V-Green Automation Adapter Kit

Installation Manual and User's Guide

For use with Century® V-Green Variable Speed Motors

A Regal Brand

REGAL

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TRADEMARKS

April 2013/USA

Contents

SAFETY

Safety is emphasized throughout this user manual. These are safety alert symbols and signal words. They alert the user to potential personal injury hazards. Obey all safety messages to avoid possible injury or death or damage to equipment and other property.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

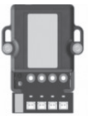
CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE identifies potential equipment damage or failure conditions. Also, alerts personnel to potentially dangerous situations.

KIT CONTENTS

PART	PART NUMBER	QTY	
Automation Adapter	2517369-001	1	
Digital Input Cable	2517463-001	4	
Lead Cable	2517465-001	25 FT	
RS-485 Connecor	2511130-001	1	
Conduit Fitting	2017587-002	1	
Terminal Box Cover Assembly	2513409-001 (Grey) 2513409-002 (Black)	1	
Plug	2514059-001	4	
Screw Driver	2517831-001	1	

INTRODUCTION

The V-Green Automation Adapter provides the ability to operate a V-Green motor with a 3rd party automation system such as the Hayward Goldline Pro Logic, Pentair Easytouch, Jandy Aqualink, and Intermatic controls. This will allow the user to control and experience the full variable speed capability of a V-Green product through an existing automation system.

OVERVIEW

⚠ WARNING

Access to the connections referenced in the diagrams below could be in close proximity to mains connections which carry line voltage capable of causing personal injury or damaging the equipment if contact is made. Power should be turned off when accessing these areas.

System:

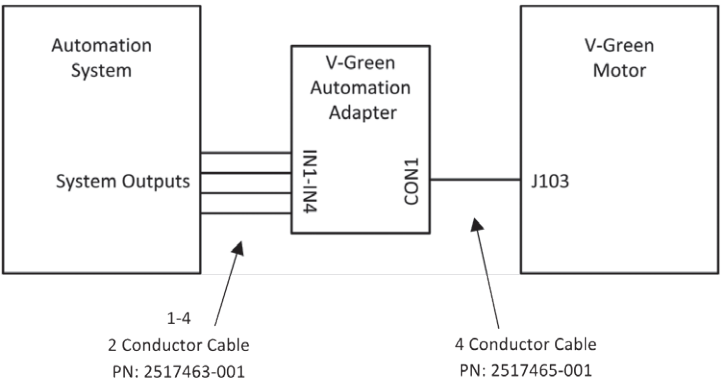


Figure 1

Adapter Control Board:

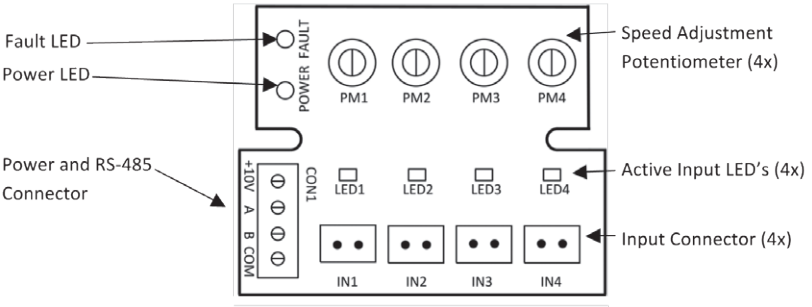


Figure 2

Power/ RS-485 Input

CON1:

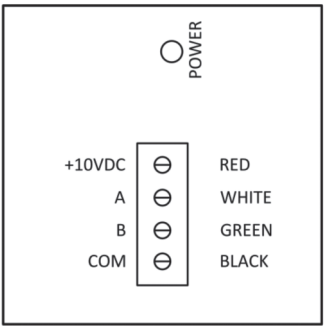


Figure 3

Digital Inputs:

IN1, IN2, IN3, IN4: 9-30 VAC/VDC (2mA Typical, 22mA MAX)
Connect to relay coil or valve control of automation system.

PWM IN1 ONLY: 70-125Hz 5-97 % Duty Cycle

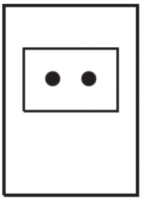


Figure 4

CONECTING TO A V-GREEN MOTOR

⚠ WARNING
The automation adapter must be wired according to the locally adopted version of the NEC. A licensed, qualified electrician should complete the wiring for this product. Failure to comply with this may result in death, serious personal injury or property damage.

NOTE: Refer to manufacturer's instructions for wiring on all other products other than the automation adapter.

The following steps should be followed to connect the automation adapter to a V-Green motor.

1. Disconnect all power sources from the motor and wait five minutes.
2. Remove the terminal box cover from the controller (two screws).

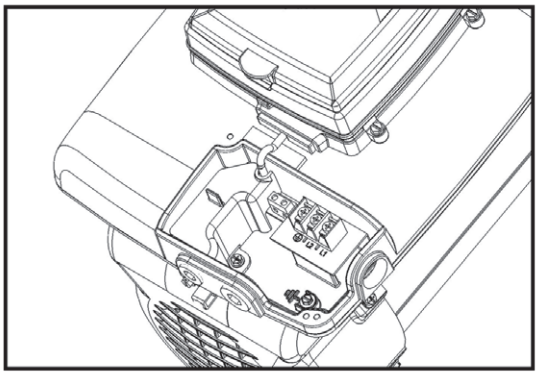


Figure 5: Terminal Box Cover Removed

3. Remove the 3/8” conduit hole plug with a 5/16” Allen wrench.

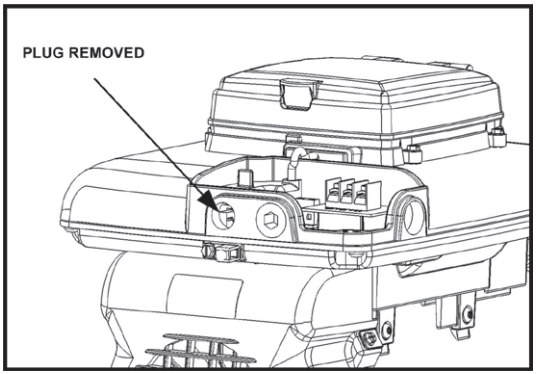


Figure 6: 3/8” Conduit Hole Plug Removed

4. Remove the plastic wiring cover inside the terminal box (one screw).

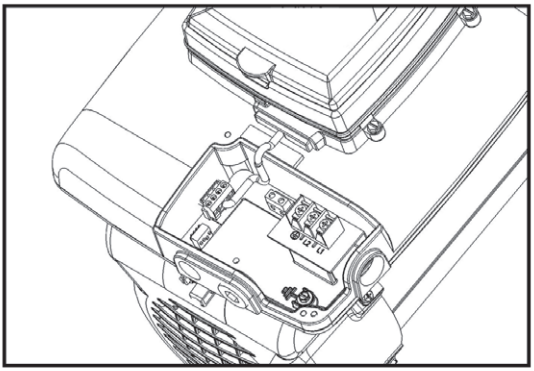


Figure 7: Internal Plastic Cover Removed

5. Disconnect the 4-pin communication connector (J103) by pulling up on the connector.

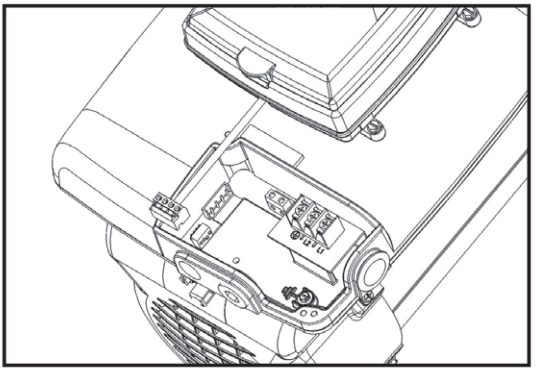


Figure 8: Communication Connector Disconnected

6. Remove the User Interface from the controller (4 screws).

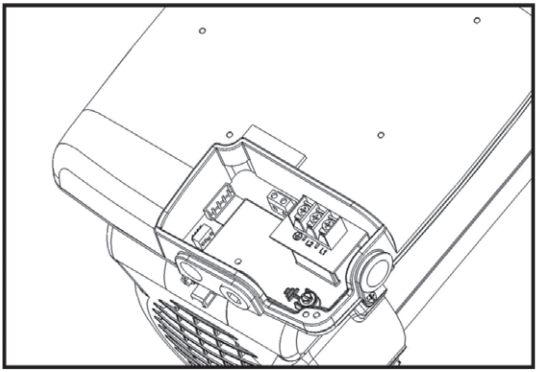


Figure 9: User Interface and Rubber Gasket Removed

7. Install the Conduit Fitting (PN: 2017587-002), turning until snug.

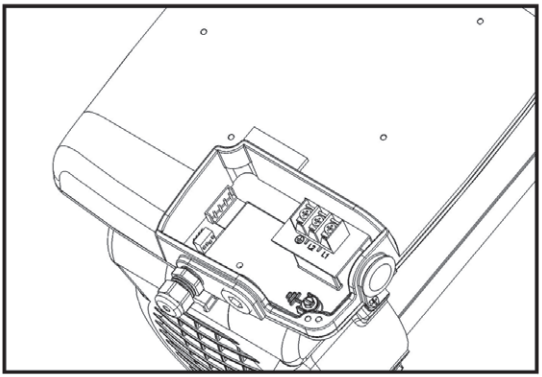
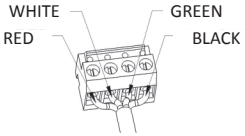


Figure 10: Conduit Fitting Installed

8. Route the cable (PN: 2517465-001) through the conduit fitting, and install to the J103 connector (PN: 2511130-001) on the cable. See the wiring diagram. Tighten the seal nut on the conduit fitting until snug.



Pin #	Wire Color	Description
J103 -1	Red	+10V
J103 -2	White	RS485-A
J103 -3	Green	RS485-B
J103 -4	Black	Isolated Ground

Figure 11: Communication Connection Wiring

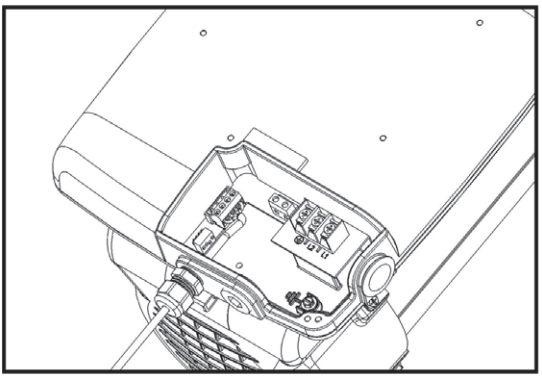


Figure 12: Cable Installed

DIP Switches:

Dip switches one and two of the V-Green motor need to be on in order for the automation adapter to function.

REFER TO THE V-GREEN MOTOR USER MANUAL FOR DIP SWITCH POSITIONING.

9. Replace the plastic cover inside the terminal box (one screw).

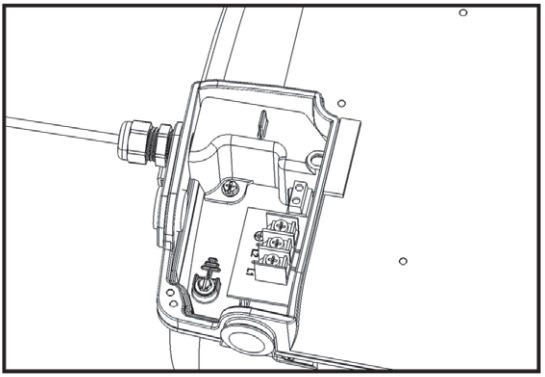


Figure 13: Plastic Cover Installed in Terminal Box

10. Attach New Gaskets to new terminal box cover.

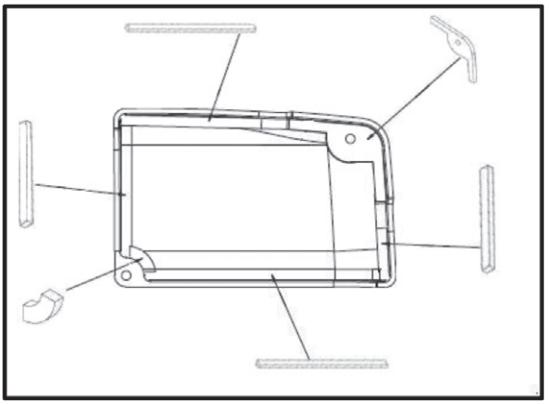


Figure 14: Gasket Placement on New Terminal Box Cover

11. Assemble the new metal terminal box cover (2 screws). Plug the four User Interface mounting holes with the plastic clips (PN: 2514059-001).

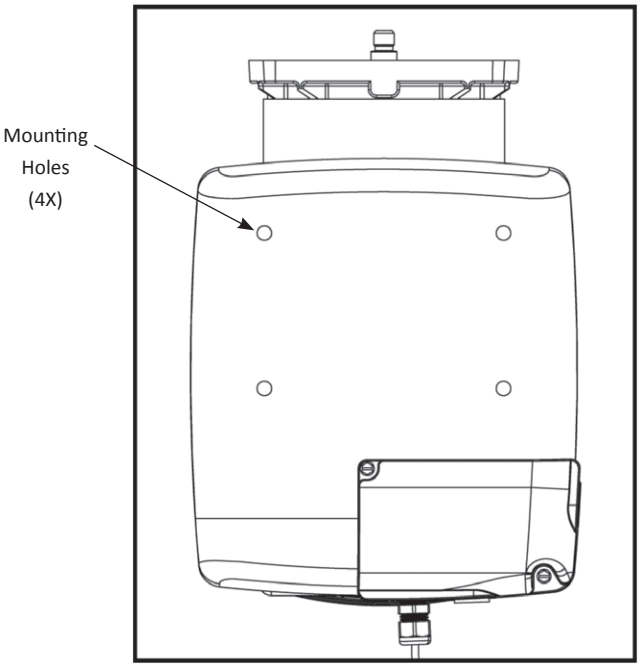


Figure 15: Terminal Box Cover and Clips Installed

12. Mount the automation adapter inside of the automation system control box using double sided mounting tape supplied on the back of the adapter. Place unit so that the orientation of the input connectors are downward.

NOTE: Automation adapter wiring is all low voltage; choose a mounting location away from all high voltage wiring.

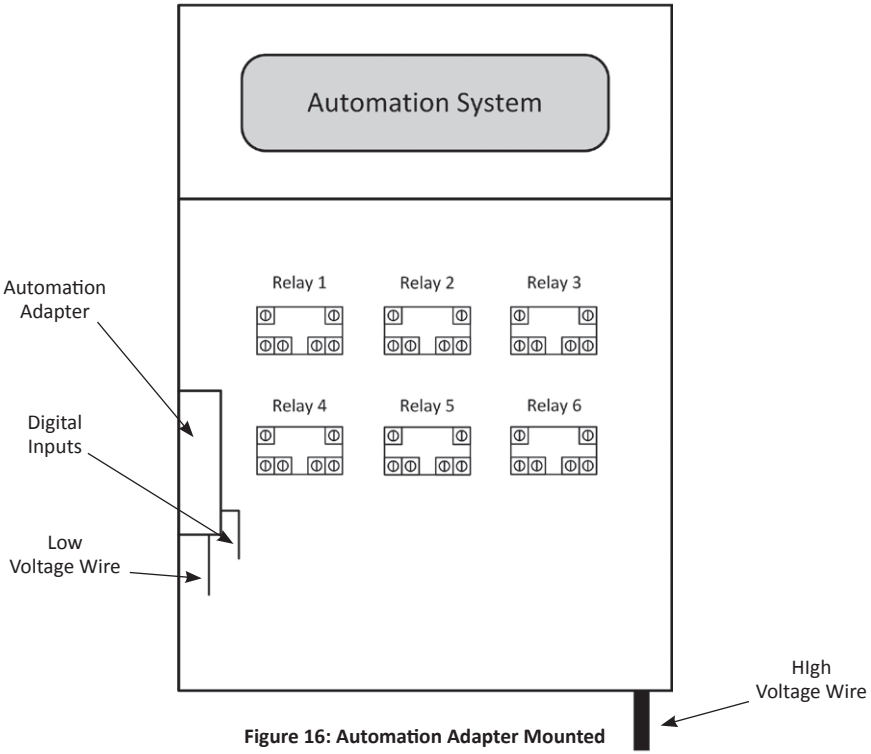


Figure 16: Automation Adapter Mounted

13. Connect the 4 wires from the motor to the automation adapter.

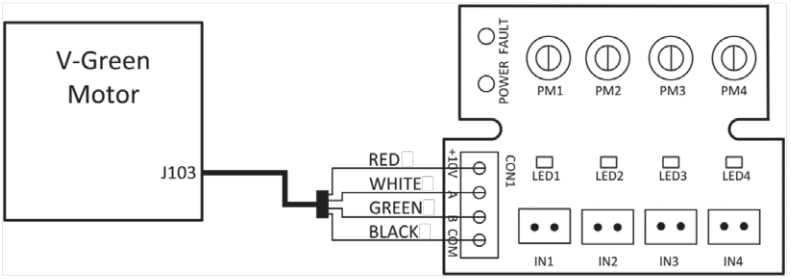


Figure 17: Motor Connected to Adapter

Connecting to an alternate power source

If you choose not to power the automation adapter from the V-Green motor, (J103 low voltage power supply) the automation adapter can be powered from any 10-14 VDC alternate power supply.

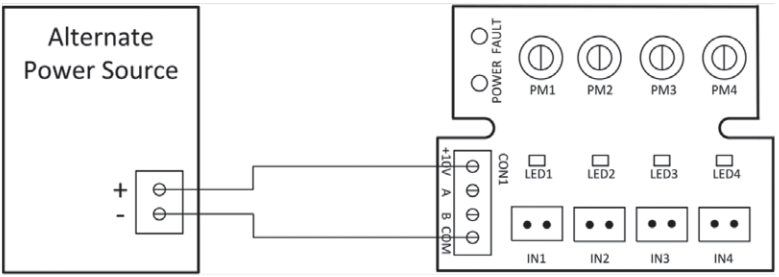


Figure 18: Automation adapter connected to alternate power source

CONNECTING TO AN AUTOMATION SYSTEM

⚠ WARNING

Access to the connections referenced in the diagrams and instructions below could be in close proximity to mains connections which carry line voltage capable of causing personal injury or damaging the equipment if contact is made. Power should be turned off when accessing these areas.

NOTE: User may use a minimum of 1 and a maximum of 4 inputs to the automation adapter.

⚠ WARNING

Failure to connect the automation adapter to the automation system wighout using correct polarity may result in damage to the automation adapter and automation system.

Using automation system output connectors

Connect IN1 to AUX1 or any output from the Automation System. Repeat this for IN2, IN3, and IN4 using different automation system outputs for each input.

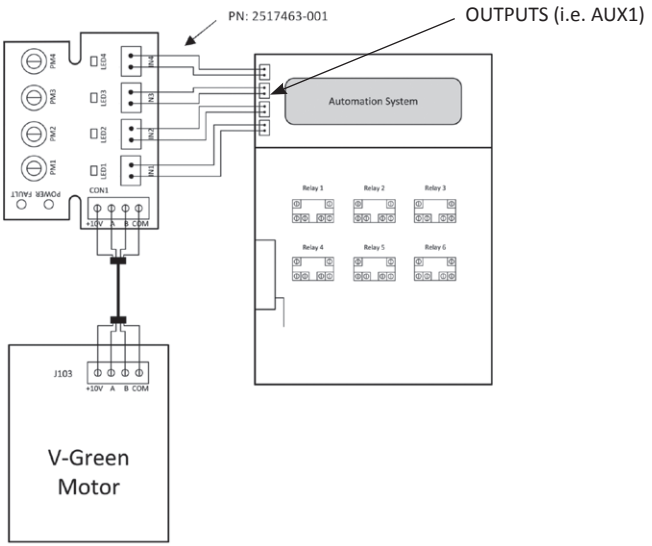


Figure 19:

Automation adapter connected to automation system using the automation system outputs

Using automation system relays

Connecting to Input (i.e. Low Voltage) side of Relays

Connect IN1 to Relay 1 or any relay from the Automation System. Repeat this for IN2, IN3, and IN4 using different automation system relays for each input.

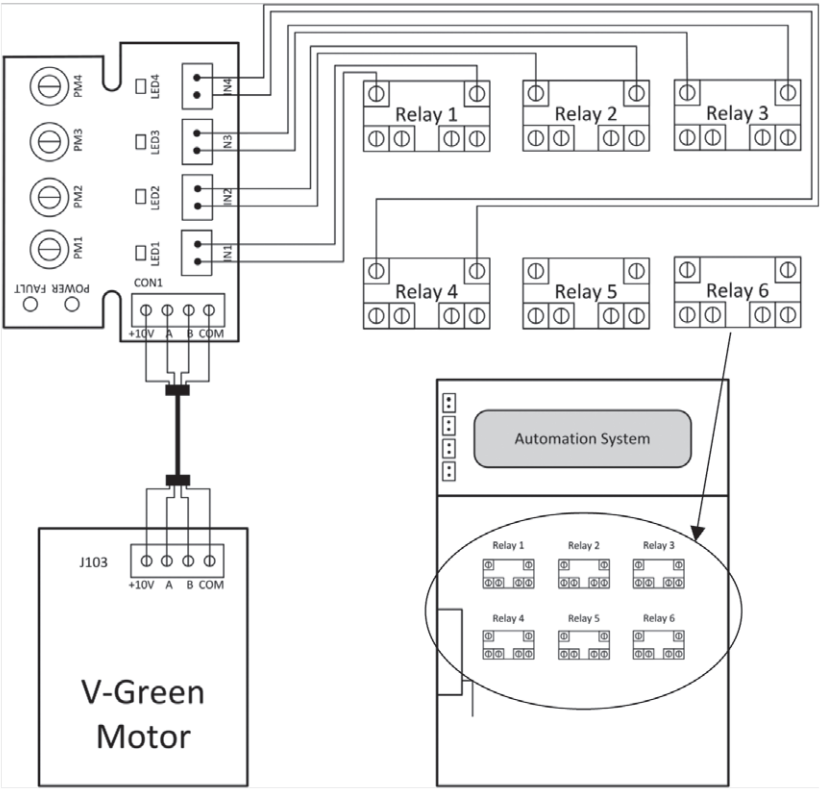


Figure 20:

Automation adapter connected to automation system using the automation system relays

Connecting to Output (i.e. High Voltage) side of Relays

Output Signal Powered by Automation Adapter

From the 10V connection of the automation adapter board (CON1), run a wire to the input on desired relays. Run the output of the relay to the right pin of an input on the automation board. (IN1-IN4) Connect IN1-IN4 left pin with COM on CON1 of the automation adapter.

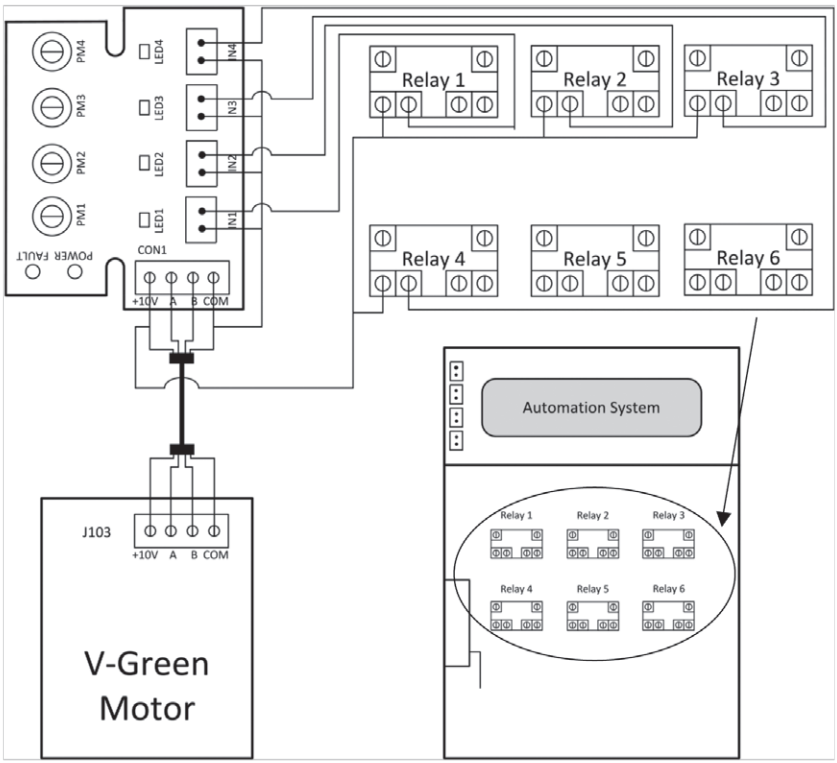


Figure 21:

Automation adapter connected to automation system using the automation system relays

Output Signal Powered by Alternate Power Source

From an alternate power supply (9-30 VAC/VDC), run a wire from the positive side of the power source (DC+) to the input on the desired relays. Run the output of the relay to the right pin of an input on the automation board. (IN1-IN4) Connect IN1-IN4 left pin with the common (DC-) of the alternate power source.

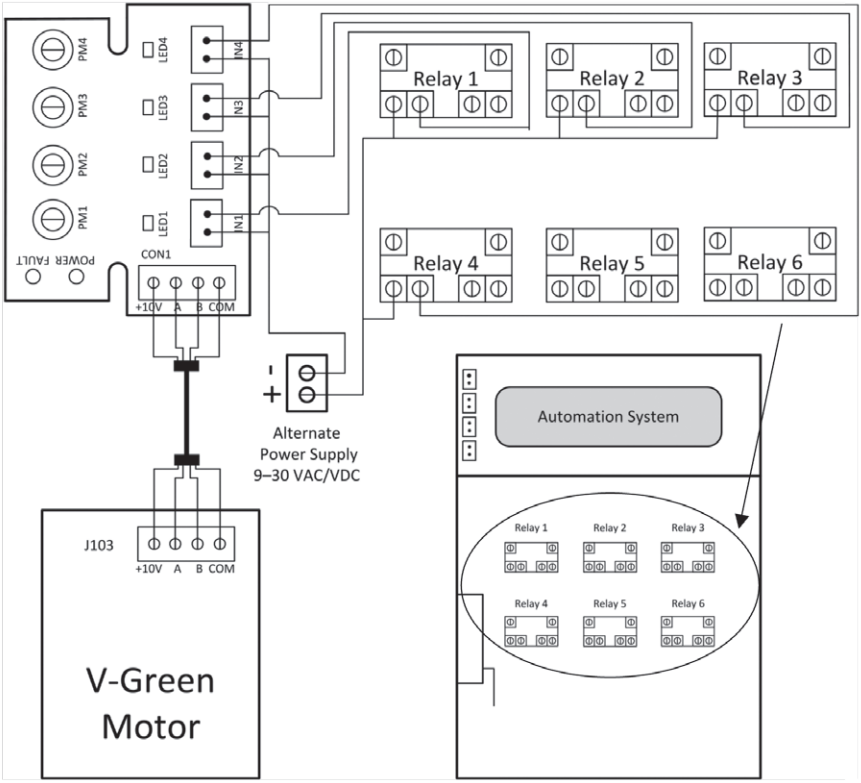


Figure 22:

Automation adapter connected to automation system using the automation system relays

OPERATING A V-GREEN AUTOMATION ADAPTER

Adjusting motor speed:

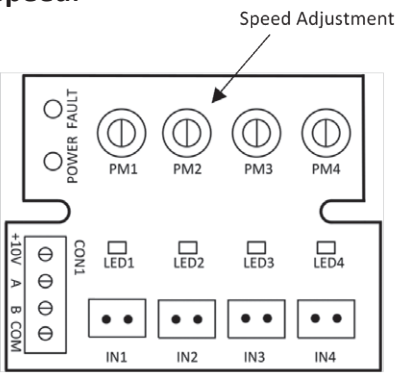


Figure 23: Automation adapter board

The motor speed for each input can be set independently. To do this, using the screw driver provided, turn the potentiometer clockwise or counterclockwise. Clockwise increases the speed and counterclockwise decreases the speed. The speed ranges from 600-3450 RPM. Do this for each input.

When applying a PWM signal to IN1, the speed is based on the duty cycle. A 97% duty cycle is 3450 RPM and a 5% duty cycle is 600 RPM. Intermittent speeds can be set by raising or lowering the duty cycle of the PWM signal.

NOTE: When using a PWM signal as an input for IN1, if the duty cycle is less than 5%, the Automation Adapter will not accept this input. It will be treated as if there is no input being applied. If the duty cycle is greater than 97%, the Automation Adapter will accept this input as a DC voltage or normal input. In this case the speed of the motor is controlled by the corresponding potentiometer.

NOTE: If more than one digital input is present, then the automation adapter will give priority to the highest number digital input. Therefore IN4 has highest priority followed by IN3, then IN2, then IN1. To show this, the highest priority input LED is the only input LED illuminated when two or more inputs are present.

NOTE: When communication between the adapter and the motor is interrupted or lost, the motor will continue to operate for approximately 1 minute before stopping.

FAULT TABLE

Fault LED Behavior	Definition	Potential Solutions
OFF	No Error	N/A
Flash 1 Time	No Response	Check Communication Connections (RS-485)
Flash 2 Times	Data Error	
Flash 3 Times	CRC Error	
Flash 4 Times	Low input voltage	Check Power Connection and verify that there is a 10 VDC input
Flash 5 Times	Motor Fault	Refer to your V-Green User Manual
Flash 6 Times	Command Error	

TROUBLESHOOTING GUIDE

Symptom	Possible Causes	Potential Solutions
Power is applied to the motor, but power LED is not illuminated on the automation adapter	Power supply cables are loose at the RS-485 connector	Check/tighten the connections
	Power supply cables are loose at CON 1 of the adapter	Check/tighten the connections
	Motor Dip Switches1 and 2 are not on	Turn motor Dip Switches 1 and 2 on
	Automation adapter is damaged	Replace automation adapter
Automation Adapter is presenting a digital input, but motor is not running	Possible connection loss	Check/tighten connections
	Automation adapter is damaged	Replace automation adapter
Fault LED Blinked	Check Fault Table	

SPECIFICATIONS

OVERALL RATINGS

Input (CON1)		10-14 VDC (30mA Typical)
Aux Inputs (IN1 - IN4)		9-30 VAC/VDC (2mA Typical, 22mA MAX)
- PWM Input (IN1 Only)		70-125Hz 5-97 % Duty Cycle
Ambient Conditions		
	Storage	-30°C to 80°C (-22°F to 176°F)
	Operating	0°C to 50°C (32°F to 122°F)
	Humidity	0-85% Non-Condensing

DISCLAIMER

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