

QUANTA *Basic*

USER GUIDE

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Section 1

Controller Description

<input type="radio"/>	<input type="checkbox"/> Program Momentary	<input type="checkbox"/> Program Maintained	<input type="radio"/>
	<input type="checkbox"/> Select Input		
	<input type="checkbox"/> Select ON Relays		
	<input type="checkbox"/> Select OFF Relays		
	<input type="checkbox"/> Select Blink Relays		
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PROGRAM	CONTINUE	CANCEL

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Objectives

In this Section you will learn about the structure and configuration of the QUANTA Basic Controller.

Overview

The QUANTA Basic is a microprocessor-based lighting controller. You can program the QUANTA Basic to control lighting relays in response to switch signals sensed by its inputs. The QUANTA Basic is UL approved and FCC certified for both commercial and residential applications.

1.1 Controller Architecture

The major components making up the controller are: (See Figure 1.1.)

- NEMA enclosure
- control transformer
- CPU I/O board
- additional I/O boards
- Basic keypad
- lighting relays

1.1.1 Enclosure – The enclosure is rated NEMA 1. It is divided into a line voltage section containing the line voltage side of the control transformer and lighting relays and a low voltage section containing the Class 2 side of the lighting relays, transformer secondary, and electronic components. Enclosures are available in 6 sizes to accommodate 8, 16, 24, 32, 40 and 48 inputs, outputs, and lighting relays. (See Table 1-1). The QUANTA Basic is shipped to the job-site as a complete assembly. (See Figure 1-1 which illustrates a QUANTA Basic 8.)

1.1.2 Transformer – A 40 VA multi-tap control transformer (120 or 277/24 VAC) provides the 24 VAC input to power the controller electronics.

1.1.3 CPU I/O Board – (See Figure 1.2.) The CPU board provides the controller's intelligence and memory and the first eight (8) of the controller inputs and outputs. Components of interest to the installer include:

- *Switch Inputs* – can accept input from either 2- or 3-wire momentary or maintained dry contact devices. Each input has two associated LEDs. The ON LED lights when a closure is sensed on the ON and COMMON terminals. The OFF LED lights when a closure is sensed on the OFF and COMMON terminals. The inputs are noise- and surge-resistant. A switch may be located up to 1500 feet from the controller, provided a minimum of 18 gauge wire is used.
- *Relay Outputs* – Each output switches its associated lighting relay ON and OFF. Each output has an associated LED (light emitting diode). The LED lights when the output switches the relay ON.
- *Override Switches* – Each relay output is equipped with an ON and an OFF override switch. These switches allow you to turn the associated lighting relay ON or OFF. (See Figure 1.2.)

1.1.4 Additional I/O Board(s) – Additional I/O boards composed of 8 inputs and 8 outputs can be added to the appropriate size enclosure to expand the controller capacity up to 48 switch inputs and 48 relay outputs. (See Figure 1.3, which illustrates a QUANTA Basic 32.)

1.1.5 Basic keypad – (See Figure 1.4.) The Basic keypad provides you with access to program controller data. It consists of a tactile response keypad. The Basic keypad is mounted to the CPU I/O board.

1.1.6 Lighting Relays – control the line voltage loads. The lighting relays can control 120 or 277 VAC loads rated up to 20 amps. The Class 2 low voltage control part of each relay is

terminated to a relay output on the controller CPU I/O board. (See Figure 1.2.) Each relay output controls only one lighting relay.

1.2 Controller Capacity

Each QUANTA Basic can control up to 48 programmable switched inputs and 48 relay outputs.

Model	# of Relays & I/O Points	Width	Height	Depth
Basic 8	8	18 inches	15 inches	4 inches
Basic 16	16	24 inches	18 inches	4 inches
Basic 24	24	24 inches	36 inches	4 inches
Basic 32	32	24 inches	36 inches	4 inches
Basic 40	40	24 inches	48 inches	6 inches
Basic 48	48	24 inches	48 inches	6 inches

Table 3.1 QUANTA Basic Configurations

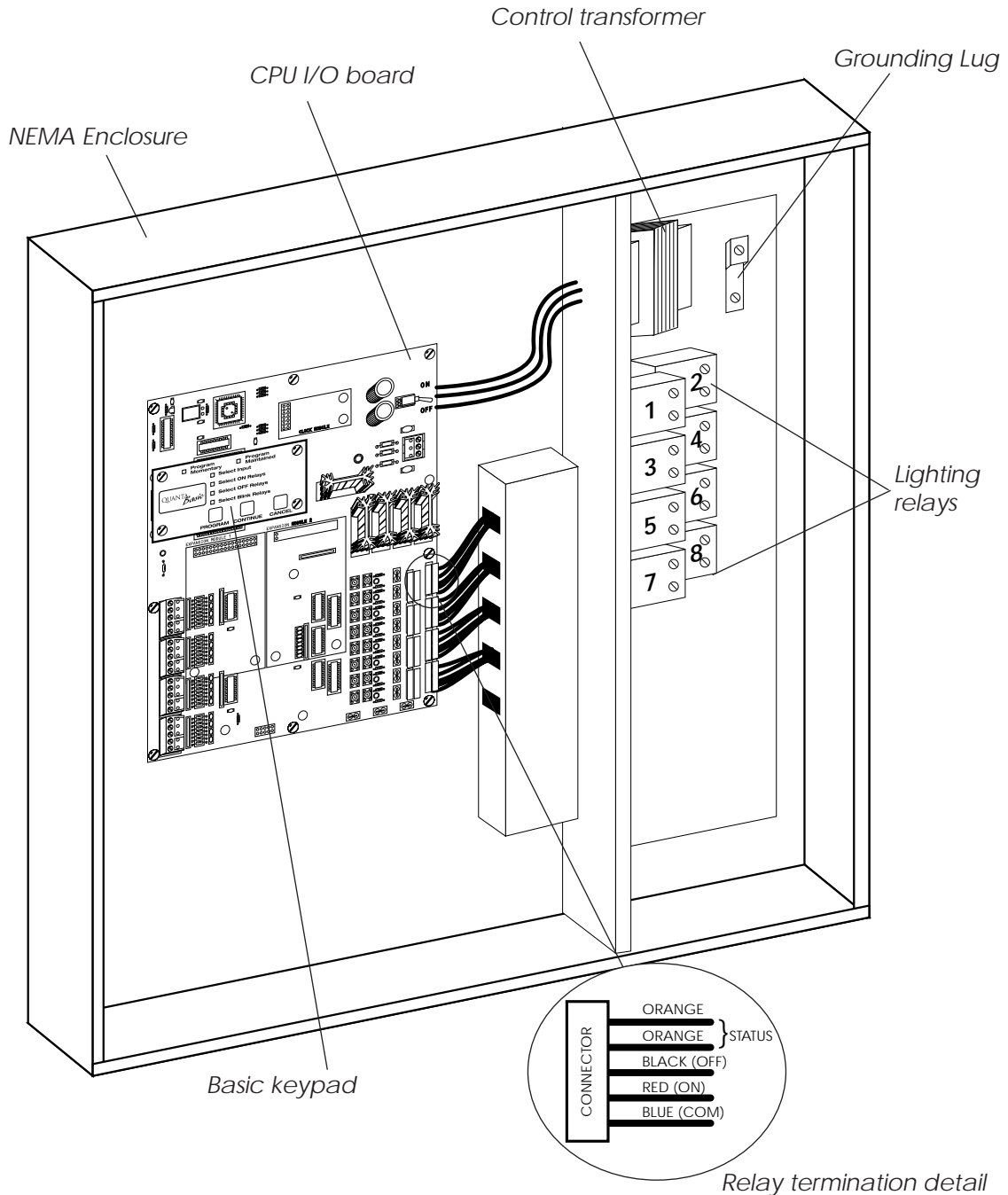


Figure 1.1 – QUANTA Basic 8 Controller

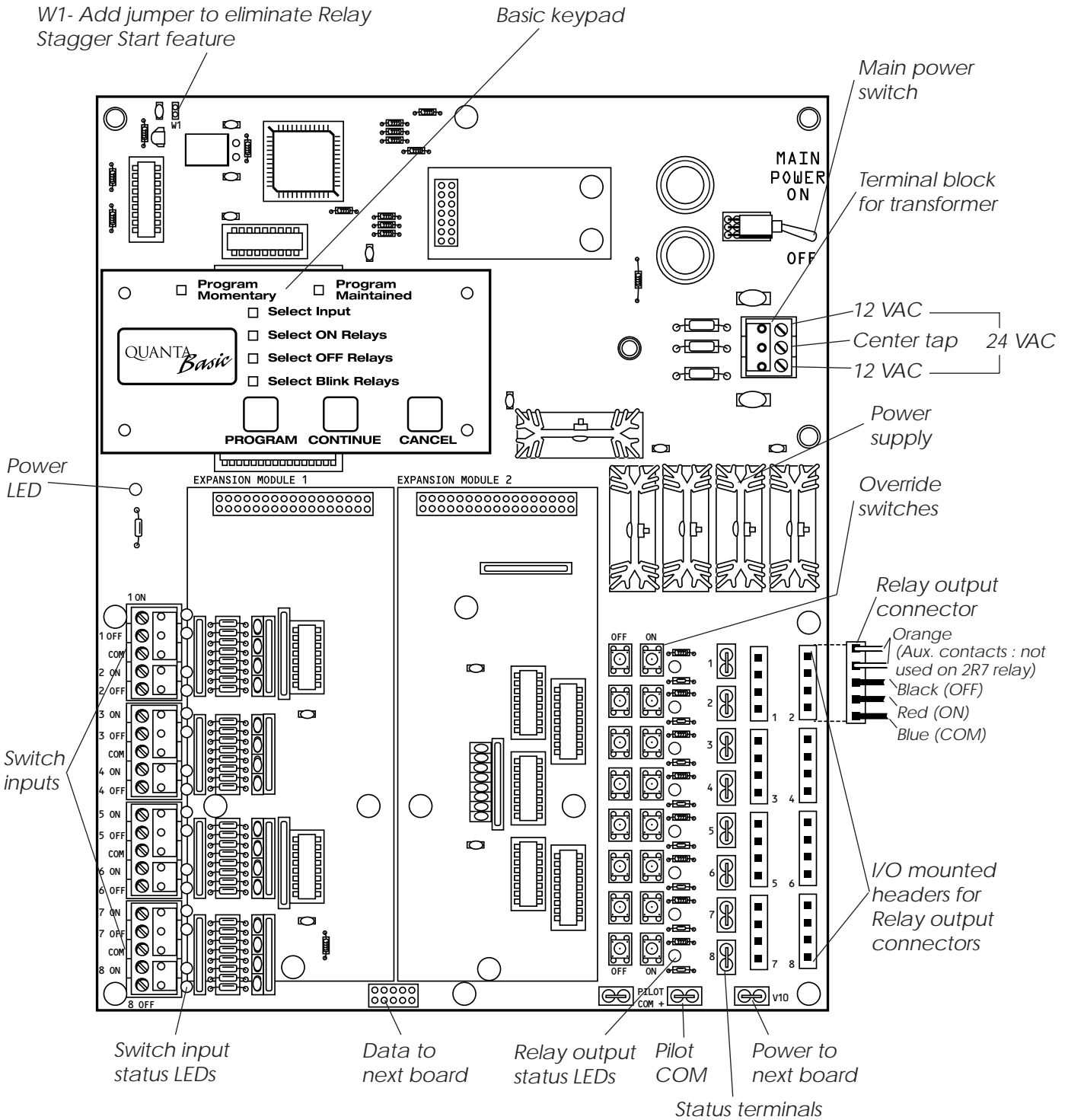


Figure 1.2 – CPU I/O Board

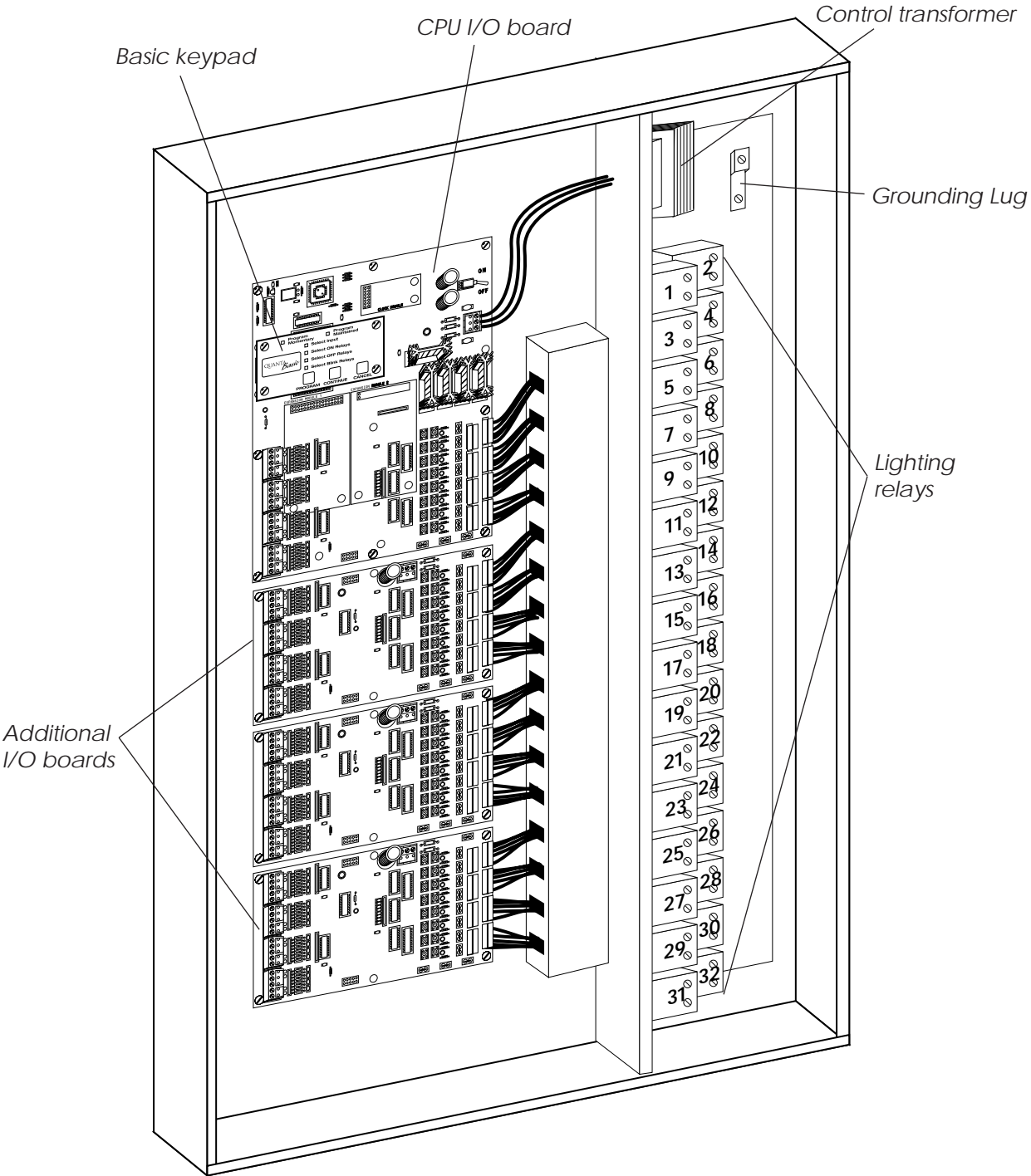


Figure 1.3 – QUANTA Basic 32

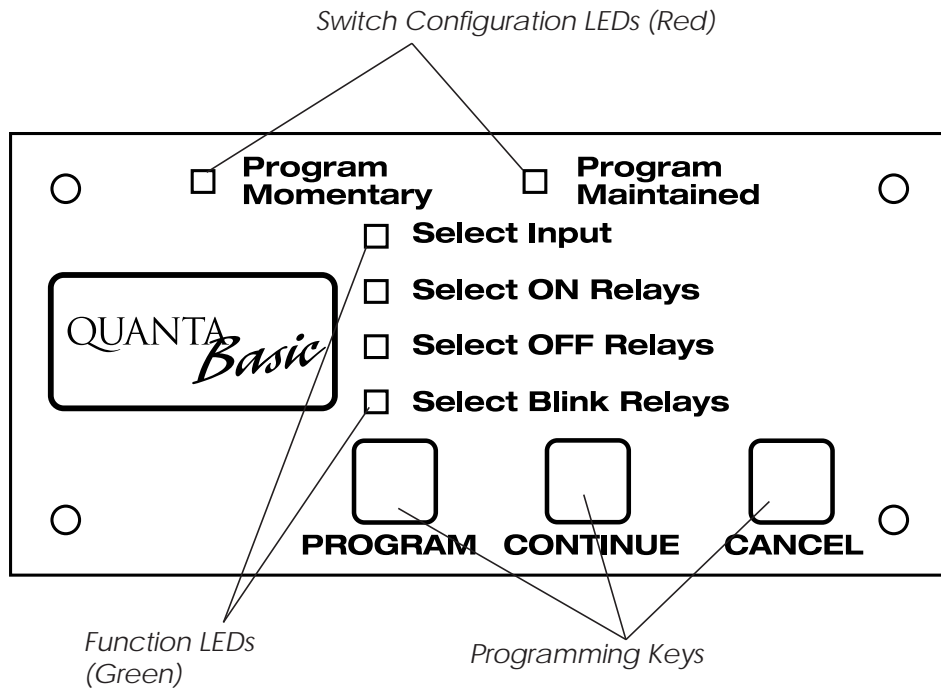



Figure 1.4 – QUANTA Basic keypad

Section 2

Installation/Programming

<input type="radio"/>	<input type="checkbox"/> Program Momentary	<input type="checkbox"/> Program Maintained	<input type="radio"/>
	<input type="checkbox"/> Select Input		
	<input type="checkbox"/> Select ON Relays		
	<input type="checkbox"/> Select OFF Relays		
	<input type="checkbox"/> Select Blink Relays		
<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	PROGRAM	CONTINUE	CANCEL

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Objectives

This sections shows you how to install and program the QUANTA Basic Controller.

Overview

This section covers the following topics:

- Pre-installation checks
- Mounting the controller
- Wiring the controller
- Pre-power-up checks
- Power-up and checkout
- Troubleshooting
- Programming

2.1 Pre-Installation Checks

Do the following before beginning the installation:

1. Verify that you have received the proper equipment. Check the packing slip against the materials you ordered and verify that the material is appropriate for the project. Check to ensure that the voltages of the controller(s) transformers match the available power. Report any discrepancies or visible damage at once.
2. Review submittal, programming worksheets, electrical prints, and other project documentation.
3. Ensure that you have a digital multi-meter.

2.2 Mounting the Controller

Consider the following when selecting a site for the QUANTA Basic.

2.2.1 Location – Typically, the QUANTA Basic controller is mounted near the lighting panel containing the circuits to be controlled by the lighting relays. The enclosure is manufactured with pre-drilled mounting holes located near the four corners of the rear wall of the enclosure. Secure the enclosure to the mounting surface with hardware appropriate for the application.

2.2.2 Environmental Considerations

The QUANTA Basic is designed to operate in temperatures between 0 and 50 degrees C (32°-112°F.) and 10%-90% humidity non-condensing.

CAUTION

THE QUANTA BASIC SERIES CONTROLLER IS HOUSED IN A NEMA 1 ENCLOSURE. DO NOT INSTALL IN SITUATIONS REQUIRING SPECIAL PURPOSE ENCLOSURES OR IN AREAS WHERE THE CONTROLLER WILL BE SUBJECT TO CONDITIONS OUTSIDE ITS DESIGNED OPERATING RANGES.

2.2.3 Distance From Control Devices

Switches and other control devices can be located up to 1500 feet from the QUANTA Basic controller using 18 gauge wire.

2.3 Wiring the Controller

Perform the following procedures to wire the line and control circuits of the QUANTA Basic. Do **NOT** apply power to any circuits until instructed to do so.

2.3.1 Wire the Control Transformer

Run a dedicated 120 or 277 VAC circuit, including grounding conductor, and terminate it to the primary of QUANTA Basic control transformer. (See Figure 2.1.)

2.3.2 Connect Line and Load – Connect line and load wires of the line voltage circuits to the Lighting Relays.

2.3.3 Wire Switch Inputs – Wire the Class 2 Switch Circuits. (See Figure 2.2.)

1. Run the required wiring between the controller and the field-installed switches. Consult project documentation to determine the type and quantity of required switch circuits. Check each switch run to ensure that there are no shorts between conductors or to ground. Also verify that there are no opens.
2. Make the connections at the switch end.
3. Make the connections to the controller switch input terminals.

2.3.4 Set Relay Response

If you want all relays to respond to a signal instantaneously rather than to stagger ON/OFF one at a time, add a jumper to W1 on the CPU I/O board. (See Figure 2.1.)

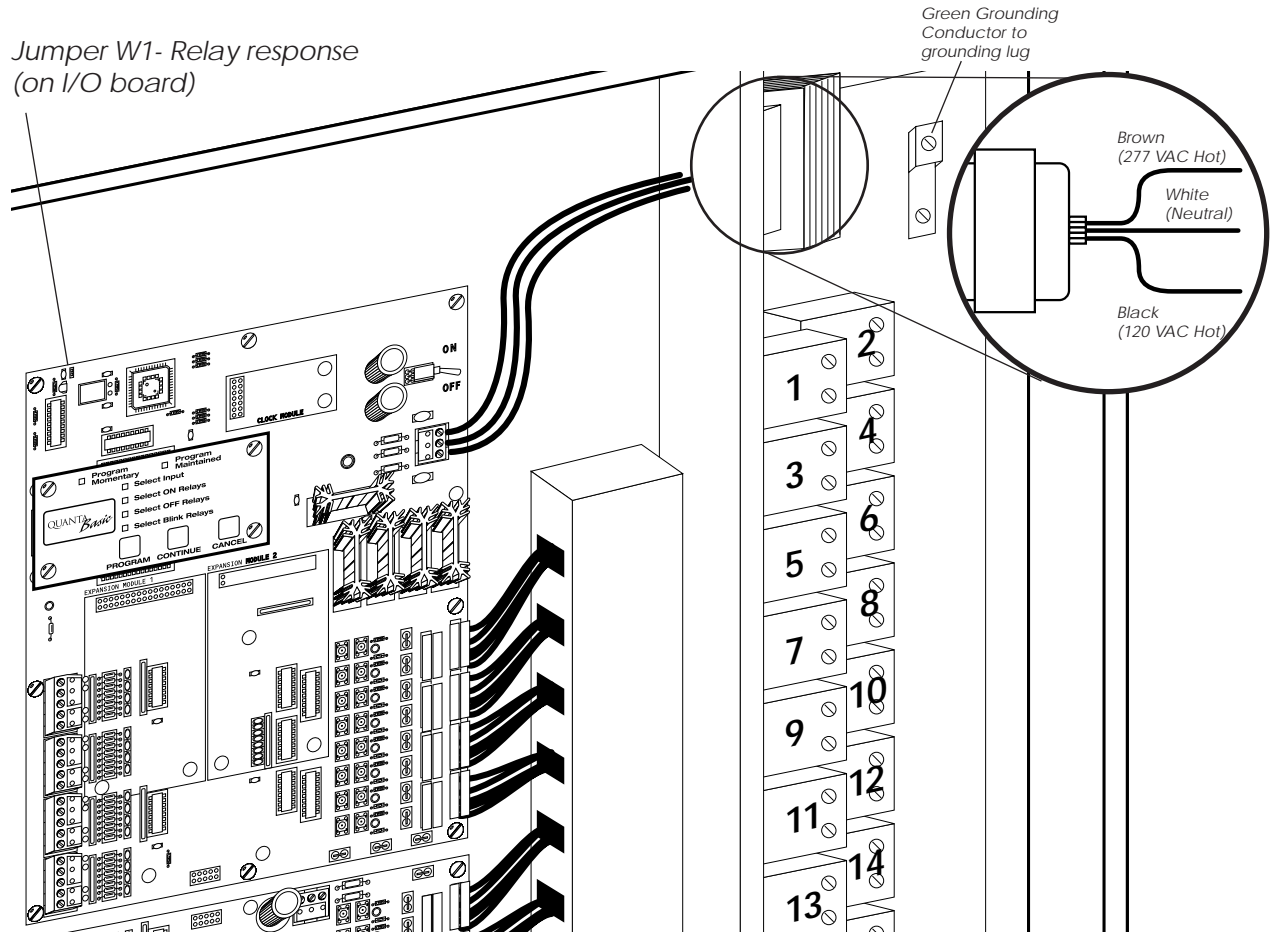


Figure 2.1 – Terminate Line to Control Transformer Primary

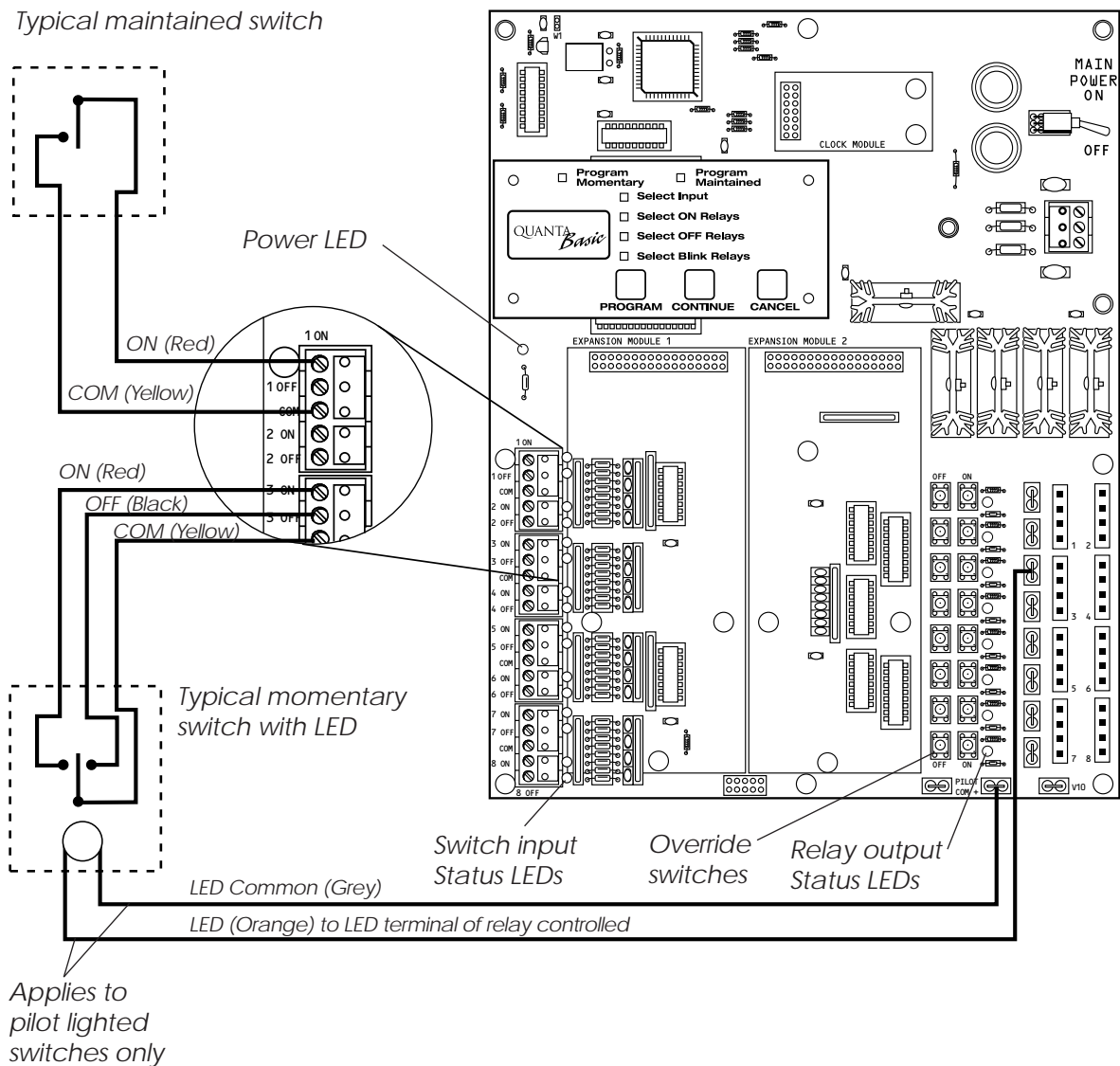


Figure 2.2 – Wire Class 2 Switch Circuits

2.4 Pre-Power Checks

Complete the following checks BEFORE applying power to the QUANTA Basic controller.

2.4.1 Check Controller Power Input

1. Verify that the controller power switch is OFF.
2. After verifying that control transformer source voltage is 120 or 277 VAC (whichever is appropriate), power-up the circuit.
3. Verify correct line voltage on the primary of the transformer.

2.4.2 Verify Controller's Supply Voltage

Verify that there is 24 VAC on control transformer secondary and 12 VAC between each leg and the center tap. (See Figure 1.2.)

2.4.3 Double-Check Connections

1. Verify integrity of I/O connections.
2. Verify integrity of all internal and external wire/cabling.

2.5 Power-Up and Check-Out

Complete the following procedures to power-up and checkout the QUANTA Basic controller.

2.5.1 Power-Up the Controller

1. Turn the power switch located on the CPU I/O board ON. (See Figure 1.2.)
2. Verify that the controller keypad screen displays the default time and date.
3. Verify that the power light on each I/O board is lit. (See Figure 1.2.)

2.5.2 Verify the Lighting Relays

Switch each relay ON and OFF pushing the override switches located on the CPU I/O and the other I/O boards. There are separate ON and OFF switches for each lighting relay. (See Figure 2.2.) Verify that the relay status LED goes ON and OFF and that the relay itself changes state. Verify that the relay controls the proper circuit.

2.5.3 Program the Controller (See Figure 2.3)

2.5.4 Verify the Switching Function

1. Operate each switch.
2. Verify that each switch controls the correct lighting relays in the manner you have programmed.

2.6 Troubleshooting

In the event of trouble, use the following procedures to identify the problem.

2.6.1 Controller Will Not Power-Up

1. Verify that there is 120/277 VAC on the primary and 24 VAC on the secondary of the control transformer.
2. Verify that the power LED on the CPU I/O board is lit.
3. If there is proper primary and secondary voltage on the transformer but the power LED is not lit. The controller CPU I/O board may be defective.

2.6.2 Lighting Relay(s) Will Not Function

1. Verify that there is 24 VAC on Control Transformer secondary.
2. Make sure that lighting control wiring is landed properly on the relay output of the CPU I/O or other I/O boards. (Blue is common, red is ON, black is OFF, orange is status.) (See Figure 1.1.)
3. Override the affected relay ON/OFF with the override switches located on the I/O board. (See Figure 1.2.)
4. If the relay doesn't respond, replace the relay.

2.6.3 Switch Input Will Not Function –

1. Check your programming.
2. Verify proper connections at field and controller end.
3. Verify that there is only one maintained switch connected per input.
4. Unhook field connections from affected input. Connect test switch of same type as field switch.
5. Work the test switch. Observe whether the switch input status LED lights when it senses a switch closure.
6. If the switch input status LED lights and the relays function properly, there is probably a problem with the field wiring. If not, the I/O board may be affected.

2.6.4 Entire I/O Board(s) Doesn't Work

1. Check to ensure that the data and power cables linking the I/O boards are connected properly and are free of opens and shorts.
2. Check to ensure that the power LED on the I/O board is lit.
3. If checks 1 and 2 are normal, you may have a defective CPU or I/O board.

Step 1: POWER UP– Turn the Power **ON**. The red power indicator LED will light.

Step 2: SELECT THE SWITCH TYPE– On the keypad, press **Program**, once to program a Momentary switch, twice to program a Maintained switch. The appropriate LED will light.

Step 3: Press **Continue** on the keypad. The green “Select Input” LED will light.

Step 4: PROGRAM AN INPUT– Using an insulated wire, momentarily jumper between COM and ON of the input to be programmed. All relays will go to the OFF state. The keypad green LED will direct you to “Select ON Relays”.

Step 5: SELECT THE ON RELAYS– Press the manual override “ON” of each relay you want this input switch to turn ON (the red relay status LED will turn ON).

Step 6: Press **Continue**. All of the relays will go to the ON state. The keypad green LED will direct you to “Select OFF Relays”.

Step 7: SELECT THE OFF RELAYS– Press the manual override “OFF” push-button of each relay you want this input switch to turn OFF (the red relay status LED will turn OFF).

Step 8: Press **Continue** on the keypad twice to finish programming this switch. Repeat Steps 2 through 8 to program additional switches and relays.

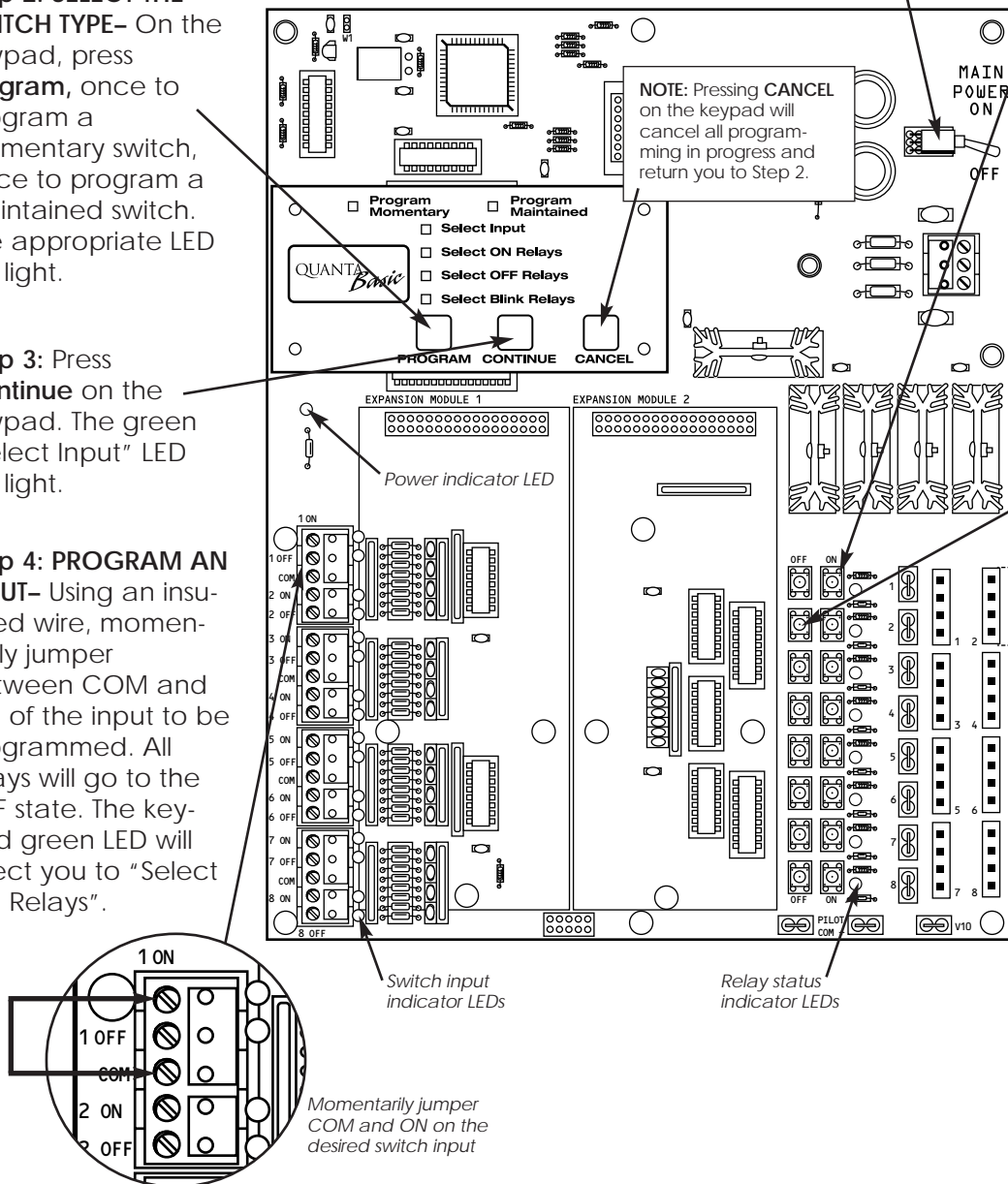


Figure 2.3 – Quanta Basic Programming Procedure