



**2XX-SFP / 2XX-SFG**  
**Serial Fiber Plastic Option**  
**Serial Fiber Glass Option**  
**Installation Manual**

**For 200 Series Indicators**



# INTRODUCTION

The 2XX-SFP (Serial Fiber Plastic) and 2XX-SFG (Serial Fiber Glass) option cards provide a third serial port for Cardinal's Series indicators. This third port is bi-directional and available for printing, continuous output, nControl, computer query and computer control.

**NOTE!** The 2XX-SFG option card has the same layout as the 2XX-SFP, however the connectors are different due to using Glass fiber optic cable.

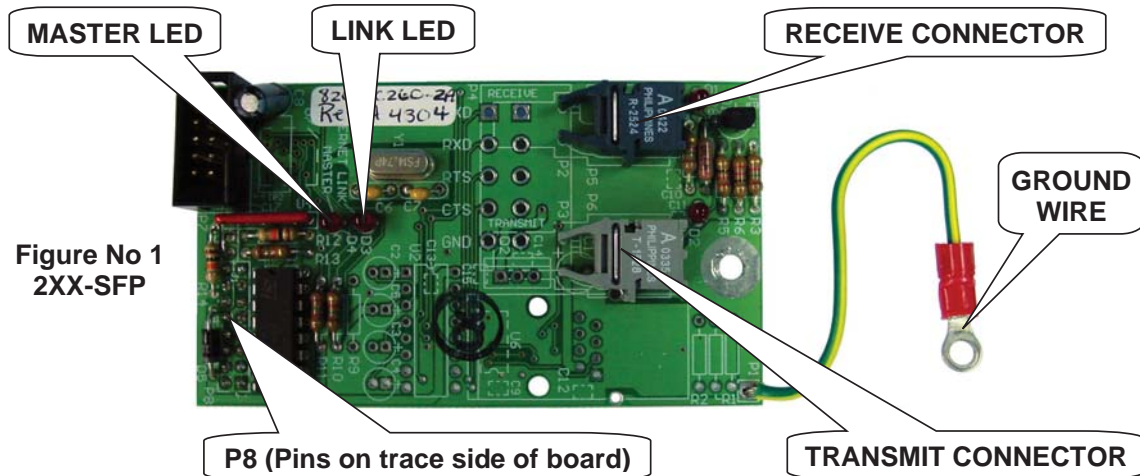


Figure No 1  
2XX-SFP

## FCC COMPLIANCE STATEMENT

This equipment generates, uses and can radiate radio frequency and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user will be responsible to take whatever measures necessary to correct the interference.

You may find the booklet "How to Identify and Resolve Radio TV Interference Problems" prepared by the Federal Communications Commission helpful. It is available from the U.S. Government Printing Office, Washington, D.C. 20402. The stock number is 001-000-00315-4.

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## PRECAUTIONS

Before beginning installation of this option card, read this manual and pay special attention to all "WARNING" symbols:



IMPORTANT



ELECTRICAL  
WARNING



STATIC  
SENSITIVE

# FIBER OPTIC CABLE

## Plastic Fiber

When using plastic fiber optic cable, it will be necessary to terminate the end of each cable in a special connector for attachment to the option card in the indicator. Before installation of the connectors, however, it is first necessary to route the cable between the serial device and the indicator. **NOTE!** The cable provided is of a duplex type which means that it contains two fiber optic cores so that it can both transmit and receive data over the same cable and that one of the two conductors has a mark running the length of the cable to distinguish it from the other conductor.

## PLASTIC FIBER CABLE PREPARATION

Being careful not to bend or nick the cable, route a piece of cable from the serial device to the indicator. You are now ready to attach a connector to the ends of each fiber optic cable. The connectors can be easily installed on cable ends with standard tools. Polishing the ends of the cable can be accomplished using the Hewlett-Packard HFBR-4593 Polishing Kit (Cardinal p/n 6770-9009) which consists of a polishing fixture, 600 grit abrasive paper and 3 um pink lapping film. The connector may be used immediately after polishing. The following materials and tools are required to terminate the plastic fiber cable:

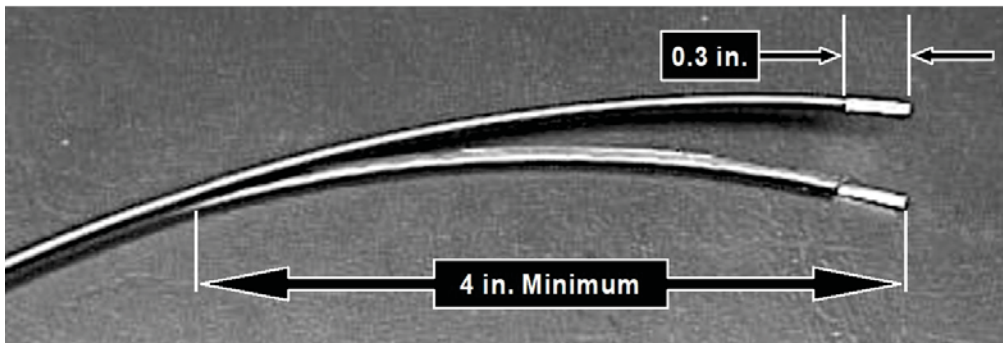
- Wire cutters or scissors
- 16 gage wire stripper
- Plastic optical fiber (Cardinal p/n 6980-2004)
- Crimpless connectors (HP HFBR-4532) (Cardinal p/n 6610-2003)
- Hewlett-Packard polishing kit HFBR-4593 (Cardinal p/n 6770-9009)

### Step 1.

The zip cord construction of the duplex fiber optic cable makes it easy to separate the cable into two conductors. The conductors should be separated a minimum of 4 inches but no more than 6 inches back from the ends to permit installation of the connectors and polishing of the conductor ends. After cutting the cable to the desired length, strip off approximately 0.3 inch of the outer jacket using the 16-gage wire stripper. Refer to Figure No. 2.



**Be careful not to nick or otherwise damage the plastic core of the fiber optic cable when removing the outer insulation jacket. Damage to the plastic core can reduce the fibers ability to transmit light, leaving the system inoperable.**

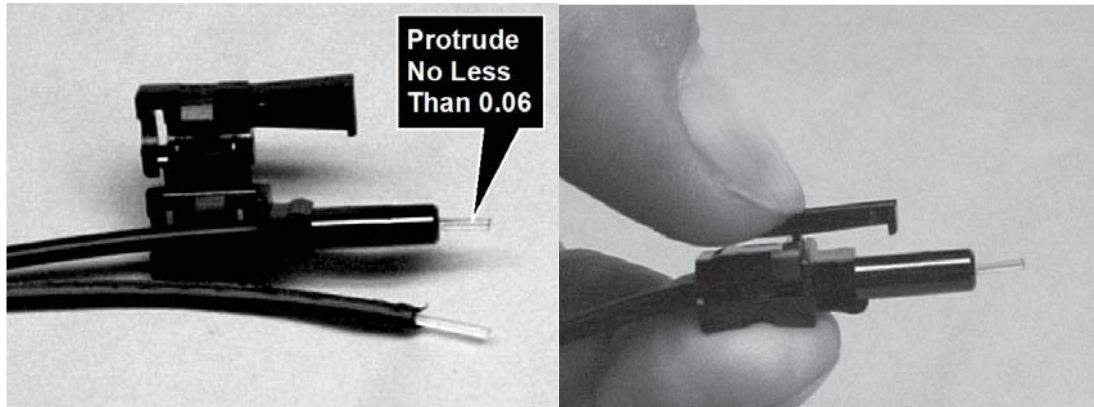


**Figure No. 2**  
**Preparation of Plastic Fiber Optic**  
**Cable for Connector Installation**

## FIBER OPTIC CABLE, Cont.

### Step 2.

Place a connector body on the end of the cable fiber as shown in Figure No. 3. Slide the connector down until the fiber jacket stops it. The fiber should protrude no less than 0.06 inch from the end of the connector. Flip the top half of the connector over and snap it into the ferrule half. Use only your fingers to do this. **Do not use pliers!** When the top half of the connector latches inside the body of the ferrule half, proper connector-to-cable attachment has been achieved. Manually press the connector halves together in the center of the assembly. The connectors are secured when the top half latches into the ferrule half.



**Figure No. 3**  
**Connector Attachment to Optical Fibers**

### Step 3.

Any fiber in excess of 0.06 inch protruding from the connector end should be cut off with the wire cutters or scissors. Insert the connector fully into the polishing fixture with the trimmed fibers protruding from the bottom of the fixture. This plastic polishing fixture can be used to polish the fibers from two connectors (*not recommended*) simultaneously, if you so choose.



**NOTE:** The four dots on the bottom of the polishing fixture are wear indicators. Replace the polishing fixture when any dot is no longer visible.

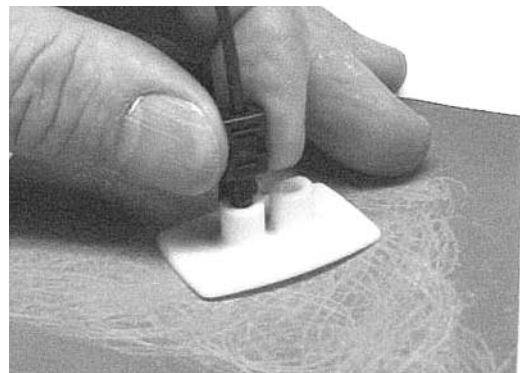
**Figure No. 4**  
**Polishing Fixture Wear Indicators**

Press the polishing fixture down on the 600 grit abrasive paper. Polish the fiber ends using a figure eight pattern until the connector is flush with the bottom of the polishing fixture. Wipe the connector with a clean cloth or tissue.

### Step 4.

Place the fiber end of the polishing fixture on the dull side of the 3 um pink lapping film and continue to polish the fiber ends in the same figure eight pattern for approximately 25 strokes. The fiber ends should be flat, smooth and clean.

**Figure No. 5**  
**Trimming and Polishing**  
**Fiber Optic Cable End**



## **FIBER OPTIC CABLE, Cont.**

### **Glass Cored Fiber**

Cardinal does not recommend the field termination and preparation of glass cored fiber optic cable because of the complexity of the process and the increased risk of error. For this reason, when glass cored fiber optic cable is used, the cables will be received pre-terminated. Use the same precautions when routing glass cored fiber optic cable. That is, do not subject them to bends of less than 1-inch radius, take care not to nick the cable or its protective jacket, make sure to keep the cable ends clean and do not crush the cable. Damage to the fiber optic cable can keep the system from working.

# INSTALLATION

## Models 205, 210 and 215

### Mounting the Option Card

**NOTE!** Should your indicator come with the option card already installed, the following section describing mounting it does not apply. Proceed to the Cable Installation section.



**ATTENTION! OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.**

1. Make sure the power to the indicator is OFF. Unplug the AC power cord.
2. Loosen the gland connector(s) where the AC power cord and any other cables enter the back panel of the indicator.
3. Remove the 3 acorn nuts securing the Battery Access Cover to the bottom of the indicator. On the 205/210, if using the optional battery, remove it. On the 215, even if not using batteries, remove the battery tray.
4. After removing the battery or battery tray, remove the 12 acorn nuts securing the back panel to main housing.
5. Lift the back panel from the main housing, taking care not to stretch the cable and wires between the panel and main housing. Lay the back panel on the workbench next to the indicator.
6. Referring to Figure No. 6, locate the threaded stand-off and P4 OPTION BOARD connector (above P11, SERIAL I/O) on the main board.
7. To install the option card, carefully align the P8 connector (pins on trace side of option card) with connector P4 on the indicator main board and apply even downward pressure to the end of the option card at P8.
8. Align the hole in the option card with the threaded stand-off on the main board and using the lock washer and screw supplied with the option card, secure the card to the main board.
9. To attach the ground wire, remove a 6-32 nut and washer from the corner of the main board. Refer to Figure No. 7.
10. Connect the ground wire from the option card by placing the ring terminal over the 6-32 threaded stud.
11. Reinstall the washer and 6-32 nut and tighten.

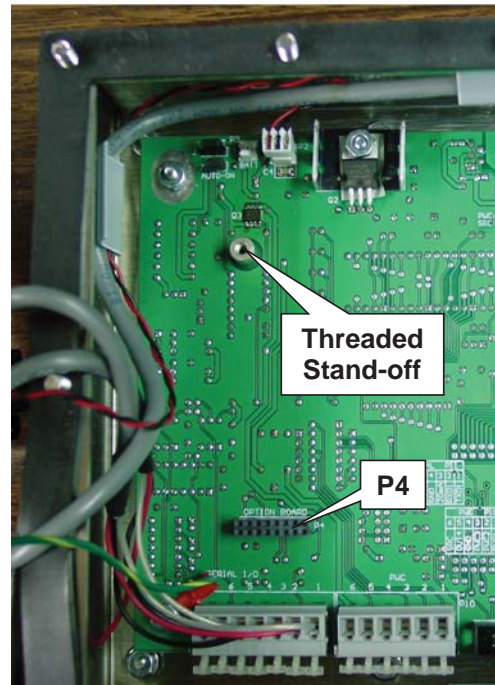


Figure No 6

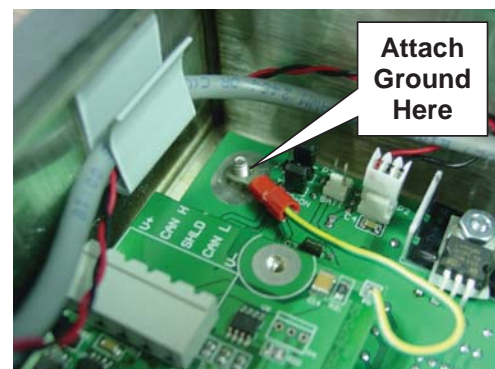


Figure No 7

# INSTALLATION, Cont.

## MODEL 220

### Mounting the Option Card

**NOTE!** Should your indicator come with the option card already installed, the following section describing mounting it does not apply. Proceed to the Cable Installation section.



**ATTENTION! OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.**

1. Make sure the power to the indicator is OFF. Unplug the AC power cord.
2. Loosen the gland connector(s) where the AC power cord and any other cables enter the back panel of the indicator.
3. Remove the 14 acorn nuts securing the back panel to the main housing.
4. Lift the back panel from the main housing, taking care not to stretch the cable and wires between the panel and main housing. Lay the back panel on the workbench next to the indicator.

5. Referring to Figure No. 8, locate the threaded stand-off (below P3) and the P4 OPTION BOARD connector on the main board.
6. To install the option card, carefully align the P8 connector (pins on trace side of option card) with connector P4 on the indicator main board and apply even downward pressure to the end of the option card at P8.
7. Align the hole in the option card with the threaded stand-off on the main board and using the lock washer and screw supplied with the option card, secure the card to the main board.

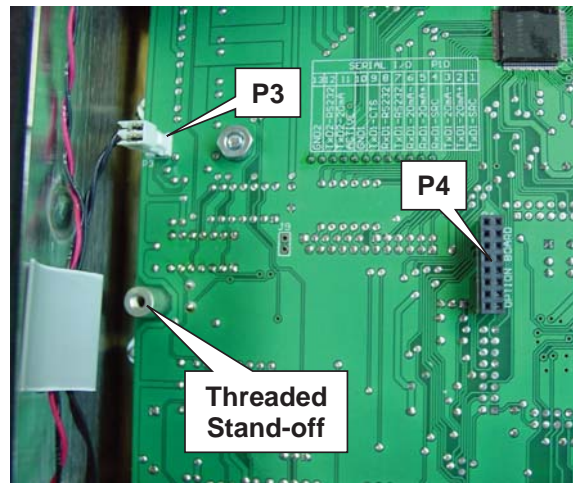


Figure No 8

8. To attach the ground wire, remove a 6-32 nut and washer from the corner of the main board. Refer to Figure No. 9.
9. Connect the ground wire from the option card by placing the ring terminal over the 6-32 threaded stud.
10. Reinstall the washer and 6-32 nut and tighten.

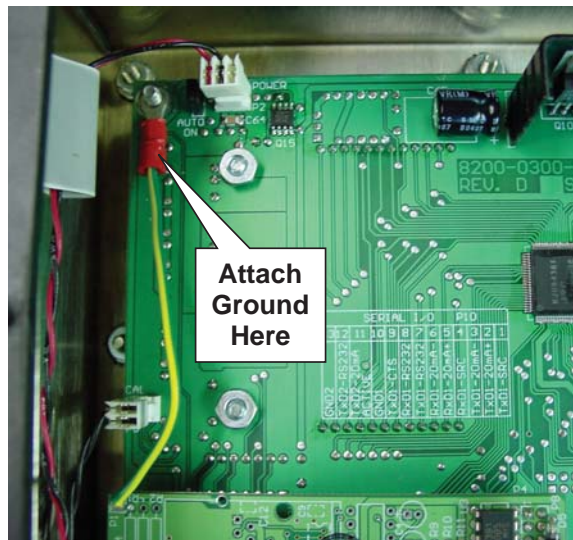


Figure No 9



## INSTALLATION, Cont.

### Cable Installation in Indicator

1. Begin by inspecting the duplex fiber optic cable and noting that one of the two conductors has a mark running the length of the cable to distinguish it from the other conductor.
2. Loosen a gland connector for the Fiber Optic cable.
3. Slip the cable through the gland connector and into enclosure.
4. Referring to Figure No. 10, connect the fiber that has the mark to the TRANSMIT connector on the option card.
5. Next, connect the unmarked fiber to the RECEIVE connector on the option card.
6. Make the connections by fully inserting the fiber connectors into the connectors.

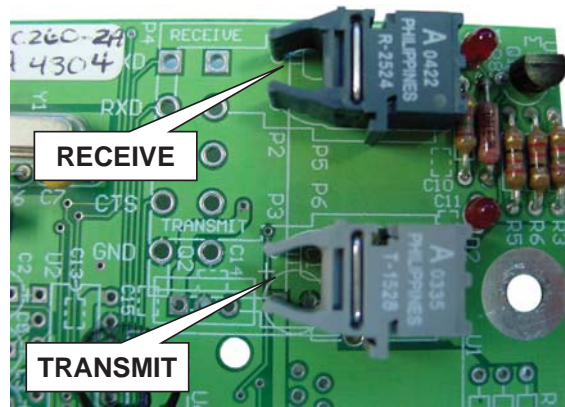


Figure No 10

### Re-Installing the Rear Panel

After all terminations have been made, remove the excess cable from the instrument enclosure and securely tighten each of the cable gland connectors. Do not over-tighten these connectors but make certain they are snug. **DO NOT USE TOOLS!** Finger tighten only! Insure any unused gland connectors are plugged.

1. Make certain no cables or wires are exposed between the main housing and rear panel and then place the rear panel onto the main housing.
2. Secure with the acorn nuts (12 on the 205, 210 and 215, 14 on the 220) removed earlier. Follow a diagonal pattern when tightening the acorn nuts.
3. On the 205/210, if using the optional battery,
  - A. Insure the ( - ) negative polarity markings of the battery are positioned facing up (towards the front of the indicator) and the alignment notch in the battery is to the left.
  - B. Slide the battery into the opening, compressing the battery ejector spring, until you feel resistance and the battery is almost flush with the bottom of the indicator.
  - C. Replace the Battery Access Cover and install the three acorn nuts removed earlier, securing the battery in place.
4. On the Model 215,
  - A. Place the narrow end of the battery tray in the guides of the opening.
  - B. Slide the battery tray into the opening, until you feel resistance and the edge of the battery tray is flush with the bottom of the indicator.
  - C. Replace the Battery Access Cover and install the three acorn nuts removed earlier, securing the battery tray in place.



**IMPORTANT!** On the Model 215, the battery tray (with or without batteries) must be installed for the indicator to function.

5. If required, install the lead and wire calibration seal.

# INDICATOR SETUP

A new section has been added to the SETUP menu for the option board. The new sub menu *Opt Ion* (OPTION) has been placed after *LOCOUT* (LOCOUT). The *Opt Ion* sub menu contains the setup required to establish communications.

## *baud*: (Baud Rate)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, use the numeric keys to enter a new baud rate, then press the **ENTER** key to save it. Allowable values are:

|                        |                        |                        |
|------------------------|------------------------|------------------------|
| <i>24</i> = 2400 Baud  | <i>48</i> = 4800 Baud  | <i>96</i> = 9600 Baud  |
| <i>19</i> = 19.2k Baud | <i>38</i> = 38.4k Baud | <i>57</i> = 57.6k Baud |
|                        |                        | <i>76</i> = 76.8k Baud |

## *Parity*: (Serial Port Parity)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the arrow keys, select a new setting then press the **ENTER** key to save it. Allowable values are: 0, 1, or 2.

|                             |                       |                        |
|-----------------------------|-----------------------|------------------------|
| <i>0</i> = NONE (No Parity) | <i>1</i> = Odd Parity | <i>2</i> = Even Parity |
|-----------------------------|-----------------------|------------------------|

## *bits*: (Serial Port Data Bits)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the arrow keys, select a new setting then press the **ENTER** key to save it. Allowable values are: 7 or 8.

## *stop*: (Serial Port Stop Bits)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the arrow keys, select a new setting, then press the **ENTER** key to save it. Allowable values are: 1 or 2.

## *Cont3*: (Continuous Output Serial Port 3)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the arrow keys, select a new setting then press the **ENTER** key to save it.

|                           |                          |
|---------------------------|--------------------------|
| <i>Cont3</i> : <i>YES</i> | <i>Cont3</i> : <i>no</i> |
| Continuous Output         | No Continuous Output     |

If *Cont3*: *YES* (Continuous Output) is selected, an additional prompt, *TYPE*: will be displayed.

If *Cont3*: *no* (No Continuous Output) is selected, the indicator will operate in the Weight On Demand mode (only output data in respond to a weight request, ENQ).

## *TYPE*: (Continuous Output Format)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the arrow keys, select a new setting, then press the **ENTER** key to save it. Allowable values are: 0, 1, 2 or 3.

|         |            |            |
|---------|------------|------------|
| 0 = SMA | 1 = SB-400 | 2 = SB-200 |
|---------|------------|------------|

## INDICATOR SETUP, Cont.

### CTS: (Clear To Send, Handshaking)

Press the **ENTER** key to show the current value. If the setting displayed is acceptable, press the **ENTER** key again to save it. Otherwise, using the arrow keys, select a new setting then press the **ENTER** key to save it.

CTS= YES  
Handshaking Enabled

CTS= NO  
Handshaking Disabled

For a complete description of the Continuous Output and the Weight on Demand formats, refer to the SIO (Serial Input/Output) section in manual 8200-M024-O1 for the 205 and in manual 8200-M411-O1 for the 210 and 215. Refer to the SERIAL? (Serial Input/Output) section in manual 8200-M502-O1 for the 220.

## STATUS LED'S

The option card contains two LED's to indicate the communication status of the Serial Input/Output connection. See Figure No. 11.

### LINK (D3)

This LED will illuminate when the option card has been successfully connected to a external device and flicker when data is being transmitted or received from the external device. Note that this LED is identified on the option card as Ethernet Link.

### MASTER (D4)

This LED will flash with every communication between the option card and the indicator. If the D4 LED is not flashing, then communications between the option card and the indicator has failed.

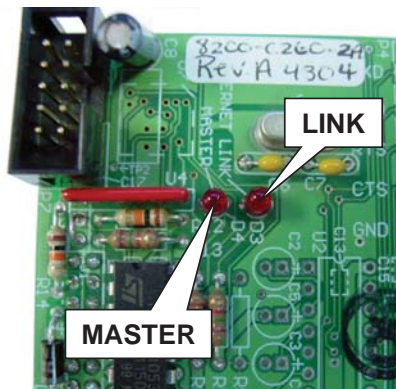


Figure No 11

Printed in USA  
8200-M506 Rev A 06/07

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