Form M500 V6

500 SERIES
Process Controllers

5 0 0

Hardware Installation and Modification Manual

for Electronic Products Series 531, 532, 535, 545, 555 Model 2

MOORE INDUSTRIES

Installation

INTRODUCTION

This technical brochure provides hardware installation and modification instructions for our controllers:
Series 531, 532, 535, 545, and 555. Use these instructions with the following kits:

Display Assembly Kits
531-632 ..... 531 Display Assembly Kit
532-632 ..... 532 Display Assembly Kit
535-632 ..... 535 Display Assembly Kit
545-634 ..... 545 Display Assembly Kit
555-632 ..... 555 Display Assembly Kit

Output and Communications Module Kits
532-600 ..... 531, 532 Analog Module Kit
535-600* ..... Mechanical Relay Module Kit
535-601* ..... Milliamp Module Kit
535-602* ..... SSR Module Kit
535-603* ..... SSR Drive Module Kit
535-604* ..... Loop Power Module Kit
535-705* ..... RS-485 Communications Module Kit

Power Supply Kit
535-730* ..... 90 to 250VAC Power Supply Kit
535-732 ..... 24VAC/VDC Power Supply Kit

Mounting Kit
535-761* ..... Mounting Kit

Miscellaneous Kits
532-100 ..... 531, 532 Bypass Board Kit
535-188* ..... Rear Terminal Upgrade Kit
535-660 ..... 531, 532, 535, 545, 555 Jumper Kit
535-662* ..... Gasket Kit
(1 Panel Gasket, 1 Bezel Gasket)
535-763* ..... Bezel Retention Screw Kit
535-664* ..... Module Retention Kit
(Retention Plate and Tie Wrap)
535-665* ..... Module Retention Tie Wrap Kit
093-128* ..... Lithium Battery

EPROM Kits
531-740 ..... 531 EPROM Kit
532-740 ..... 532 EPROM Kit
535-741 ..... 535 EPROM Kit (RSP)
535-775 ..... 535 Profiler EPROM Kit (No RSP)
535-776 ..... 535 Profiler EPROM Kit (RSP)
535-740 ..... 535 EPROM Kit (No RSP)
545-740 ..... 545 EPROM Kit (No RSP)
545-741 ..... 545 EPROM Kit (RSP)
555-740 ..... 555 EPROM Kit

Microcontroller (MCU) Board Kits
535-731 ..... MCU Board Kit
545-733 ..... MCU Board Kit with CE Option

Option Board Kits
535-720 ..... 531, 532, 535, 545 Option Board Kit
(No Options)
535-721 ..... 531, 532, 535, 545 Option Board Kit
(Digital Inputs)
535-722 ..... 535, 545 Option Board Kit
(Slidewire Feedback)
535-723 ..... 535, 545 Option Board Kit
(Digital Inputs and Slidewire Feedback)
545-724 ..... 531, 532, 535, 545, 555 Option Board Kit
(RSP)
545-725 ..... 531, 532, 535, 545, 555 Option Board Kit
(Digital Inputs and RSP)
545-726 ..... 535, 545, 555 Option Board Kit
(Slidewire Feedback and RSP)
545-727 ..... 535, 545, 555 Option Board Kit
(Digital Inputs, Slidewire Feedback,
and RSP)

*** Universal Kit (can be used with all 500 Series Controllers)**

HOW TO USE THIS MANUAL:

A. **CAUTION: Static discharge will cause damage to equipment. Always ground yourself with a wrist grounding strap when handling electronics to prevent static discharge.**

B. Before removing or inserting any hardware on the controller, **copy down all configuration parameters**. Also, **replacing the battery, EPROM or MCU Board will erase parameter settings** and they will need to be reset.

C. For all hardware adjustments, **perform steps 1, 2 and 3.**

D. Follow the guide and complete any additional steps as required by your particular application.

E. **Complete** your hardware adjustments with **steps 15, 16, 17, 18, 19 & 20**.

EQUIPMENT

To make any hardware changes to the units, you will need the following equipment:

- Wrist grounding strap
- Small flat blade screwdriver
- I.C. Extractor (if changing the EPROM)
- Phillips screwdriver (#2)
- Wire cutters

INSTRUCTIONS

To Disassemble the Unit

For any hardware modifications, disassemble the unit.

1. With power off, loosen four captive front screws with a Phillips screwdriver. Remove the four screws.

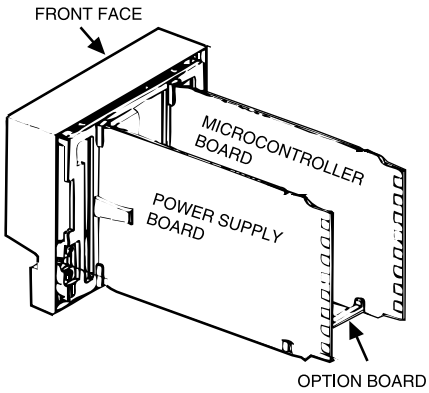


Figure 1
Location of Printed Circuit Boards for Hardware Configuration

2. Slide the chassis out of the case by pulling on front face plate assembly at the bezel (see **Figure 1**).

3. Locate the retention clips holding the front face assembly to the rest of the chassis. Pry apart these retention clips gently with a screwdriver to separate the printed circuit board group from the front face assembly (Photo 3). Take care not to break the clips or scratch the circuit board.

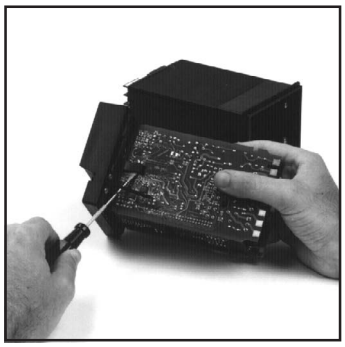


Photo 3. **Pry Clips**

   The Microcontroller Board and Power Supply Board remain attached to the Operator Interface Assembly by wired connectors.

4. The Microcontroller and Power Supply board are attached to either side of the Option board by male/female pin connectors. Use a gentle rocking motion and carefully apply pressure in a uniform direction to separate one of the larger two boards from the Option Board (Photo 4). Be careful not to bend the connector pins. Separate the other board in the same manner.

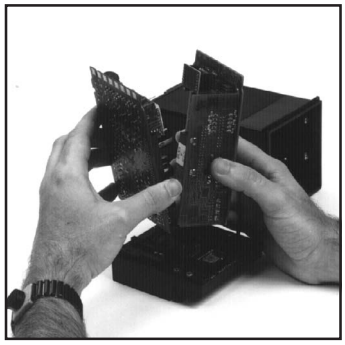


Photo 4. **Separate Boards**

   Figure 2 (opposite page) shows the Microcontroller Board, Option Board and Power Supply Board.

To Add or Change Output Modules

The 500 Series units have provisions for four output modules. The units come factory configured with specified modules installed in appropriate locations. You can make field modifications by properly removing and/or adding the modules into the appropriate sockets.

Three of the output sockets are located on the Power Supply Circuit Board. A fourth output socket is located on the Option Board (refer to **Figure 2**).

5. A retention plate and tie wrap hold Output modules 1, 2, and 3 (on the Power Supply board) firmly in place. To remove the retention plate, snip the tie wrap with wire cutters (Photo 5).

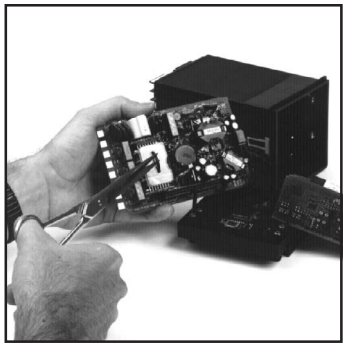


Photo 5.
Remove Retention Plate

CAUTION: Always snip the tie wrap on top of the Retention Plate, as shown in photo 5, to prevent damage to the surface mount components.

6. A disposable tie wrap holds Output module 4 (on the Option board) in place. To remove the module, snip the tie wrap (Photo 6).

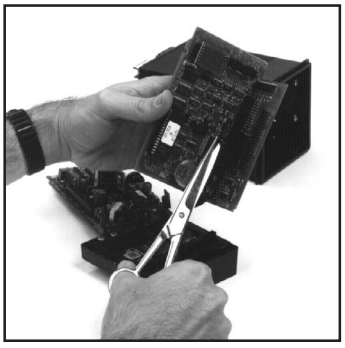
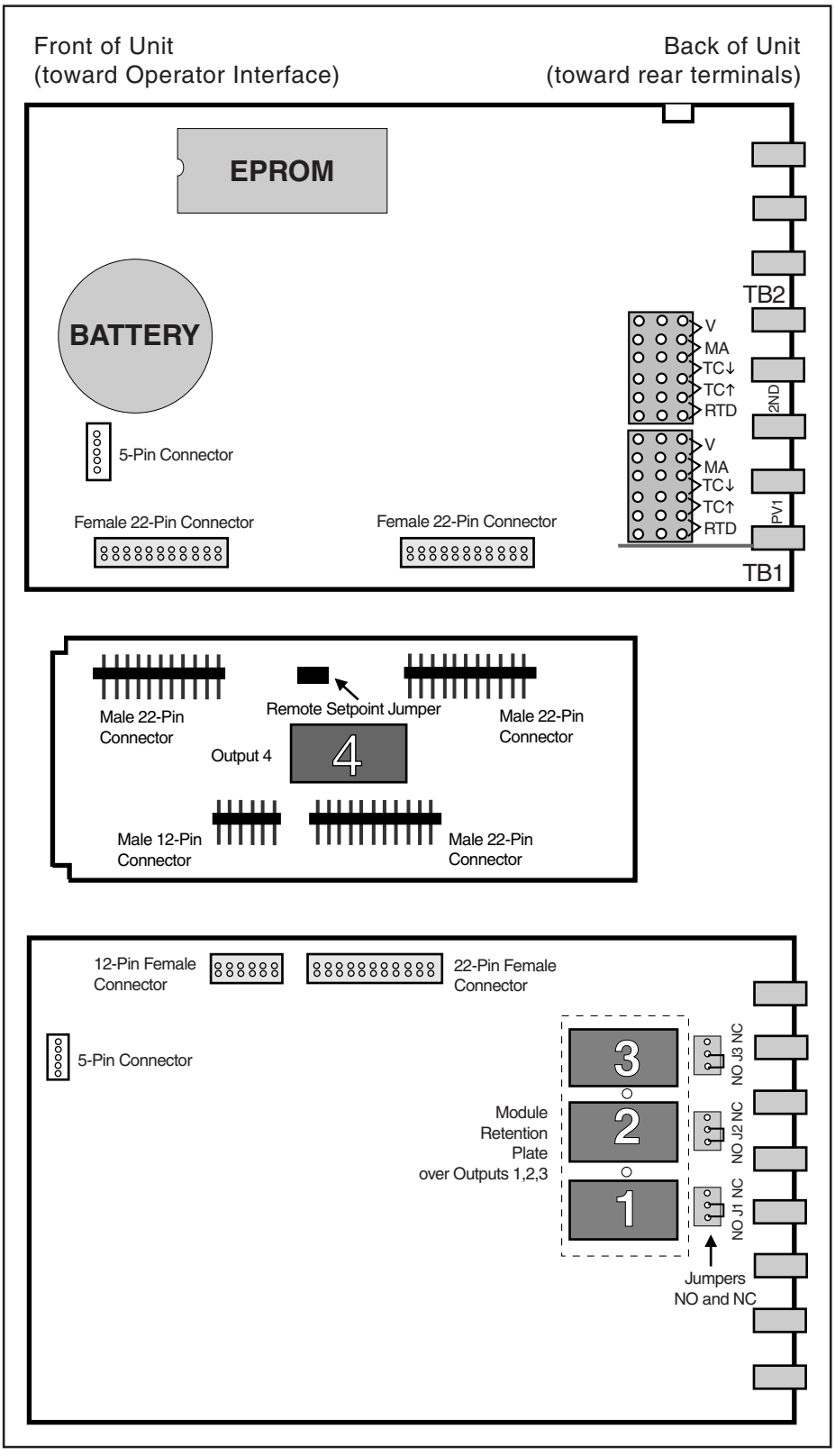


Photo 6.
Snip Tie Wrap on Mod. 4

7. Inspect each module before installation to make sure the pins are straight. Align the pins with the socket holes and carefully insert the module. Press down on the module to seat it firmly on the board.



NOTE:
If you replace the EPROM chip, you must align the notch facing the front of the unit.

NOTE:
The 5- and 22-Pin connnectors on the boards are all keyed so they will only align one correct way.

Figure 2
Microntroller Board, Option Board, and Power Supply Board

8. Replace tie wraps for the Retention Plate and for Output Module 4 with new ones.

   Failure to use these devices may result in a loosening of the module and eventual failure. If you ordered a module separately, it should have come with a tie wrap. An extra set of tie wraps is available by ordering Part #535-665.

   Note: For greatest accuracy, milliamp modules added for retransmission must be calibrated per instructions in Operator's Manual.

To Change the Option Board

9. (See Photos 3 and 4) Replace the existing Option board with the NEW one.

   Note: When adding Option board for 5 digital inputs, associated screw terminal in the rear terminal block must be installed. (See information on page 1 for ordering a Screw Kit.)

To Change the Power Supply or Microcontroller (CPU) Board

10. For the Microcontroller Board, disconnect the 5-pin female connector that wires it to the Display Assembly. Reattach the connector to the new board. You can only orient the connector one way.

    For the Power Supply Board, disconnect the 5-pin female connector that wires it to the Display Assembly. Reattach the connector to the new board. You can only orient the connector one way.

To Change the Display Assembly

11. Disconnect the 5-pin female connector that wires the Microcontroller Board to the Display Assembly. Disconnect the 5-pin female connector that wires the Power Supply Board to the Display Assembly.

12. Attach the new Display Assembly to the boards at the appropriate connectors.

CAUTION

Static discharge will cause damage to equipment. Always ground yourself with a wrist grounding strap when handling electronics to prevent static discharge.

CAUTION
Do not scratch the boards or bend the pins of the connectors.

To Change the EPROM

13. The EPROM is located on the Microcontroller Circuit board (**Figure 2**). It has a white label that list the part number and software revision level. Use an I.C. Extractor to carefully remove the EPROM. If you do not have an I.C. extractor, gently use a small flat blade screwdriver to pry up the EPROM. DO Not bend the EPROM legs.

14. Carefully insert the new EPROM. To position correctly, match the notched end of the EPROM to the markings on the board. The notched end will face towards the display. Make sure all pins are in the socket.

To Reassemble the Unit

15. (See **Figure 2**) Align the connector pins on the Option Board with the connector sockets on the Microcontroller and Power Supply boards. Squeeze them together, making certain all three are properly seated against one another. Check along the side edges for gaps. Make sure the conector is properly aligned. Also, check that the cable assemblies are not pinched.

16. (See **Figure 2**) Align the board assembly with the front face assembly, with the Option board at the bottom (see **Figure 1**). Reinstall the retention clips. Align the boards into the slots of the front face assembly and the clips will snap into place.

17. When you are ready to reassemble the unit, align the boards in the chassis with the case's top and bottom grooves. Press firmly to slide the chassis into the case. If you have difficulty, check that you have properly oriented the chassis, and there are no screws interfering with the case.

18. Carefully insert and align screws. Tighten them until the bezel is seated firmly against the gasket. DO NOT OVERTIGHTEN.

19. If may be necessary to re-configure the software features of your controller or station. Please refer to your User's Manual.

20. To maintain NEMA 4X Rating, you may need new mounting gaskets, order part #535-662. Refer to your user's manual.

Declaration of Conformity

EMC Directive 89/336/EEC

Manufacturer's Name: Moore Industries-International, Inc.
Manufacturer's Address: 16650 Schoenborn Street
North Hills, CA 91343-6196
USA

Declares that the product(s):

Product Name: **500 Series**

	MODEL	/	INPUT	/	OUTPUT	/	POWER	/	OPTIONS	/	HOUSING
Model Number(s):	**500 Series**		*		*		**24 Vdc**		** **H or J**		*

*Indicates any input, output, option and housing as stated on the product data sheet.
**Indicates CE Compliant.

Conforms to the following EMC specifications:
EN61326-1, 1998, Electromagnetic Compatibility requirements for electrical equipment for control use.

Conforms to the following safety standard:
EN 61010-1, 2001

Supplemental Information:
CE option requires CE KIT PN 535-766.

Janurary 9, 2003
Date

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Declares that the product(s):

Product Name: **500 Series**

	MODEL	/ INPUT	/ OUTPUT	/ POWER	/ OPTIONS	/ HOUSING
Model Number(s):	**500 Series**	*	*	**Universal Power Supply**	** **H or J**	*

*Indicates any input, output, option and housing as stated on the product data sheet.
**Indicates CE Compliant.

Conforms to the following EMC specifications:
EN61326-1, 1998, Electromagnetic Compatibility requirements for electrical equipment for control use.

Conforms to the following safety standard:
EN 61010-1, 2001

Supplemental Information:
CE option requires CE KIT PN 535-765.

August 15, 2005
Date

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RETURN PROCEDURES

To return equipment to Moore Industries for repair, follow these four steps:

1. Call Moore Industries and request a Returned Material Authorization (RMA) number.

   Warranty Repair –
   If you are unsure if your unit is still under warranty, we can use the unit's serial number to verify the warranty status for you over the phone. Be sure to include the RMA number on all documentation.

   Non-Warranty Repair –
   If your unit is out of warranty, be prepared to give us a Purchase Order number when you call. In most cases, we will be able to quote you the repair costs at that time. The repair price you are quoted will be a "Not To Exceed" price, which means that the actual repair costs may be less than the quote. Be sure to include the RMA number on all documentation.

2. Provide us with the following documentation:
   a) A note listing the symptoms that indicate the unit needs repair
   b) Complete shipping information for return of the equipment after repair
   c) The name and phone number of the person to contact if questions arise at the factory

3. Use sufficient packing material and carefully pack the equipment in a sturdy shipping container.

4. Ship the equipment to the Moore Industries location nearest you.

The returned equipment will be inspected and tested at the factory. A Moore Industries representative will contact the person designated on your documentation if more information is needed. The repaired equipment, or its replacement, will be returned to you in accordance with the shipping instructions furnished in your documentation.

WARRANTY DISCLAIMER

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ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY AGREES WITH THE COMPANY THAT THE SOLE AND EXCLUSIVE REMEDIES FOR BREACH OF ANY WARRANTY CONCERNING THE GOODS OR SERVICES SHALL BE FOR THE COMPANY, AT ITS OPTION, TO REPAIR OR REPLACE THE GOODS OR SERVICES OR REFUND THE PURCHASE PRICE. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES EVEN IF THE COMPANY FAILS IN ANY ATTEMPT TO REMEDY DEFECTS IN THE GOODS OR SERVICES , BUT IN SUCH CASE THE BUYER SHALL BE ENTITLED TO NO MORE THAN A REFUND OF ALL MONIES PAID TO THE COMPANY BY THE BUYER FOR PURCHASE OF THE GOODS OR SERVICES.

ANY CAUSE OF ACTION FOR BREACH OF ANY WARRANTY BY THE COMPANY SHALL BE BARRED UNLESS THE COMPANY RECEIVES FROM THE BUYER A WRITTEN NOTICE OF THE ALLEGED DEFECT OR BREACH WITHIN TEN DAYS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH, AND NO ACTION FOR THE BREACH OF ANY WARRANTY SHALL BE COMMENCED BY THE BUYER ANY LATER THAN TWELVE MONTHS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH.

RETURN POLICY

For a period of thirty-six (36) months from the date of shipment, and under normal conditions of use and service, Moore Industries ("The Company") will at its option replace, repair or refund the purchase price for any of its manufactured products found, upon return to the Company (transportation charges prepaid and otherwise in accordance with the return procedures established by The Company), to be defective in material or workmanship. This policy extends to the original Buyer only and not to Buyer's customers or the users of Buyer's products, unless Buyer is an engineering contractor in which case the policy shall extend to Buyer's immediate customer only. This policy shall not apply if the product has been subject to alteration, misuse, accident, neglect or improper application, installation, or operation. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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