the input wiring board:

1. Remove all 24V control power, contactor enable power, and 360/480V AC input power from the system.
2. Wrap the black adhesive end of the disposable ESD wrist strap to your wrist and secure the copper foil adhesive end to an unpainted surface on the 1394 chassis. Ensure good adhesive contact to your wrist and unpainted chassis surface.
3. Label and remove all external control board connections (feedback, A Quad B, etc.). Note the location of each cable removed for re-assembly later.

**Important:** Do not remove wires connected to the input wiring board.

4.

<b>If the 1394 system module:</b>	<b>Then open the front door and:</b>
Has a HIM mounted on the front door	<ol style="list-style-type: none"> <li>1. Disconnect the cable from the HIM module.</li> <li>2. Go to main step 5.</li> </ol>
Does not have a HIM mounted on the front door	<ol style="list-style-type: none"> <li>1. Disconnect the cable from the HIM module cradle.</li> <li>2. Go to main step 5.</li> </ol>

Note: To identify the series of your 1394 System Module look in the *SERIES* field on the data name plate.

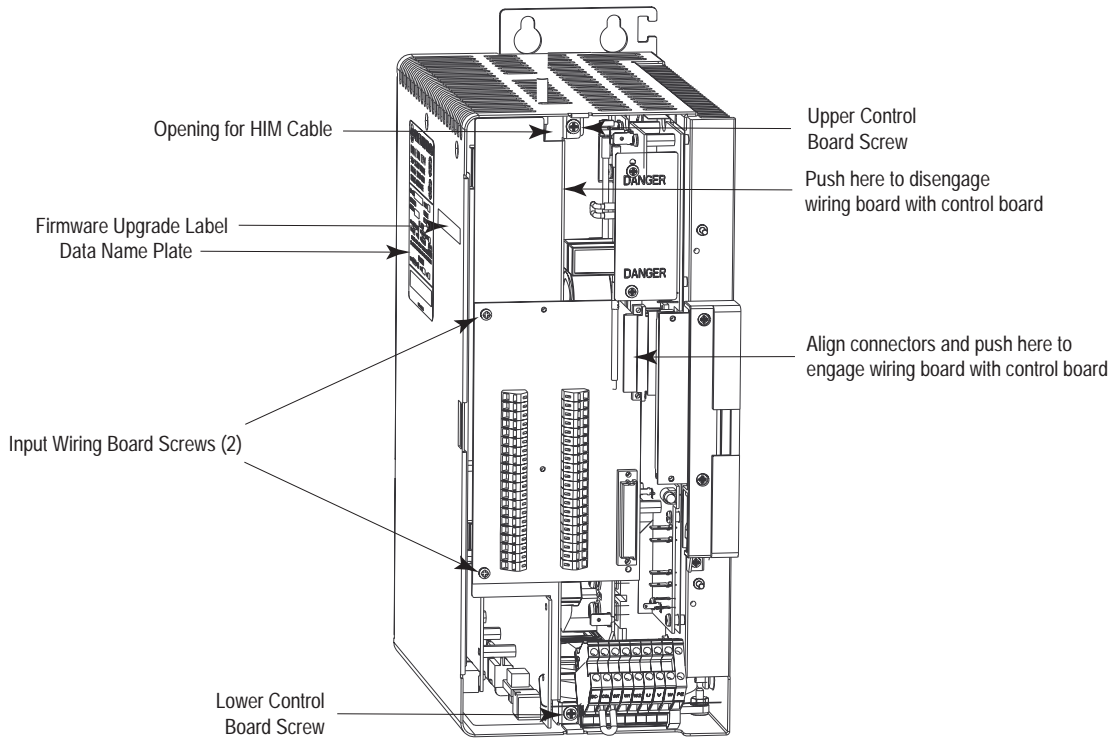
## 5.

<b>If your 1394 system module is:</b>	<b>Then:</b>
5 and 10 kW (Series A and B systems)	<ol style="list-style-type: none"> <li>1. Remove the upper and lower control board screws (refer to Figure 1).</li> <li>2. Slide the input wiring board and control board assembly to the left until the connector on the right side of the wiring board disengages (refer to Figure 1).</li> <li>3. Remove the upper and lower input wiring board screws.</li> <li>4. Go to main step 6.</li> </ol>
5 and 10 kW (Series C systems)	<ol style="list-style-type: none"> <li>1. Remove the upper, lower, and side control board screws (refer to Figure 2).</li> <li>2. Unplug the ribbon cable from the input wiring board.</li> <li>3. Remove the upper and lower input wiring board screws.</li> <li>4. Go to main step 6.</li> </ol>
22 kW (any series)	<ol style="list-style-type: none"> <li>1. Remove the front and side control board screws (refer to Figure 3).</li> <li>2. Unplug the ribbon cable from the input wiring board.</li> <li>3. Remove the upper and lower input wiring board screws.</li> <li>4. Go to main step 6.</li> </ol>

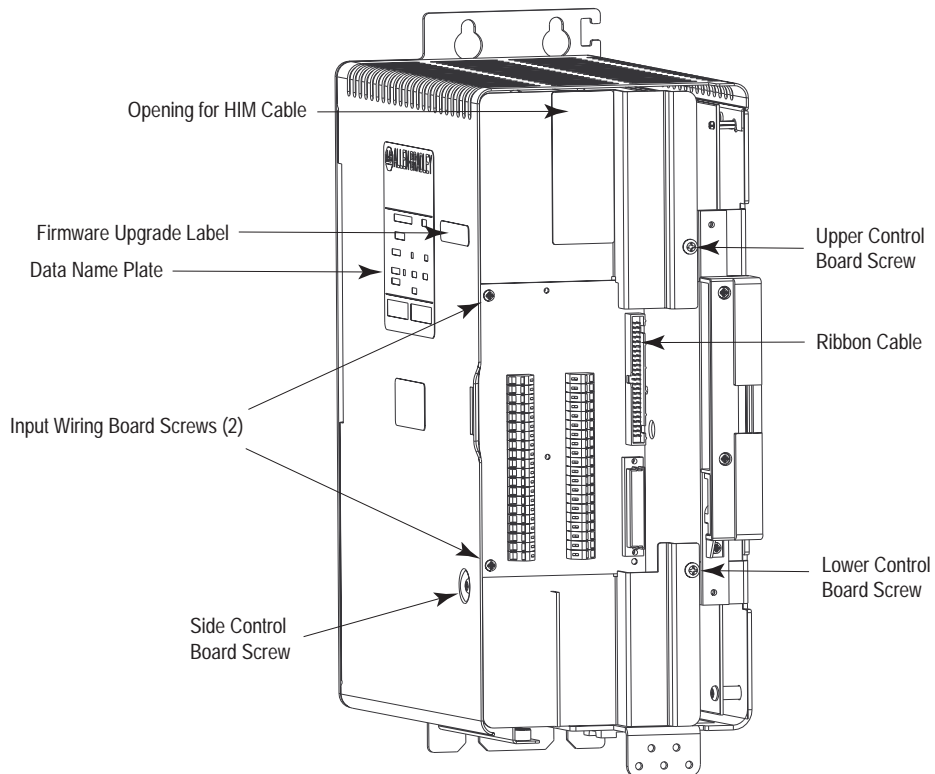
## 6. Pull the input wiring board straight out (without twisting).

**Important:** Twisting the wiring board can damage the connector on the back of the board.

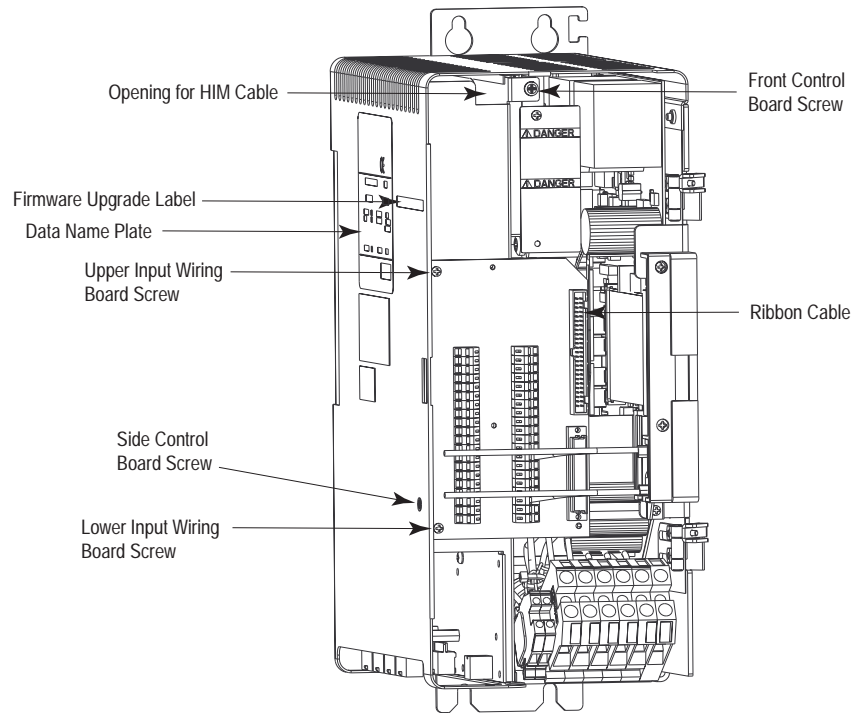
**Figure 1**  
**Removing the Input Wiring Board from 5 and 10 kW Systems (Series A and B)**



**Figure 2**  
**Removing the Input Wiring Board from 5 and 10 kW Systems (Series C)**



**Figure 3**  
**Removing the Input Wiring Board from 22 kW Systems (any series)**



### Removing the Control Board

To remove the control board:

1. Gently pull the control board straight out from the enclosure. Be careful not to snag the mounting tabs on any of the other components.
2. Move the control board to a grounded ESD work station.

**Important:** Check your ESD protection guidelines for correct packaging and handling of ESD sensitive assemblies.

3. Position the board so that the four feedback connectors (FB0-FB3) are on the lower right side (refer to Figure 4 for board position information).

### Installing the New Firmware EPROMs

To install the new firmware EPROMs:

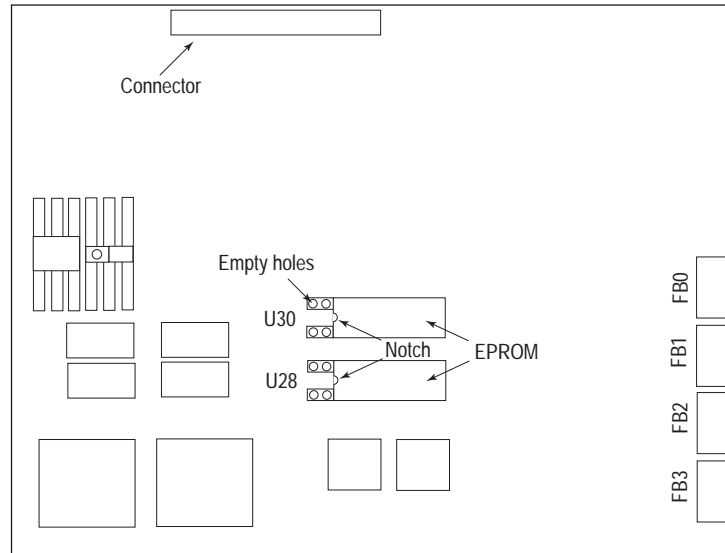
1. Locate old firmware EPROMs in sockets U28 and U30 (refer to Figure 4 for socket locations).
2. Orient each EPROM with the notch on the left hand side and align the EPROMs flush with the right hand set of socket holes.

Note: The control board or the sockets may have unused holes.

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3. Using a PROM puller or other appropriate tool, remove the old firmware EPROMs from sockets U28 and U30. Gently pull EPROMs straight up and out of their sockets.
4. Position the new EPROMs in sockets U28 and U30 respectively so that the pins are in line with the holes.
5. Gently push down on the EPROMs to seat pins into holes.

**Figure 4**  
**1394x-SJTxx-A Control Board Layout**



### Re-Installing the Control Board

To re-install the control board:

1. Route the HIM cable through the opening at the top of the bracket (refer to Figure 1, 2, or 3 for the location).
- 2.

<b>If your 1394 system module is:</b>	<b>Slide the control board into the enclosure and:</b>
5 and 10 kW (Series A and B systems) or 22 kW (any series)	<ol style="list-style-type: none"> <li>1. Seat the tabs on the back edge of the board into the slot on the heat sink.</li> <li>2. Go to <i>Re-Installing the Input Wiring Board</i>.</li> </ol>
5 and 10 kW (Series C systems)	<ol style="list-style-type: none"> <li>1. Align the guide pins in the enclosure with the holes in the control board.</li> <li>2. Go to <i>Re-Installing the Input Wiring Board</i>.</li> </ol>

## Re-Installing the Input Wiring Board

To re-install the input wiring board:

1. Line up the connector pins on the back of the input wiring board with the connector on the control board and gently push the board into position.
2. Insert and tighten the two input wiring board screws.
- 3.

<b>If your 1394 system module is:</b>	<b>Then:</b>
5 and 10 kW (Series A and B)	<ol style="list-style-type: none"> <li>1. Align the connector pins on the input wiring board with the mating connector on the control board and push to the right until the pins seat firmly into place (refer to Figure 1).</li> <li>2. Insert and tighten the upper and lower control board screws.</li> <li>3. Go to main step 4.</li> </ol>
5 and 10 kW (Series C)	<ol style="list-style-type: none"> <li>1. Re-connect ribbon cable from enclosure to wiring board (refer to Figure 2).</li> <li>2. Insert and tighten upper, lower, and side control board screws.</li> <li>3. Go to main step 4.</li> </ol>
22 kW (any series)	<ol style="list-style-type: none"> <li>1. Re-connect ribbon cable from enclosure to wiring board (refer to Figure 3).</li> <li>2. Insert and tighten the front and side control board screws.</li> <li>3. Go to main step 4.</li> </ol>

4. Re-connect the HIM cable.
5. Re-connect all the external control board connections (feedback, A Quad B, etc.).

6.

If your 1394 system module is:	Attach the firmware upgrade label next to the data name plate, as shown in:
5 and 10 kW (Series A and B)	Figure 1
5 and 10 kW (Series C)	Figure 2
22 kW (any series)	Figure 3

7. Apply power to the system.

8. Check for proper operation. Refer to your *1394 Digital AC Multi-Axis Motion Control System User Manual* (publication 1394-5.0) for additional start-up information.

**Important:** Although your existing 1394 system configuration will not change after a firmware upgrade, parameters new to this version firmware are configured with default values. Refer to the applicable 1394 release notes for specific changes.

For more information refer to our web site: [www.ab.com/motion](http://www.ab.com/motion)

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