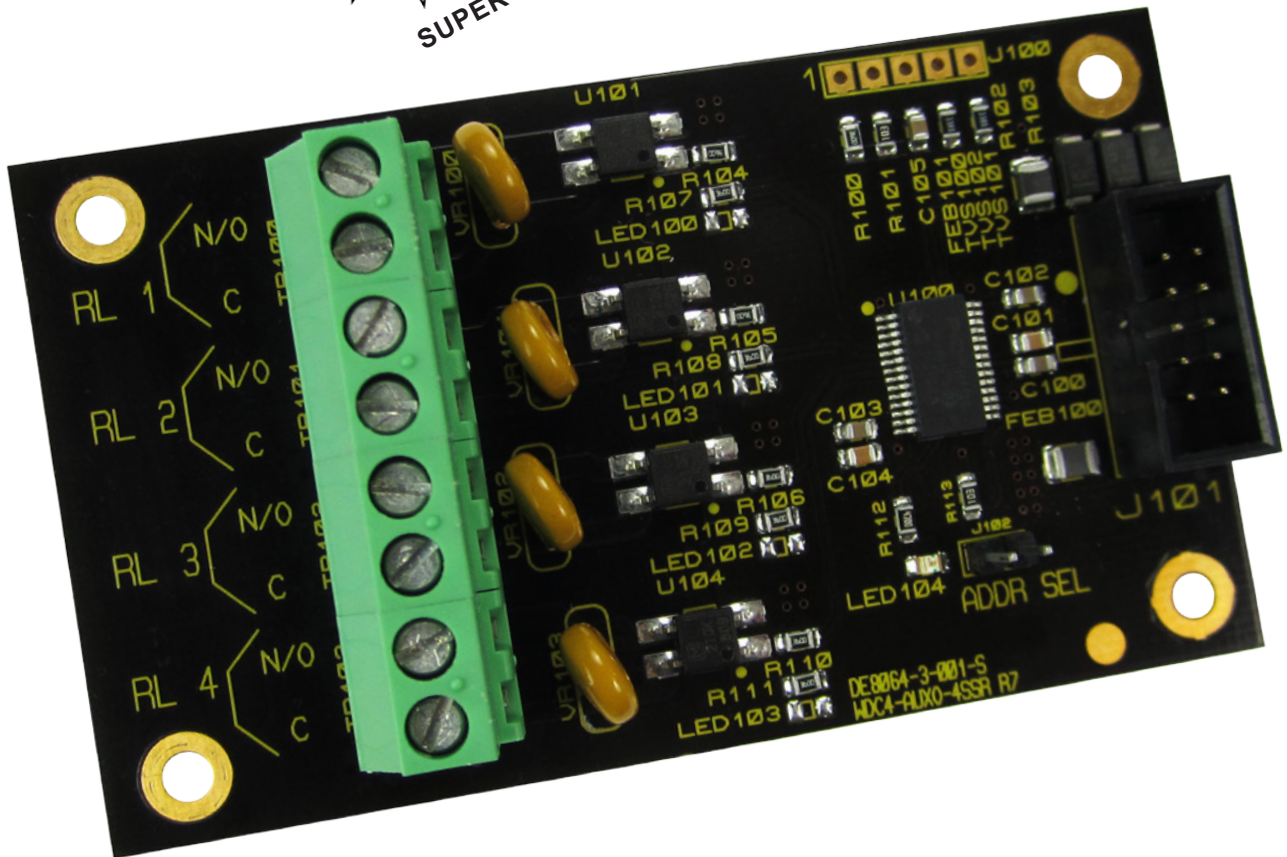




PLC Expansion Board

SOLID STATE RELAY OUTPUTS






INSTALLATION INSTRUCTIONS

OPERATION MANUAL

Part No. WDC4-AUXO-4SSR

www.go4b.com/usa

 	<p> WARNING</p> <p>Rotating parts can crush, cut and entangle.</p> <p>Do NOT operate with guard removed.</p> <p>Lockout power before removing guard or servicing.</p>
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<p> DANGER</p>	
	
<p>Exposed buckets and moving parts will cause severe injury or death.</p> <p>Lockout power before removing cover or inspection door.</p>	

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Dear 4B Customer:

Congratulations on your purchase. 4B appreciates your business and is pleased you have chosen our products to meet your needs.

Please read in its entirety and understand the literature accompanying the product before you place the product into service. Please read the safety precautions carefully before operating the product. With each product you purchase from 4B, there are some basic but important safety considerations you must follow to be sure your purchase is permitted to perform its design function and operate properly and safely, giving you many years of reliable service. Please read and understand the Customer Safety Responsibilities listed below. Failure to follow this safety directive and the Operation Manuals and other material furnished or referenced, may result in serious injury or death.

SAFETY NOTICE TO OUR CUSTOMERS

- A. In order to maximize efficiency and safety, selecting the right equipment for each operation is vital. The proper installation of the equipment, and regular maintenance and inspection is equally important in continuing the proper operation and safety of the product. The proper installation and maintenance of all our products is the responsibility of the user unless you have asked 4B to perform these tasks.
- B. All installation and wiring must be in accordance with Local and National Electrical Codes and other standards applicable to your industry. (Please see the article “Hazard Monitoring Equipment Selection, Installation and Maintenance” at www.go4b.com.) The installation of the wiring should be undertaken by an experienced and qualified professional electrician. Failure to correctly wire any product and/or machinery can result in the product or machine failing to operate as intended, and can defeat its design function.
- C. Periodic inspection by a qualified person will help assure your 4B product is performing properly. 4B recommends a documented inspection at least annually and more frequently under high use conditions.
- D. Please see the last page of this manual for all warranty information regarding this product.

CUSTOMER SAFETY RESPONSIBILITIES

1. READ ALL LITERATURE PROVIDED WITH YOUR PRODUCT

Please read all user, instruction and safety manuals to ensure that you understand your product operation and are able to safely and effectively use this product.

2. YOU BEST UNDERSTAND YOUR NEEDS

Every customer and operation is unique, and only you best know the specific needs and capabilities of your operation. Please call the 24-hour hotline at 309-698-5611 for assistance with any questions about the performance of products purchased from 4B. 4B is happy to discuss product performance with you at any time.

3. SELECT A QUALIFIED AND COMPETENT INSTALLER

Correct installation of the product is important for safety and performance. If you have not asked 4B to perform the installation of the unit on your behalf, it is critical for the safety of your operation and those who may perform work on your operation that you select a qualified and competent electrical installer to undertake the installation. The product must be installed properly to perform its designed functions. The installer should be qualified, trained, and competent to perform the installation in accordance with Local and National Electrical Codes, all relevant OSHA Regulations, as well as any of your own standards and preventive maintenance requirements, and other product installation information supplied with the product. You should be prepared to provide the installer with all necessary installation information to assist in the installation.

4. ESTABLISH AND FOLLOW A REGULAR MAINTENANCE AND INSPECTION SCHEDULE FOR YOUR 4B PRODUCTS

You should develop a proper maintenance and inspection program to confirm that your system is in good working order at all times. You will be in the best position to determine the appropriate frequency for inspection. Many different factors known to the user will assist you in deciding the frequency of inspection. These factors may include but are not limited to weather conditions; construction work at the facility; hours of operation; animal or insect infestation; and the real-world experience of knowing how your employees perform their jobs. The personnel or person you select to install, operate, maintain, inspect or perform any work whatsoever, should be trained and qualified to perform these important functions. Complete and accurate records of the maintenance and inspection process should be created and retained by you at all times.

5. RETAIN AND REFER TO THE OPERATION MANUAL FOR 4B'S SUGGESTED MAINTENANCE AND INSPECTION RECOMMENDATIONS

As all operations are different, please understand that your specific operation may require additional adjustments in the maintenance and inspection process essential to permit the monitoring device to perform its intended function. Retain the Operation Manual and other important maintenance and service documents provided by 4B and have them readily available for people servicing your 4B equipment. Should you have any questions, please call the free 24-hour hotline number (309-698-5611).

6. SERVICE REQUEST

If you have questions or comments about the operation of your unit or require the unit to be serviced please contact the 4B location who supplied the product or send your request via fax (309-698-5615) or call us via our 24-hour hotline number in the USA (309-698-5611). Please have available product part numbers, serial numbers, and approximate date of installation. In order to assist you, after the product has been placed into service, complete the online product registration section which is accessed via our website www.go4b.com/usa.

! WARNING

- Rotating machinery can cause serious injury or death
- Always lockout and tagout the machine prior to installation

PRODUCT OVERVIEW

The PLC expansion board provides the ability to connect additional signals from the WDC4 Super Elite to a PLC. The Expansion card has four solid state relays that can be used to indicate alarm conditions related to speed, misalignment, temperature and auxiliary alarms as four separate signals.

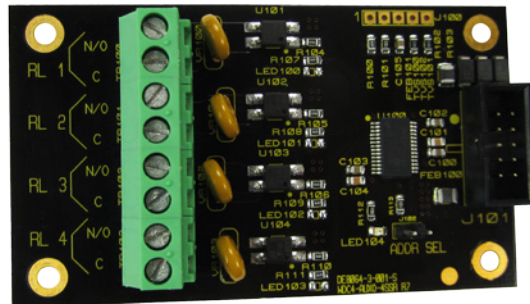
SPECIFICATIONS

Solid State Relay Alarm Outputs (4 Total) -	<ul style="list-style-type: none">• Speed• Misalignment• Temperature• Auxiliary
Relay Ratings (Typical) -	50 mA @ 240 VAC/VDC (Non-Inductive Load, Max. Per Relay)
Contact Leakage (Typical) -	13 uA @ 240 VAC (Equivalent Contact Leakage in Off State)
Contact Default State	Closed (Open in Alarm - Fail Safe)
Dimensions -	85 mm x 50 mm x 21 mm (L x W x H)

PLC EXPANSION BOARD KIT CONTENTS

1. PLC Board (1)
2. Ribbon Cable (1)
3. Insulation Card (1)
4. M3 x 48 mm Hex Pillar, M3 Screw and Washer (4)

1.



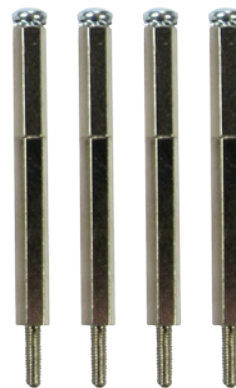
2.



3.



4.



! WARNING

Expansion boards are NOT suitable for HOT INSTALL. Never install expansion boards while the WDC4 is powered or damage will occur. Always remove power from the WDC4 prior to board installation.

INSTALLATION

For factory pre-installed boards, skip to *Electrical Connection* on page 10.

There are two expansion board installation locations on the Watchdog Super Elite WDC4. For the rest of this manual, the top board position will be referred to as EXP1 (blue), and the bottom board will be referred to as EXP2 (red) as show in image 3. The PLC expansion board can be installed in either location.

Step 1 - Remove power from the WDC4 before proceeding with the expansion board installation.

Step 2 - Ensure that the hex pillars are assembled and are securely connected as shown in the board kit contents (#4). Remove the four M3 screws and washers and proceed to step 3.

Step 3 - Line up the insulation card with the back of the expansion board. Gently push the M3 screws through the mounting holes on the front of the expansion board so that they extend though the insulation card (image 1). Set the completed assembly aside for the moment and proceed to step 4.

Step 4 - Attach the four hex pillars to the threaded brass inserts for EXP1 or EXP2 on the WDC4 board. The inserts are located near the power supply as shown in image 2. Carefully hand tighten the hex pillars so that they are flush to the top of the brass insert on the board. Over tightening can strip the threads of the inserts. Image 4 shows the hex pillars installed for position EXP1.



Image 1 -
Insulation Card Installed

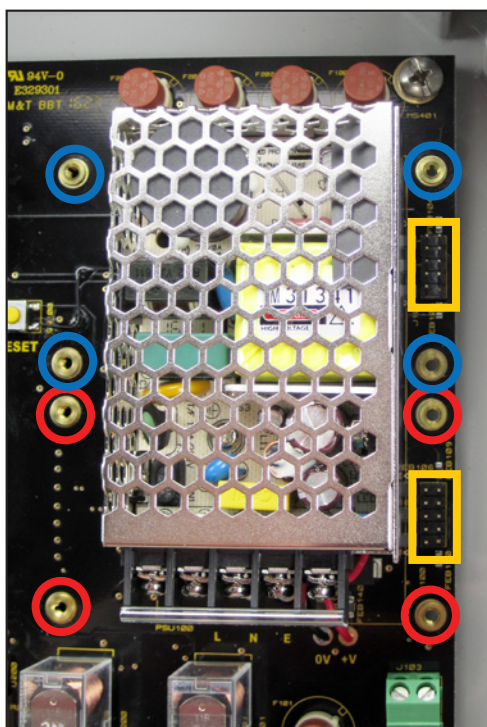


Image 2 -
EXP1 Hex Pillar Inserts (Blue)
EXP2 Hex Pillar Inserts (Red)
Ribbon Cable Connection (Yellow)

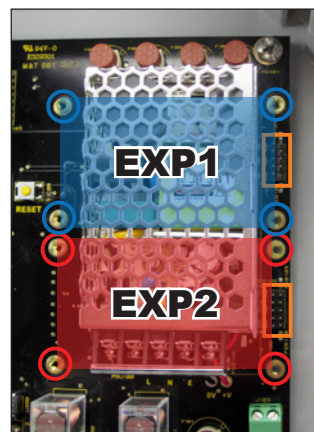
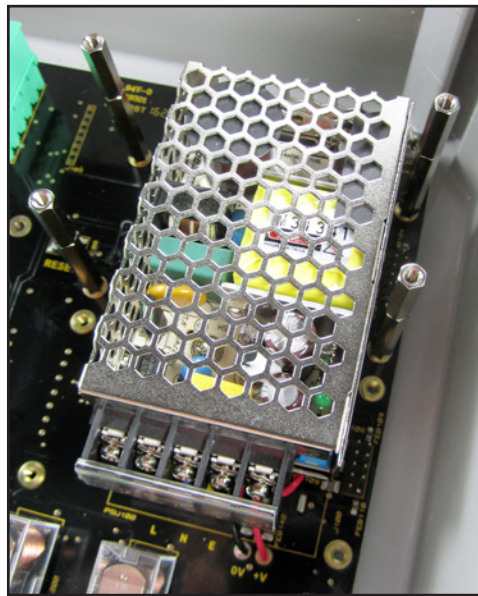


Image 3 -
Expansion Board Positions

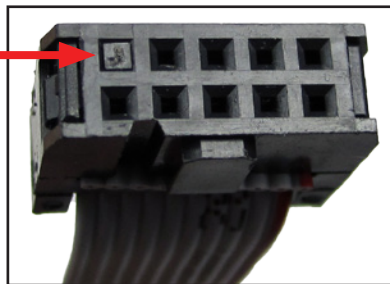


**Image 4 -
Hex Pillars Installed (EXP1)**

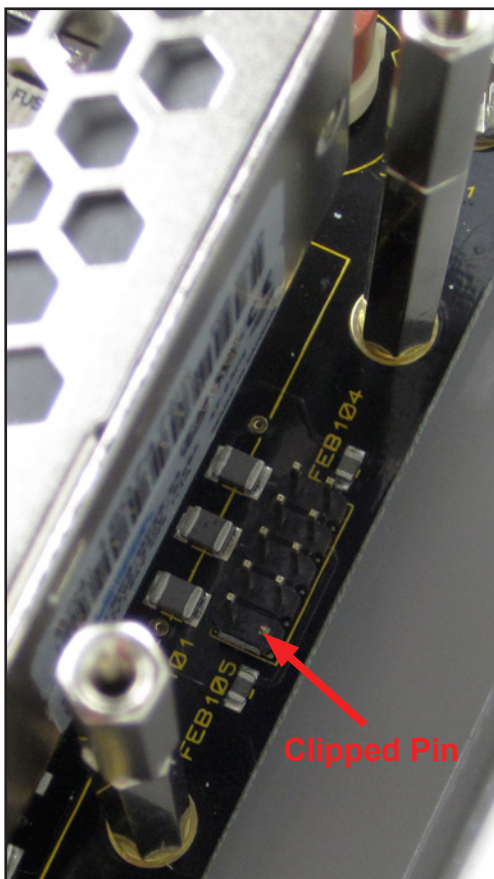
Step 5 - Look at both ends of the ribbon cable, one end will have a blocked connection (image 5). On the WDC4 board, one connection pin is clipped (image 6). Connect the ribbon cable to the WDC4 board, using the end with the blocked connection (image 7).

Step 6 - Place the assembled expansion board and insulation card from step 3 onto the four pillars, make sure that the green wire terminal block is on the left. Attach the board to the hex pillars using the M3 screws (image 8). Be careful not to over tighten the screws.

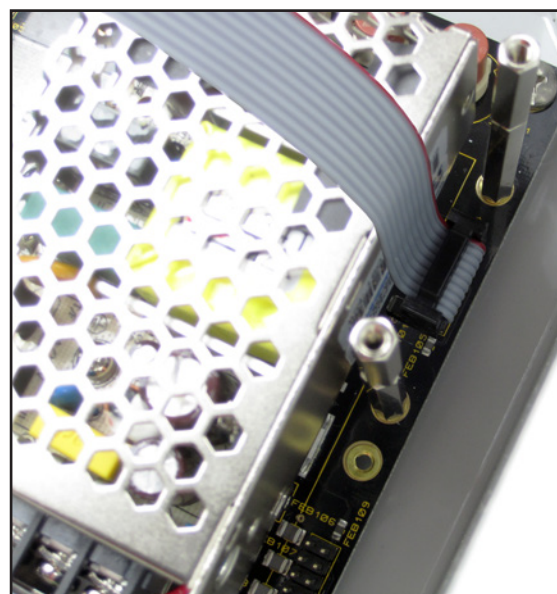
**Blocked Pin
Connection**



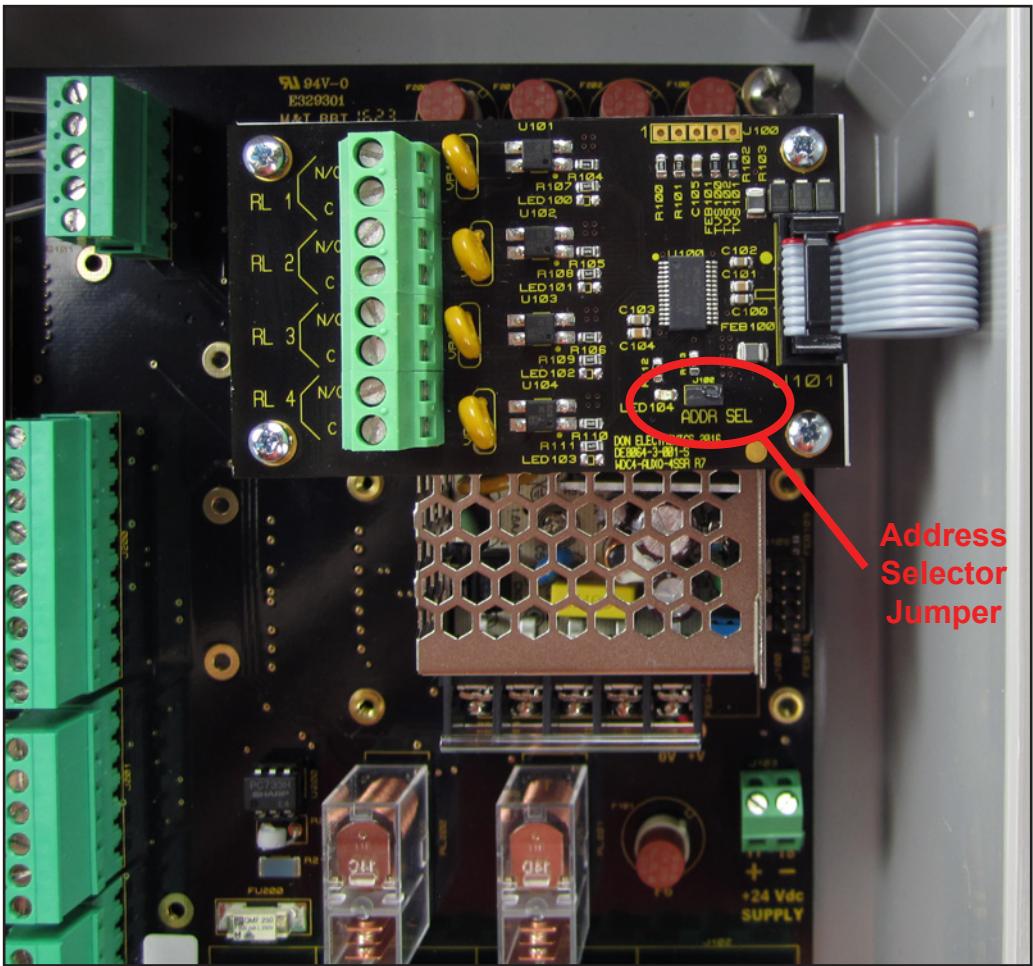
**Image 5 -
Ribbon Cable End
for WDC4 Board
Connection**



**Image 6 -
WDC4 Board Pin Connection**



**Image 7 -
Ribbon Cable Installed on WDC4 Board**

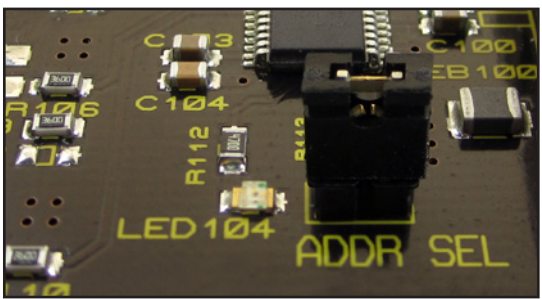


**Image 8 -
EXP1 PLC Board Installed**

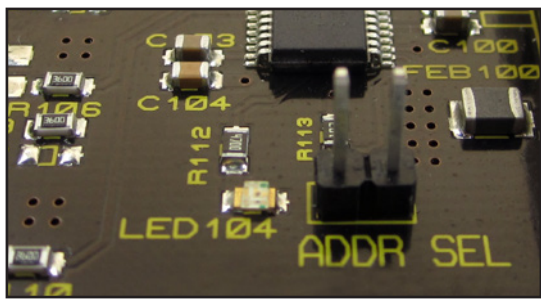
Step 7 - Connect the ribbon cable to the PLC expansion board (image 8).

Step 8 - Near the bottom of the expansion board, there is an address selector jumper (ADDR SEL). This jumper tells the Watchdog control unit that an expansion board has been installed in either location EXP1 or EXP2. The top expansion board should be jumpered to EXP1, and the bottom board EXP2.

Leaving the pre-installed jumper on the board sets the PLC board address to EXP1, removing the jumper will change the address to EXP2 (Image 9A & 9B).



**Image 9A -
Address Selector Jumper On (EXP1)**



**Image 9B -
Address Selector Jumper Off (EXP2)**

Step 9 - After the PLC board has been installed and addressed correctly, proceed to the ELECTRICAL CONNECTION section.

ELECTRICAL CONNECTION

All wiring must be in accordance with local and national electrical codes and should be undertaken by an experienced and qualified electrician.

WARNING

Expansion boards are NOT suitable for HOT INSTALL. Never install expansion boards while the WDC4 is powered or damage will occur. Always remove power from the WDC4 prior to board installation.

Relay's 1 to 4 operate in a fail-safe mode, meaning that the relay is energized (closed) during normal operation and de-energizes (opens) during alarm conditions or when a system failure occurs. The relays are for alarm indication purposes only and should not be connected to inductive or capacitive loads.

Relay Output Overview -

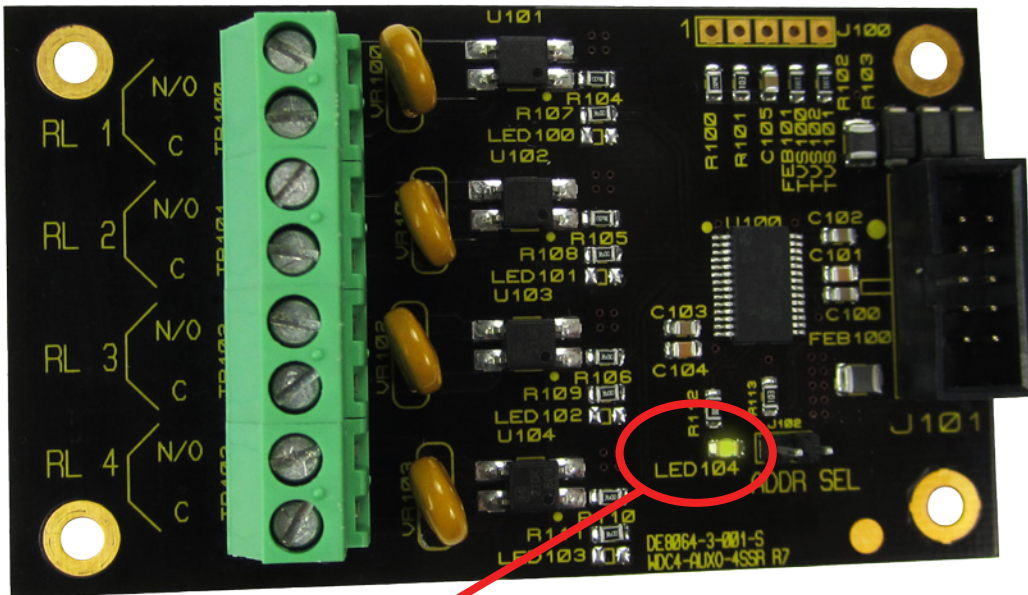
Relay 1 (RL 1) - Speed	Energizes when the speed detection is normal and will de-energize when an under or over speed condition is detected.
Relay 2 (RL 2) - Misalignment	Energizes when the alignment detection is normal and will de-energize when any misalignment condition is detected.
Relay 3 (RL 3) - Temperature	Energizes when all temperatures are in the normal ranges and will de-energize when any temperature alarm is detected.
Relay 4 (RL 4) - Auxiliary Sensor	Energizes when the auxiliary sensors (plug or pulley) are in their normal state and will de-energize when an alarm condition is detected.

The four solid state relays have an operating voltage of 240 VAC/VDC at 50 mA per relay (maximum). The relays are protected against short circuit and transient voltages up to 275 VAC/VDC (typical).

Each relay is electrically isolated from the other relays. This permits a mixture of voltages to be used on the contacts (see warning below).

WARNING

When using mixed voltages extreme care must be taken when making connection to avoid shorting the supplies together, which can result in damage to the unit.



Diagnostics LED (LED104)

**Image 10 -
Diagnostics LED 104**

After all expansion boards have been installed and all sensor inputs are wired, re-connect power to the WDC4 control unit.

Before the new expansion boards and sensors can be used, they will need to be activated and programmed into the WDC4 control unit. Refer to the Watchdog Super Elite manual for setup information (section 12).

NOTE

A diagnostics green LED (LED 104) is located next to the ADDR SEL jumper on the PLC expansion board (image 10). This LED will flash to indicate that the expansion board is communicating with the Watchdog Super Elite. If the LED is not flashing, refer to the TROUBLESHOOTING GUIDE.

TROUBLESHOOTING GUIDE

FAULT	REMEDY
EXP1 is enabled but not functioning (LED 104 is flashing).	<ol style="list-style-type: none"> 1. Check that the ADDR SEL jumper is on (image 9A). 2. Check that the PLC expansion board has been set up in the WDC4 control unit menu.
EXP1 LED 104 is not flashing.	<ol style="list-style-type: none"> 1. Check that the ADDR SEL jumper is on (image 9A). 2. Check that the ribbon cable is properly connected to the PLC expansion board and the WDC4 board. 3. Check that the PCL expansion board has been set up in the WDC4 control unit menu.
EXP2 is enabled but not functioning (LED 104 is flashing).	<ol style="list-style-type: none"> 1. Check that the ADDR SEL jumper is off (image 9B). 2. Check that the PLC expansion board has been set up in the WDC4 control unit menu.
EXP2 LED 104 is not flashing.	<ol style="list-style-type: none"> 1. Check that the ADDR SEL jumper is off (image 9B). 2. Check that the ribbon cable is properly connected to the PLC expansion board and the WDC4 board. 3. Check that the PLC expansion board has been set up in the WDC4 control unit menu.

For installation questions or trouble shooting help, contact 4B.

PRODUCT WARRANTY

1. EXCLUSIVE WRITTEN LIMITED WARRANTY

ALL PRODUCTS SOLD ARE WARRANTED BY THE COMPANY 4B COMPONENTS LIMITED AND 4B BRAIME COMPONENTS LIMITED HEREIN AFTER REFERRED TO AS 4B TO THE ORIGINAL PURCHASER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE (1) YEAR AFTER DATE OF PURCHASE FROM 4B. ANY PRODUCT DETERMINED BY 4B AT ITS SOLE DISCRETION TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO A 4B BRANCH OR AUTHORIZED SERVICE LOCATION, AS 4B DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT 4B'S OPTION.

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3. NO WARRANTY "BY SAMPLE OR EXAMPLE"

ALTHOUGH 4B HAS USED REASONABLE EFFORTS TO ACCURATELY ILLUSTRATE AND DESCRIBE THE PRODUCTS IN ITS CATALOGS, LITERATURE, AND WEBSITES, SUCH ILLUSTRATIONS AND DESCRIPTIONS ARE FOR THE SOLE PURPOSE OF PRODUCT IDENTIFICATION AND DO NOT EXPRESS OR IMPLY A WARRANTY AFFIRMATION OF FACT, OF ANY KIND OR A WARRANTY OR AFFIRMATION OF FACT THAT THE PRODUCTS WILL CONFORM TO THEIR RESPECTIVE ILLUSTRATIONS OR DESCRIPTIONS. 4B EXPRESSLY DISCLAIMS ANY WARRANTY OR AFFIRMATION OF FACT, EXPRESSED OR IMPLIED, OTHER THAN AS SET FORTH IN THE EXCLUSIVE WRITTEN LIMITED WARRANTY STATEMENT ABOVE, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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